National Radio Astronomy Observatory

Annual Report 2024

NRAO Facts and Figures 2024

498 Employees

...with expertise in science, computing, engineering, business, administration, and operations.

78 Media Products

...sharing incredible results with news outlets around the world.

1066 Refereed Publications

...showcasing groundbreaking results in science, engineering, and computing.

Over 25,000 hours science observations

...utilizing the leading world-class facilities in radio astronomy.

Front Cover: A VLA antenna in New Mexico at sunset. Photo by Brian R. Kent (U.S. NSF / AUI / NSF NRAO)
Inset: ALMA under the Milky Way southern skies. Photo by Bettymaya Foott (U.S. NSF / AUI / NSF NRAO)

TABLE OF CONTENTS

Annual Report
2024

The NSF National Radio Astronomy Observatory and NSF Green Bank Observatory are facilities of the U.S. National Science Foundation operated under cooperative agreement by Associated Universities, Inc.


NO PARKING
WITHIN 50 FT

FOREWORD FROM THE DIRECTOR

The National Radio Astronomy Observatory (NSF NRAO) continues to push the boundaries of astronomical discovery with its world-class radio telescope facilities. The NSF Karl G. Jansky Very Large Array (NSF VLA), the Very Long Baseline Array (NSF VLBA), and the Green Bank Observatory (NSF GBO) have delivered new insights in time-domain astronomy, star formation, astrochemistry, extragalactic studies, and planetary science. The Atacama Large Millimeter/submillimeter Array (ALMA) continues to drive groundbreaking research on planetary disks, astrochemistry, star formation, and black holes in galaxies near and far.

In 2024, the Observatory advanced several strategic initiatives that strengthen our scientific impact and enhance user access. The Science Ready Data Products initiative is enabling a wider community of researchers to engage with NRAO data, while the Central Development Lab continues to lead in instrumentation and technology development. From improving sensitivity and resolution to exploring new capabilities in radar astronomy and advanced spectrum monitoring, these efforts are expanding the frontier of what our telescopes and users can achieve.

Major projects also continue to make remarkable progress. The ALMA Wideband Sensitivity Upgrade is moving forward with international partners, and the prototype next generation Very Large Array (ngVLA) antenna started construction in New Mexico with European industrial colleagues. The VLA Sky Survey (VLASS) is advancing our understanding of AGN and transient phenomena across the radio sky.

At the heart of NRAO's mission are our people and users. We are proud to lead the worldwide radio astronomy community through programs such as the Jansky Fellowships, Reber Fellows, student research opportunities, Student Observing Support funding, new radar initiatives, and Spectrum Management activities. These efforts are building the foundation for the next generation of astronomers and engineers, while broadening participation in the field.

The NRAO staff remain dedicated to operating, maintaining, and advancing our world-class radio telescopes, supported by the U.S. National Science Foundation, Associated Universities, Inc., the scientific community, and industry partners. This Annual Report highlights a year of outstanding progress, reflecting the dedication and vision of the entire NRAO community.

Biography: ***Anthony (Tony) J. Beasley*** *was appointed as NRAO Director by the AUI Board of Trustees effective 21 May 2012. After receiving his Bachelor's in Physics in 1986 and his Doctorate in Astrophysics in 1991 from the University of Sydney, Beasley joined NRAO as a Postdoctoral Fellow in 1991. He was appointed as a Deputy Assistant Director in 1997, and served as Assistant Director from 1998 to 2000. In 2000, he left NRAO to become Project Manager for the Combined Array for Research in Millimeter-wave Astronomy. In 2004, he returned to NRAO as an Assistant Director and Project Manager for the Atacama Large Millimeter/submillimeter Array in Chile. Prior to his appointment as NRAO Director, Beasley served as the Chief Operating Officer and Project Manager of the NSF-funded National Ecological Observatory Network (NEON), a continental-scale ecological observatory designed to detect ecological change and enable forecasting of its impacts.*

VLA antenna on the Plains of San Agustin, New Mexico. Photo by Brian R. Kent (US NSF / AUI / NSF NRAO).

THE NATIONAL RADIO ASTRONOMY OBSERVATORY:
WORLD CLASS FACILITIES FOR RADIO ASTRONOMY

Created in 1956 by the US NSF and AUI, the NRAO designs, builds, and operates world class astronomical telescopes, instrumentation, and research facilities at radio wavelengths. In 2024, the NRAO operated a complementary suite of four world-class telescopes, each the world leader in its frequency domain: the international Atacama Large Millimeter/submillimeter Array (ALMA), the Karl G. Jansky Very Large Array (VLA), the Robert C. Byrd Green Bank Telescope (GBT), and the Very Long Baseline Array (VLBA).

ALMA maintains a strong community interest as the largest ground-based global astronomy endeavor in history. Composed of 66 high-precision antennas on an excellent 5000+ meter elevation site in northern Chile, ALMA is delivering orders of magnitude improvements in millimeter-wave sensitivity, frequency coverage, resolution, imaging, and spectral capabilities. ALMA's capabilities span wavelengths from 9.6 to 0.3 mm (31–950 GHz), a key part of the electromagnetic spectrum for observing the first stars and galaxies, directly imaging planet formation, and studying supermassive black holes.

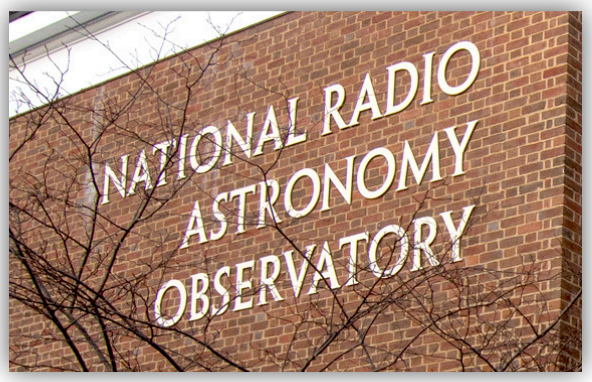
Photos by Jeff Hellerman, Bettymaya Foott, Brian R. Kent, and Jay Young (US NSF / AUI / NSF NRAO / ALMA / NSF GBO)

The Karl G. Jansky VLA in New Mexico has scientific capabilities at the adjacent centimeter-wavelength range that are complementary to ALMA. The current VLA capabilities exceed the original VLA design by one to four orders of magnitude. These new capabilities were delivered on schedule and on budget via the Expanded Very Large Array project, and the array is meeting all of the project's technical specifications and scientific objectives. The upgraded VLA is the world's most capable and versatile centimeter-wavelength imaging array and is yielding dramatic new science results that range from Galactic protostellar clouds to the molecular gas in early galaxies.

The Robert C. Byrd GBT is the world's premiere single-dish radio telescope operating at meter to millimeter wavelengths. Its enormous 100-meter diameter collecting area, its unblocked aperture, and its excellent surface accuracy provide unprecedented sensitivity across the telescope's

full 0.1 – 116 GHz (3.0m – 2.6mm) operating range. The single focal plane is ideal for rapid, wide-field imaging systems – cameras. Because the GBT has access to 85% of the celestial sphere, it serves as the wide-field imaging complement to ALMA and the EVLA. Its operation is highly efficient, and it is used for observations about 6500 hours every year, with 2000-3000 hours per year available to high frequency science.

The VLBA is the premier dedicated Very Long Baseline Interferometer (VLBI) array. Astrometry with the VLBA has reached the precision of a few micro-arcseconds, supporting distance and proper motion measurements of astronomical objects in the solar neighborhood, across the Milky Way, within the Local Group, and moving with the Hubble flow. When used in conjunction with the phased VLA and GBT, the resultant High Sensitivity Array (HSA) vastly enhances the sensitivity of VLBI observations and broadens the range of novel scientific research.



NRAO Headquarters in Charlottesville, Virginia is home to the North American ALMA Science Center (NAASC), Business & Administration, Human Resources, Education & Public Outreach, Program Management, and the Director's Office.

The Central Development Laboratory (CDL) conducts the technological research and development that improves operational NRAO telescopes and helps realize next generation facilities. CDL oversees a science-driven research and development program that supports the community's highest priority goals.

NRAO telescopes, operated individually and synergistically throughout 2024 with optical, infrared, and X-ray telescopes to open new frontiers across a broad range of modern astrophysics: proto-planetary disks and extrasolar planet formation; astrochemistry; the early phases of star formation; fundamental physics; molecular gas in early galaxies; the environments of supermassive black holes; cosmology; and much more.

In addition to research, the NRAO broadly impacts science and society via its education and public outreach programs. A program of compelling science, technology, engineering, art, and mathematics (STEAM) education programs are introducing students every year to the excitement and opportunities of careers in science, computing, and engineering.

After more than six decades of continual improvement under AUI management, the NRAO comprises the nation's core competency in radio astronomy, an invaluable resource for the astronomical research community in the United States and around the world.

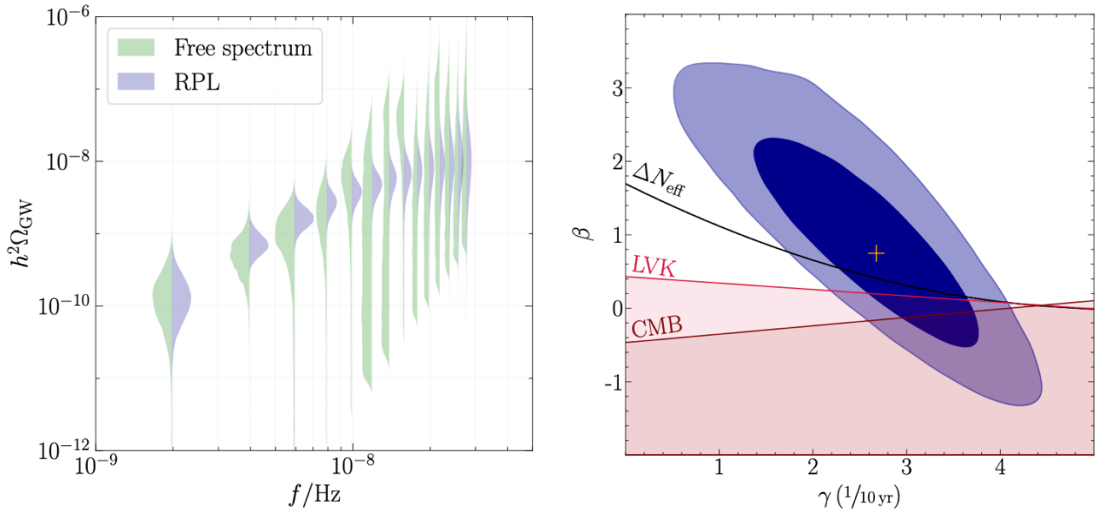
SCIENCE HIGHLIGHTS

The NRAO facilities remain the global leaders in radio astronomy for studies of the cosmos at centimeter through submillimeter wavelengths. These facilities play a crucial role in the modern era of multi-messenger astronomy, working in concert with the facilities such as JWST, Chandra, and non-electromagnetic observatories, to characterize cosmic phenomena ranging from gravitational wave sources, to asteroids, to the formation of planets, to the first galaxies in the Universe.

The following are highlights of some of the major science discoveries from the last year. These highlights include results from ongoing large programs at the NRAO facilities, and from the major NRAO surveys, such as the VLA Sky Survey (VLASS). A particularly fruitful synergy has been established, in which the unique high resolution and sensitivity of the NRAO facilities provide the ideal complement to new areas of research enabled by the JWST.

Time Domain Studies and Fundamental Physics

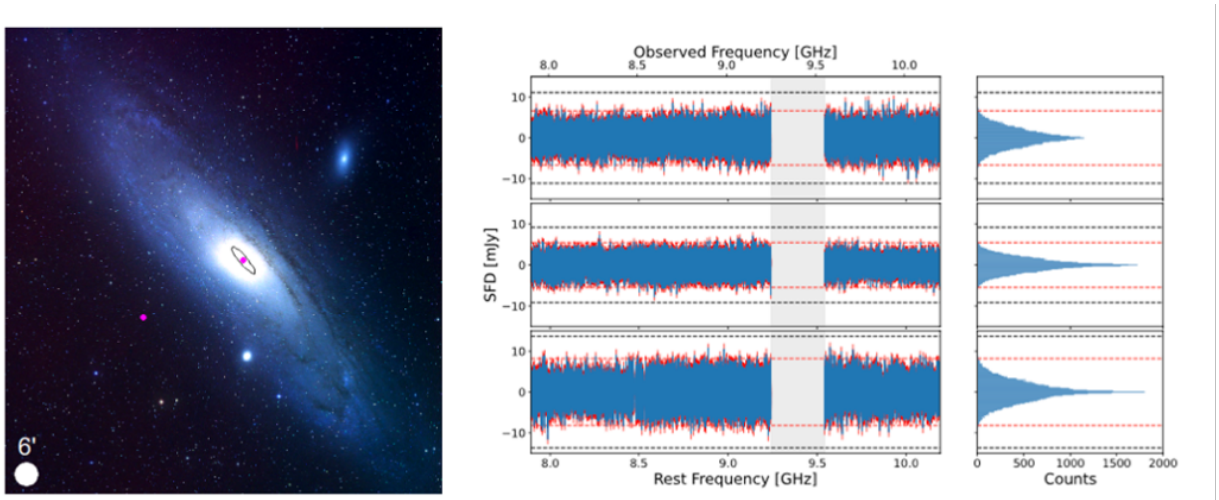
The GBT, with the support of the VLA, has made core contributions to the North American Nanohertz Observatory for Gravitational Waves (NANOGrav) strong evidence for the stochastic gravitational wave background from merging supermassive black holes throughout the cosmos. This discovery represents a watershed event in modern physics. The 15-year data have now been used to set a more refined limit on the power spectrum of the gravitational waves, beyond a simple amplitude and power-law spectral index, by allowing for a running logarithmic change in the spectral index with frequency. The results show no evidence that the spectral index changes with frequency. The results are used to constrain models of primordial gravitational waves from cosmic inflation during the first 10^{-32} s of the Universe.



Left: NANOgrav power-spectrum of the gravitational wave background for a spectrally free model (independent frequency bins), and a constrained running power-law spectral index. Right: NANOgrav constraints (blue) with other cosmological measurements, on the power-law spectral index and running of the power-law index, for primordial gravitational waves from cosmic inflation (NANOGrav consortium 2024 arXiv:2408.10166).

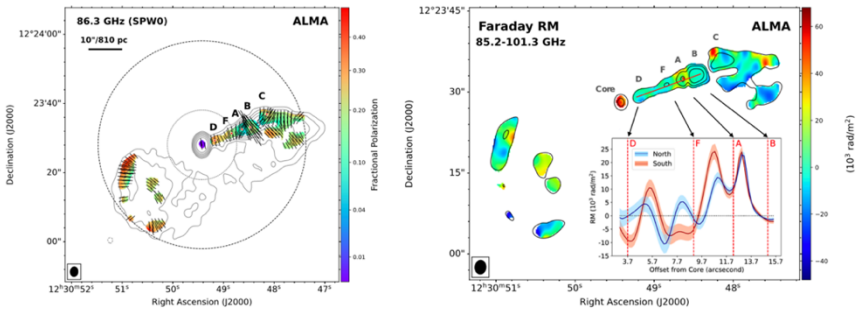
Plasma Bubbles and the Engine of Fast Radio Bursts. Illustration by Sophia Dagnello (US NSF / AUI / NSF NRAO).

The GBT has performed its first searches for quantum chromodynamic (QCD) axions that represent a primary candidate for dark matter. QCD axions might be converted into photons in regions of very strong magnetic field, such as around strongly magnetized neutron stars. The interaction between an axion miniclump and a neutron star might lead to a very narrow band and transient radio signal. The GBT is an ideal facility for such a search, given its sensitivity and spectral capabilities. The VErsatile GBT Astronomical Spectrometer (VEGAS) was used at X-band at the GBT to search for such lines from the center of the Andromeda galaxy, plus a control region well off the galaxy. Extensive methodology was developed to avoid spurious signals. The measurements were sensitive to axions with masses between 33 and 42 μeV. The null result from the short observations was consistent with the current model for axion dark matter, although the constraints are not strong given the limited observing time. However, the noise limited spectra are a key technical demonstration, and a guide to future experiments over wide areas in the Milky Way or longer observations of Andromeda, possibly with a dedicated radio telescope.



Left: Image showing the regions searched for Axionic dark matter in Andromeda (red dots). Right: noise limited GBT spectra for different time records, cleaned of RFI, at 8 GHz (Walters et al. arXiv:2407:13060).

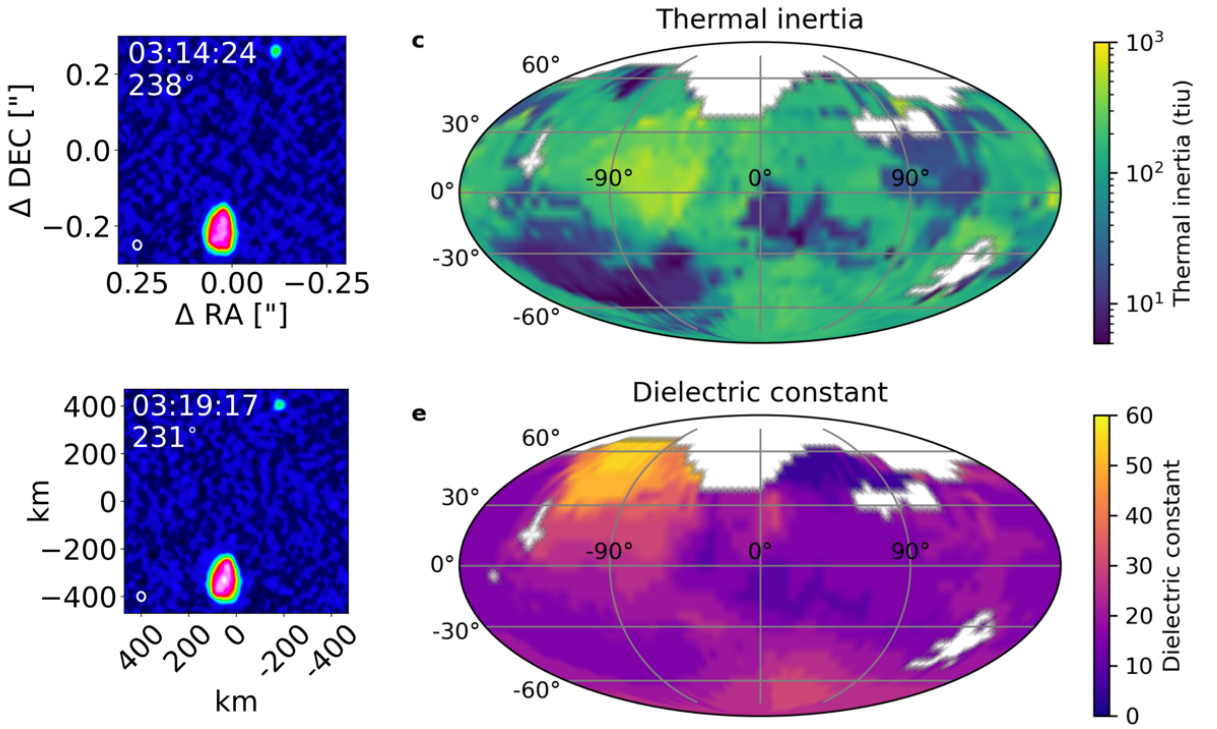
ALMA has mapped the polarized emission and Faraday rotation measures across the radio jet in M87 at 2" resolution at 90 GHz. The core has a large RM of 4.5×10^4 rad m^{-2}, and time variability suggests the magnetized plasma causing the rotation measures may be due to an ionized wind from the Active Galactic Nuclei (AGN) within a few thousand gravitational radii of the black hole. The RM along the jet suggest a helical configuration for the external magnetic field on kpc-scales.



Left: Total intensity (contours) and fractional polarization (color), plus E-field vectors for M87 from ALMA at 86GHz. Right: Faraday rotation measures across the jet and core (Peng et al. 2024, arXiv:2409.12028).

Solar System and Planetary Science

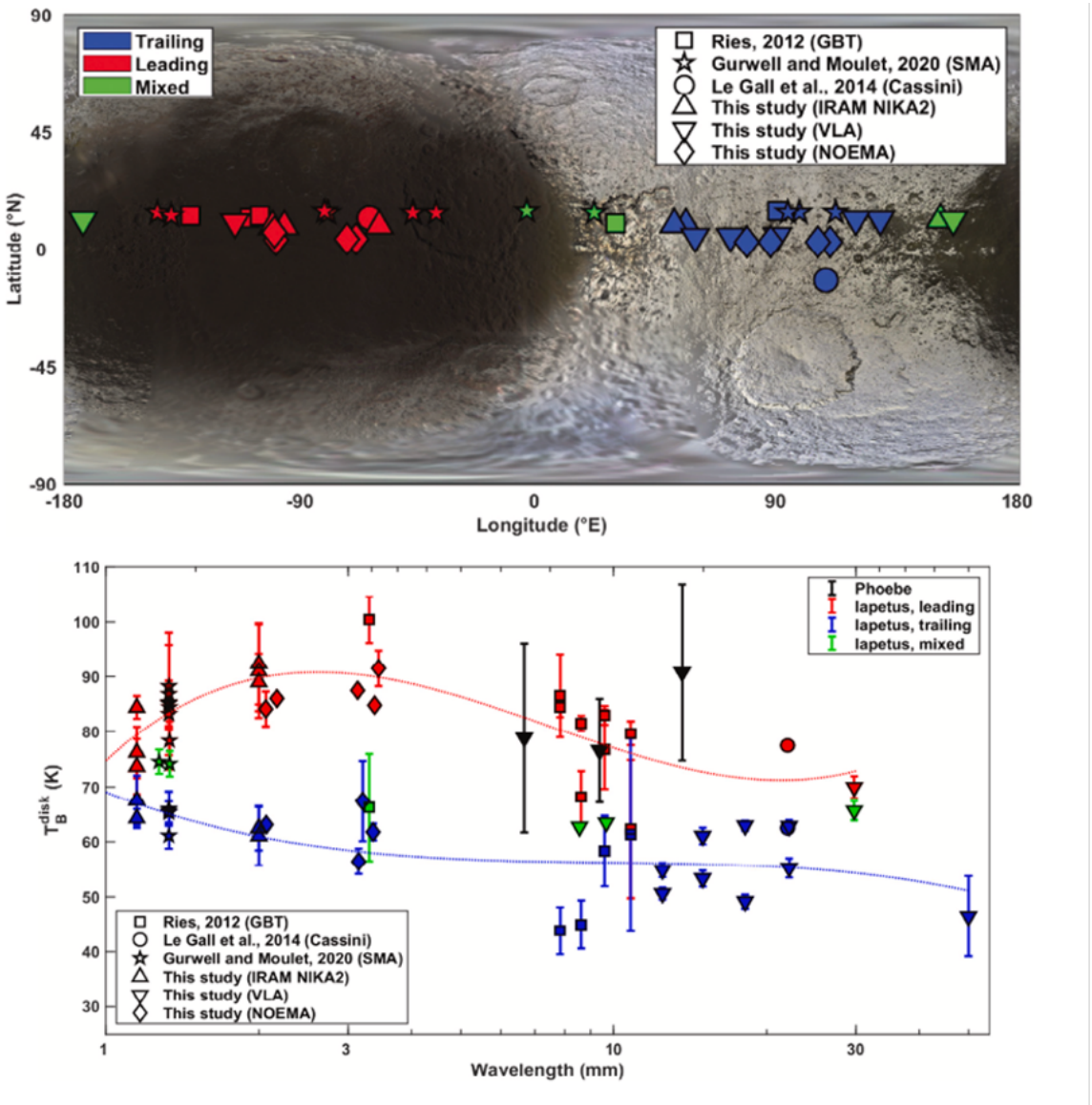
ALMA and the VLA have been used to determine the abundance and distribution of metals on the surfaces of the asteroid Kalliope and its moon Linus, with observations at 1.3, 9, and 20 mm down to 25 mas resolution (30 km on the surface). Kalliope is an M-type asteroid, with a high concentration of metals, such as iron. The mean thermal inertia of Kalliope is about 116 J m^{-2} $s^{-0.5}$ K^{-1}, and the surface radio emissivity about 0.6. Kalliope's millimeter wavelength emission is suppressed compared to its centimeter wavelength emission, and it is also depolarized. The radio emissivity for Linus is higher, indicating a less metal-rich surface composition. Spatial structure in the emissivity is observed on Kalliope, with a region in the northern hemisphere with a high dielectric constant, suggesting enhanced metal content. These results are consistent with a scenario in which Linus formed from reaggregated ejecta from an impact onto a differentiated Kalliope (differentiation meaning elemental separation during a melting phase driven by radioactive elements), leaving Kalliope with a higher and more structured surface metal distribution than Linus. The low emissivity and lack of polarization suggest a regolith composition where iron is in the form of metallic grains and constitutes ~25% of the surface composition.



Left: images of one rotational/orbital phase of the asteroid Kalliope and its moon Linus at 1.3mm with ALMA at 30 km (25 mas) resolution, with units of arcsec (upper) and km (lower). Right: derived physical surface quantities for the regolith in a full surface projection (de Kleer et al. 2024, arXiv:2409:12364).

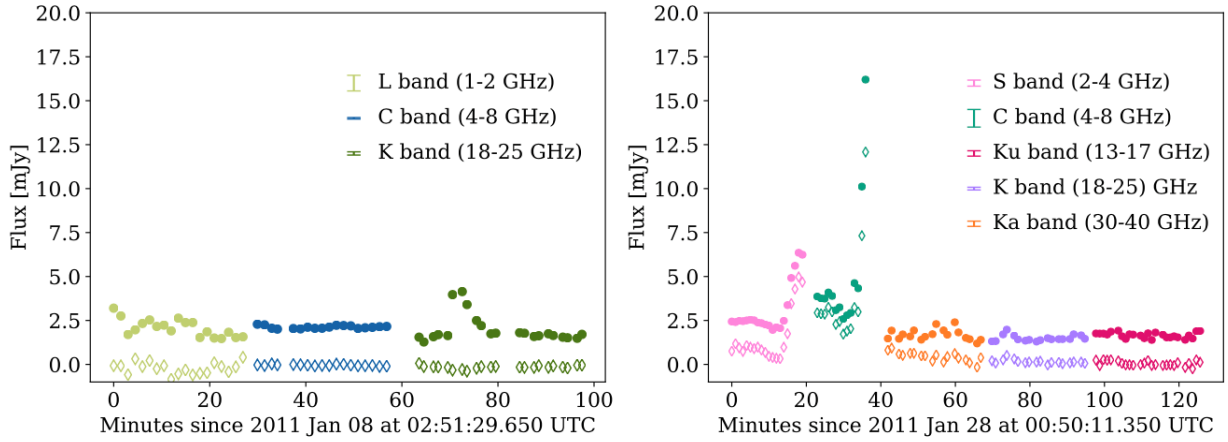
The VLA and IRAM telescopes have been used to study the centimeter and millimeter brightness distribution across Saturn's synchronous moon Iapetus. In the optical, Iapetus has the most dramatic difference of albedo for two hemispheres of any object in the Solar system, with the albedo on the leading hemisphere (direction of orbit), much lower than on the trailing hemisphere. This optical albedo difference is thought to be due to an accumulation of dark material on the leading hemisphere, while the trailing hemisphere remains mostly icy and bright. The centimeter and millimeter observations are sensitive to thermal emission from the subsurface, but they also show a major difference between leading and trailing hemispheres in radio emissivity, or

brightness temperature. The results imply complex variations in structure and/or composition with depth on the leading side, while the trailing side emissivity is low at all observed frequencies, indicating efficient scattering processes on subsurface structures, as observed on Saturn's other icy moons. These radio observations also involve Saturn's retrograde moon Phoebe. Iapetus' prograde orbit is within the inner edge of the large but faint outermost 'Phoebe ring' around Saturn, thought to be formed by material ejected by meteoric impacts on the surface of Phoebe. The radio observations show a high radio emissivity for the surface material of Phoebe, similar to the leading side of Iapetus, supporting the theory that Phoebe is the source of the optically dark material accumulated on the leading hemisphere of Iapetus.



Top: optical image of Saturn's synchronous moon Iapetus indicating the measurement regions of radio brightness temperature. Bottom: the brightness temperature spectrum in these regions (Bonnefoy et al. 2024, Icarus 411, 115950), showing the large difference in radio emissivity of the leading (red) vs trailing (blue) hemispheres.

Magnetic activity on M-dwarf stars has become topical in the search for life in other planetary systems, since many M-dwarfs host potentially habitable planets, but strong stellar storms may inhibit development of life. The VLA and ALMA have observed the nearby (2.7 pc) binary M-dwarf system BL and UV Ceti, from 1 GHz to 100 GHz. The stars have similar masses, spectral types, and rapid rotation rates, but UV Ceti has much stronger magnetic activity, showing radio flares similar to Solar coronal flares, auroral-like emission analogous to planetary magnetospheres, and slowly varying persistent emission. These phenomena suggest both small-scale field reconnection activity, and larger scale auroral currents in a global magnetic field. The persistent emission mechanism may parallel that seen for gyrosynchrotron emission from Jupiter's radiation belts, corresponding to electrons trapped in a large scale radiation belt associated with the star.

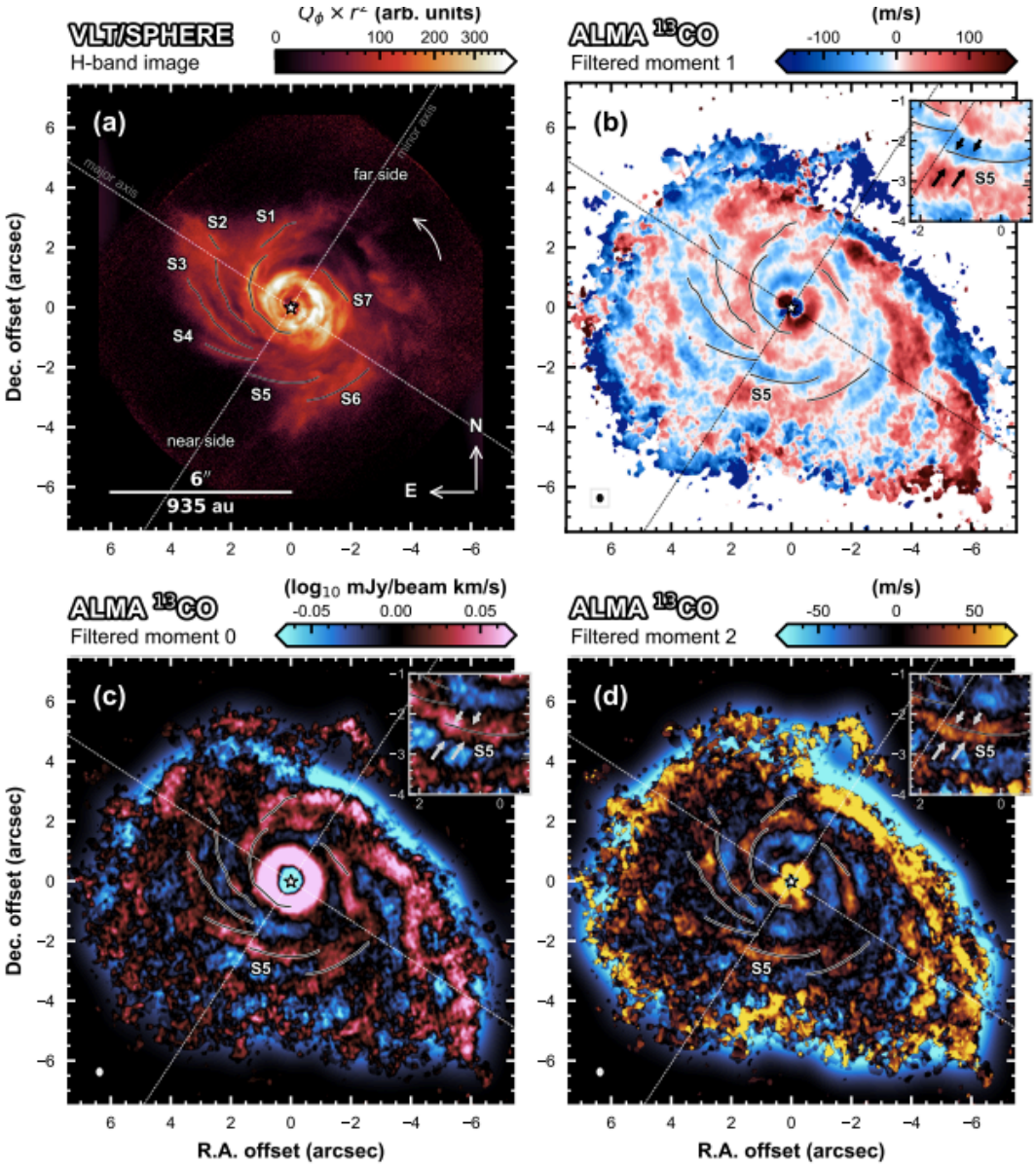


VLA light curves for UV Ceti on two days. Stokes I is shown with filled circles and Stokes V with open diamonds (Plant et al. 2024, 2406.17280). Flaring, time varying, and persistent emission can be seen.

The sun sets on the Very Large Array in New Mexico. Photo by Jeff Hellerman (US NSF / AUI / NSF NRAO).

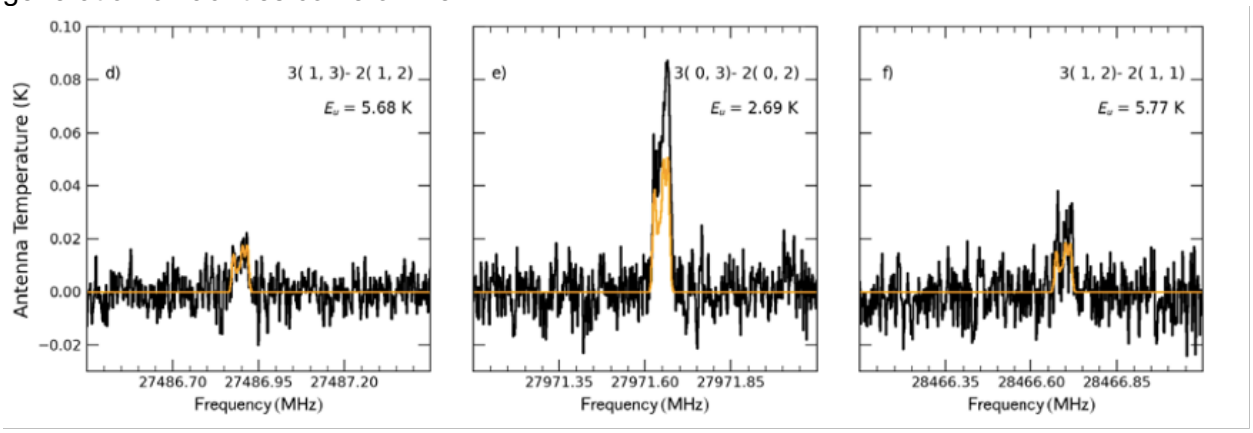
Star and Planet Formation and Evolution, and the Search for Life

Most models of planet formation entail growth from accretion from small pebbles to rocks to planetesimals in a dusty disk. But the possibility exists for planets to form from large collapsing clouds in a disk with spiral arms, if the disk is more than 10% the stellar mass and gravitationally unstable to non-Keplerian dynamics. ALMA observations of the CO emission from the disk around the Class II protostar and disk, AB Aurigae (2.4 $M_\odot$ and 3.5 Myr old), shows such an unstable spiral disk of gas and dust, with a disk to stellar mass ratio of about 1/3. This unstable gas disk suggests that there may be multiple channels toward planet formation in protoplanetary disks, including direct collapse of a massive gas fragment.



ALMA and VLT images of the gas and dust in the protoplanetary disk around AB Aurigea, showing dynamical evidence for a massive disk and spiral structure that may enhance monolithic massive planet formation (Speedie et al. 2024 Nature 633, 58). The CO column density, mean velocity, and velocity dispersion are shown.

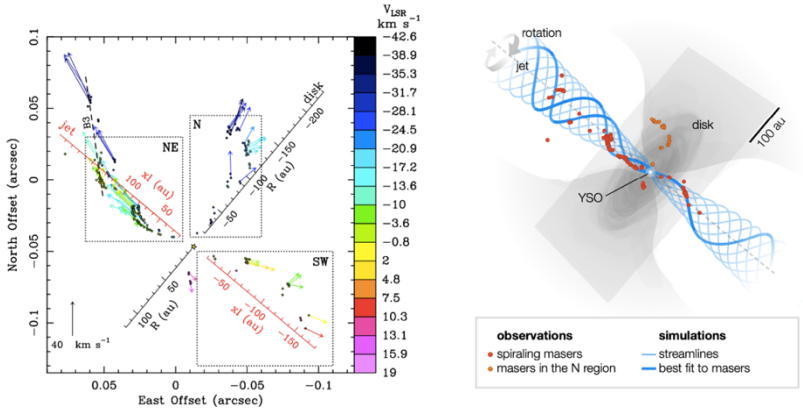
Complex molecular chemistry, including large organic molecules, has become a key field in astronomy, on the path toward understanding the development of life in the Universe. One challenge for such studies is accurate knowledge of rest frame frequencies of transitions from these molecules. The GBT has been used, in concert with high resolution (2 kHz) laboratory measurements, to obtain an accurate spectrum of propynal (HCCCHO) emission from the well-studied molecular cloud, TMC-1. These measurements also provide a greatly improved knowledge of the rest frequencies of the complex spectrum of propynal. The new data imply a propynal column density of 7×10^{12} cm^{-2}, five times higher than previous studies, with a surprisingly low excitation temperature of 3 K. The results highlight the synergy between laboratory and astronomical chemistry and emphasize that accurate spectral catalogs are essential to the success of modern astronomical facilities. This will only become more important as the next generation of facilities come online.



GBT spectra of propynal (HCCCHO) emission transitions from TMC-1 (black trace), plus model fitting based on new laboratory measurements combined with the GBT spectra (Remijian et al. 2024 arXiv:2409.16435).

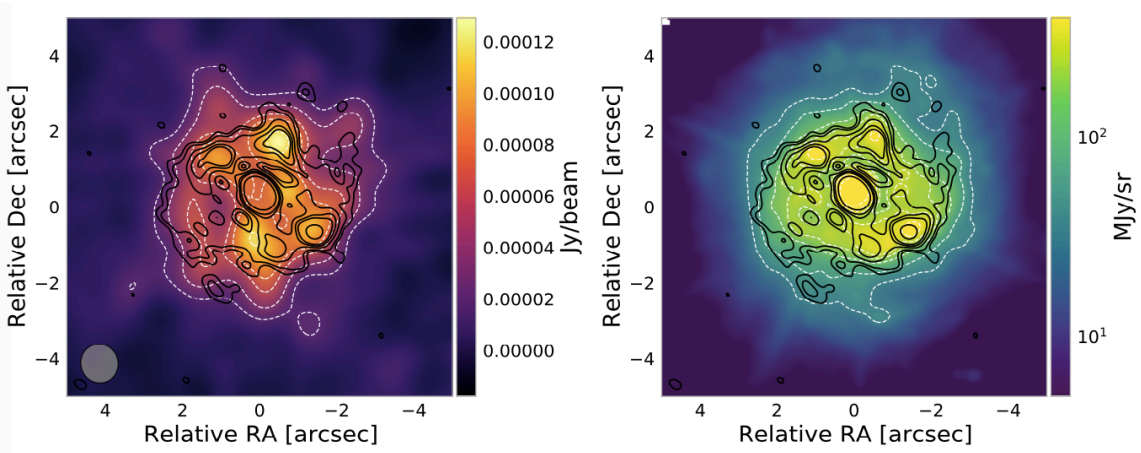
Observations occur at high altitude with ALMA under glow of the night sky.
Photo by Bettymaya Foott (US NSF / AUI / NSF NRAO).

The Protostellar Outflows at the EarliesT Stages (POETS) large program at the VLBA is designed to understand the enigmatic mechanisms behind jet launching from forming massive stars via measurements of water maser proper motions in a sample of 37 young stellar objects. A detailed study of the YSO 21078+5211 shows a maser 3D velocity field consistent with a magnetohydrodynamic (MHD) model of a wind created in an accretion disk associated with the forming star, with the jet launch radius of about 10 au. The jet both collimates and accelerates to 60 km/s out to 50 au. At 100 au distance, the masers trace a slower shock front possibly driven by magnetic pressure.



Left: Water maser 3D velocities in IRAS 21078+5211 from the VLBA. Right: 3D model of the MHD disk-wind in this source, with maser spots overlaid on MHD streamlines predicted by simulations of a jet around a forming massive star (Moscadelli et al. 2024 arXiv:2408.11968).

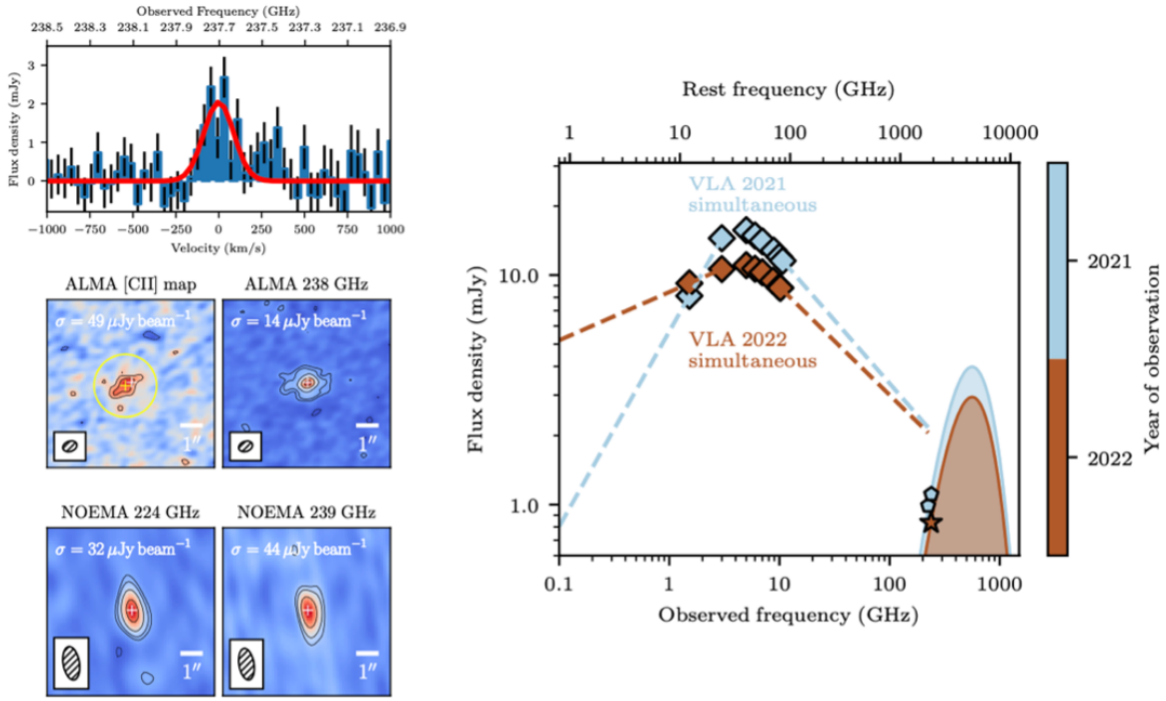
The VLA, ALMA, and the JWST have teamed-up for an in-depth study of star formation in the luminous infrared Seyfert galaxy NGC 7469, at a resolution of ~100 pc, in the starburst ring that dominates star formation in this AGN host galaxy. Observations include 1.2 mm dust continuum, CO2-1 line, VLA 22 GHz continuum, and starlight and polycyclic aromatic hydrocarbon (PAH) emission with the JWST. A star formation rate of 11.5 $M_\odot$/yr and molecular gas mass of 6.4×10^9 $M_\odot$ are derived. The star formation distribution along the ring is traced closely by the 22 GHz, 1.3 mm, and 7.7 μm PAH emission. The gas mass to star formation rate relationship in NGC 7469 is found to be intermediate between starburst galaxies and galaxies hosting an active nucleus.



Left: VLA 22 GHz continuum (color and white contours) plus ALMA 1.3mm continuum contours (black) of the IR-luminous Seyfert galaxy NGC 7469. Right: JWST F770W image, with same black ALMA contours (Zanchettin et al. 2024, arXiv:2406.07901).

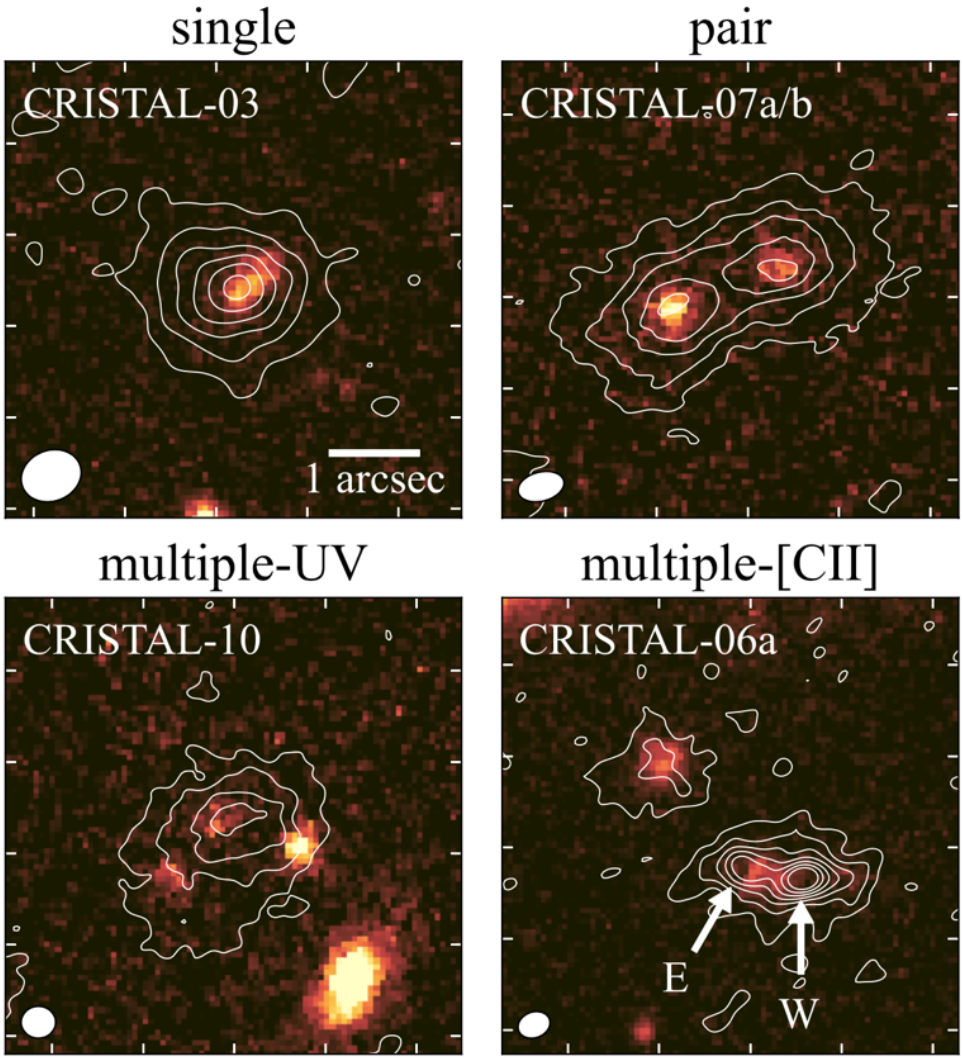
Galaxies and Galaxy Formation

The most distant known radio blazar has been discovered in the VLASS, J0410-0139 at z = 7. Broadband VLA radio observations show that this source is a highly time variable, GHz-peaked spectrum radio AGN, characteristic of blazars, a conclusion supported by X-ray observations. ALMA and the Northern Extended Millimeter Array (NOEMA) observations of the [CII] 158□m emission provide a very accurate redshift of 6.9964, and a star formation rate of 50 $M_\odot$ yr^{-1}. The [CII] dynamics imply a host galaxy mass of 4.6×10^9 $M_\odot$. The black hole mass to host galaxy mass ratio is 0.16, which is larger than is seen for the relationship in nearby galaxies, suggesting earlier growth of the supermassive black hole relative to the host galaxy.



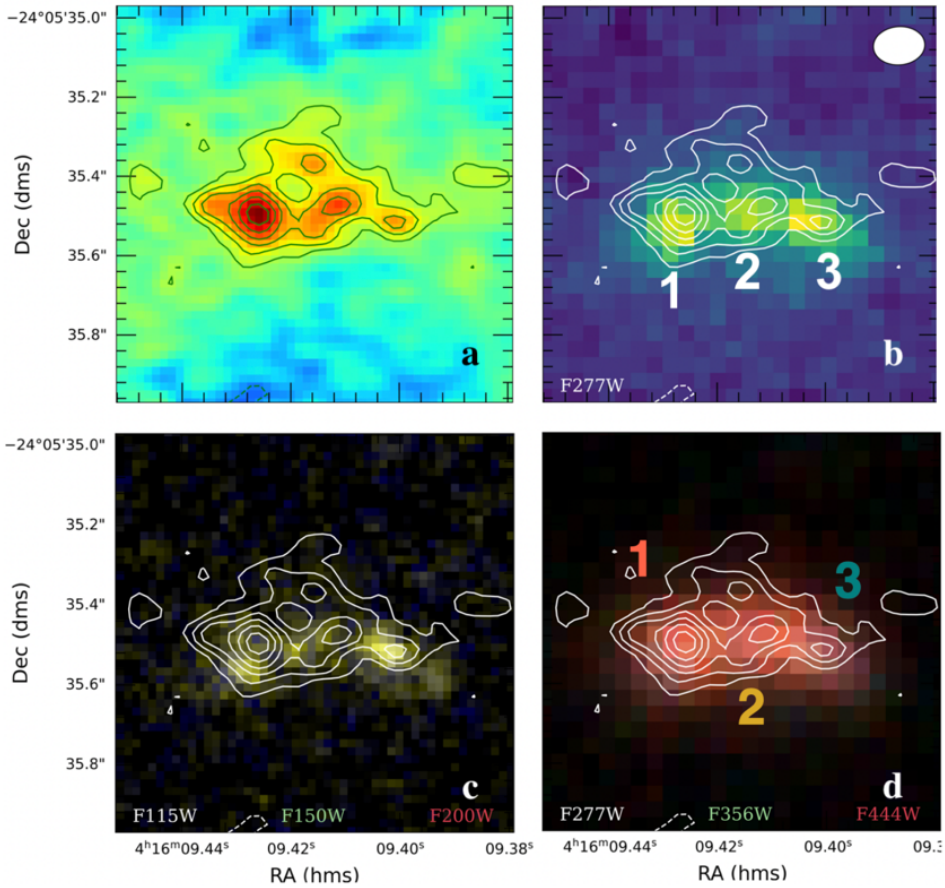
Left: ALMA and NOEMA observations of the [CII] 158□m emission and mm continuum from the most distant known radio Blazar at z = 7, identified in the VLASS. Right: the radio spectrum and time variability verifying the blazar nature of the source (Banados et al. 2024, arXiv:2408.12299), including variability and a GHz-peaked spectrum.

The [CII] Resolved ISm in STar-forming galaxies with ALMA (CRISTAL) large program with ALMA observed the gas ([CII]), dust, and stellar distribution (with Hubble Space Telescope, or HST), in a sample of z = 4 to 6 galaxies. The derived gas distributions range in size from 0.5 to 3.5 kpc, with an average value of 1.9 kpc, and the gas appears to be more extended than the dust emission and the stars by factors of 2.9 and 1.5, respectively. The [CII] emission can be explained by photodissociation regions driven by star formation, plus a possible contribution from more diffuse neutral atomic gas. The effect of mergers further inflates the [C II] spatial distributions.



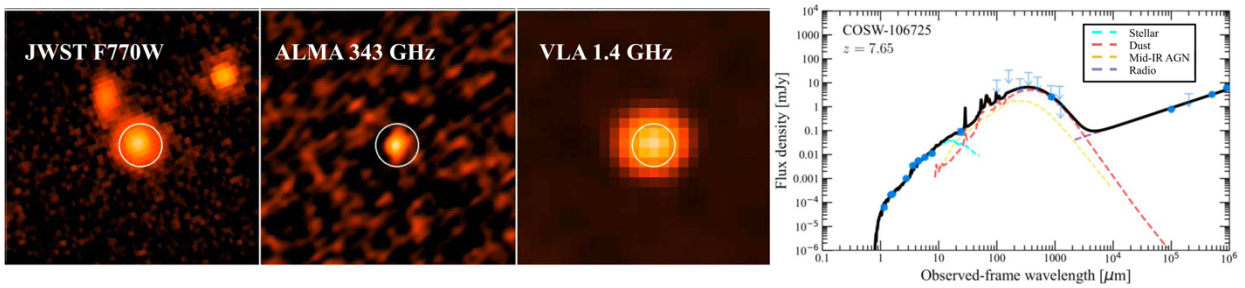
ALMA [CII] 158□m observations of z = 4 to 6 galaxies in the CRISTAL large program (contours), with the HST images (Ikeda et al. 2024, arXiv:2408.03374).

A gravitationally lensed z = 8.3 galaxy was observed with ALMA and the JWST, resolving the three primary star forming regions in the galaxy on sub-kiloparsec scales, in a possibly merging galaxy system. This gas-rich galaxy shows comparable star formation efficiency to cosmic noon galaxies (z ~ 2), and the emission line ratios of the galaxy indicate an evolved interstellar medium, again similar to z ~ 2 star-forming galaxies, with possible evidence for ionization from an active galactic nucleus. Comparison of the thermal dust emission with the rest frame UV and optical emission, shows major dust obscuration of the dominant star forming regions, such that the UV only reveals a trace amount of the star formation activity in the galaxy. The dust temperature is high, 60 K, likely resulting from very active star formation, with a possible dust heating contribution from a narrow line AGN.



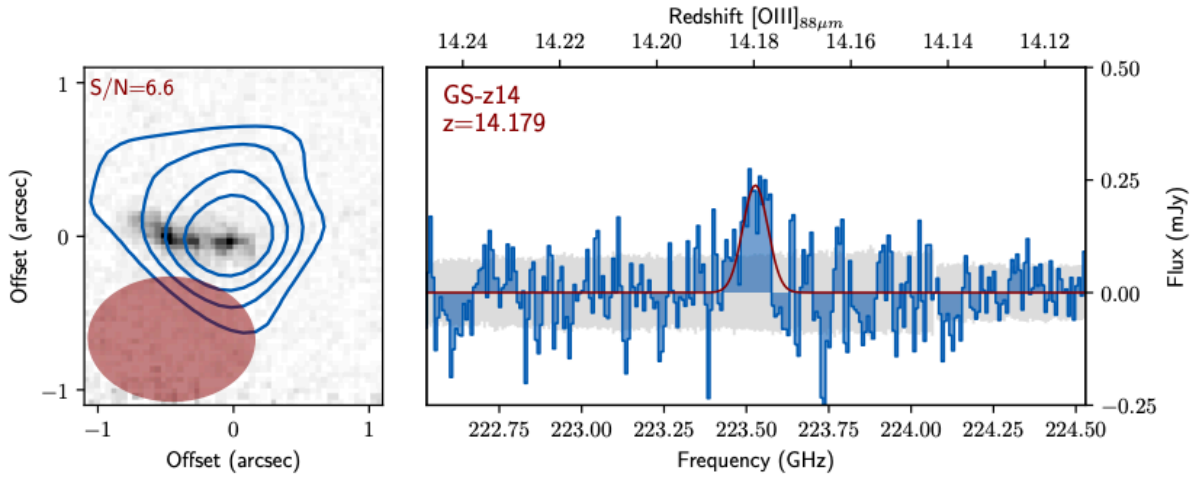
Images of the z = 8.3 lensed galaxy MACS0416-Y1: (a) ALMA 353 GHz dust continuum emission; (b) JWST near-IR F277W image with the three stellar components of the galaxy labeled, with ALMA contours; (c) JWST RGB image of rest-frame UV; (d) JWST rest frame optical image (Harshan et al. arXiv:2408.12310).

The VLASS, VLA Low-band Ionosphere and Transient Experiment (VLITE), and ALMA, working with the JWST and other telescopes, have identified the highest redshift, heavily obscured, radio-loud (RL) active galactic nucleus (AGN) to date at z = 7.7 in the Cosmic Evolution Survey (COSMOS) field. The AGN is seen only at radio through (possibly) mid-IR wavelengths, implying extreme obscuration, with $N_H > 10^{43}$ cm^{-2}. A massive stellar host galaxy is seen, with a stellar mass of ~ 10^{12} $M_\odot$. The AGN bolometric luminosity for the growing supermassive black hole is of order 10^{47} erg/s. This source represents the farthest-known highly obscured radio loud AGN.



Images of the z = 7.7 AGN galaxy with the JWST, ALMA, and the VLA, and the UV to meter wavelength spectrum. This is the most distant radio loud AGN identified to date (Lambrides et al. 2024, ApJL 961, L25).

Perhaps the most exciting result from the JWST has been the robust detection of galaxies well into the epoch of reionization, at z = 10 to 15, corresponding to the very first generation of star formation in the Universe, within a few hundred Myr of the Big Bang. ALMA provides crucial follow-up observations, through the study of the interstellar medium in these first galaxies, with observations of the rest-frame far infrared fine structure lines. The new record holder for the most distant ALMA galaxy detection is [OIII] 88□m line emission from JADES-GS-z14-0. The ALMA detection yields a spectroscopic redshift of z = 14.1793□0.0007, improving the precision on the JWST redshift by a factor of 180! The star forming galaxy is at the lower end the local $L[OIII]_{88}$ – star formation rate relation. No dust continuum emission from GS-z14 is detected, implying an upper limit on the dust-to-stellar mass ratio of 0.002, consistent with dust production from supernovae. GS-z14 is surprisingly metal-enriched ($Z \sim 0.05 - 0.2Z_o$). The detection of a bright oxygen line in GS-z14 thus reinforces the notion that galaxies in the early Universe undergo rapid evolution and InterStellar Medium (ISM) enrichment through active star formation, just 300 Myr after the Big Bang.



The ALMA [OIII] 88□m detection of a z = 14.18 galaxy. Left shows the [OIII] contours on the JWST near-IR image. Right shows the ALMA spectrum (Schouwn et al. 2024 arXiv:2409.20549).

The Moon rises behind an ALMA antenna. Photo by Pablo Carrillo (ALMA).

NORTH AMERICAN ALMA OPERATIONS

North American ALMA Operations (NA ALMA Ops) provides North America's scientific and technical partnership support to the international ALMA Observatory, and supports the North American community in their use of ALMA. NA ALMA Ops ensures that the North American scientific community has the tools, information, support, and access to make optimal scientific use of ALMA. It also provides scientific, technical, and business support to ALMA Observatory operations in Chile in concert with the Joint ALMA Observatory (JAO) staff and international partners, and supports a long-term development program for the technical enhancement of ALMA.

NA ALMA Ops consists of four divisions: (1) the North American ALMA Science Center (NAASC); (2) the Offsite Technical Maintenance and Support group, including Construction Warranty support; (3) the NA ALMA Development Program; and (4) the NRAO/AUI Office of Chilean Affairs (OCA).

In FY2024, NA ALMA Ops focused on the following high-level initiatives:

- Continue to provide outstanding support for JAO Operations and NA scientific community use of ALMA;
- Support the JAO and the NA scientific community with the Cycle 11 Call for Proposals
- Carry out a vigorous program of outreach to the NA Community, including supporting the general astronomy community in their use of ALMA, facilitating scientific productivity, and expanding the user base;
- Support the ALMA-wide implementation of the Development Roadmap Wideband Sensitivity Upgrade (WSU), including key NA deliverables—the ATAC Second-Generation Correlator System, Band 6v2, the NA collaboration in the Digital Transmission System, and submission of the Operations Support Facility (OSF) Correlator Room Upgrade for approval by the ALMA Board;
- Carry out an obsolescence mitigation program for NA-responsible instrumentation and infrastructure at ALMA; and
- Enhance and expand Promovamos Vocaciones Científicas (PROVOCA) the successful mentoring program that promotes greater participation and retention of girls and women in Science, Technology, Engineering, and Mathematics (STEM) careers, including programs for students and mentors.

The sections below highlight the deliverables that realized these high-level initiatives of NA ALMA Operations.

The North American ALMA Science Center (NAASC)

ALMA User Support

The ALMA User Support group provides core support for the North American ALMA user community, and its members also provide support for Community Program initiatives such as the ALMA Ambassadors. The User Support Group supports the face-to-face visitor program; it is also responsible for the in-depth validation and analysis of existing or proposed user tools, research in support of requirements definition for the ALMA calibration and imaging pipeline, routine testing and requirements definition for these user tools, and the coordination of NRAO-wide CASA testing. The group is responsible for the calibration, imaging, and delivery of PI science data to

Star trails surround the south celestial pole behind an ALMA antenna (Photo by Pablo Carrillo, ALMA).

the community and contributing to ALMA archive improvements and deployment testing. In FY2024, the ALMA User Support group performed its core services and planned initiatives, fulfilling its interface role with North American ALMA users.

User Documentation: ALMA end user documentation preparation is an annual task in which the NAASC takes a leading role supporting the JAO. The documentation preparation and review includes the upcoming Call for Proposals, Proposer's Guide, ALMA Primer, ALMA Technical Handbook, Guide to the NA ARC, software user guides (including CASA Guides) and additional documentation on how to access NAASC services. The team participates in the international ALMA working groups to prepare these documents for the user community. In FY2024, NAASC staff again took a lead role in the preparation of the Cycle 11 Call for Proposals and user documentation, including all updates and edits to the ALMA Science Portal. As in Cycles 9 and 10, the Cycle 11 proposal process included dual anonymous and Distributed Peer Review (DPR). The NAASC provided clear instructions to proposers on the impact of DPR and dual-anonymous review on proposal construction and processing.

Face-to-face Visitor and Helpdesk Support: The NAASC provides overall management of ALMA Helpdesk activities including routine ticket reviews, enforcement of ticket service-level agreements, and formulation of new Knowledgebase articles based on user questions. Face-to-face (f2f) support includes hosting one to two data processing teams from NA institutions per week at the NA ALMA Regional Center (ARC) in Charlottesville, VA or at the National Research Council (NRC) in Victoria, British Columbia. The visiting teams work with the NAASC Data Analysts and NAASC or NRC scientific support staff on various aspects of data processing and image analysis. F2F visitors can also get support with proposal preparation and support for Large Programs. In FY2024, the NAASC continued to offer both in-person and virtual f2f visits and support. In addition, in Q1 of FY2024 the NAASC hosted a "data reduction party" workshop to support and train up to 10 users in techniques of data combination— the first such event since before the pandemic.

ALMA Pipeline Development and CASA Testing: ALMA Calibration and Imaging Pipeline testing and development continued in FY2024 with the deployment of a new Cycle 11 2024 ALMA calibration and imaging pipeline which included the following features:

- Calibration of Band-to-Band and Bandwidth switching data;
- Research on more sophisticated product mitigation methods to improve performance and increase the number of delivered products without compromising science content;
- New Quality Assurance (QA) heuristics and modifications to QA continuing towards the goal of future automated weblog review; and
- Pipeline-facilitated self-calibration for appropriate ALMA data.

The first three points above are all prerequisites to efficient processing of data from the ALMA Wideband Sensitivity Upgrade (WSU).

CASA development and testing for FY2024 focused on:

- Testing to support current CASA and Pipeline in operations including:
    - Validating bug fixes for ALMA related issues; and
    - Developing additional stakeholder tests.
- Research and development work needed to support processing data from the ALMA WSU.

Pipeline and CASA also continued contributing to the ALMA-wide planning for processing data from the ALMA WSU.

Data Processing Workflow/Lustre Access: A main objective of the Data Processing Workflow is to deliver fully calibrated data and representative images of ALMA science data. The target for data delivery to PIs after it is marked as fully observed is 30 days for data reduced by the ALMA Pipeline, and 45 days for manually reduced data. In FY2024, NAASC staff continued to work closely with the JAO teams to deliver 30–35 datasets per week to the NA ALMA user community. This rate maintained pace with data acquisition to prevent a data processing backlog. The NAASC continued to coordinate and manage the calibration, imaging, and delivery of PI data products through the ALMA Archive and the Labor-saving Added Value Automation (LAVA) service, which provides North American PIs access to calibrated Measurement Sets (MS), as well as value-added data products generated by the ALMA Data Mining Toolkit (ADMIT). The team provided summary reports on data processing and delivery as needed and projections of anticipated workload on a quarterly basis.

NA ALMA Telescope Interface and Diagnostics Team

The Telescope Interface and Diagnostics group is the NAASC technical liaison to the JAO. Communication and interaction between the ARCs and the JAO via this group is of critical importance to ALMA project success. The ALMA Telescope Interface and Diagnostics group was responsible for the activities described below in FY2024.

Phase 2 Group (P2G): NAASC P2G staff provide the technical expertise to review and set up Phase 2 materials (Scheduling Blocks, or SB) submitted by NA PIs for an observing cycle. This includes modifying SBs that require expert technical input, coordinating with the JAO to request calibrator searches, and ensuring that all SBs are ready to run on the telescope. During a cycle, the NAASC staff also provide any SB changes required following an approved change request or other edits requested by the PI or as needed for scheduling, and also support new programs approved mid-cycle, including Director's Discretionary Time (DDT), Targets of Opportunity (ToO), supplementary calls, and Observatory-type projects. In preparation for an upcoming cycle, NAASC staff participate in software testing of the ALMA Observing Tool (OT) and relevant end-to-end tests, as well as software such as the Project Tracker; and closely coordinate with the JAO, other ARCs, and OT working group on developing P2G best practices at the annual P2G face-to-face meeting. In FY2024, the P2G group performed these core services.

Contact Scientists: NAASC staff provide oversight and support for all the approved NA ALMA PI programs for an observing cycle. This includes ensuring PIs have reviewed (and, if necessary, approved) their projects for scheduling prior to the start of a cycle, and, if needed, providing communication between PIs and the JAO during a cycle. NAASC staff also provide oversight of the status of PI SBs and, if needed, coordinate with the JAO on scheduling issues. Throughout FY2024, NAASC staff continued to act as Contact Scientists (CS) and liaisons to the NA ALMA PI observing programs in support of Cycle 10 observations and in preparation for Cycle 11 observations.

Telescope Diagnostics: In FY2024, the NAASC continued to play a critical role in the JAO technical and diagnostics-related meetings and teleconferences, such as the Control System and Correlator Group weekly meetings and software readiness review meetings. The NAASC also continued to coordinate with the JAO on troubleshooting issues and problems found with the telescope systems or in data collection and analysis. NAASC staff continued to maintain a close

interaction between data processing and the telescope diagnostics teams at the JAO to ensure all problems are reported and tracked efficiently.

Extension and Optimization of Capabilities (EOC): Although the scale of EOC was dialed back to focus effort on preparing for the Wideband Sensitivity Upgrade, NAASC staff continued to contribute to EOC activities in FY2024, including participating in the Go/No-Go for 7-m subarraying on the baseline correlator and serving as reviewers for testing and verification plans for Band 1.

NA ARC Data Analyst Group

The NA Data Analysts are integrated into NA ALMA Operations and are critical to user and telescope support. The Data Analyst group continued to support the following activities in FY2024:

- Data services, including the Data Processing Workflow, NA data processing, and weblog review (pipeline and manual); calibration survey data processing; QA3 execution and documentation.
- CASA Guides, in-person visitors, data processing workshops, Synthesis Imaging Workshop (SIW) documentation and demonstrations, ALMA Ambassador training, community outreach events, and the ALMA Helpdesk.
- ALMA scientific software including involvement in ALMA Pipeline and CASA software testing, CASA documentation, diagnostics investigations, Science Portal maintenance, and generating meeting webpages.

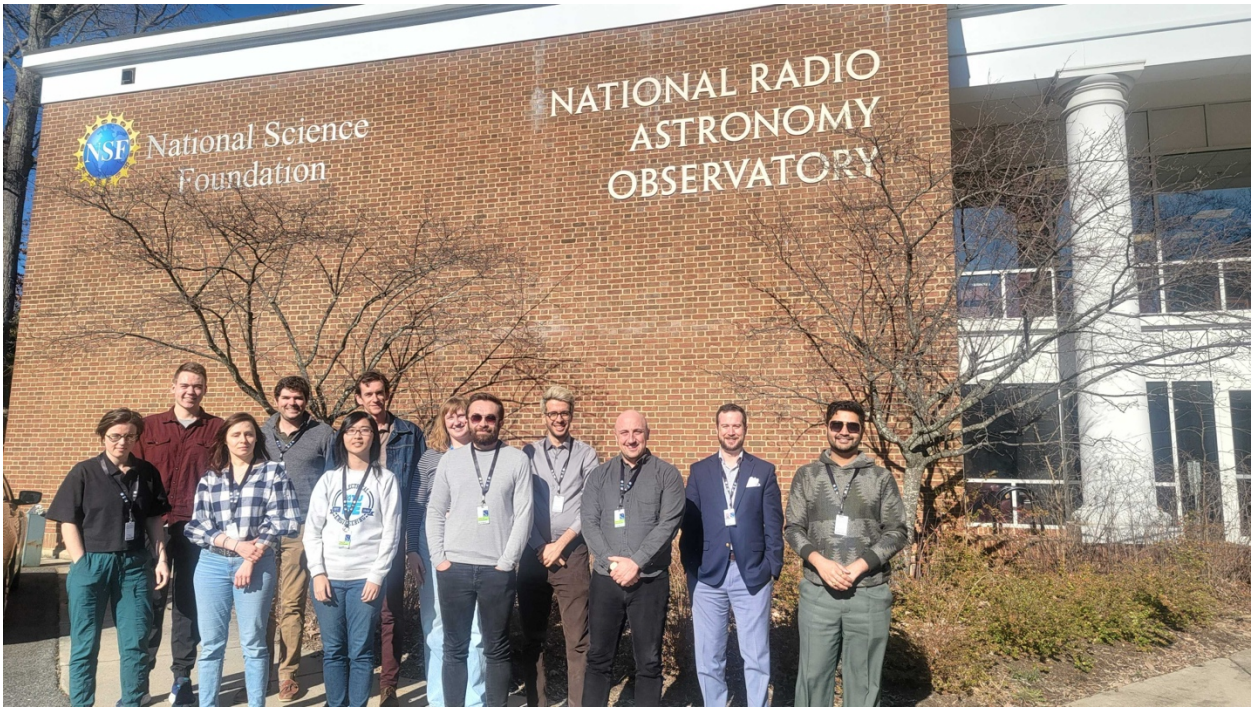
Community Outreach

In FY2024, the NAASC continued to design and execute a portfolio of initiatives engaging the astronomy community at large, coordinated by the Community Programs team (hereafter CP team). The portfolio addressed three overarching goals: supporting the general astronomy community in their use of ALMA; facilitating scientific productivity; and expanding the user base. In FY2024, the CP team also focused on two strategic areas: developing awareness of scientific cases which would specifically benefit from the WSU, and facilitating archival data use.

The CP team continued to produce the flagship program ALMA Ambassadors based on the successful model established in previous years. This program effectively addressed all three key goals, by supporting early career community members and expanding the user base by raising awareness of ALMA's data and observations across the community. In FY2024, the NAASC recruited (Q1), trained (Q2, Q4) and supported the Cycle 11 cohort of 11 early career researchers to conduct workshops at their own institutions. The content of the ambassador-led workshops were either focused on ALMA Cycle 11 proposal preparation (for six Q3 events) and/or ALMA data reduction and analysis for PI and archival users (for seven Q4 / Q1 FY2025 events). Training of the cohort continued to be structured around two multi-day visits to the NAASC. Ambassadors also participate in the review of alma archival SOS proposals, for which they receive focused training in serving on review panels. The Cycle 12 cohort was recruited in Q4, two of whom already participated in training in Q4.

The CP team continued to carry out the community workshop and meeting support program in FY2024. This program offers the opportunity for the NAASC to reach out to new and diverse audiences which may not be currently strongly engaged with ALMA, addressing two of the key goals— supporting the community and expanding the user base. A change from previous years was that support to established teams for completing their ALMA data analysis (typically through

invitation-only workshops for large-program teams) was awarded separately, which allowed this program to focus on broadening the ALMA user community. In addition, the visibility of the NAASC at sponsored events was reinforced with dedicated materials and/or presentations. After a call for proposals in Q4 FY2023, five awards were announced in Q4 FY2023 for events held throughout FY2024. Amongst the award recipients, the “Cool Stars” meeting, held in San Diego and gathering more than 500 attendees, was specifically selected to reinforce the connection to the stellar community. Another of these events was a workshop hosted at NRAO headquarters, “Spatio-spectral modeling of ALMA data cubes,” which allowed for strong interaction between NAASC staff and around 30 attendees. The FY2025 call was issued in Q4.



ALMA Ambassadors meet to discuss workshop planning in Charlottesville, February 2024.

The CP team produced or participated in an increased number of scientific events, designed to both support current users and expand the user base by disseminating information about opportunities:

- Coordinated presence at the AAS Winter meeting in January 2024, in close partnership with the Communications office and EPO. Such presence took the form of an ALMA special session: “ALMA as a high-z powerhouse: the impact of the Wideband Sensitivity Upgrade,” which gathered 50 attendees; a polarization data clinic at the NRAO booth, an exhibit hall presentation on the WSU, and the distribution of new printed materials;
- A poster presentation on the impact of the WSU for kinematic studies at the “Winds in the Universe” workshop in Annapolis (October 2023);
- Coordinated presence at the International Symposium of Space Terahertz Technology in Charlottesville (April 2024), with several presentations on the WSU (invited talks, contributed talks and posters); and
- An oral presentation on the impact of the WSU on stellar environment studies at the ‘’Radio Stars in the Era of New Observatories” workshop (April 2024).

The CP team put in place two new initiatives in FY2024, centered around the key goal of facilitating scientific productivity:

- Documentation and information enhancement: materials were designed and produced, such as text, figures, leaflets, posters, and webpages. Printed versions were distributed at community-wide events (AAS), NAASC-sponsored events, and other scientific meetings. Several materials highlighted the relatively new support services available to archive users— specifically, reprocessing and re-imaging through ALMA User-Defined Imaging (AUDI).
- Data interpretation tools: the CP team gathered information about existing data interpretation tools and scripts maintained in the community (worldwide). Such tools can provide very valuable information and examples, especially for early career researchers and users new to submillimeter observations, on how to translate archival SRDPs into quantitative measurements of source properties. The CP team published a list of such tools on the NAASC webpage, which continues to be updated

Development

The North American ALMA Development Program supports Studies and Projects from NA-led (U.S. and Canada) initiatives to keep ALMA at the forefront of scientific discovery based on the ALMA-wide priorities set in the ALMA Development Roadmap. ALMA and hence the NA ALMA Development Program is presently focused on the highest near-term priority of the Roadmap that has come to be known as the Wideband Sensitivity Upgrade (WSU).

The WSU aims to expand ALMA's digitized bandwidth by up to a factor of four, increase the correlated bandwidth by at least a factor of two (with future expansion path to 4x larger bandwidth), and to deploy the first wideband receivers (IF 3x to 4x wider than current 2SB receivers) by 2030. The resulting efficiency gains from the digital improvements alone are equivalent to affording an order of 1000 more hours of 12m-array ALMA observing time per year. The increased bandwidth will improve continuum sensitivity by at least sqrt(2), as well as the observing efficiency of spectral scans. Indeed, spectral line studies will never again need to trade bandwidth for the requisite spectral resolution. The increased spectral grasp of the new correlator— total spectral bandwidth, channelization, and flexible bandpass tuning— will allow some projects to save many factors of observing time (up to 64x) through simultaneous observation of lines of interest, not possible before. See ALMA memo 621 (https://library.nrao.edu/public/memos/alma/main/memo621.pdf) for a detailed summary of the science gains that will be afforded by the WSU.

The WSU has made significant progress in FY2024, including the start of nearly all the requisite hardware and infrastructure projects, updates to ALMA Science and Technical System Requirements and non-functional requirements for the WSU, as well as successful completion of both individual subsystem and WSU System Preliminary Design Reviews.

NA ALMA Development efforts during FY2024 are described in the subsequent sections; efforts related to the WSU are prepended with "WSU."

Studies Completed in FY2024

WSU: Investigate Use of Next Generation FPGA Technology in the 2nd Generation ALMA Correlator[1] (NRC): This Study investigated the use of the next-generation Field Programmable Gate Array (FPGA) technology from Intel called the Agilex-M Series for the signal processing stages of the ALMA WSU 2nd Generation ALMA Correlator known as the Advanced Technology ALMA Correlator (ATAC). This study verified that this technology, as well as 400 GbE Switches, are well-suited to be the signal processing and communications platforms for ATAC and was used to inform the formal down-selection for the successful ATAC Preliminary Design Review in June 2024 (Q3 FY2024). The Study report can be found here:
https://science.nrao.edu/facilities/alma/science_sustainability/copy_of_2024_07_15_ATAC_Memo009_ngFPGA_Study_Report_Signed_SH_MP_BC.pdf

WSU: Wideband Isolators for Submillimeter Astronomy (Submillimeter Receiver Lab at the Center for Astrophysics | Harvard and Smithsonian): This Study designed and produce improved wideband 4–20 GHz cryogenic edge-mode isolators for use in the NRAO Band 6v2 receiver prototype baseline design. A wideband isolator is required to ensure a good match between the SIS mixer and the cryogenic low noise amplifier over wide bandwidths. The three main goals of this study were met: (1) to optimize the bandwidth coverage; (2) to increase the isolation to the upper end of the frequency band; and (3) to reduce the physical dimensions and thermal mass of the isolators, paving the way for a successful implementation in the Band6v2 project. The Study report can be found here:
https://science.nrao.edu/facilities/alma/science_sustainability/Zeng_Isolators_Closeout_report_ver2.pdf

WSU: A Detailed Characterization of Spectral Regridding and Noise in the WSU Era (Harvard-Smithsonian Center for Astrophysics): The interpolation associated with spectral regridding during imaging can have significant and problematic consequences for the noise properties and signal behavior in the output (regridded) image channels. While the future WSU correlator design has the notable scientific benefit of sampling data in effectively uncorrelated channels, it is also the worst-case scenario for the noise scalloping issue (roughly 2x worse than the current situation, and present in *every* dataset). This study investigated a promising alternative interpolation algorithm to help mitigate the existing spectral regridding problems and developed a functioning prototype that could be incorporated into CASA. The Study report can be found here:
https://science.nrao.edu/facilities/alma/science_sustainability/ALMA_Development_regridding.pdf

[1] Since this Study began, the 2nd Generation ALMA Correlator project has been renamed from the *ALMA TALON Central Signal Processor* (AT.CSP) to the *Advanced Technology ALMA Telescope* (ATAC).

Projects Completed in FY2024

ALMA Phasing System Phase 2 (APP2) (MIT Haystack Observatory): APP2 includes several initiatives to improve ALMA VLBI capabilities and performance. Major components included:

- Enabling a prototype spectral line VLBI mode;
- Extending the frequency range of phasing capabilities to Bands 1 (~7mm) and 7 (~0.87mm);
- Implementation of a passive phasing mode to allow for the observation of weaker science targets;
- Expansion of the ALMA Phasing system to allow for pulsar observations; and
- Improved delay calibration to enable better phasing efficiency.

Although completion of all these goals took a few years longer than anticipated (the pandemic and ALMA cybersecurity as well as weather all played a role) this project has significantly improved ALMA's phasing capabilities. The final Project report can be found here.

Enabling New VLBI Science with the ALMA Phasing System – Phase 3 (APP3) (MIT Haystack Observatory): The APP3 small project has further expanded and improved the VLBI/phasing spectral line capabilities to include Bands, 1, 3, 6, and 7 and even explored Band 9. The team also assisted with the replacement of the ALMA Hydrogen maser in Q1 FY2024 (see news story). A key aspect of this project was to facilitate knowledge transfer between the project team and ALMA Science Operations so that Phased Array observations can become more routine in the future. The final Project report can be found here.

Ongoing Development Studies and Projects

Studies and projects that are directly related to the WSU are indicated at the beginning of the title.

Ongoing Studies:

WSU: Wideband InP and GaAs Intermediate-Frequency Low Noise Amplifiers (LNA) (NRC): This study will apply NRC's transistor and Monolithic Millimeter-wave Integrated Circuits (MMIC) technologies to the development of a cryogenic, wideband, intermediate frequency LNA with a target operating bandwidth of 4–20 GHz. Two technologies will be assessed: (1) NRC's designs using Gallium Arsenide (GaAs) mHEMT technology, and (2) NRC's Indium Phosphide (InP) LNA technology. Performance of the two material technologies will be compared and their potential to meet future ALMA IF LNA requirements assessed.

Status: This Study received a No Cost Extension to the end of 2024 (Q1 FY2025) due to an unexpected expert staffing shortage. Fabrication of devices has completed and testing is underway.

Ongoing NA Led Projects

WSU: Advanced Technology ALMA Correlator (ATAC) (NRC/NRAO): The 2nd Generation ALMA Correlator (ATAC) will double the correlated bandwidth of ALMA, while providing vastly more channels, increased digital efficiency and flexibility in science spectral window placement. The ATAC is a collaboration between the NRC (hardware and firmware) and the NRAO (software and integration). The WSU ALMA correlator will handle data from both the 12 m and 7 m arrays and forms an essential cornerstone of the WSU. Its design can be readily upgraded in the future to quadruple the current bandwidth. Additional information about the software aspect of this

project can be found in the Software Section 7. ATAC successfully passed its Subsystem Requirements and Preliminary Design Reviews in June 2024 (Q3 FY2024).

Status: ATAC is progressing the critical design with prototyping and integration testing toward a Critical Design Review in Q4 FY2025. A scaled version of ATAC will be deployed in the Integrated Digital Test Facility at the CDL in Q1 FY2025. Additionally, the ATAC Team is working with commercial vendors Bittware and CoolIT to develop a liquid-cooled version of the ATAC signal processing server called a TeraBox for efficient cooling at 2,900 m elevation.

WSU: ALMA Band 6v2 Receiver Upgrade – Phase 1 (NRAO): This project is designing and testing a production-ready 2nd Generation Band 6 receiver. Version 2 of Band 6 will at least triple the IF bandwidth of ALMA's most used receiver band, significantly improving its noise performance across the full IF. In conjunction with the Wideband ALMA 2030 Upgrade, Band 6 continuum sensitivity will be improved by at least a factor of two and extend the radio frequency tuning range from 211–276 GHz to 209–281 GHz allowing access to diagnostic spectral line combinations that are currently impossible. This Phase 1 project will culminate in a Critical Design Review, after which ALMA will pursue a Phase 2 project for production. Additional information on the Band 6v2 project is provided under CDL (Section 5) and PMD (Section 8).

Status: The Phase 1 Band 6v2 project is undergoing an In-Progress Review in Q1 FY2025, after which fabrication of the M03 mixer chips will begin (which are expected to provide compliance with the requisite receiver noise goal) with prototype testing to complete in Q4 FY2025. The next milestones are to then build a pre-production cartridge which will be tested on-sky in Q1 FY2026, followed by Critical Design Review in Q2 FY2026.

WSU: OSF Correlator Room – Phase 1 (NRAO): The OSF Correlator Room Project (OCRO) is a project to upgrade an existing space in the Observatory Support Facility (OSF) at 2,900 m to house the WSU hardware for the ATAC, receiving end of the Data Transport System (DTS), and the Total Power GPU Spectrometer, as well as associated computing and IT equipment. The upgrade will require work on the electrical, fire protection, and HVAC. Phase 1 of this project includes stakeholder engagement, detailed design, as well as preparation of the contractor bidding material (Engineering, Procurement, and Construction (EPC) contract) and initial electrical connection work. Phase 1 successfully passed its Preliminary Design Review in June 2024 (Q3 FY2024) and prepared a proposal for Phase 2 during Q4 FY2024.

Status: The Phase 1 OCRO project will conclude with electrical connection work during the 2025 annual February shutdown (Q2 FY2025). A follow-on Phase 2 OCRO Project, that includes awarding of the EPC contract, a Critical Design and Manufacturing Readiness Review, and finally construction and acceptance, will be considered by the ALMA Board in Q1 FY2025 to start early in Q2 FY2025.

Characterization of New Helium Compressor for Cryogenic System (NRAO): The NRAO will test a new Sumitomo Variable Speed compressor used in the Front-End receiver cryostat due to the limitations revealed during extreme cold weather at the Array Operation Site (AOS). Major aspects include classification of the compressor under field conditions, determination of efficient cold temperature start-up and optimum speed versus thermal loading and estimates of operational power and science time savings.

Status: This project has been delayed by several issues beyond the control of the development team including the FY2023 ALMA Cyber Security attack (which has introduced new strict off-site access policies). This small project is scheduled to end in Q1 FY2025.

Ongoing Collaborations with ALMA Partner Projects

WSU: Data Transmission System (DTS) Project – Phase 1(Led by NAOJ): Project to prototype the WSU Data Transmission System (DTS) that puts the digitized signal onto optical fiber and reads it off again for delivery to the WSU Correlator. The NRAO is providing engineering design assistance and integration testing support. This project underwent successful Preliminary Design Review in October 2024 (Q1 FY2025).

Status: This project, led by NAOJ, is currently in the critical design phase and will seek funding for the Phase 2 production in FY2025.

ALMA Development Milestone Summary

NA ALMA Offsite Hardware Technical Support

The NRAO NA ALMA offsite hardware maintenance team is comprised of six NRAO support groups in Charlottesville and Socorro responsible for maintaining various sub-systems, as well as a support team at NRC-Herzberg (Victoria, BC) which maintains the Band 3 cold cartridge as part of the NA ALMA partnership. These groups addressed all of the operational activities listed in the FY2024 Program Operating Plan (POP). The following paragraphs summarize the key operational activities of the various NRAO groups to support the operations and maintenance of the ALMA telescope.

Offsite Hardware Support Group Activities

Antenna Group: Preventive and corrective maintenance tasks are a JAO responsibility, in accordance with the ALMA Operation Plan. The role of the offsite team in this model is to provide technical support and to serve as the interface with the NA Antenna Vendor (Vertex).

The NA Offsite antenna corrective maintenance related activities included the following:

- In FY2024, the NA Antenna Group continued to provide technical support to the JAO Antenna Management Group (AMG) during antenna overhaul efforts which are mostly back on track following the interruption of maintenance operations during the pandemic. NRAO efforts focused on improving and streamlining preventive maintenance procedures, which led to hardware upgrades including in the Antenna Servo Cabinet.
- Science commissioning of the Receiver Cabin Wall Heater Systems, which the ALMA JAO Staff was unable to initiate in FY2024 because of staff scheduling issues, will be continued into FY2025. During FY2024, the NA Antenna Group did begin development of a procedure for the Primary Surface Setting for Commissioning of the Receiver Cabin Wall Heater Systems in conjunction with the JAO AMG Staff. This procedure addresses holographic measurements and surface resetting efforts necessary to confirm satisfactory wall heater system performance. The NA Antenna Group will continue to provide technical support to the JAO AMG Staff during FY2025 as that group commences the execution of science commissioning of the Receiver Cabin Wall Heater Systems.
- Driven by the need to mitigate the pending obsolescence of two critical antenna components, the Antenna Controller Unit (ACU) and the Azimuth and Elevation Position Encoders, the NRAO awarded a contract in Q3 FY2024 to CPI Vertex Antennentechnik GmbH, the original

equipment manufacturer and integrator for the North American antennas, for the upgrade and replacement of the existing antenna ACU and Encoder components.

- Hardware and software upgrade development is currently underway with First Article hardware and software installation, integration, and verification testing to be completed in Q3 FY2025.
- During FY2024, the NA Antenna Group continued to monitor the condition and spare parts availability for the antenna Hexapod and Hexapod Controller Units as part of ongoing obsolescence mitigation efforts. Per agreement by the ALMA Management Team (AMT) and the ALMA Budget Committee (ABC), each Executive is responsible for obsolescence mitigation for the antennas originally delivered by their region.
- As part of the NA Antenna Group technical support to the JAO Antenna Maintenance Staff, corrective maintenance activities were reviewed via antenna coordination meetings, ALMA JIRA tickets, and the ALMA Computerized Maintenance Management System (CMMS). During FY2024, a total of 401 JIRA corrective maintenance issues were reported for the North American Antennas,

Front End (FE) and Band 6 Cartridge Group: This offsite hardware support group at the CDL in Charlottesville is responsible for maintaining the following systems:

- Band 6 Cold Cartridges (including mixer-preamplifier subassemblies, feed-horn, Orthomode Transducers (OMT), and warm IF amplifiers),
- A majority of FE components including various electronic sub-assemblies such as:
  - IF switches,
  - Cartridge Bias Modules,
  - Gate Valve Drivers,
  - Front-End Monitor & Control (FEMC) units,
  - FE Thermal Interlock modules, and several mechanical parts), and
  - Software support for the FEMC firmware.

The responsibility of this NA Integrated Engineering Team (IET) group includes maintenance of CDL test systems including the Band 6 SIS Mixer Test Set (MTS), the Band 6 Cold Cartridge Assembly (CCA) Test Set (CTS), and test systems for several other FE component and sub-assemblies for the repair and requalification of components and modules. This NA Integrated Engineering Team (IET) group is also responsible for the hardware and software support of three FE Test and Measurement Systems (FETMS)—including noise temperature measurement apparatus, tilt tables, and beam scanners— two situated at the ALMA Operations Support Facility (OSF) and one in NA (at CDL), as well as their respective associated test operation and measurement software suites. Additionally, the FE group provides management support, product assurance, and executes other administrative activities (e.g., arranging for ALMA-related export/import with support from the NRAO export/import officer) in Charlottesville.

During FY2024, 25 Front End Line Replaceable Units (LRU) were worked upon (Tier-2 repair), and 67 lower-level sub-assemblies/modules were serviced (Tier-3 repairs), or new replacements built. The following is a partial list of significant support tasks undertaken this year:

- A complete four-channel modular FETMS IF Processor was built, and continues to be tested prior to its delivery to the OSF. This is identical to the modular FETMS IF Processor built for the NA FE integration center in the past year.
- Work continued on the repair and retest of several Band 6 mixer-preamplifiers as well as Band 6 Cold Cartridge Assemblies (CCA).

- Several broken bias module assemblies were diagnosed, debugged and repairs made to the circuit boards to restore functionality.
- The FE group started prototype development and conceptual review of a next generation Front End Monitor and Control (ngFEMC) module. The ngFEMC module will mitigate obsolescence (previously identified) of some parts required by the existing FEMC design.
- During the onsite support visit to the ALMA OSF in February/March of 2024, a long-standing communications problem with the existing FEMC module was diagnosed and a firmware solution was devised.
- During the OSF support visit, several user-requested changes were implemented on the Front-End Test and Measurement systems which were also qualified for the ESO Band 2 receiver and the associated LO hardware.
- The replacement of the Band 6 CTS measurement software was completed in FY2024. New CTS measurement capabilities required for Band 6v2 development effort were also initiated and will continue into FY2025.
- The required improvements to the mixer test system (MTS) software for Band 6v2 were completed. The associated data analysis software for Band 6 mixer and cartridge noise temperature was also completed.

The FE support group contributed expertise to the WSU Acceptance, Integration, Verification, and Commissioning (AIVC) workgroup, the WSU Transition to Parallel Operations workgroup, and participated in impact assessments for various ALMA-wide WSU development projects when requested.

Front End Local Oscillator (FE LO) Group: This CDL group repairs and maintains the Warm Cartridge Assembly (WCA) for all receiver bands (including active multiplier chains, power amplifiers and phase lock modules— this requires microassembly and wire bonding capability— as well as FE LO cryogenic multipliers which are physically integrated into the CCAs. This group operates and maintains the necessary bench test sets needed to carry out repair and requalification of FE LO components and modules, as well as the First LO offset generator distribution modules.

During FY2024, FELO hardware upkeep was the primary task of this offsite support team. There was a steady stream of warm cartridges being returned for repairs throughout the year. A total of 20 WCAs were repaired (tier-2 LRU work) and returned to the OSF during this period. Additionally, 85 lower level (tier-3) assemblies were diagnosed, fixed, and returned to the NA spares pool for effecting future WCA repairs.

Of the repaired WCAs returned to the site, six were Band 7 WCAs containing InP Heterojunction Bipolar Transistor (HBT) Monolithic Microwave Integrated Circuits (MMIC). These WCAs are in addition to the first two articles incorporating the HBT MMICs delivered in FY2023 for initial qualification. While a final and formal conclusion on these devices has not been made, no issues have been associated with their use in the array. Given that the legacy MMICs used in Band 7 are obsolete and can no longer be manufactured, all Band 7 WCA failures involving this MMIC are being replaced with the new InP HBT MMIC. To make the task of manufacturing the power amplifier and active multiplier chain modules (based on the HBT MMIC) easier, revised bias boards were designed, tested, and improved. Newer iterations will be fabricated for continued use in FY2025.

Back End (BE) Group: This group in Socorro, NM, is responsible for offsite maintenance of the BE Antenna Articles (AA), including Fiber Optic Wraps (FOW), Data Receiver Articles (DRXA), and support of some LRUs in the Central LO Article (CLOA). The group is also responsible for

the maintenance and operation of various test systems, in Socorro and at the OSF, for requalification and testing of repaired or failed BE modules. Additionally, the BE group provides management support, product assurance, and other administrative activities (e.g., arranging for ALMA-related export/import with support from the NRAO export/import officer) at Socorro.

In FY2024, significant LRU level repairs included BE IF processors which were repaired and returned to the OSF. Significant effort was spent in refactoring and porting the amplitude stability measurement software (based on an obsolete version of LabVIEW) to a maintainable modern code. Close coordination continued with the IFP vendor to ensure timely and increased throughput of the IFP LRUs sent in for repairs, despite their staffing/resource issues and their change of company ownership.

Spares of commercial power supplies used in the BE racks in the antenna receiver cabin, ordered in the prior years, were received during FY2024.

The network analyzer and power meters on the NA/Socorro based IFP test stand were calibrated and swapped with those in the OSF IFP test stand in order to update it and ensure continued operation at the site. In order to be able to quantify the recently observed LO2 leakage problem above 10 GHz IF (since the start of use of Band 2 receivers which use an extended IF range above 10 GHz), corroborative measurements were made after restarting the appropriate test sets in order to quantify the magnitude and scope of the problem. The test set configuration and procedures were also conveyed to the OSF staff to assist them with restarting and configuring the corresponding test sets to carry out similar measurements at site prior to shipping the suspect IFP hardware back to Socorro for repairs.

During FY2024, the BE team also worked with an alternate YIG-tuned oscillator vendor to qualify a replacement for an obsolete device used in the original design, to have viable spares for repairs. This task is ongoing. Comprehensive obsolescence identification effort was executed for all supported BE hardware. Central reference distributor, First LO offset generator, second local oscillator, IF processor, digitizer clock circuit, and the data transport system were identified among the LRUs most at risk. In some cases, they share common obsolete electronic modules and the time and schedule for obsolescence mitigation of these was incorporated into future planning by the ALMA management team, while factoring in that some of the hardware only needs to be supported a few more years in light of upcoming replacement with the new WSU hardware.

Back End Photonics and Local Oscillator Group: This CDL group maintains and repairs the CLOA elements: fiber lasers (Master Laser and Laser Synthesizer) and amplifiers (Master Laser Distributor, Photonics Reference Distributor, and Low Frequency Reference distributor), passive splitters, Sub Array Switch (SAS) and Line Length Corrector (LLC) LRUs, as well as LO Photonic Receivers (LPR) which are part of the Front End assemblies. The group also supports the Hydrogen Maser at the site for VLBI operation and maintains a fully functional reference generation and distribution system at CDL to serve as a test bed for returned and/or repaired LRUs. This duplicate system serves as a source of last resort for backup spares if the OSF runs out of single point failure LRU spares (while broken ones are being serviced).
In FY2024, significant LRU level repairs included Sub-Array Switch optical units (upgrades), LO Reference Test Module (LORTM), and a complement of several optical fiber cables of differing configurations. Significant intervention and remedial effort was required from the NA staff to restore several laser synthesizers to their normal operation after multiple lock failures were reported by the operations staff. The active components in several laser synthesizers have degraded over the years, but it was possible to restore operation by readjusting relevant bias values and without having to repair/replace hardware (degradation was not severe enough to

justify such an intrusive intervention as per the vendor recommendations). A Photonic Reference Distribution (PRD) article had to be replaced with a spare to restore operations. Since this is a single point failure LRU that is obsolete, and of which there is only one remaining spare at the OSF, the original vendor was commissioned to design and produce a replacement spare article using modern components, meeting the original specifications.

The Master Laser LRU has an embedded doubler that has been identified as obsolete. During FY2024, effort was made to identify and qualify a replacement to ensure continued maintainability of this significant LRU. In FY2024, this group worked with Teraxion, the original equipment manufacturer vendor of the Laser Synthesizer (LS) and LORTM, which is used in the FE Test and Measurement System, to ensure its continued support for maintenance. Given Teraxion's inability to support these LRUs any longer, the photonics group assembled the necessary knowledge to enable repair of these LRUs in-house. One LORTM article was successfully repaired as a result of this effort and will be returned to the OSF shortly.

During FY2024, the team members supported the acceptance and commissioning of the new hydrogen maser at AOS. Following in-plant acceptance in late FY2023, which this group also supported, the vendor delivered this new hydrogen maser to the site in early FY2024.

The photonics support team staff continued work on further development of the new Ethernet to CAN (E2C) modules for ALMA. This E2C hardware is required as replacement hardware for the now obsolete ALMA bus master computers, and is the platform for enabling future migration of the ALMA M&C system to ethernet bus in order to support the more stringent ALMA WSU requirements. After its initial deployment and testing at the site in FY2023, the E2C needed to be qualified with respect to vibration and EMC requirements. This task was completed, and the documentation for the Critical Design and Manufacturing Review was prepared for the Q4 review.

The photonics team members were also tasked with carrying out impact assessments for various WSU development projects, and with providing the systems engineering and development support to the NAOJ based WSU Data Transmission System (DTS) development team. This group drafted and submitted a proposal for a WSU sub-project to procure, qualify, and deliver optical fibers to the ESO-led project whose goal is to provide connectivity from the AOS to the OSF. With assistance from the NRAO CDL staff, this group is also helping to stand up the WSU Integrated Test Facility at the OSF, where the prototype ATAC and DTS hardware will be integrated and tested, prior to their delivery to the ALMA project.

Correlator Group: The correlator/Digital Signal Processing (DSP) group supported the ALMA Baseline Correlator by providing requested support to the ALMA correlator group in Chile (most Baseline Correlator issues are handled directly by the Chilean correlator group).

During FY2024, this ALMA correlator support continued. Failures of the clock distribution boards were analyzed, and the root cause was identified as the degradation of a medium power clock amplifier on these distribution boards. Amplifiers on the functioning boards were also found to be marginally degraded, but not yet out of specification. Since the original amplifier is obsolete, a drop-in replacement amplifier was identified, procured, and tested. A long lead order was placed for sufficient quantity in order to be able to replace this component on all the distribution boards, when necessary.

ALMA Hardware Maintenance Activities Summary:

Careful monitoring of LRU failure rates, shipping/transit time to and from the OSF, as well as time to repair returned articles, enabled CDL to ensure an adequate supply of operational spares at the OSF, and to take mitigating and corrective actions when necessary. Having a usable spare available on site (when required to execute a tier-1 repair by replacement on the telescopes) ensured that science time lost was only time spent to execute the replacement, rather than wait for the part to arrive.

Most NRAO members of the NA IET who execute the tiered maintenance and support activities are members of the ALMA development teams executing projects. The ALMA IETs are jointly responsible for maintaining technical oversight of ALMA hardware— existing and under development. In that role, the NA IET executed these support functions in FY2024 by providing the NRAO personnel whose knowledge and expertise were relevant. As described in the preceding paragraphs, NA IET continued participating in various working groups set up to achieve the goals of the ALMA 2030 Roadmap.

The center of the Milky Way galaxy over the ALMA sign in Chile. Photo by Bettymaya Foott (ALMA).

PROVOCA student graduation – June 2024

PROVOCA mentor summit – September 2024

Chilean Affairs

The NRAO office in Santiago supports the legal and business affairs of AUI/NRAO in Chile for ALMA operations. It provides the services that require a local presence in Chile and cannot be effectively discharged from North America. The Office of Chilean Affairs (OCA) oversees compliance with Chilean law in all Observatory operations, with a particular focus on human resources activities, including the implementation of collective contracts. The office is responsible for fiscal functions, contracts and procurement, local property management, export/import activities, and travel support. OCA also monitors safety, environmental, and regulatory issues in coordination with the NRAO safety manager and the ALMA Environmental Working Group.

Representation

This function links AUI/NRAO with Chilean governmental and other institutions. Of particular importance are the interactions with the ministry of Foreign Affairs, the Agencia Nacional de Investigación y Desarrollo (ANID, formerly CONICYT) and universities. The AUI/NRAO representative: leads local interactions with ESO, NAOJ, and other international observatories (Association of Universities for Research in Astronomy, Carnegie, Giant Magellan Telescope) and North American projects in the ALMA concession or Parque Astronómico Atacama (PAA); defines the strategic direction for education and public outreach; interacts with the U.S. Embassy; and coordinates U.S. VIP visits to ALMA.

In FY2024, the AUI/NRAO representative engaged with the ministries of Science and Foreign Affairs and coordinated ALMA's commitments in support of Chile's successful bid to host the IAU General Assembly in 2030. She also led the process of articulating and providing feedback that helped ANID streamline the management of the ALMA-ANID Fund.

In the relations with non-ALMA projects on the PAA, the AUI/NRAO representative negotiated an amendment to the site use agreement with Simons Observatory, contributed substantively to the site use agreement with the University of Tokyo Atacama Observatory (TAO), and made progress on the site use agreement with Caltech for the Leighton Chajnantor Telescope.

The AUI/NRAO representative organized and hosted VIP visits to ALMA, including by the UN secretary general, António Guterres; AUI Trustees; U. Chile professors; and the GMT representative. She also briefed staffers from the House and Senate Science, Space, and Technology and Armed Services Committees, when they visited Santiago.

Business

In FY2024, the business team at OCA continued to strengthen communications with the JAO, ESO, and NAOJ. The Chilean fringe pool remained a focal point throughout the year. Recent audits by ESO and JAO, combined with the transition to a new ERP system, provided opportunities to improve reporting and align stakeholder expectations.

The implementation of the second stage of the Chilean fringe mechanism incorporated additional liabilities into the provisional rate, focusing on earned, but untaken, vacation days and increased severance obligations. The accrued amounts are being deposited in a Chilean bank account in guaranteed, inflation-indexed, fixed-term deposits. The JAO, ESO, and NAOJ receive quarterly updates on the progress and impact of the fringe pool implementation.

In late FY2024, the implementation of the new ERP impacted all areas of business operations at OCA, reshaping processes that range from purchase requisitions to the generation of audit

documentation. To ensure a smooth transition, OCA has concentrated on mastering essential tasks and deliverables while gradually familiarizing themselves with the system's broader functionalities.

Human Resources

AUI/NRAO manages its responsibilities and legal obligations as sole employer of JAO and OCA local staff members and supports NRAO expatriate/international staff in Chile.

Local Staff: The OCA Human Resources (HR) manager monitors the application of Chilean legal rules and regulations, payroll activities, including periodic visits to the OSF and the Santiago Central Office (SCO), and local staff union matters. OCA also coordinates management of compensation, recruitment, and terminations with the JAO and NRAO Human Resources.

International Staff: OCA, through its legal representative, accredits and monitors all responsibilities associated with NRAO international staff in Chile. The expatriate assistant looks after the well-being of the international staff members and their families.

In FY2024, the main focus of the HR-Payroll team at OCA was the migration to a new payroll system, successfully transitioning from ADP (outsourced) to a payroll operation that is entirely run in-house with the payroll software BUK. As of January 1, 2024 salaries have been paid with the new system, vacation requests have been digitalized, and legal documents can be signed electronically.

Other noteworthy HR activities included active participation in the two working groups agreed during the last collective bargaining process; the application of a series of new labor laws in the areas of telework; prevention of sexual, labor harassment, and violence at work; as well as the legally mandated work and mental health bi-annual survey.

Safety, Health and Environment

The OCA senior engineer oversees safety, health, environmental, and regulatory matters in coordination with the NRAO and JAO safety managers. The engineer also monitors site protection (mining rights and radio frequency) and ongoing activities of the joint peer committees.

In FY2024, the OCA senior engineer helped assess the environmental impacts and implications of the OSF-AOS fiber optic project, which is part of the WSU. He also facilitated the relinquishment of the remaining mining rights on the Chajnantor plateau. The decision to relinquish these rights was jointly made by the JAO, ESO, NAOJ, and AUI/NRAO, taking into account that the risk of mining exploration/exploitation by third parties is low and the cost of maintaining the rights is increasing and no longer justifiable. Moving forward, OCA will monitor if third parties request mining rights in the ALMA concession area.

Education and Public Outreach

In collaboration with NRAO EPO and ODI, the outreach employees and EPO coordinator led the OCA EPO efforts in Chile, with a focus on new participants in STEAM. These positions are responsible for initiatives and activities to promote STEAM career vocations among students, bringing science closer to the community.

In early FY2024, the OCA EPO team completed the second generation of PROVOCA mentoring, certifying 23 new mentors and 36 new students. For the first time, the cohort included two students from the deaf community. Later in FY2024, PROVOCA began its third generation of mentoring with an increase of 94% in the applications from mentors and 71% from students. OCA responded to the greater demand by increasing the number of mentoring groups by 60%. For the second year in a row, PROVOCA welcomed two students from the deaf community to its student mentorship program.

In September, OCA organized a PROVOCA mentor summit (below), bringing together mentors from the second and third generations. This in-person meeting provided a unique opportunity for networking and sharing of experiences among mentors from different regions of the country.

FY2024 also marked the beginning of the expansion of PROVOCA, nationally and internationally. Collaborations were established with Programa de Mentoría para Mujeres Científicas (PROMEMCI at U. de Cuenca) mentoring program in Ecuador, a technical institute in Santiago (IACC), and a group of four universities in southern Chile (U. de la Frontera, U. de Los Lagos, U. de Aysén and U. de Magallanes). Associate mentors are participating in the mentor training and customized workshops to assess the possibility of replicating the program at their institutions.

FY2024 was filled with other outreach activities beyond PROVOCA, including traveling thousands of miles to visit students in hard-to-reach rural communities in southern Chile, making solar observations, delivering talks and workshops, preparing the community for an annular eclipse and providing (in collaboration with Green Bank and Astronomers without Borders) 10,000 solar eclipse glasses to all schools and general public who participated in these outreach activities.


ngvla

NEXT GENERATION VERY LARGE ARRAY

The ngVLA is the highest priority for NRAO development activities. The goal is to deliver a facility that will be optimized for observations at wavelengths between the superb performance of ALMA at submillimeter wavelengths, and the future Phase I Square Kilometre Array (SKA-1) at decimeter and longer wavelengths. The key science goals for the ngVLA were distilled from individual science cases and discussed and reviewed by the ngVLA Science Advisory Council and Science Working Groups. The goals were originally described in detail in ngVLA Memorandum #19 (arXiv: 1711.09960), and have since been updated in ngVLA memo #125 (2408.14497), and include:

- Unveiling the Formation of Solar System Analogs;
- Probing the Initial Conditions for Planetary Systems and Life with Astrochemistry;
- Charting the Assembly, Structure, and Evolution of Galaxies from the First Billion Years to the Present;
- Science at the Extremes: Pulsars as Laboratories for Fundamental Physics; and
- Understanding the Formation and Evolution of Stellar and Supermassive Black Holes in the Era of Multi-Messenger Astronomy.

Prior to FY2020, the primary focus of the ngVLA project was to prepare a proposal for the Astro2020 Decadal Survey, including a compelling science case, and a rationally costed and realizable design for all the major telescope elements. This effort was driven by the larger community and coordinated through the NRAO via close consultation with external Science and Technical Advisory Councils. In FY2019, the ngVLA proposal for the Decadal Survey was submitted, the ngVLA Science Book was published, and the Reference Design Concept was completed. In FY2020, the project concept was formally presented to the Radio, Millimeter, and Submillimeter subpanel of the Decadal Survey; a Systems Requirements Review was completed; and three contracts were awarded to antenna vendors to develop ngVLA antenna design concepts. In June 2021, a contract was awarded to mtex antenna technology for the design of the ngVLA 18m antenna. In November 2021, the Astro2020 Decadal Survey published its report where the ngVLA received high priority for new ground-based observatories to be constructed during the coming decade.

Prior to FY2022, the project completed a technical system-level Conceptual Design Review, positioning it as a candidate for the Major Research Equipment and Facilities Construction (MREFC) program. This review covered key aspects of the project, including the antenna concept, antenna electronics, software architecture, array configuration, and systems engineering. Building on the feedback from this review, the design will mature through FY2024–2026, with a target of reaching the System Preliminary Design Review (PDR) in FY2026.

In FY2023, the ngVLA achieved a significant milestone with the Mid-Scale Innovations Program (MSIP) contract completing a PDR for the 18-meter antenna design, developed by mtex. An external panel of subject matter experts reviewed the PDR package, which included approximately 150 documents and drawings, totaling over 3,000 pages. This milestone also triggered the procurement of long-lead items for the prototype antenna, with fabrication beginning on major assemblies. At the VLA site, electrical and fiber infrastructure work advanced in preparation for on-site antenna installation and testing. The Integrated Product Teams (IPTs) also made substantial progress toward subsystem-level Critical Design Reviews (CDRs). In July 2023, the National Science Foundation (NSF) formally designated the ngVLA as an MREFC Design Candidate.

The ngVLA antenna structure and pedestal begin to take shape at the VLA site in New Mexico in 2024. Photo by Jeff Hellerman (US NSF / AUI / NSF NRAO).

In FY2024, the project completed subsystem CDRs across all major IPTs, paving the way for system-level and IPT-level PDR milestones. A project management baseline will be updated to reflect the anticipated funding levels. In September 2024, the NSF conducted a CDR which resulted in a strong pass. The Central Signal Processor (CSP), Data Back-End (DBE), and Reference and Timing systems also achieved unconditional passes in their respective CDRs. Under the MSIP, the receivers were fully developed and are now awaiting installation on the prototype antenna. Critical infrastructure components, such as fiber optic cabling, power transformers, and the ALMA foundation, have been prepared for antenna installation.

Looking ahead to FY2025, the focus will shift towards achieving PDR milestones at both the IPT and system levels, with a significant emphasis on antenna installation and customer testing. The ngVLA team aims to complete prototype and customer testing by the end of 2025, laying the groundwork for the Antenna Final Design Review (FDR) and progressing towards Revision F of the array design. By the end of FY2025, all subsystems will have progressed towards PDR readiness.

Strategic partnerships with domestic and international agencies, academic institutions, and industry will be critical in advancing the project. Many collaborations have already been established through participation in the ngVLA's science and technical advisory councils, working groups, workshops, and community design studies. Ongoing discussions will aim to formalize these relationships and secure additional work packages from domestic and international partners to contribute to the ngVLA design.

For 2025 and beyond, the ngVLA has identified the following priorities in preparation for PDR in CY2026, as outlined in the FY2025 Program Operating Plan (POP):

- **Receiver Development**: Focus on the development of receiver cartridges and RF components for the most technically complex feeds, enabling additional system-level testing in both laboratory and prototype environments.
- **Downconverter and Frequency Reference Modules**: Advance the development of downconverter-digitizer modules and antenna frequency reference modules for end-to-end lab tests and system-level testing on the prototype antenna.
- **Digitizer Solution Maturation**: Further mature the commercial-off-the-shelf (COTS) digitizer solution to replace custom in-house developments, reducing schedule, cost, and technical risk. Ensure successful digitizer synchronization and clock recovery, integrating with the digital back-end.
- **Sub-Band Processor Development**: Technically demonstrate the sub-band processor design within the Central Signal Processor (CSP).
- **Data Processing and Software**: Maintain focus on the data processing challenge and continue maturing the computing and software system designs to handle ngVLA data processing needs.
- **Array Configuration and Infrastructure**: Develop the array configuration in a Geographic Information System (GIS) model to advance site development, infrastructure planning, and operational requirements.

The long-term objective of the ngVLA project is to fully refine the science requirements, system architecture, and design, culminating in the successful completion of the MREFC final design phase and advancing to the construction phase. Subject to funding, the project is targeting detailed design and development between CY2025 and CY2028, with construction planned from

CY2029 to CY2039. First science observations are anticipated by 2033, with full scientific operations expected to begin by 2039.

The project also hosted a conference in Morelia, Mexico, working with colleagues on a program of 67 talks and 37 posters that explored the novel scientific opportunities that will unfold with the unprecedented angular resolution and sensitivity capabilities offered by ngVLA.

Participants at the Morelia, Mexico 2024 ngVLA conference.

The ngVLA prototype begins assembly in New Mexico. Photo by Jeff Hellerman (US NSF/AUI/NSF NRAO).

NEW MEXICO OPERATIONS

Two of NRAO's telescope facilities—the NSF VLA and the NSF VLBA—are maintained and operated from New Mexico. Both instruments provide unique centimeter-wavelength capabilities to the astronomy community. The following subsections separately describe the operational, maintenance, and development activities associated with each instrument, though many activities are closely coordinated across both instruments and are carried out by the same personnel.

Very Large Array (VLA)

The VLA comprises twenty-seven 25-meter diameter antennas laid out in a Y-shaped configuration on the Plains of San Agustin in west-central New Mexico. It offers a wide range of capabilities for the astronomy community, via ten receiver bands and four different array configurations.

In FY2024, the NRAO continued to provide a suite of powerful VLA capabilities to the astronomy community as well as continuing its program of VLA infrastructure improvements. Initiatives also enabled the VLA site to become a test bed for the next generation VLA (ngVLA) prototype antenna and associated operations.

VLA Science Operations

Observing Programs: The NRAO continued to offer three types of observing programs to VLA users in the Calls for Proposals issued in FY2024: General Observing (GO), Shared Risk Observing (SRO), and Resident Shared Risk Observing (RSRO). The latter, in principle, is any VLA observing mode that does not fall under GO or SRO. In the Call for Proposals for both the 2024B and 2025A observing semesters, no new GO or SRO capabilities were added.

In FY2024, the real-time RFI blanking software controls for the user in the OPT were updated to provide full flexibility. Observers can select a pre-defined NRAO observing resource, in which case the blanking is on by default but the observer can opt-out. Alternatively, if an observer needs a user-defined resource the blanking can be applied through an opt-in choice. In both types of resources, the user can define the threshold blanking level and length of the data chunk to be blanked. This has been demonstrated to be effective at blanking interference from radar transponders in L, S, and X bands, especially those used for aeronautical navigation between 1.0 and 1.2 GHz.

Support for commensal systems on the VLA was continued in FY2024; there were three such systems that were able to take data at the same time as PI-proposed observations. The first was the VLA Low-band Ionosphere and Transient Experiment (VLITE) system, which takes data at P-band during regular observations that use bands other than P-band. The second was the *realfast* system, which takes data at very fast dump rates in an effort to detect Fast Radio Bursts (FRB) or other transient phenomena while observing at L- through X-bands, in parallel with standard continuum correlator configurations. The third system was the Commensal Open-Source Multimode Interferometer Cluster Search for Extraterrestrial Intelligence (COSMIC-SETI) project; this commensal mode used a pre-correlation SETI backend at the VLA for real-time identification of potential SETI signals, running with VLA observing throughout FY2024, in particular focused on the regular observing pattern of the VLASS.

Scientific Support of Receiver, Antenna, and Array Performance: A large fraction of the FY2024 scientific support went toward maintaining receiver, antenna, and array performance and

The center of the Milky Way galaxy begins to appear at dusk over the Plains of San Agustin and the Very Large Array. Photo by Jeff Hellerman (US NSF / AUI / NSF NRAO).

ensuring that the NRAO user community had access to quality instrumentation and updated information to effectively use the VLA. Operational tasks carried out by the scientific staff in support of these functions are listed below.

Support Calls for Proposals: Capabilities offered in the 2024B and 2025A semesters were defined, and user documentation for all capabilities for the relevant Call for Proposals updated; scientific testing of user tools needed to prepare proposals (e.g., the Proposal Submission Tool (PST), General Observing Setup Tool (GOST)/Resource Catalog Tool (RCT), Exposure Calculator Tool (ECT)) was undertaken, and technical reviews for proposals and evaluation of proposals for RSRO contributions were performed.

Hardware, Software, and Operational Documentation: Technical documentation detailing hardware and software functionality for staff and users was written, as well as operational procedures and documentation for the operations staff. The VLA Observational Status Summary was updated before the 2024B and 2025A Call for Proposals, along with the Guide to Proposing with the VLA and the Guide to Observing with the VLA on the NRAO science web site.

Track and Measure VLA Performance: The sensitivity and gain response of each antenna at each band was characterized periodically. Surface accuracy checks with holography were carried out to ensure optimal efficiency at the highest frequency bands. Antenna positions, collimation offsets, and pointing accuracy were determined whenever the array was moved into a new configuration.

Scientific Testing of Antennas Completing Major Maintenance: Antenna positions, collimation offsets, and pointing accuracy were determined each time an antenna came out of the Antenna Assembly Building (AAB) after a maintenance overhaul. The performance of a newly installed ACU was evaluated.

System Health and Maintenance Feedback: Routine health checks were performed to determine if there were any hardware failures that must be followed up with maintenance tickets. RFI monitoring tests were carried out to characterize and help mitigate RFI contamination in observing bands.

Data Quality Assurance Checks: Data quality was evaluated based on Pipeline results, and test observations were run to identify and diagnose problems that were not caught by the standardized tests and engineering checks.

Calibration Data: Detailed data were collected with the array for a range of calibration purposes, including flux density scale calibrator models, and polarization and bandpass calibration.

VLA Array Operations

Array Configurations: The array was reconfigured in FY2024 to the D, C, B, and BnA configurations.

Operating Model: The VLA operators continued to oversee array operations from the VLA Control Room at the array site throughout FY2024.

For FY2024, the Array Operations Division focused on two high-level VLA initiatives. Both of these targets were achieved in FY2024.

- Continue the effort started in FY2023 to improve the monitoring points and alerts, by completing the software requirements for future implementation by the DMS department; and
- Work towards the long-term goal of a single team of Array Operators for both VLA and VLBA Operations, which will also be required for ngVLA in the future. In FY2024, the process of cross training between VLA and VLBA operators continued, with one additional operator completing training.

Electronics Maintenance and Renewal

The New Mexico Electronics Division is responsible for maintaining all VLA electronic components, VLA servo and fiber systems, and the WIDAR Correlator. Division staff are located either at the VLA site or at the DSOC in Socorro, with maintenance and renewal activities occurring at both places. Due to the lifecycle stage of the VLA, maintenance and obsolescence management is a critical focus for the Division. Routine work for FY2024 consisted of the following:

Digital

- Perform checks on the WIDAR Correlator boards and replace or repair as needed.

Front End and Cryogenics

- Overhaul ~30 receiver cold heads per quarter to keep VLA receivers operating.
- Recondition and replace receiver desiccant in each of 240 units twice per year.
- Perform preventive maintenance on ~75 VLA compressor flexible lines twice per year.
- Overhaul ~15 VLA compressors due to normal wear-and-tear.
- Perform preventive maintenance on four helium circuits to maintain cryogenic performance.
- Repair and/or retrofit/upgrade approximately 30 Front End receivers per year.
- Repair and/or upgrade 40+ Front End M&C modules per year.
- Ongoing repair and upgrades to the Low Band Receiver system.

Local Oscillator and Intermediate Frequency (LO/IF)

- Investigate issues with locking, fringing, output power, and general communication dropouts.
- Perform routine power supply and battery maintenance.
- Repair and replace RF switches.

Servo and Fiber

- Perform checks of the fiber optics system to ensure proper operations; reset as needed.
- Build and install ~six new fiber umbilical assemblies and fan-out kits for the antenna pad J-boxes.
- Perform maintenance on the remaining legacy ACUs and Focus Rotation Mount (FRM) controllers.
- Install new ACUs in two additional antennas as part of the ACU upgrade campaign.

Multiple Groups and Systems

- Retrofit upgrades or additions to enhance equipment safety.
- Perform bench work on modules for repair or assembly.

- Monitor modules responsible for array timing and transmission of data and adjust as needed.
- Monitor for local RFI at the VLA site.
- Calibrate the site weather station yearly for preventive maintenance.

VLA Engineering Services Maintenance and Renewal

The New Mexico Engineering Services Division is responsible for maintaining the VLA antenna mechanical components, as well as the buildings and site infrastructure such as the electrical and HVAC systems. Routine work for FY2024 consisted of the following, listed by the group or groups assigned to the work:

Antennas: VLA antennas are routinely cycled through the Antenna Assembly Building (AAB) for checkout and overhaul throughout the year. The overhaul process includes: (1) structural inspections that may reveal existing and potential problems; (2) the installation of upgrades to mechanical parts, electrical systems, and electronic equipment; (3) addressing maintenance issues that require AAB resources, such as azimuth gear and bearing replacement; (4) inspecting and changing oil in gearboxes; (5) carrying out touch-up painting on the structure; and (6) repairing and replacing other parts as needed.

Additional work is required for antennas receiving an ACU upgrade. The ACU upgrade work roughly doubles the time required for a regular antenna overhaul, which impacts the number of overhauls that can be carried out per year. Four antenna overhauls, including two with ACU upgrades, took place in FY2024. Antenna azimuth bearings were inspected, and one was replaced.

(Left) Subset of the Engineering Services team performing the azimuth bearing replacement on Antenna 12; (Right) old (bottom) and new (top) bearings for Antenna 12.

Preventive maintenance was conducted in the field to inspect, clean, and lubricate each antenna's Focus Rotation Mount (FRM) and azimuth and elevation bearings. During these maintenance operations, antenna mechanics routinely checked grease for metal chips on all antennas in the field for potential failure of moving parts. This is especially important for the sustainability of the azimuth gears. The antenna mechanics respond to mechanical/structural problems that occur regularly, such as inoperative motors, water leaks into the antenna equipment rooms, realigning misaligned FRMs, and addressing other antenna issues brought to their attention.

Antenna mechanics also inspect the 73 concrete antenna pads. This is done to ensure their structural integrity and to measure for signs of shifting. If the tripod legs of a pad were to shift too far apart, the antenna would no longer be able to be bolted to the pad. Some of the antenna pads are showing signs of deterioration due to their exposure to weather. The antenna group inspected the pedestals, ordered material, and repaired the pedestals that were most in need of restoration.

The two transporters used to move the antennas during reconfigurations also undergo maintenance and repair between move periods. Maintenance on the 40-year-old transporters includes servicing the motors, checking the generators that keep critical power to the antenna during a move, lubricating the moving parts, checking the 24-wheel axles and wheels, and maintaining the electrical and hydraulic systems. The transporter mechanics inspected and rebuilt all of the transporter trucks in FY2024.

Track: During FY2024, VLA railroad track inspections continued. The track crew checked for problems that could compromise the safety of the transporters that carry the antennas during array reconfigurations and other antenna moves. These inspections also guard against problems that could jeopardize the safety of the maintenance rail vehicles used by technicians to service the track and antennas.

Maintaining track integrity requires specialized railroad repair vehicles, equipment, and materials such as cross-ties, ballast, and rails. The Holland Track Survey conducted in 2013 recommended that 5000 cross-ties be replaced each year to maintain the minimal health of the VLA Wye. The track crew replaced ~400 crossties during FY2024, due to the overall flat funding profile and associated limitations on staffing.

Seventy-three intersections (one for each antenna pad) are included in the VLA Wye proper, along with a few more service intersections (or “spurs”). The ties that make up these intersections must be replaced on a regular basis. Due to the complexity of rebuilding an intersection, the decision was made to replace failing intersections with fabricated concrete ties rather than wooden ones. This method requires more time to accomplish than working with wooden ties, but the payoff is extended life, greater safety during moves, and less maintenance. To date, 63 of the wooden intersections have been replaced with the concrete tie design. As a majority of intersections have been repaired, the track crew have focused their efforts on repairing misaligned or broken railroad spurs. In FY2024, the track crew repaired another two intersections and three spurs.

New Mexico Facilities: In FY2023, the 35-year old roof on the Domenici Science Operations Center (DSOC) failed, threatening the safe occupation and operation of the building, services, and equipment it contains. While the building belongs to the New Mexico Institute of Mining and Technology, on whose campus it resides, the repair of the facility is the responsibility of the NRAO. In FY2023, funding to replace the roof (include solar panels) was received from the NSF and in FY2024, the roof was replaced with the solar panel installation.

VLA Observing Capability Enhancements

The VLA continued to provide new capabilities to the user community to optimize and enhance the science that can be done with the array. This strategy has proven to be effective in keeping users engaged, and it is a critical factor in keeping the scientific productivity of the VLA high.

In FY2024, the VLA scientific staff were able to partially support the development of capabilities that could benefit both the ngVLA project, such as a new on-the-fly holography mode for the ngVLA that could also be used to improve VLA holography and pointing, and the development of

the ability to integrate the ngVLA prototype antenna into the VLA system for commissioning and science verification.

VLA Technical Upgrades and Enhancements

Technical upgrades are chosen based on considerations of safety, operational efficiency, ease of maintenance, impact on data quality and delivery of science, cost, obsolescence planning, and impact on overall NRAO strategic goals.

VLA ACU Replacement: The electronics parts to repair the original ACUs are no longer available. Without these replacement parts, antennas with failed ACUs would no longer be able to participate in observations, posing a serious operational risk. All legacy ACUs are to be replaced with units using newer technology, including NRAO-developed all-digital Silicon Controlled Rectifiers (SCR), which enable a more supportable VLA, as well as eliminating some inherent problems with the legacy design and greatly improving the pointing and tracking capabilities of the antennas. The Servo Group installed two additional units in FY2024.

Variable Frequency Drive (VFD) Development: As part of the continued effort to reduce the power consumption and energy costs associated with operating an antenna, an NRAO-developed VFD electronics package was integrated and characterized with a cryogenic refrigerator and compressor system in the electronics laboratory in FY2021. Further development on this system in FY2024 was not possible given the flat budget projection and current under-staffing.

Buffered Compressor Tank Development: To improve operational reliability and performance, Electronics Division engineers and staff have been developing a buffered compressor tank system for use on antennas. Under this design change, all antenna compressors are now manifolded together to allow for pressure regulation to be controlled electronically. The final system will minimize the diurnal pressure oscillations that are produced by ambient temperature changes and will also compensate for small leaks in the system using a helium charge tank, minimizing maintenance visits. An initial installation of the system occurred in FY2021 as the preliminary design was finalized for portions of the system and the system's control electronics, remaining valves, and buffer and charge tanks were installed on VLA antenna 14 in FY2022. To date the system is performing as expected, but given the flat budgeting, no additional deployments occurred in FY2024.

NRAO crews prepare to move an antenna as the VLA transitions into a new configuration. Photo by Jeff Hellerman (US NSF / AUI / NSF NRAO).

Very Long Baseline Array (VLBA)

The VLBA comprises ten 25-meter diameter antennas at locations ranging from Hawaii to the U.S. Virgin Islands. It is the only array in the world with antennas fully dedicated to astronomical Very Long Baseline Interferometry (VLBI). It is also able to join other ad-hoc VLBI arrays such as the Global Millimetre VLBI Array (GMVA), High Sensitivity Array (HSA) and global cm-VLBI experiments.

In FY2024, the NRAO provided new VLBA capabilities (e.g., improved VLBA network speeds, E-transfer demonstration, site weather station upgrades, Earth Orientation Parameter calibration correction) to the astronomy community that have been under development in previous fiscal years and continued its program of improvements to the digital and physical infrastructure. The engineering team performed further structural inspections and addressed defects found during previous inspections, to ensure continued operation of the VLBA.

VLBA Science Operations

Observing Programs: The NRAO continued to offer three types of observing programs to VLBA users in FY2024: General Observing (GO), Shared Risk Observing (SRO), and Resident Shared Risk Observing (RSRO). As for the VLA, any VLBA observing mode that does not fall under GO or SRO may be proposed under the RSRO program. In the Call for Proposals for 2024B observing semester, no new GO or SRO capabilities were offered. In the Call for Proposals for the 2025A observing semester, no new GO capabilities were added, while under SRO the delivery of wideband VLA data (from WIDAR, phased array Y27) during VLBI observations was offered.

Scientific Support of Receiver, Antenna, and Array Performance: Operational tasks carried out by the scientific staff during FY2024 are listed below and focused on maintaining receiver, antenna, and array performance and ensuring that the user community had access to quality instrumentation and updated information to effectively use the VLBA.

Support Calls for Proposals: Capabilities offered in the 2024B and 2025A semesters were defined, and user documentation for all capabilities for the relevant Call for Proposals updated; scientific testing of user tools needed to prepare proposals (e.g., Proposal Submission Tool (PST), European VLBI Network Sensitivity Calculator and Observation Planner) were undertaken, and technical reviews for proposals and evaluation of proposals for RSRO contributions were performed.

Hardware, Software, and Operational Documentation: Technical documentation detailing hardware and software functionality for staff and users was written, as well as operational procedures and documentation for the operations staff. The VLBA Observational Status Summary was updated before the 2024B and 2025A Calls for Proposals, along with the Guide to Proposing with the VLBA and the Guide to Observing with the VLBA on the NRAO science web site.

Track and Measure VLBA Sensitivity, Pointing, and Focus: The sensitivity, pointing, and focus of each antenna at each band were characterized periodically, as receivers and equipment were replaced or as software was upgraded.

The VLBA antenna at the North Liberty, Iowa station prepares to make observations.
Photo by Jeff Hellerman (US NSF / AUI / NSF NRAO).

Clock Maintenance: Accurate time keeping is central to VLBI, and is provided by hydrogen masers and reference signals inserted into the astronomical data. Quality assurance checks were performed periodically by scientific staff and data analysts.

System Health and Maintenance Feedback: Routine health checks and analysis of the data to determine if there are any hardware failures were followed up with maintenance tickets. RFI monitoring tests were carried out to characterize and help mitigate RFI contamination in observing bands.

Data Quality Assurance Checks: Data quality was evaluated and test observations run to identify and diagnose problems that were not caught by engineering checks.

User Support: VLBA User Support continued to be provided by scientific staff in NM Operations on all aspects of proposing, observing, data access, and data reduction via the helpdesk and/or one-on-one when applicable.

Coordination for Global Millimetre VLBI Array and the High Sensitivity Array: The VLBA occasionally observed in parallel with other observatories, as requested by users whose scientific goals require the inclusion of baselines to large aperture and/or distant facilities. Scheduling and correlation of these observations required coordination with local schedulers at each participating observatory, a significantly more complex process than normal VLBA-only observations require.

VLBA Array Operations

Scheduling and Observing: Standard scheduling and observing procedures were used during FY2024 for the VLBA. The VLBA operations staff also correlated and inspected observations using standard methods.

Operating Model: VLBA Operations is moving towards the ability to perform electronic transfer of incoming data from non-VLBA stations over the internet, in particular, to minimize the need for the shipping of disk packs internationally.

For FY2024, the Array Operations Division focused on the following high-level VLBA initiatives:

- In FY2022, VLBA Operations developed a procedural framework for the electronic transfer of incoming data from non-NRAO VLBI stations over the Internet, which included the requirements for an e-transfer filesystem in the DSOC for staging transferred data. In FY2023, the e-transfer Operations Plan was drafted, however due to hardware procurement and installation delays, it could not be verified. Operational tests between the correlator and the filesystem took place in FY2024. In addition, the cyber security measures resulting from the audit described in Section 3.2.3 were implemented.
- Initiated a program to improve the clarity of monitoring points and alerts of both new and aging VLBA systems, as has been done for the VLA. A set of improvements was identified and implemented in FY2024.
- As noted in Section 3.1.2, the Division has a long-term goal of a single team of Array Operators for both VLA and VLBA Operations, which will also be required for ngVLA in the future. In FY2024, the process of cross training between VLA and VLBA operators continued with another operator trained to operate both facilities.

USNO-specific Operations: Every day, the USNO used two to five VLBA antennas to perform Earth orientation measurements. After observations were completed, a data quality assessment

was performed by VLBA Operators and then the data were made available for download to the USNO correlator. When needed, the VLBA correlator was used as a back-up to the USNO correlator. This capability was tested on a two-station observation every month. In these tests, data from Kōkeʻe Park, Hawaii, and Wettzell, Germany were transferred to the VLBA correlator and then the data were correlated and post-processed on computers within the DSOC. During FY2024, these tests were incorporated into the e-transfer framework described above.

VLBA Development

During FY2024, progress was made on five development projects.

VLBA Back-End Retrofit Project (VBER): An Electronics Division project that consists of five interrelated development projects:

- New E-Rack for VLBA vertex room to house new electronics
- L404B flexible frequency synthesizer
- E-Rack power supply for the L404B and future electronics
- Timing and Reference Distribution Module
- VLBA New Digital Architecture Project (VNDA)

The projects were all brought under one project structure to ensure uniformity in documentation and carefully considered interfaces. Each of the five VBER efforts listed above are at different development stages. Installation of the E-Racks and the Preliminary Design Phases for the L404B flexible frequency synthesizer and P401 power supply were completed in FY2022. During FY2023, E-Racks were fully commissioned with L404B synthesizers and P401 power supplies at three sites and a Final Design Review was completed for the Timing and Reference Distribution modules. The following activities were completed in FY2024:

- *Commissioning of E-Racks:* E-Racks were commissioned with new L404B synthesizers and P401 power supplies at an additional VLBA site in FY2024; the remainder will be completed in FY2025.
- *Procure VBER Timing and Reference Distribution Module hardware to support VNDA development:* Hardware to populate the VLBA test rack was purchase and installed in support of the VNDA ZBT. Hardware for two VLBA sites was purchased and will be installed in early FY2025 to support VNDA on-the-sky-testing. Orders were placed for hardware, including spares, necessary to outfit the entire array with delivery scheduled for Q1 FY2025.

VLBA New Digital Architecture Project (VNDA): This effort began in FY2019 in response to growing concern about the ability to maintain the VLBA digital system, the ROACH Digital Back Ends. Since replacement hardware was not available, a new development project was needed. During FY2023, difficulties in executing the planned development path triggered an engineering change that allowed VNDA to employ a hardware and development platform that was not available in FY2019 for the sampler and a migration to GPUs for the channelizer. This change pushed the VNDA timescale somewhat later but is not expected to negatively affect the project budget. During FY2024, three major milestones were completed:

- In Q3, the first major laboratory test (the Zero-Baseline Test or ZBT) of the full VNDA system was conducted. This retired most of the project technical risk and was the gate to procurement of the prototype hardware to be installed at two antennas in early FY2025.

The Scientific Information Services (SIS) and New Mexico Systems (NMS) groups from DMS worked with NM Operations to execute this test.

- In Q4 after successful ZBT, the PDR was held. This review covered the technical progress, the upcoming on-the-sky test plan, operations and maintenance plan, and project management. Two pieces of software, to be developed by the NMS group of DMS, was included in the review: the Monitor Interface Board (MIB) emulator software and the VNDA Switched Power Receiver. PMD assisted NM Operations in executing the PDR.
- In Q4, the VNDA project completed the procurement of two sets of prototype hardware which will be installed on VLBA antennas in FY2025.

VLBA ACU Design Development: Similar to the experience of its VLA counterpart, the VLBA ACU electronics hardware has reached obsolescence after 30 years of operations, posing a critical risk to antenna availability. Leveraging the VLA design, a new ACU assembly draft conceptual design was created and an initial project estimate made. A planning session was held late in FY2023 to initiate effort on this project. In FY2024, sufficient Conceptual Design documentation was planned to be completed by Q4 to allow prototype material purchases to commence in FY2025, should funding and resources be made available. The sustained flat NRAO budget required cuts in the NMOps Engineering areas supporting this effort; the Conceptual Design is now planned for FY2025, with the NMS group in DMS.

High-speed VLBA networks: Real-time correlation became a routine tool for weekly diagnostic testing during FY2021. This capability relies on the high-speed network that was deployed as part of CSA-F. In FY2024, in collaboration with the NRAO Administration and DMS departments, NM Operations was able to demonstrate increases in real-time capability and incremental improvements in real-time data transfer to all VLBA stations (at least 1 Gbps for nine stations, excluding St Croix which is limited by the island's infrastructure). The VLBA site at Mauna Kea has a 10 Gbps link which supports the VLBA's full data rate, and additional funding is being sought with the future goal of achieving this rate across the VLBA sites (excluding St Croix).
E-transfer: A petabyte-scale filesystem was deployed in late FY2023 through Q1 FY2024 to facilitate transfer of large (TB-class) data sets, either to the VLBA from foreign sites, or from the VLBA to foreign correlators. During Q1, NM Operations assisted by the SIS group conducted a security audit of some VLBI-specific data copy protocols and planned for implemented one of them in a manner consistent with the NRAO's cybersecurity standards. During Q2, NM Operations, with assistance from the DMS SIS and NMS groups, prepared the filesystem and demonstrated its use on a first real-world use case using a local data copy from Mark6 to the filesystem and then a direct read by the correlator.

VLBA Maintenance and Renewal

The New Mexico Electronics Division is responsible for maintaining all VLBA electronic components, many mechanical systems, VLBA station infrastructure, and recording and playback hardware. Two VLBA site technicians are located at each VLBA site, and many engineers and technicians provide VLBA support from the DSOC in Socorro.

The site technicians carried out the bulk of the routine maintenance tasks at the VLBA sites. For FY2024, this work consisted of the following at all 10 VLBA sites.

Monthly Maintenance:

- Testing of all emergency systems, including backup generator.
- Compressor oil level and pressure analysis.
- Azimuth cable wrap maintenance.

- Wheel assembly position inspection.
- Gearbox oil filter cleaning.
- Uninterruptible Power Supply inspection and tests.

Quarterly and Semi-Annual Maintenance:
- Fire extinguisher and alarm inspections and cleaning.
- HVAC maintenance.
- Intermediate Frequency (IF) Converter level and Synthesizer setting tests and adjustments.
- Antenna mechanical gear, pinion, gearing, bearing, and motor lubrication and inspection.
- Vacuum Pump and Manifold tests and inspections.
- Inspection of brushes and commutators on antenna motors.
- Inspection and testing of Antenna emergency limit motion.
- Inspection of antenna grounding system.
- FRM servo amplifier alignment.
- Dry-air system maintenance.

Electronics division staff performed the following routine VLBA work in FY2024:

Front End and Cryogenics:
- Overhauled 40 receiver cold heads to keep VLBA Front Ends operating.
- Performed preventive maintenance on 4 helium circuits to maintain cryogenic performance.
- Repaired and/or upgraded/retrofitted 8 VLBA Front End receivers.

Local Oscillator and Intermediate Frequency (LO/IF):
- Investigated issues with locking, fringing, output power, and general communication dropouts.
- Monitored maser performance and timing, adjusting as needed.

Data Acquisition and Digital:
- Repaired 12 VLBA recording and playback modules.
- Repair of up to 50 recording disk packs.
- Repaired 4 Digital Back End modules.

Multiple Groups and Systems:
- Retrofitted upgrades or additions to enhance equipment safety.
- Performed bench work on modules for repair or assembly.
- Monitored for local RFI at the VLBA sites.
- Supported major maintenance visits to two VLBA sites.

Both the Electronics Division and the Engineering Services Division supported the following major maintenance activities in FY2024:

Major Antenna and Site Maintenance: Scheduled major maintenance was conducted at both the Pie Town and Los Alamos VLBA sites. During these maintenance visits the following work was conducted:

- Inspect and lubricate Focus Rotation Mount (FRM), azimuth wheel, elevation, and pintle bearings; replace as necessary.
- Inspect azimuth and elevation gearboxes and elevation gear sector; oil and filter change as needed.
- Inspect azimuth inner/outer bearings, idler bearing; replace as needed.
- Subreflector painting and coatings on quad legs.
- Inspect feeds, feed cone and dichroic reflector system and replace/repair as needed.
- Inspect and repair azimuth rail and grout.
- Inspect and repair cable wrap and pintle structure.

Los Alamos Subreflector painting in situ (left: before, right: after). Measurable gain improvements were seen following this major maintenance visit.

PT Elevation Bearing: In FY2023, metal flakes were discovered in the grease which lubricates one of the elevation bearings at the PT antenna. Further inspections determined this bearing was approaching end of life. In FY2024, both elevation bearings were replaced.

BR AZ2 Idler Wheel: In early summer of FY2024, a normal periodic inspection revealed the outward slippage of one of the Brewster antenna idler wheels. A period of enhanced monitoring and an invasive inspection to verify bearing integrity followed while the antenna remained in operation. Ultimately the slippage exceeded safe operational limits and a maintenance team repaired the wheel in August 2024.

Engineering Inspection Visits: The VLBA antennas have been in operation for over 30 years, which exceeds their original design life. In FY2023, engineering teams inspected the structural and mechanical elements on the Kitt Peak, Fort Davis, Mauna Kea, and St Croix antennas. Structural defects discovered during these inspections were addressed in FY2024 as part of routine maintenance. An engineering team visited the Los Alamos station in FY2024 and conducted a complete structural evaluation.

VLBA Reliability Analysis: In FY2022, Electronics Division staff began an Operations Engineering based analysis of the VLBA with the goals of predicting and extending the lifetime of the array. In FY2023, a reliability analysis of the VLBA antenna electronics began but was terminated due to staffing and budgetary constraints. This research resumed in FY2024 with the

addition of an Electronics Division staff member focused on quality, reliability, and operational excellence.

VLBA Observing Capability Enhancements

The VLBA continued to provide new capabilities to the user community to optimize and enhance the science that can be done with the array. This strategy has proven to be effective in keeping users engaged, and it is a critical factor in keeping the scientific productivity of the VLBA high. Scientific staff and RSRO effort were directed to the following observing capability enhancements in FY2024.

VLBA Technical Upgrades and Enhancements

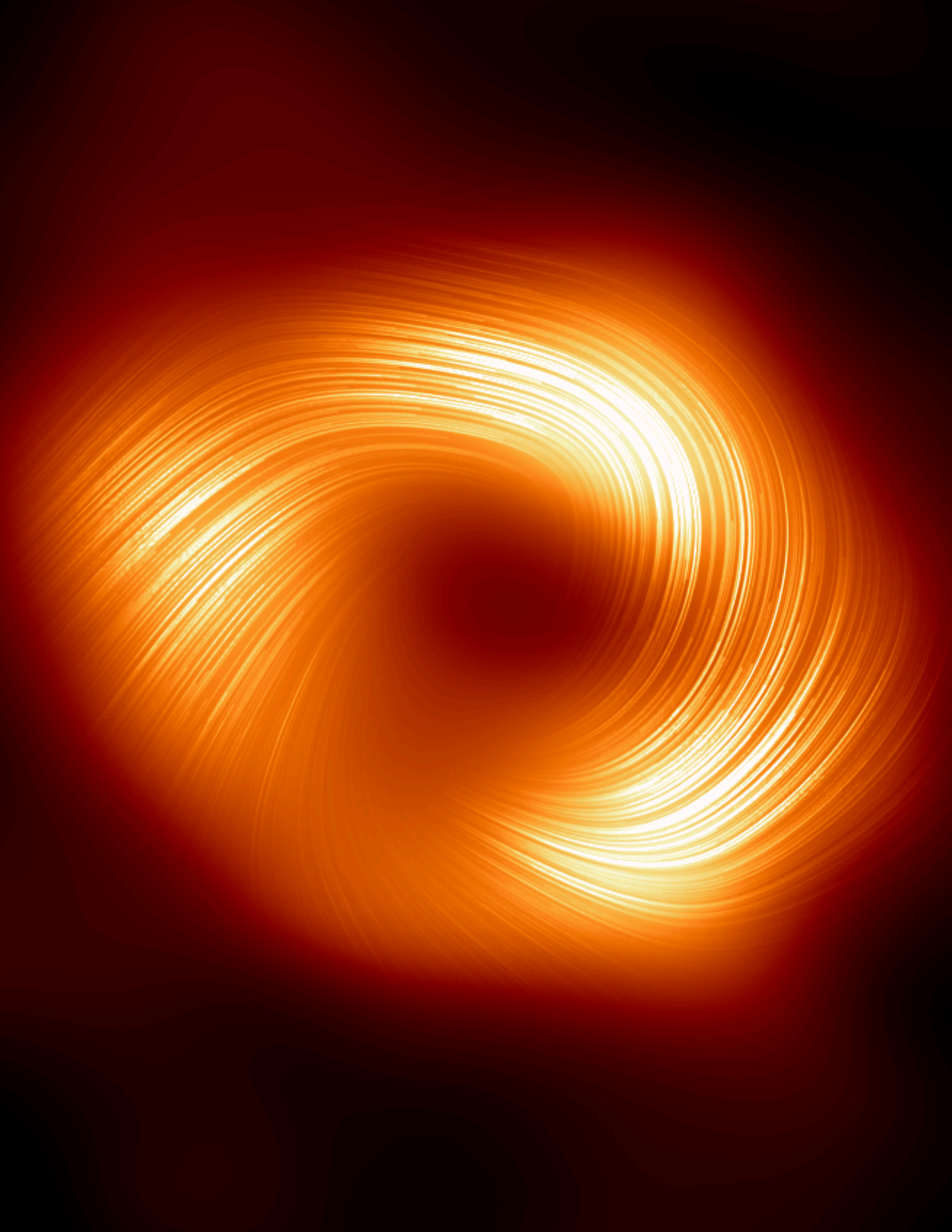
The following VLBA technical upgrades and enhancements were worked on during FY2024.

The Long Baseline Observatory (LBO) Reintegration Proposal describes an eight year program of infrastructure improvement focused on equipment and infrastructure upgrades for the VLBA. In FY2024, these focused on the RDBE replacement and site generators (Hancock); the staging of the improvements in New Mexico has been revised annually to accommodate alternative funding opportunities, infrastructure costs, facilitate urgent repairs, and gain operational efficiencies.

In FY2024, the design and development effort to replace the aging RDBE continued through the VNDA project. Equipment procurements also included additional weather station and antenna gearbox hardware.

Site Weather Station Upgrades: Design of the weather station upgrade and first installation was completed in FY2021. As part of the continued rollout of the revised design, additional sensors and related hardware, sufficient to complete the entire array, were procured in FY2022. In FY2023, an additional upgraded weather station was installed at Pie Town. By the end of FY2024, all production was completed, including shipments of the upgrades, to the remaining VLBA sites.

Data Buffer Servers (DBS): NM Operations supported the DMS SIS group in deploying the remaining nine DBS systems across the VLBA as upgrades and lifecycle renewals for the aging X-cube systems at the VLBA sites. These systems will be a core component of the final real-time data transfer system.



SCIENCE SUPPORT AND RESEARCH

The Science Support and Research (SSR) department coordinates and manages the efforts to support scientific users of NRAO facilities, seeks to broaden the Observatory's impact through education and visitor programs for scientists, and supports and oversees the research and scientific productivity of the scientific staff. The SSR Department comprises several Divisions, namely Telescope Proposal Support Services, Reference Services, Scientific User Outreach Services, and SSR Special Programs.

Telescope Proposal Support Services

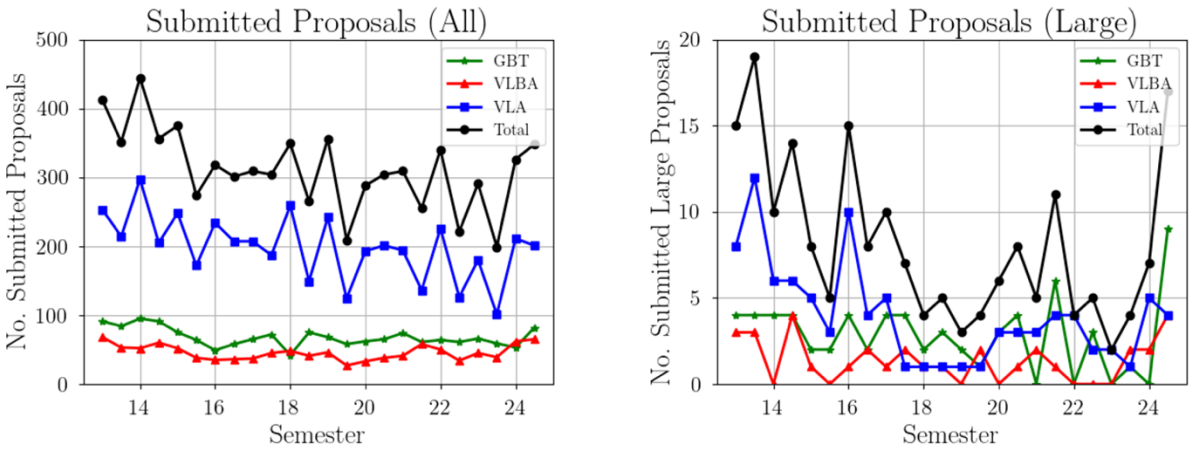
The NRAO Telescope Proposal Support Services contains the Telescope Time Allocation (TTA) Group. TTA is in charge of supervising the entire proposal process and offering the necessary tools for preparing, submitting, and peer-reviewing proposals for scientific observations conducted of the VLA and the VLBA. It also handles the allocation of telescope time. Currently, TTA extends its support to the GBT through a Service Level Agreement with GBO. Starting in Semester 25B, there will be a single proposal solicitation through the NRAO as a result of the reintegration of GBO on 01 October 2024. ALMA proposals are managed separately by the JAO, in accordance with international agreements.

The NRAO proposal process is semester-based with proposal deadline dates on the closest Wednesday to 1 February and 1 August. In FY2024, as in previous years, TTA prepares each Call for Proposals and, in coordination with VLA/VLBA and GBT Science Operations, the associated documentation regarding schedules and offered observing capabilities, and supports astronomers with any issues they may encounter during the proposal submission process. All proposals are evaluated on the basis of scientific merit by ten Science Review Panels (SRP), each covering a unique scientific category. SRP members are recruited from the scientific community for a typical term of four semesters (up to two years). Proposals are reviewed for technical feasibility by members of the NRAO scientific staff. Scientific and technical reviews are forwarded to the Time Allocation Committee (TAC) composed of the chairs of the SRPs. The TAC considers the entire set of proposals and recommends time allocations for the VLA and the VLBA to the NRAO Director, and for the GBT to the GBO Director. After consideration of TAC recommendations by the Directors, disposition letters are sent to proposers and the approved science programs are posted online.

Over the last year, the NRAO successfully ran two proposal review processes on 31 January 2024 (Semester 24B with 363 proposals submitted requesting time on the VLA, VLBA, GBT, and GMVA) and 31 July 2024 (Semester 25A with 334 proposals submitted) with the final rankings for Semester 25A being sent to the PIs after the TAC meeting in Q1 FY2025. In addition, all the associated software tools to run the proposal calls were updated to accommodate accepting and evaluating PI proposals.

In Semester 24B, joint observing programs between NRAO and the JWST were offered. NRAO/NSF signed an agreement with NASA's Imaging X-ray Polarimetry Explorer (IXPE) for a Joint NRAO/IXPE Proposal process. This capability will be offered starting with NRAO Semester 25B. Finally, the decision to offer a two-year proprietary period to all student observing programs with accepted thesis proposals was taken. Planning and implementation will start in FY2025 and first offered with the Semester 25B observing program. The images below show the trends in the number of submitted observing proposals (regular and large) through Semester 24B.

The Event Horizon Telescope (EHT) collaboration has captured a new view of the massive object at the center of our Galaxy: how it looks in polarized light. This is the first time astronomers have been able to measure polarization, a signature of magnetic fields, this close to the edge of Sagittarius A. This image shows the polarized view of the Milky Way black hole. Credit: EHT Collaboration.*



Plots of the number of submitted observing proposals (regular and large) through Semester 24B.

Adapting the well-tested NRAO review process to support dual anonymous peer review is a key feature of the new TTA tools. In FY2024, the TTA tools project implemented the interfaces and reporting tools that support the time allocation process, which includes the Telescope Time Allocation meeting and the Director's Review. In FY2025, the TTA tools project will implement functionality to existing interfaces that are necessary to facilitate time allocation, delivery of Disposition Letters to proposers, and project creation.

Reference Services

NRAO Library: The NRAO Library proactively seeks online, distributed access to research and reference materials for NRAO staff and the community. This supports usage across all Observatory sites from one centralized location. While many of the journals are going to open access, the incurred cost of running and publishing in the journal is now being transferred to page charge support. In addition, most journals have needed to increase their fees for subscriptions, whether open access or not, in order to stay competitive. Both of these issues will be addressed going forward.

The NRAO Library is responsible for the publication, posting, and maintenance of the 83 different NRAO Memo and Report series, refereed and non-refereed. This ensures the availability and retention of these documents that are used by the AUI observatories and the scientific community.

In FY2024, the NRAO Library supported the publication of 117 papers from ALMA, VLA and the VLBA. Library staff responded to 399 requests for assistance and published 46 new memos. The final phase of a comprehensive memos database project to support ease of discovery of NRAO Memos and Reports completed in August 2024 with the database of 5853 official memos now associated to 8881 author entries.

The Library staff support NRAO internal and external reporting functions by collecting a variety of data and metrics in coordination with Statistics and Metrics services (see below). This effort includes ongoing development of ALMA and VLA user and publications metrics in addition to the standard metrics requested monthly, quarterly, or annually. The Observatory Librarian participated in a multi-observatory bibliography group to review best practices for gathering scientific papers and collecting metadata on them. The group's recommendations have been published via a refereed paper in the Open Journal of Astrophysics. The group's discussions

included software and utilities which will inform decisions about potential replacements of the legacy system for bibliometrics. The establishment of a faceted search index by DMS will close the Library's decade-long digitization project. The request for this programming time has been submitted.

Historical Archives: The NRAO/AUI Historical Archives seeks out, collects, organizes, preserves, and provides access to NRAO institutional records as well as personal papers of staff, former staff, and others with connections to the NRAO; preserves multimedia materials relating to NRAO history; and conducts oral history interviews. As resources permit, Archives makes these materials available to the public through an extensively documented web site and personal contact with internal staff and external individuals and organizations. As the national facility for radio astronomy, the NRAO/AUI Historical Archives also includes materials on the history and development of radio astronomy. It is one of the few Archives worldwide that already provides such a wide range of materials online without the need for researchers to physically visit the Archives, and its growing reputation has made the NRAO Archives the de facto repository for the history of U.S. and Canadian radio astronomy.

Over the course of FY2024, the Archives continued to respond to internal and external requests for information; support visiting researchers and NRAO staff and process and document new acquisitions. Large acquisitions included ~40 linear feet of materials from Miller Goss on the legacy of radio astronomy in Australia as well as ~110 linear feet of historical observation logs from GBO. A new lobby exhibit at the NRAO Edgemont Road offices, "A Century of Low Noise Technology," was completed in the Summer of 2024. The images below show the NRAO Edgemont Road exhibit in the lobby.

Artifacts on display at the new lobby exhibit at the NRAO Edgemont Road offices, "A Century of Low Noise Technology."

The Archivist and Senior Archivist attended the book launch for *Joe Pawsey and the Founding of Australian Radio Astronomy* in September 2023; and the Archivist attended two conferences, as well as a training workshop held by the Society of American Archivists in June 2024. Finally, Archives produced a strategic, five-year plan focused on growth, sustainability, and succession planning.

Statistics and Metrics: The NRAO observing metrics database contains data used for contractual reporting to the NSF with consistent information pertaining to the operation of AUI-operated telescopes: ALMA, VLA, VLBA, and GBT. The database is also used to provide monthly reports to NRAO management, and quarterly reports to GBO management. Statistics and Metrics also supports the production of the NRAO's monthly, quarterly, and annual reports.

Statistics and Metrics will continue to support the Performance Evaluation and Management Reports (PEMR) for NRAO, comprising the ongoing collection and monitoring of a broad suite of metrics across the range of Observatory activities to provide an informative snapshot of NRAO performance that is of value to NRAO senior management, the NSF, and other stakeholders.

Scientific User Outreach Services

SSR coordinates the Research Experience for Undergraduates (REU) and NRAO summer student programs, Co-Op students, undergraduate and graduate student interns, Reber Doctoral Fellows, Jansky postdoctoral Fellows, the Student Observing Support program, and the Post-Baccalaureate Program.

Undergraduate Students: The long-running (since 1959) NRAO summer student program continues its success. Each year, this 12-week program allows students to work under the supervision of NRAO and GBO staff members at the sites in New Mexico, Virginia, and West Virginia to carry out original research in astronomy, computing, and engineering.

In FY2024, the NRAO funded 36 undergraduate and graduate summer students out of a record number of applications— nearly 430. Also during FY2024, NRAO was awarded a new five-year renewal of its summer student REU program that will support 15 undergraduate researchers each year through FY2028. The NRAO also supports a co-op program that enables undergraduate engineering or astronomy students to gain practical, career-based experience as part of their formal academic education. Two engineering co-ops were supported in NM and two at CDL during the course of FY2024.

Participants of the 2024 NRAO Summer student program during the visit to the Green Bank Observatory as part of the GBO Bootcamp.

Modest funding is available for undergraduate internships, where promising undergraduate students participate in scientific or engineering activities, supervised by NRAO staff, over a period of weeks to a semester.

SSR coordinates closely with student programs run by the NRAO. Participation in SSR student programs is intertwined, and SSR supports the selection of students through the web-based forms and database used for all summer student applications. The SSR department also coordinates with the Physics Inspiring the Next Generation (PING) program, run by the GBO.

2024 NRAO Summer students on the GBT.

Graduate Students: The NRAO is committed to training the next generation of scientists and engineers working in radio astronomy. Several programs aimed at graduate students support this mission. Graduating seniors and first- and second-year graduate students may participate in the NRAO summer student program described above. This program gives students experience in radio astronomy research early in their graduate careers, allowing them to incorporate these projects into their thesis research. The NRAO also awards Reber Doctoral Fellowships to students who have completed institutional requirements for doctoral candidacy so that only their thesis research remains for them to complete their Ph.D. Such Fellows take up residence at one of the NRAO sites, typically for two years, while they complete their thesis under the supervision of an NRAO staff member. Over the course of FY2024, NRAO/GBO supported 15 Reber Fellows at the three sites.

Post-doctoral Researchers: SSR oversees the Jansky Fellows postdoctoral program— the NRAO's long-standing prize research fellowships. This highly competitive program attracts some of the best young scientists to postdoctoral appointments at an NRAO site, or at external institutions in the U.S. (non-resident Fellows). The Jansky Fellows program was also broadened to include engineering as a strategic priority— the Jansky Engineering Fellowship program— tailored to the unique needs of engineering postdocs, and opportunities within CDL. SSR will continue to work closely with existing and incoming Jansky Fellows to identify and implement opportunities for professional development while maintaining the focus on excellence in astronomical and related engineering research. Each Jansky Fellow is provided with a substantial research budget for scientific travel, page charges, and computing resources. SSR will facilitate engagement of the Jansky Fellows in the unique opportunities afforded by being involved in a postdoctoral program at a national observatory. In parallel to research mentoring, the NRAO provides focused training and resources to foster development of non-academic career skills of

the Jansky Fellows, including leadership, administrative and project management, communications, and organization.

The NRAO also hosts postdoctoral fellows funded by other institutions, such as the Hubble Space Telescope, the Einstein Observatory, and NSF Fellows.

Over the course of FY2024, four new Jansky Fellows started at NRAO sites: Samantha Scibelli (Charlottesville), Cosima Eibensteiner (Charlottesville), David Monasterio (Charlottesville/CDL), and Hendrik Muller (Socorro). Rebecca Charbonneau (Charlottesville) and Julia Blue Bird (Socorro) concluded their respective Jansky Fellowships in 2024 August and September. Also starting in FY2024 was the 2025 Jansky Cohort including Kyle Massengill (Socorro). Adam Dong (GBO) will complete the 2025 Jansky Cohort when he starts in Q2 FY2025.

Student Observing Support: Financial support is available on a competitive basis for students at U.S. universities observing with ALMA, VLA, or VLBA through the Student Observing Support (SOS) program. SOS funding provides a stipend and covers miscellaneous expenses such as computers and travel to conferences to a maximum of $40,000 USD per award. This program is regularly highlighted by the Users Committee as being highly valued by the user community.

Over the course of FY2024, NRAO supported 11 students on ALMA projects, 4 students on VLA/VLBA, and 9 more on ALMA archival science. The oversubscription rate is typically 2-3x and for budgetary considerations, the Semester 24B opportunity was skipped. Planning has also started to provide SOS funding in 2025A for GBT projects.

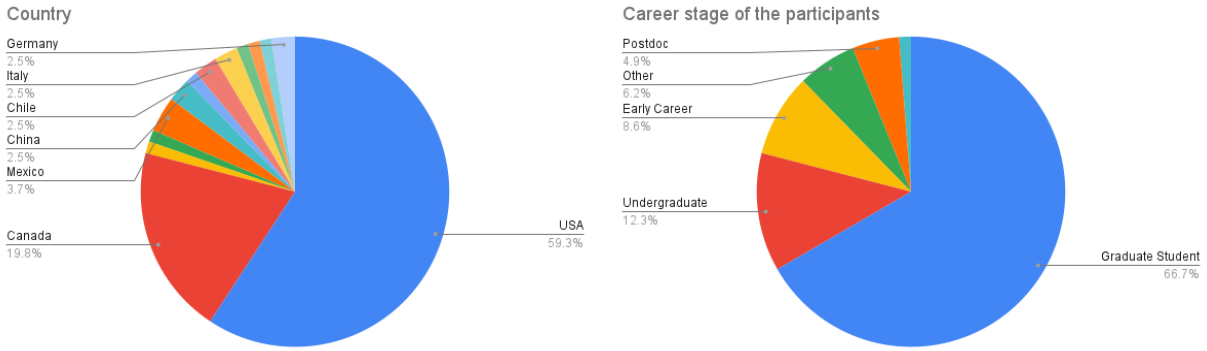
Post-Baccalaureate Students: The Post-Bacc program is a new initiative for students in between their undergraduate and graduate educations who are aiming to strengthen their applications to Ph.D. programs in astronomy or a related field. The program supported two successful post-baccs in CY2023–2024 and will have four starting in CY2024–2025 selected from 80 strong applicants. Two of these post-baccs will be supported with supplemental funding with individual PI grants. In FY2025, NRAO hopes to support a post-bacc program in Socorro.

VLA Scientific User Support: The NRAO provides the scientific community with the support to execute successful scientific programs with the VLA. In the longer term, and through the products of the SRDP project, the NRAO will provide the scientific support for users to access, reduce, calibrate, and analyze their data as well as to help the community generate new and innovative ideas for science by fostering cross-disciplinary and cross-field ideas and techniques.

Staff members will continue to provide education and outreach services to astronomers who use NRAO facilities, including face-to-face visitor support/data reduction visits, Helpdesk support, Knowledgebase articles, science forums, science meetings and conferences, science web content and the NRAO User Portal interface, user documentation, workshops and tutorials, online training, and educational material. Coordination with the NAASC, which handles such activities for North American ALMA users, will also continue to ensure that NRAO users benefit from these services including expanding on the very successful ALMA Ambassador Program to include NRAO Ambassadors that will provide support for VLA community outreach.

In FY2024, the NRAO organized the 20th Synthesis Imaging Workshop on 15–22 May in Socorro, NM. The school covered fundamental and advanced lectures on aperture synthesis theory and techniques, data calibration, imaging and analysis methods, along with 2 days of tutorials on handling VLA, VLBA, and ALMA data. The school attracted 81 in-person participants, with over 66% being graduate students. While the school typically also attracts early career scientists

(postdocs and early career staff scientists), this year there was an uptick in the attendance of undergraduate students despite the advanced level of the school. Almost 83% of participants were affiliated with North American institutions and universities (U.S., Canada, Mexico).



Participant demographics from the 20th Synthesis Imaging Workshop from 15–22 May in Socorro, NM.

20th Synthesis Imaging Workshop conference photo.

SSR Special Programs

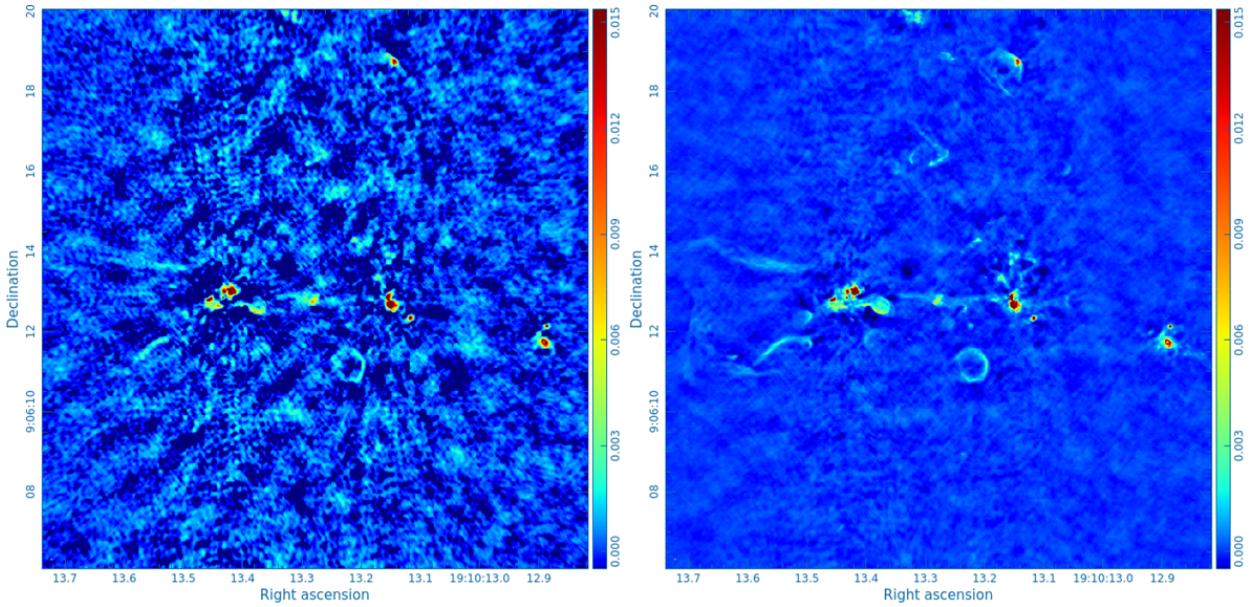
Science Ready Data Products

The NRAO Science Ready Data Products (SRDP) program is designed to broaden participation in radio astronomy and increase the science impact of the NRAO interferometers. It will achieve this by removing barriers to scientific access to the radio portion of the electromagnetic spectrum.

Through on-demand processing on Observatory computing resources and curating a rich archive of science-ready images, the NRAO provides easier access to the unique capabilities of its telescope facilities.
The Science Ready Archive and Operations (SRAO) project represents the original scope of the SRDP program, focused on pipeline development, operations, and development of the archive; incrementally delivering capabilities through a five-year roadmap. The SRAO heuristics team deployed a new pipeline to support operations of VLA standard calibration, imaging, and ALMA User-Defined Imaging (AUDI) in Q1. This new pipeline added the ability to calibrate and image spectral line data for the VLA. Updates to flux density bootstrapping were made to better handle high and very low fractional bandwidth modes. Numerous improvements were made to the automated self-calibration to produce better outcomes, and self-calibration heuristics for ALMA and VLA continued to be refined. The next set of heuristic updates to perform self-calibration on ALMA mosaics and better support long-baseline data will be available in FY2025. The next set of heuristic updates will support better self-calibration outcomes for data with wide fractional bandwidth and high signal-to-noise. Finally, total electron content data are once again available for data taken after August 7, 2023.

Based on the heuristic development from FY2024, SRDP operations continued the imaging of VLA data (which began Q4 FY2022) and will expand to include spectral line imaging in FY2025 when the VLA moves to D-configuration where most spectral line science occurs.

The NRAO Archive interface for VLA and VLBA data was refined to better support data discovery by users. Within the archive interface, users are now able to access full target and spectral window metadata to determine if an archival dataset will be useful for their science. Data processing workflows that provide users with calibrated measurement sets have been updated to enable better workflow maintenance, tracking, and metrics.



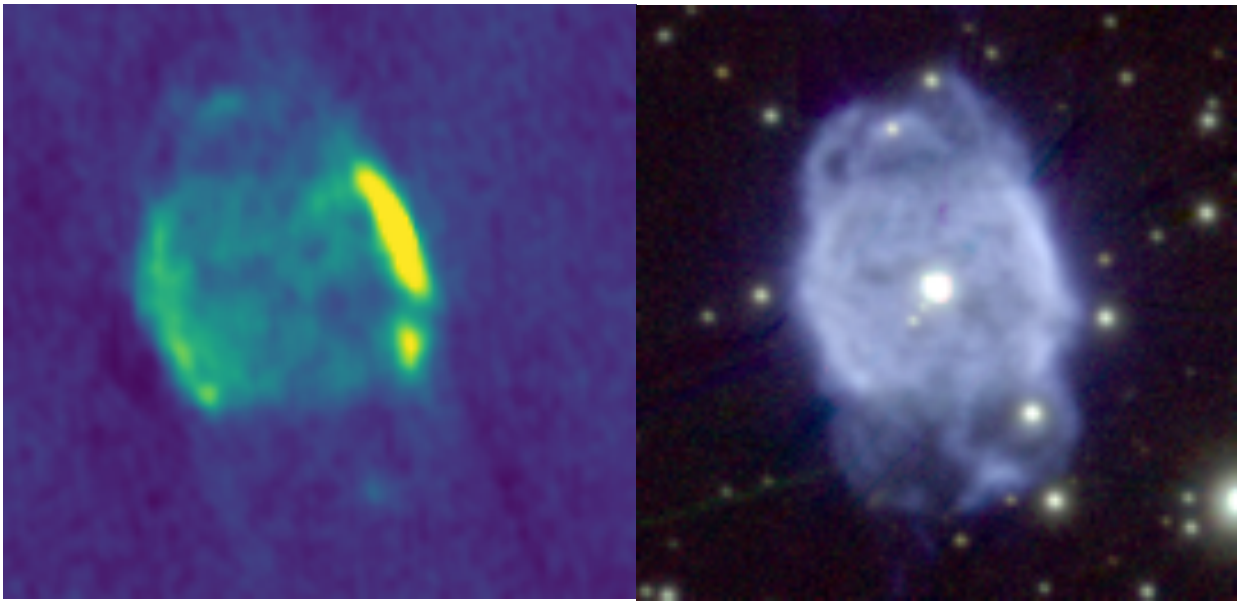
ALMA long baseline data toward W49 A, massive star forming region, at 1.3 mm, 0.04" beam. Standard ALMA calibration on left, auto-self-calibration on the right. De Pree et al. (2024).

VLA Sky Survey

The VLASS captures the full sky visible from the VLA (34,000 deg^2) at unparalleled resolution. Designed as a synoptic survey to capture the dynamic radio Universe, the VLASS observes the full sky in each of three epochs.

Observations of the second half of the third epoch of VLASS, VLASS 3.2, started in May 2024 and continued until October 2024. Quick Look image production for VLASS 3.2 started in Q3 and will complete in Q1 FY2025.

Production of the higher quality Single Epoch images from VLASS Epoch 2 data, which began in FY2022, continued during FY2024 and will continue throughout FY2025. The focus in FY2024 was the production of a training set of images to develop and test algorithms for automating the quality assurance of the majority of SE images. The development team continued to work on a pipeline to combine data from all three epochs, as well as implementing improvements to assist the automated quality assurance process for SE imaging, and testing of a GPU-based gridder. Finally, an external review of the fourth Epoch proposal from the VLASS SSG took place on 17 September. As such, a decision was taken to conduct observations for an Epoch 4.1 starting in Q4 FY2025, followed by a change of focus from observing to SE data processing and the development of enhanced data products.



The Bow Tie Nebula (NGC 40), a planetary nebula, is seen in the light of free-free emission both in the VLASS SE continuum image (left) and in the optical (right). This demonstrates both that VLASS matches the resolution of optical surveys and the high fidelity of VLASS SE imaging, even for very extended (~ 1 arcmin) objects.

Scientific Staff

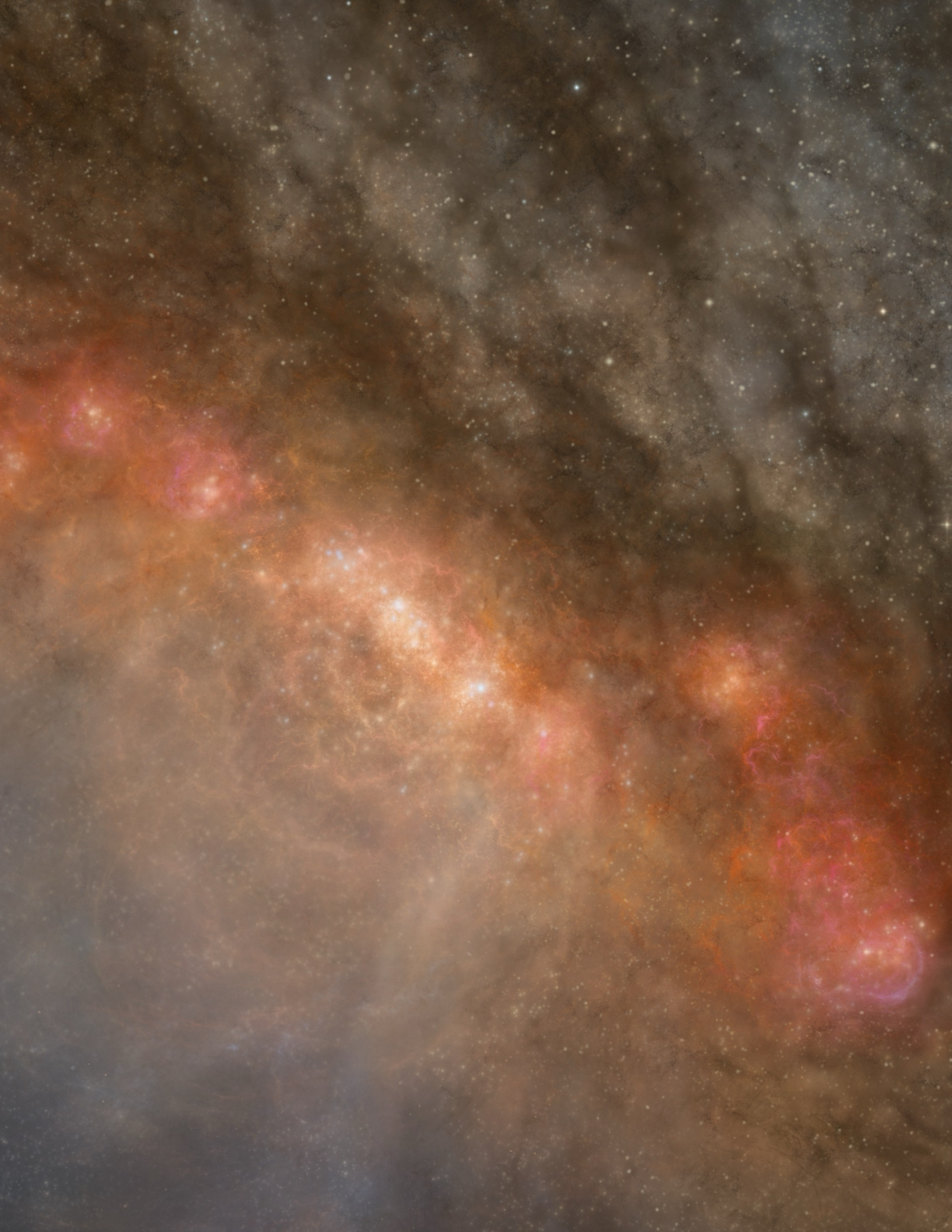
A productive and scientifically active staff is a prerequisite for the successful operation of a cutting-edge national observatory. The scientific staff is key to telescope testing, operations, user support, and long-range development and planning, as well as promoting productive scientific exploitation of the Observatory's capabilities. The NRAO has a world-class staff of ~80 astronomers, computer scientists, and research engineers, recognized internationally for their excellence in telescope design and support, as well as their technical and scientific knowledge and leadership.

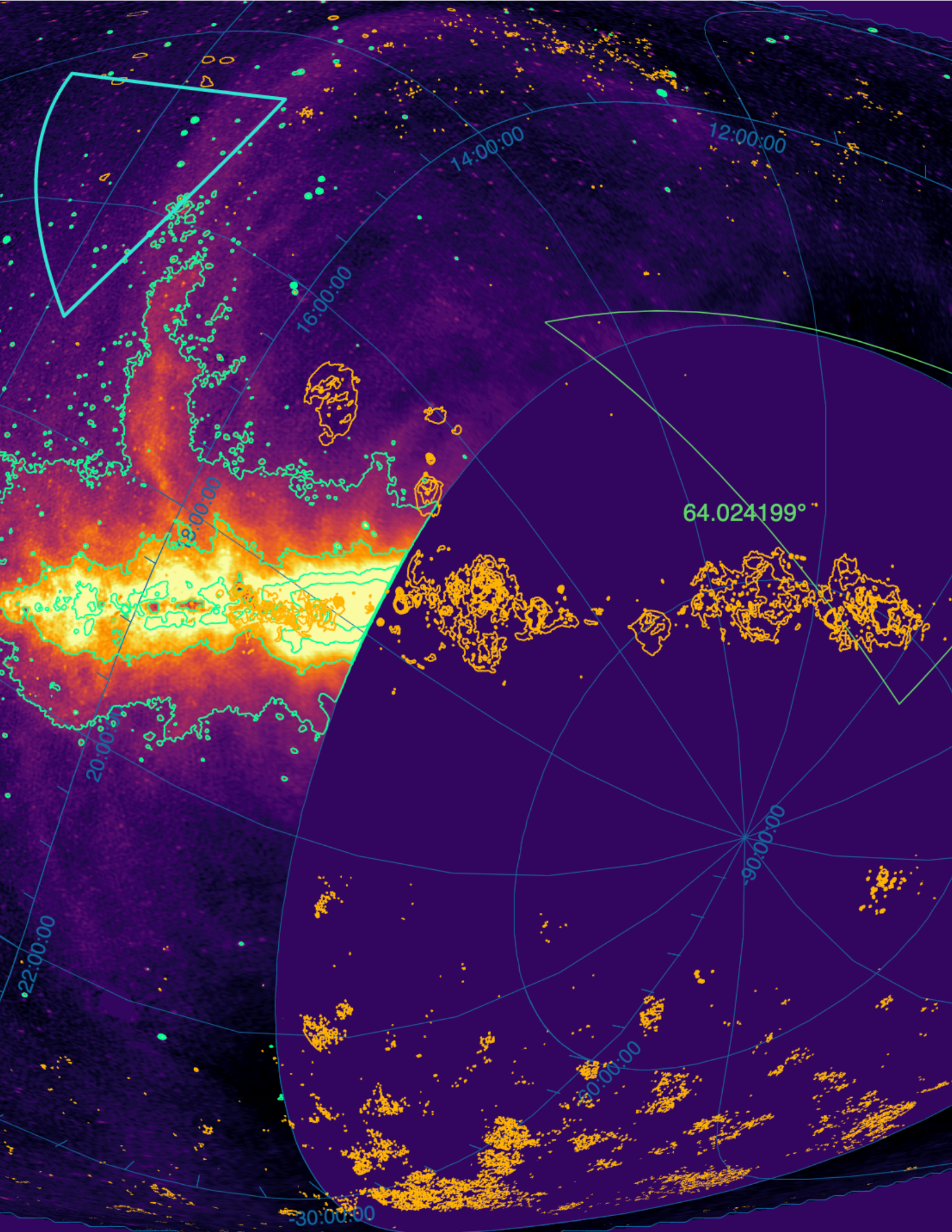
The scientific staff is fully integrated into Observatory operations. All staff members have clear functional duties relating to the Observatory's mission and facilities. Staff members also lead efforts in educating the professional astronomy community, as well as public outreach—fostering a scientifically literate society. A vibrant scientific staff, engaged with the community, is a required element in the full realization of the scientific potential of the NRAO facilities by the astronomical community.

SSR has primary responsibility for the research environment at the NRAO, and for oversight of the scientific productivity of staff with a research component to their role. SSR oversees the research aspects of all astronomers, computer scientists, and research engineers and is involved in recruitment and other HR issues involving scientific staff. Specific SSR responsibilities include implementation and evolution of scientific staff policy, oversight of funding to support research-related travel and computing needs for scientific staff, annual scientific performance appraisals, scientific staff hiring, and academic promotions. SSR also provides funds to support a scientific visitors program, scientific meetings, the colloquium series at each site, and the Jansky Lectureship which recognizes outstanding contributions to the advancement of radio astronomy. The 2024 Jansky Lecturer was Dr. Ken Kellerman.

The 2024 Jansky Lecturer Dr. Ken Kellerman, Senior Astronomer, Emeritus of the National Radio Astronomy Observatory.

Artist's impression of galaxy NGC 253, studied by ALMA with the ALCHEMI project. Credit: ALMA.




14:00:00
12:00:00
16:00:00
18:00:00
20:00:00
22:00:00
64.024199°
-90:00:00
-60:00:00
-30:00:00

DATA MANAGEMENT AND SOFTWARE

The Data Management and Software (DMS) Department delivers scientific computing infrastructure, software, and algorithms to support current Observatory functions and to develop new capabilities for future needs. The department consists of Scientific Information Systems (SIS), Software Development, and the Algorithm Research and Development Group (ARDG). DMS works closely with the ngVLA project and Information Services. Computing management and personnel supporting the development of the ngVLA project are matrix managed by DMS.

DMS Development

ngData Processing System: DMS in conjunction with the ngVLA and ALMA-WSU projects has been conceptualizing and identifying requirements for a next generation data processing system. Substantial progress in FY2024 was made with identification of a complete set of requirements and the definition of a conceptual architecture. With the addition of a project director for the Radio Astronomy Data Processing System (RADPS) ALMA project, the RAPDS program office was established and staffed and has been charged with developing the programmatic and technical details of the program.

Telescope Time Allocation Tools: In cooperation with the SSR department and Green Bank Observatory, DMS is developing a new suite of tools to support the proposal and review process. This new generation of tools is designed to reduce the telescope specific knowledge required to successfully apply for time on the AUI North American telescopes and will support the proposed next generation VLA as well. During FY2024, the project implemented key simulation capabilities, simplifying developer and tester workflows and increasing testability and maintainability of the software. Interfaces, view, and reports supporting the time allocation process were developed and demonstrated to key user groups. Management responsibility for this project has been returned to the SSR group although DMS will continue to stay involved as the development team.

Algorithm Research and Development Group (ARDG)

The NRAO Algorithm Research and Development Group pioneers algorithms necessary to support the scientific objectives of the Observatory. Currently the expertise within the ARDG is working closely with the ngVLA and ALMA WSU projects to understand the processing challenges posed by the projects.

In FY2023, the ARDG initiated the development of a scalable Algorithm Architecture in support of the development of a next generation data processing system. Involving staff from multiple groups within DMS. This framework will design a next generation system and help develop a consensus for the system architecture. Beginning in FY2023 and continuing through this year, the ARDG is prototyping standalone relocatable implementations of specific architectural components. These prototypes will be used to evaluate the candidate architecture and perform critical stress-tests to better inform the design.

GPU Imaging: Building on a 2023 simulation of ngVLA data at restricted scale, the ARDG worked with the Partnership to Advance Throughput Computing (PATh) facility to produce simulated ngVLA data to verify critical algorithms necessary for calibration of the ngVLA data. In addition to pushing the NRAO software, this pioneered the scaling-up of the PATh facility itself from its current size and the ARDG will be one of the first users/testers. This involvement as early users of the scaled-up PATh facility is useful to both partners but has impacted the schedule for the creation of the ngVLA simulation. During the first half of the year, DMS successfully simulated

The CARTA package allows astronomers to visualize large datasets with different map projections.
Credit: CARTA international team of scientists and developers.

ngVLA data to verify the software, and tested deployment of it on PATh. Runtime measurements were made to estimate resource requirements for at-scale simulation of a ngVLA data set for use in verification of ngVLA size-of-computing estimates. While estimates imply that the computing resources may be available via PATh and Open Science Grid, the resources for storage and processing such a data set are not yet available. The current plan is to simulate and process scaled-down data sets for ngVLA. The necessary technical work for this was completed in the latter half of the year. Progress for processing it for algorithmic and computing-size verifications is currently resource limited. ARDG also collaborated with the DMS Science Information Services (SIS) division to assess the run-time performance of the current code and evaluate the algorithm architecture to better inform the size-of-computing estimates for the ALMA WSU and ngVLA projects. This work continues and is being done using both in-house and with PATh resources.

Wide-scale imaging R&D: This exploratory R&D effort seeks to correct differences in instrument response as a function of the wide range of spatial scales instantaneously sampled by ngVLA, multi-configuration JVLA, and ALMA. Initial software was developed and numerical tests performed to evaluate the concept in FY2023. Based on that preliminary investigation, a better characterization of the problem and further work was initiated, and a proof-of-concept demonstration done as a prototype during FY2024. Work is in the advanced stages for developing post-imaging tools necessary to evaluate the results and for scientifically documenting this work (scientific publication). This initiative also required modification of the existing infrastructure software to enable more realistic tests with application to ngVLA and other similar telescopes. Depending on the results of this research and working with the NRAO Technology Transfer office, a provisional patent may be pursued prior to scientific publication.

As an expected side-effect, this work also led to improvements in the imaging performance of the ASP-Clean (Adaptive Scale Pixel) algorithm already distributed in the Common Astronomy Software Applications (CASA) production software, and in its wide-band version (the WASP algorithm). The WASP algorithm has since been also made available for validation and release in the CASA software package.

LibRA (Library for Radio Astronomy) Project: This is a new initiative to develop a reusable library of algorithms without explicit dependence on radio astronomy domain concepts and data models. The product is expected to be usable for the next generation of data processing systems within the NRAO and by external groups in the radio astronomy community, and for non-radio astronomy applications. Exploratory work done since FY2023 evaluated the feasibility of extracting algorithms from the existing CASA suite. In FY2024, the architectural components necessary for imaging were developed and tested by application to existing large VLA data sets which could not be otherwise imaged due to excessive runtime. This enabled the deployment of the Algorithm Architecture at a scale that is order of magnitude larger than previously possible. Work toward deploying at even larger scale using NSF-funded computing resources distributed across the U.S. is now in progress. To support this work, ARDG is pursuing a supplemental funding proposal.

Scientific Information Services

The restructured Scientific Information Services (SIS) division is focused on providing the technical infrastructure to support the scientific operations of the Observatory. The SIS division works closely with the Information Technology (IT)-centric Computing and Information Services (CIS) division (Section 9). There are three major functional groups in SIS and SIS had three core

goals for FY2024: Securing Existing Systems, Continuing Operational Support, and Preparing for Next Generation Instruments.

Securing Existing Systems

The Observatory will continue to make progress in increasing the security and resiliency of existing compute systems.

NRAO Archive Backup: In FY2024, SIS completed a project to develop and prototype software and procedures for creating a tape-based second backup copy of the NRAO Archive that is geographically distant from the other two copies (the production storage systems and a nearby copy located in a different data center). This tape-based third copy of the Archive is intended for disaster recovery and risk mitigation in case of an event affecting the other two. Building on the earlier development and prototyping, a subsequent part of the project targeting the implementation of the full tape backup was delayed due to resource (funding) issues. In FY2025, DMS will commission the additional hardware needed to complete the full tape backup, begin the backup, and re-baseline the delivery date.

System Access Security: In FY2024, SIS began work to design and implement a layered network segmentation strategy to protect NRAO compute assets while also providing simple, secure access to NRAO compute resources and data for external observers. Prototyping network segmentation technology surfaced a missed prerequisite to first isolate observer access to these protected resources from staff access so the two can be handled differently, and the implementation was deferred. In FY2025, SIS will address this preliminary requirement by commissioning observer-only bastion hosts in New Mexico and Virginia (and studying the impacts of doing so in Green Bank), and then further secure resources by enabling multi-factor authentication on the staff-only bastion hosts.

Additionally, the project to upgrade all SIS managed systems to RHEL8 that was begun in FY2024 was reorganized to focus on upgrading systems with external exposure first, and SIS has revised and updated its use of an industry standard configuration management system to help provision these systems in a uniform manner and keep them up to date. Work is ongoing and expected to be completed in FY2025.

Continuing Operation Support

In FY2024, SIS reorganized into workgroups with functional non-geographic responsibilities: support for instruments and operations for the ALMA, Green Bank, VLA, and VLBA has been consolidated and is the domain of the Instrument and Scientist working group. This group directly supports the day-to-day telescope operations for reliable data delivery to the archive for pipeline processing and community access. They ensure that telescope capability development projects are appropriately staffed, with resources assigned based on commitments and timelines defined within the Program Management Department (PMD), and in coordination with local operations support priorities.

E-Transfer (VSG): VLBA Operations developed a procedural framework for the electronic transfer of incoming data from non-NRAO VLBI stations over the Internet, which included the requirements for an e-transfer filesystem in the DSOC for staging transferred data. In FY2024 SIS worked with the Observatory's security officer to review and audit the proposed design and then helped configure the interface server the E-Transfer system depends on. In FY2025, SIS will continue to work with VLBA Operations installing and configuring other aspects of the system.

Data Buffer Server (VSG): In FY2024, SIS deployed Data Buffer Servers to all VLBA sites and coordinated the installation and testing with NM Ops around maintenance windows. Deployment included the development and testing of procedures for standard Hardware, OS, and Networking installation.

ALMA Observatory Monitor and Control (ASG): In FY2024, SIS continues to support bug fixes and improvements to the Observatory Monitor and Control GUI (OMC) and Dashboard software, as NA's contribution to the EU-lead Observatory Interfaces team.

ALMA Pipeline Operations (ASG): SIS delivered improvements to ALMA Pipeline Operations, including migration away from the current cluster resource manager, Torque, to a more modern, cost effective, and maintainable option, SLURM.

Preparing for Next Generation Instruments

In FY2024, SIS assessed the needs of future computing requirements and adjusted its processes to provide a more forward-looking posture. Projects range from support of near-term deliverables to strategic developments designed to modernize NRAO computing for the challenges of ALMA-WSU and ngVLA.

VLBA New Digital Architecture (VNDA): In FY2024, SIS assisted the VNDA project in commissioning single-server container orchestration software on VNDA systems. This system supports the deployment and maintenance of the VNDA system using modern container-based software. Three systems have been delivered using these technologies, and in FY2025, SIS will proceed with the deployment of the remaining systems.

GPU Processing: In FY2023, testing began on GPU processing both for VLASS and future Radio Astronomy Data Processing needs. In FY2024, plans for SIS to install additional GPUs on the cluster used for VLASS processing were put on hold due to resource issues. This project will resume in FY2025.

RADIAL: Project RADIAL addresses current and future astronomy big data challenges while cultivating a diverse and globally competitive STEAM workforce. FY2023 targets for the documentation and support of RADIAL clusters were delayed due to supply chain issues. Once hardware is available at our partner institutions, SIS will complete the delayed targets by supporting creation and deployment of the first cluster based on the prototype, along with system administration guidelines to support local management of the cluster.

Cluster Orchestration: In FY2024, SIS prototyped next generation compute cluster orchestration, both on-premises and in the cloud, and demonstrated container-based applications running on both. In FY2025, SIS will build on this work to commission production-worthy on-premises cluster orchestration and then migrate The Observatory's first observer-facing public web application to it. Additionally, SIS will work with the software development teams in DMS to define and document a standard continuous integration/continuous deployment platform, then implement it and migrate the first DMS software project to it.

Next Generation Data Storage: Several data storage systems at the NRAO are continually near capacity, are challenging to add additional storage too, and require significantly more maintenance than other storage solutions. In FY2024, SIS started, but then deferred a project to examine state-of-the-art data storage technologies and prototype a next generation storage

cluster in favor of effort to define and document Observatory-wide data storage policies and detail plans for implementing them, a project that was deemed higher value and contributes to a better understanding of the requirements of any new storage technologies. In FY2025, SIS will return to complete the delayed storage technology and prototyping project.

Software Development

DMS Software Development maintains and upgrades subsystems supporting the site-specific operations (ALMA, VLA, and VLBA) and systems. Major subsystems include: observation management, telescope monitor and control, telescope scheduling, data reduction, and data archiving.

During FY2024, DMS software continued to define and prototype the next generation Data Processing Architecture. This architecture must support not just the current telescopes but will be developed in conjunction with the ngVLA and ALMA WSU to support the challenging requirements of those projects. CASA is evolving as part of the next generation of architecture. DMS software has established its user experience practice area, taking a customer-oriented approach to design interfaces and prototyping of scientific user interfaces to NRAO's data reduction systems that support users of ALMA and future users of the ngVLA.

Operational Data Sharing (ODS) is a collaboration to provide information to SpaceX that can result in their satellites entering a mode that avoids interfering with GBT and VLA observations. During FY2024, the project was launched and a collaborative team established between GBO and VLA software teams to build on a proof of concept to develop the system.

ALMA System Software

ALMA priorities are set at the JAO in cooperation with the other partners and may change. Many areas of work depend on coordination with JAO resources. During FY2024, the NRAO worked closely with the JAO and partners to address the highest priorities as efficiently as possible.

ALMA Control Subsystem: Bug Fixing: The Control subsystem team addressed prioritized operational issues and bugs. Important bugs are fixed at high priority while lower priority bugs were scheduled to be fixed at a later time and became available to ALMA operations in planned software updates.

ALMA Control Subsystem: Infrastructure Upgrades: In FY2024, upgrades included changes in usage and libraries used for the Controller Area Network (CAN) communications between many ALMA hardware and software components. These libraries are approximately 20 years old and their usage can be significantly simplified by using improvements in the C++ language. These changes reduce the effort required to switch to using Ethernet to CAN (E2C, see below). The team also migrated to the next generation of code generation libraries for obsolescence mitigation.

ALMA Sustainability Project: Ethernet-to-CAN (E2C): As part of the ALMA Sustainability Project, DMS has an initiative to address some of the most pressing obsolescence issues facing the Control subsystem. The ALMA Control group has completed the first phase of a project to replace the ALMA real-time computers. Purchased in 2010, the computers are responsible for controlling and monitoring nearly all of ALMA operation. Phase 1 of the project, largely completed in FY2021, designed an architectural change for the next generation of real-time computers that adopts standard computers which can be easily upgraded, moves the real-time code into firmware, uses a new generation of processors, and lays the groundwork for faster monitoring and control that is expected in the next decade.

The primary architectural change is to functionally partition the existing real-time computers into two parts, the Control platform and the Ethernet to CAN translator. Phase 2 of the E2C project turns the proof-of-concept developed in Phase 1 into a production-quality prototype. Phase 3 covers the testing and verification required to pass the requirements for a Critical Design and Manufacturing Review (CDMR). And Phase 4 covers the manufacturing and delivery of the system to the JAO for deployment.

The team conducted on-sky testing in Q1 FY2024, as well as preparing for a PDR in early Q2. The project entered Phase 3 after successful completion of the delta-PDR in Q3, and has been preparing for a Critical Design and Manufacturing Review (CDMR) in October 2024, concluding Phase 3.

ALMA Sustainability Project: Final Adder (FNL): As part of the ALMA Sustainability Project, the Correlator team is working to upgrade the interface between the correlator hardware and the Correlator Data Processing (CDP) cluster from DPI/hpdi32 to 10Gb Ethernet. Changing the interface to use 10Gb Ethernet allows for more commercially available hardware options, industry standard communication links, and well-supported device drivers. In addition, it reduces the number of CDP nodes from 16 to 4, simplifies the data ingestion into the CDP nodes, and allows for debugging with industry-standard tools.
Due to competing resources between the Advanced Technology ALMA Correlator (ATAC, see below) and ALMA WSU efforts, the Final Adder software work was intentionally deferred during FY2024. Effort is underway to re-prioritize the project for completion during FY2025.

New ALMA Correlator, Advanced Technology ALMA Correlator (ATAC): The ALMA software team at NRAO submitted a proposal for the next generation ALMA Correlator as a Co-PI with NRC to the ALMA Development Program. This Advanced Technology ALMA Correlator (see also Section 2.2.1) will provide a large range of new capabilities as part of a five-year proposal with the aim to be ready for science observations in 2028. During FY2024, a successful delta Systems Requirements Review (SRR) and Preliminary Design Review (PDR) was completed in Q2. Milestones for the ATAC project are tracked through the separate ATAC award.

ALMA Baseline Correlator Subsystem: Bug Fixing and Improvements: The Correlator subsystem has maintained and supported baseline correlator operations. Improvements to the CAN interface and adaptation to the E2C project took place.

ALMA Scheduling Subsystem: Technology Improvements: During FY2024, the planned re-implementation of the DSA Algorithm and Service layers was deferred due to competing priorities with Cycle 11 and the ALMA WSU planning.

ALMA Scheduling Subsystem: **Bug fixing and Operational Improvements**: The Scheduling subsystem provided maintenance and operational support during FY2024 to ensure the existing scheduling software functioned reliably and that all the mandatory requirements needed by stakeholders for the observing cycle were implemented, tested, and available.

Science Data Model: Performance Updates and Improvements: The Science Data Model (SDM), which is the metadata that describes a given observation, is shared between three major stakeholders: ALMA, the VLA, and CASA. The data model is maintained by the software group at the NRAO. An SDM study was initiated in FY2024 to assess changes that will be required due to planned WSU projects and projected bandwidth increases.

New Mexico System Software

The responsibilities of this group involve the system software for the VLA and VLBA— primarily monitor and control, but also other operational functions, notably dynamic scheduling.

VLA System Software: During FY2024, much of the team's work involved maintenance, including troubleshooting and bug fixes. The group has spent significant time working with NM Operations to improve system performance. Deployments for PI observing use for Semesters 2024A and 2024B occurred in Q1 and Q3, respectively. Similarly, software supporting commissioning new capabilities during 2024A and 2024B were incrementally made available in Q2 and Q4.

VLA Observing Preparation Support: Two software releases for the Observation Preparation Tool (OPT) took place in FY2024: Version 1.33 during Q1 and Version 1.34 in Q4. Both releases provided fixes and functional improvements.

VLBA System Software: Support for VLBA commissioning and observing followed the same deployment cycles as the VLA. Software support for deployment of Data Buffer Servers continued in FY2024. Support for deployment of the new e-transfer file system and real time correlation continued throughout FY2024.

VLBA New Digital Architecture (VNDA): NMSS supported the successful VNDA preliminary design review. The VNDA team will begin on the sky testing as soon as VNDA hardware is deployed to sites.

CASA

Development of the CASA package continues to emphasize support for VLA and ALMA post processing. During FY2024, the NRAO added capabilities in support of current operations while also positioning CASA to handle future upgrades to ALMA and the anticipated demands of ngVLA-scale processing. CASA continued with the frequent release strategy that was established over the past two years, and the group coordinated with the Pipeline team and SSR to provide validated deployments for users.

Design and Prototyping for next-generation CASA: In FY2024, CASA engaged in design and prototyping activities for RADPS-related areas aimed at significantly improving performance and scalability. CASA worked alongside the systems group of the DMS department and ngVLA/ALMA stakeholders to ensure compatibility between data processing software architecture and system-level operations plans of the ngVLA telescope and the ALMA WSU project. Prototyping and development efforts during FY2024 were targeted towards the support of specific large ALMA and VLA use-cases whose processing and performance requirements currently stretch the existing CASA software beyond its optimal operating parameters.

Support for (ngVLA) Antenna Commissioning: In FY2023, CASA developed and validated software to support antenna commissioning activities for the VLA, thus filling a feature gap within the CASA software suite and establishing a foundation for future support of the ngVLA prototype antenna commissioning project. In FY2024, CASA continued to engage with ngVLA stakeholders to develop ngVLA-specific components within these tools. The overall schedule for antenna commissioning has been delayed.

Improved Performance for VLASS Imaging: In FY2022, a prototype of GPU software to speed up image processing for the VLASS project was transferred from the DMS ARDG to CASA. In

FY2023, CASA integrated this GPU library with production software and algorithms, and upgraded the production build system in order to efficiently support it. In FY2024, CASA provided maintenance and packaging support for its integration, test, and deployment within VLASS pipeline operations.

CARTA: Work on the Cube Analysis and Rendering Tool for Astronomy (CARTA) visualization software will continue through the collaboration with the Academia Sinica Institute for Astronomy and Astrophysics (ASIAA) CASA Development Center (ACDC) and the South African Institute for Data Intensive Astronomy (IDIA) with the intention of improving the user interface and expanding capabilities to allow CARTA to fully replace the old CASA viewer. CARTA is now routinely used for interactive image visualization. In FY2024, work continued towards development and maintenance.

Interactive Masking: Interactive masking during image reconstruction requires a custom-built interface that goes beyond the old CASA viewer. In FY2023, CASA developed a prototype and continued development towards an alpha release. In FY2024, CASA provided a usable replacement to the old CASA viewer for interactivity during image reconstruction.

Additional Collaborations: CASA has continued its partnership with the Joint Institute for VLBI in Europe (JIVE) to support tasks that enable the use of CASA for VLBI data. CASA also continued its partnership with the NAOJ to support tasks specific to single-dish analysis for the ALMA pipelines. In FY2024, CASA included VLBI/VLBA and Single-Dish development work in the continuous releases to the community, and engaged with JIVE and NAOJ partners to extend design and prototyping activities for next-generation CASA to include these VLBI and Single Dish use-cases. The CASA team supported and developed new imaging and calibration algorithms through a close connection to the NRAO ARDG. Representation and support for users of non-NRAO and non-ALMA telescopes continued on a best-effort basis. CASA worked with stakeholders to schedule the migration of remaining features currently present only in the Astronomical Image Processing System (AIPS).

CASA Pipeline

The CASA Pipeline is evolving to support ALMA, VLA operations, and SRDP/VLASS. A major release took place in Q1, supporting both ALMA and VLA operations.

For ALMA, the release included improved infrastructure and Python dependency management, simplified Pipeline task-building procedure, and full compatibility with Python 3.8. New capabilities included self-calibration in the ALMA pipeline, calibration for the ALMA polarization data, and a new continuum subtraction workflow based on the more efficient new CASA uvconstub task, with improved continuum finding algorithm. Performance and resource usage optimizations were included in both interferometric and single-dish processing. New comprehensive ALMA regression test suites with improved code testing coverage were provided. The ALMA release was accompanied by the latest ALMA pipeline heuristics description presented in a peer-reviewed journal article (Hunter et al. 2023).

For the VLA, the release included new band/antenna-based manipulation capability for syspower calibration, new heuristics of using the wproject gridder for L-/S-band imaging, options to completely or partially disable bad deformatter flagging, and various smaller improvements and bug fixes.

An additional release with improved ALMA/VLA self-calibration heuristics and enhanced support in the SRDP reprocessing interface has been delayed to Q1 FY2025.

A pipeline update in Q4 served as a test release for ALMA Cycle 11. The pipeline will continue to improve VLA calibration and imaging, SRDP capabilities, and VLASS Single Epoch processing.

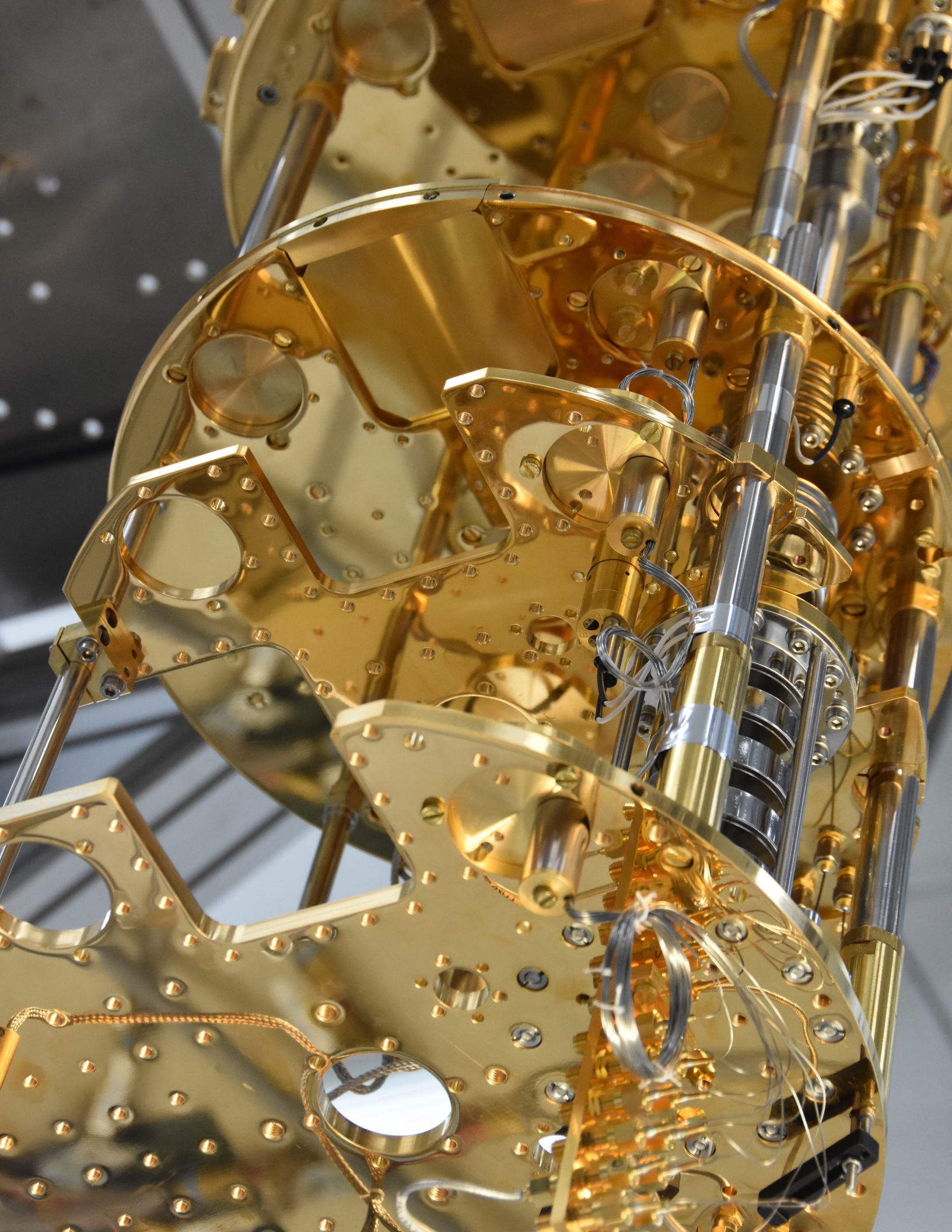
Science Support and Archive (SSA)

The SSA group is responsible for the NRAO Archive and most of the user-facing software to support NRAO telescope use. In addition to bug fixes, the group updates the software functionality and user interfaces and provides integration. The SSA team provides the software engineering for the new suite of Telescope Time Allocation tools.

Identity and Access Management (IAM): The SSA team provides the user authentication and authorization service the NRAO uses to protect access to all astronomer-facing applications that involve proprietary data such as the PST, archive, and OPT. Plans to commission a new IAM service in Q4 were deferred due to competing priorities and resource constraints. The IAM project will be replanned and scheduled during FY2025.

NRAO Archive: In FY2022, the legacy archive was deprecated and was replaced by the new archive (https://data.nrao.edu). The legacy archive still provides infrastructure upon which the new archive relies. During FY2024, the SSA team continued to work with the Science Ready Data Products (SRDP) program to add more user-requested features to the archive as detailed in Section 6.4.1. During FY2024, SSA also continued planning with the GBO Software Division to increase support for GBO data in the Archive Access Tool. A milestone to decommission the legacy archive was unable to be completed in FY2024 and has been rescheduled for late FY2025.

Proposal Process Support: The Proposal Submission Tool (PST) and Proposal Handling Tool (PHT) have been maintained and updated to support NRAO and GBO observing, with the PST updated in Q1 and Q3 for the Semester 2024B and Semester 2025A Calls for Proposals, and the PST and PHT updated in Q2 and Q4 for the Semester 2024B and Semester 2025A TAC process.



CENTRAL DEVELOPMENT LABORATORY

The CDL mission is to support the evolution of NRAO facilities by developing the technologies and expertise critical for the next-generation of radio astronomy instrumentation. CDL-developed technology is integral to all NRAO-operated telescopes and to many other radio telescopes around the world, and so, another important mission of the laboratory is providing maintenance and upgrades to these instruments. CDL maintains a staff of ~50 personnel organized into teams of engineers and technicians working across crucial radio telescope technologies, including digital design and signal processing; low noise amplifiers; millimeter and submillimeter detectors; optics and electromagnetic components; and new receiver architectures. The laboratory is the world leader in the application of many of these technologies to radio astronomy.

In addition to these traditional mission areas. the CDL is providing engineering capability for new initiatives in the Observatory, including engineering development for Advanced Spectrum Monitors (ASM) and in planning and design of the next generation radar (ngRadar) project.

CDL also supports the greater NRAO mission of developing the next generation of instrumentation engineers and scientists and advancing inclusive participation in science and engineering by:

- Hosting Jansky post-doctoral instrumentation engineers and scientists;
- Hosting post-doctoral and co-op engineers as part of CDL's Engineering program;
- Advising, mentoring, and employing undergraduate and graduate engineering and astronomy students, and;
- Participating in undergraduate summer student and graduate co-operative engineering programs.

The NRAO continued to operate three of the world's most powerful and unique radio interferometers, the VLA, VLBA, and (in cooperation with its international partners) ALMA. The NRAO, in collaboration with the U.S. radio astronomy community at-large, continued to plan and develop an engineering design for a next-generation Very Large Array (ngVLA) which passed a significant milestone of a successful Conceptual Design Review in late FY2024. By participating as members of several Integrated Product Teams, CDL actively supported this process throughout FY2024.

CDL continued to engage in cross-observatory repair, maintenance, support, and in several programmatic and work-for-other construction projects. All this while carrying out design and development of technologies for future instrumentation— including for the ngVLA and for ALMA. In addition, CDL continued investigating new and emerging technologies that have the potential to advance the state-of-the-art in instrumentation.

A key component of CDL's strategic plan is establishing talent pipelines into the laboratory. These pipelines consist of co-op students, summer interns, and post-doctoral fellows. A significant achievement in the effort to establish such pipelines, as well as to address the Observatory's mission of advancing inclusive participation in science and engineering, was secured in FY2022 by a grant from the Heising-Simons Foundation to establish a Women in Engineering (WiE) program at the laboratory, which was designed to support four women co-op students and two women post-doctoral fellowships at CDL over six year period.

Overall, in the last five years CDL has established a robust talent pipeline, hosting a total of 13

Sub-Kelvin Dewar system. Photo by Jeff Hellerman (US NSF./ AUI / NSF NRAO).

co-ops and summer students, including four as part of the WiE program. CDL has hosted two post-doctoral fellows, one as part of the WiE program, and hopes to add a second WiE-sponsored post-doc fellow in 2025.

CDL continues to work with the NRAO Technology Transfer Manager to commercialize technology developed in the laboratory. At present, patents have been issued for 17 CDL inventions, six of which have been licensed.

Repair, Maintenance, Production, Support

The CDL core production and support activities for FY2024 are described in the following paragraphs.

Low Noise Amplifiers (LNA): The low noise amplifier group continued production, maintenance, and support of CDL-produced amplifiers. In FY2024, the CDL amplifier group provided support for all VLA, GBT, and VLBA receivers in the field (a total amplifier population of about 1000 amplifiers in all). The CDL amplifier group also refurbished ALMA Band 6 IF preamplifiers for the receivers on the ALMA telescope. The LNA team used Diramics (Switzerland) devices in rebuilding Millimeter-wave Integrated Circuit (MIC)-based IF preamplifiers for use with ALMA Band 6 mixers. During FY2024, the LNA group also started the redesign of an L-band VLA amplifier using Diramics devices as a potential replacement for transistors in the event of failure. The laboratory's LNA group also continues to support the cryogenic amplifier needs of the greater radio astronomical community as Work for Others (WFO) outside the Observatory's NSF award.

Millimeter and Submillimeter Receivers (MSMRx): During FY2025, the CDL MSMRx group will continue to support the offsite maintenance of the ALMA Band 6 receivers originally built by the NRAO, with focus on maintaining a sufficient quantity of spare mixers and preamplifiers. As capacity allows, the MSMRx team will continue to support broader community projects, such as the Large Millimeter Telescope (LMT, University of Massachusetts), Arizona Radio Observatory (ARO) 10 m Telescope on Mt. Graham, the South Pole Telescope (SPT), and the ASIAA Greenland Telescope (based on the Vertex ALMA prototype antenna). With the exception of ALMA support, these, and possible other activities for outside customers, are categorized as WFO and will be undertaken only when they do not interfere with NSF award tasks.

Several Tier-3 component test setups and Tier-2 LRU-test stations use software suites that have been rendered obsolete and unmaintainable due to the natural progression of operating systems and software platforms. This has necessitated implementation of several manual work-around procedures that introduce delays. Such software obsolescence issues exist in many CDL and MSMRx sub-systems. The campaign to develop new software for both new and existing test systems for Tier-3 components as well as test systems for Tier-2 LRUs continued in FY2024. There are two software engineers working on development and obsolescence mitigation for several CDL and MSMRx sub-systems.

To help with expedited acceptance testing of Band 6 cartridges, one of the two mixer test sets and one of the two cartridge test sets were dedicated for and kept operational throughout the year. Progress was slowed due unexpected failures in both repaired cartridges as well as the test set hardware; nevertheless, one repaired Band 6 cold cartridge assembly was shipped to the OSF after completion of all post-repair testing during the course of the year. One additional repaired cartridge is nearing its acceptance test completion. The support team is down to the last few broken Band 6 cartridges that need to be fixed, but progress is hindered by the scarcity of spare

optics components (specifically, RF horns and OrthoMode Transducers) to mix and match. During FY2024, five additional Band 6 OMTs were fabricated and added to the spares pool.

Integrated Receiver Development (IRD): The IRD group continues to provide micro-assembly and micro-fabrication support to the engineering teams at our labs and telescope facilities. In FY2024, this included assistance in troubleshooting integrated modules in active user instruments as well as wire-bonding and test-support for various groups at the CDL (completing milestone 5.3.18). The IRD group has specialized experience with integrated hardware and strives to keep that institutional knowledge current within all of the Observatory's departments.

ALMA Offsite Hardware Support: The details of the repair, maintenance, production, and support activities of this CDL-based group are included in Section 2.3.

The CDL offsite hardware support team provided extensive support to ALMA operations during FY2024, this effort included software and firmware support (bug fixes, implementation of new requested features), providing expertise to diagnose and fix problems during telescope operations, and repairing and returning broken LRUs removed from service. In all, 25 Front-end LRUs (including receiver cartridges), 20 Warm Cartridge Assembly LRUs, and 66 Back-end Local Oscillator and Photonics LRUs were returned to the ALMA site after repairs. A few notable LRUs (not a comprehensive list) that were repaired during FY2024 are: Band 6 Cold Cartridge Assemblies, FE Monitor Control, Warm Cartridge/Local Oscillator Assemblies (a mix of various bands), Sub-Array Switches, LO Photonic Receiver fiber cables, and the LO Reference Test Module. Lower level hardware repair was carried out on 193 sub-assemblies during this period. Hardware for the FE Test and Measurement Systems including the IF processor modules and tilt tables were also repaired/replaced or worked upon during FY2024.

In FY2024, a FE team of four NA staff members visited the OSF laboratory during the February shutdown period to provide onsite support by upgrading FE test systems and assisting with assembly, integration, and verification of the Band 2 receivers in the ALMA cryostat. A member of the photonics support group also visited the OSF laboratory to assist with the acceptance testing and installation of the new hydrogen maser manufacturer for the ALMA observatory.

The Ethernet to CAN project (E2C) was another effort that was supported by the offsite support group staff. The E2C project is an obsolescence mitigation effort focused on replacement of the legacy real-time computing platforms with an Ethernet enabled embedded computing platform. Following phase 2 of this effort executed in FY2023 which resulted in a production-quality prototype and its onsite testing, during FY2024, a CDL-led campaign was carried out to validate its vibration and EMC compliance of the E2C prototype. The CDL support group also helped to develop documentation required for the upcoming critical design review for the project.

In FY2024, the LO support team of the offsite support group was involved in three WFO construction projects outside the Observatory's NSF award. This team built and delivered components for one ALMA Band 6 Local Oscillator article to the Chalmers University of Technology (Sweden), completing milestone 5.3.19. Additionally, two ALMA Band 1 LO sources were built and delivered to the ASIAA and one ALMA Band 6 warm cartridge assembly was manufactured and delivered to the Netherlands Research School for Astronomy (NOVA) for use on the Large Latin American Millimeter Array (Argentina), under purchase orders that were received by the NRAO. The team also helped to diagnose problems with a previously delivered Band-7 local oscillator assembly to the Swedish-ESO PI receiver for APEX consortium (SEPIA). The LRU is currently on its way back to NRAO for repairs. This addressed milestone 5.3.20.

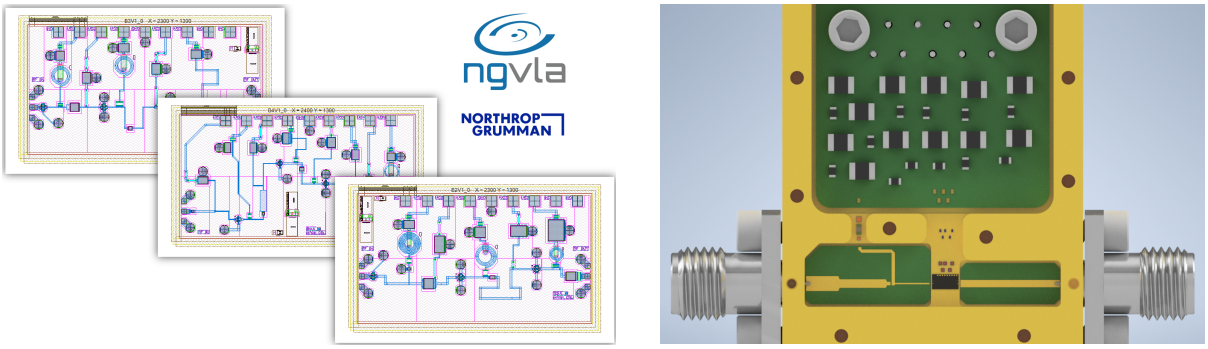
CDL Development Plan

As described in the FY2024 POP, the CDL Research and Development (R&D) efforts were aimed at supporting the following NRAO Strategic Goals:

- Developing technologies necessary for the long-range objectives of the Observatory, and
- Advancing the state-of-the-art in mission-related technology.

Low Noise Amplifiers (LNA): The low noise amplifier group has been developing amplifiers for ngVLA and ALMA Band 6v2. Different technologies are being used and new devices are being explored to build amplifiers that can meet the challenging requirements for these projects. In this context, the group's activities for FY2024 are summarized as follows:

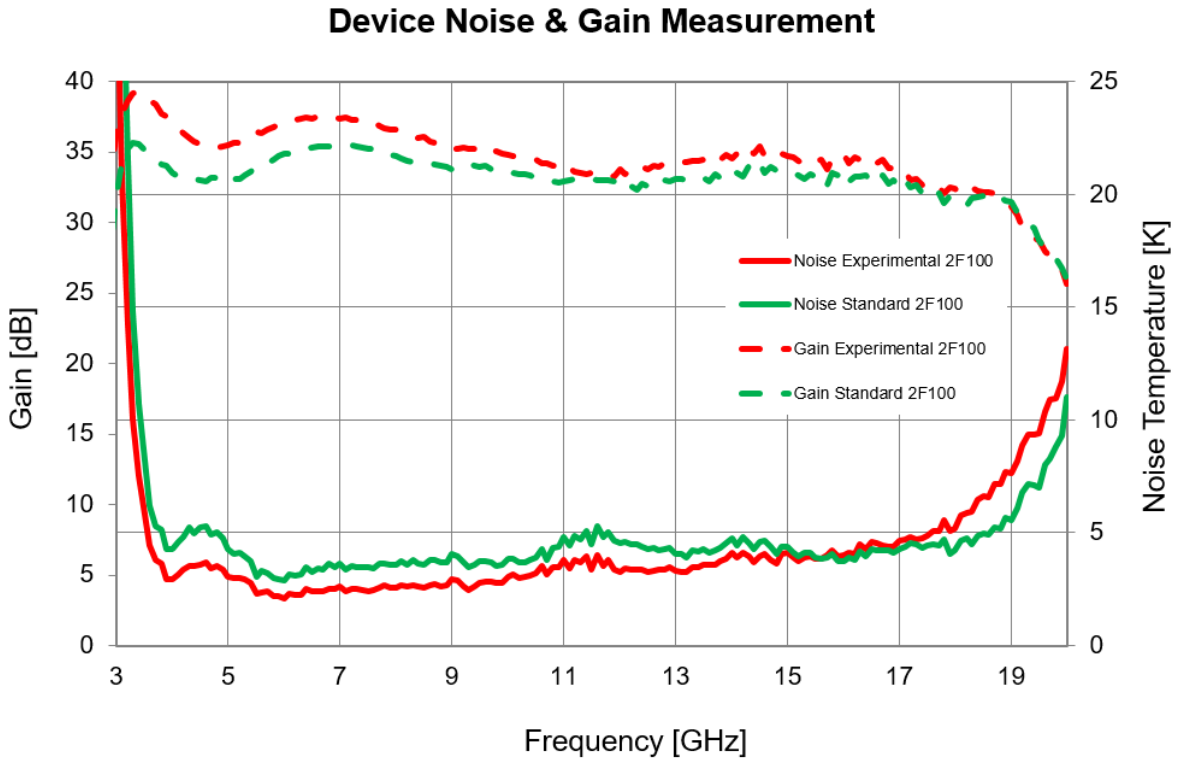
- **Amplifiers using MMIC technology**: In the past, the LNA group designed and fabricated amplifiers based on Millimeter-wave integrated circuit (MIC or chip and wire) technology exclusively. For multi-receiver projects which require a large number of amplifiers (such as ngVLA) as well as for designs requiring higher component density, MMIC technology is more appropriate. During FY2024, three MMIC designs for ngVLA Bands 2 to 4 were submitted to the Northrop Grumman Corporation foundry. The MMICs designs have been approved and are currently under fabrication, with delivery scheduled for Q1 FY2025. The design of the assembly blocks has been completed.



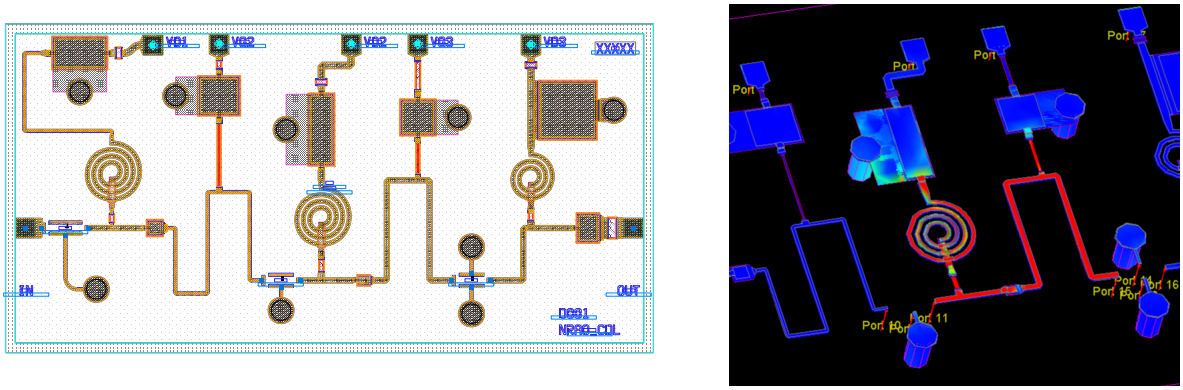
(Left) MMIC LNA designs submitted to NGC. (Right) Design of the block that will be used to test the MMICs.

- **Collaboration with Diramics AG**: Diramics AG, a Swiss company based near Zurich, produces InP–based pHEMT (p-type High-Electron-Mobility Transistors) devices that are capable of ultra-low noise performance. Assessment and testing of Diramics-produced devices and technology and determining their suitability for state-of-the-art CDL produced LNAs is extremely important. During FY2024, several devices from Diramics were tested. Devices from the latest wafer of standard transistors enabled reduction in the noise temperature of the amplifier by approximately 6% compared to its performance using transistors from previous Diramics wafers. Experimental transistor samples from the latest wafer were measured using the Band 6v2 LNA prototype amplifier design, which achieved an average noise reduction of 25% compared to the one implemented using a standard transistor, and without requiring any redesign of the amplifier. Due to the limited number of samples available, further optimization was not possible. However, Diramics has scheduled the production of additional experimental devices in FY2025, which could be used to design an enhanced amplifier.

Diramics AG has also initiated the development of a new MMIC process, which offers the advantage of the availability of cryogenic models for the transistors to aid with amplifier design. To evaluate this process, a new MMIC designed for ALMA Band 6v2, and has been submitted to the foundry for fabrication. The MMIC amplifiers are scheduled to be received and tested during Q2 FY2025.



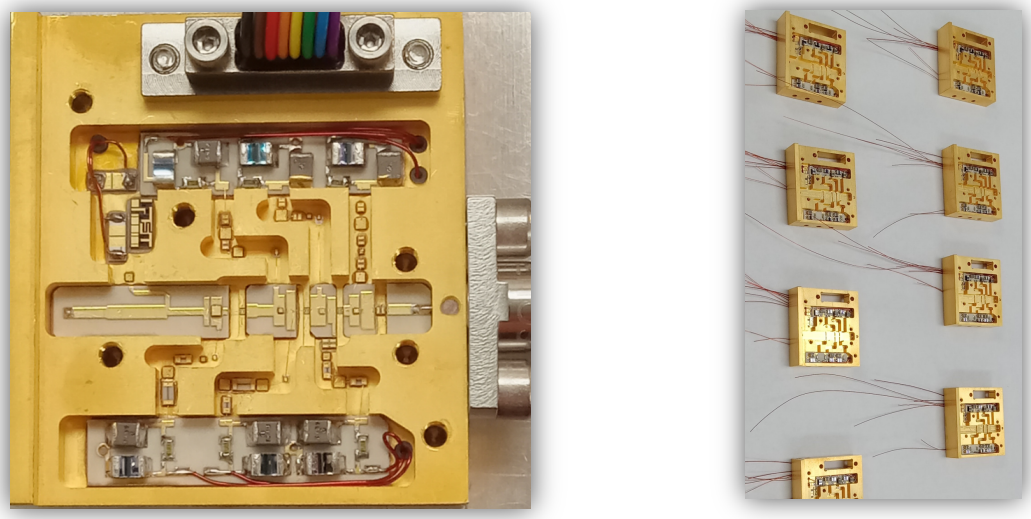
Noise comparison of the ALMA Band 6v2 amplifier using Diramics' standard transistor (green) versus the experimental device (red).



(Left) MMIC LNA design for fabrication at the Diramics foundry. (Right) Electromagnetic simulation of the internal matching network of the MMIC.

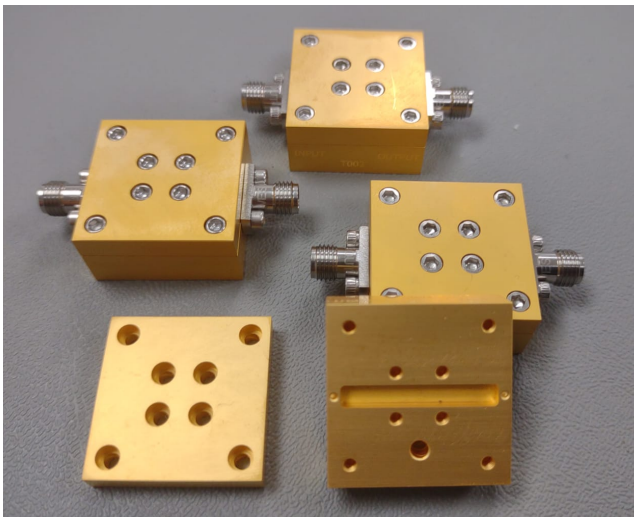
- **IF Amplifiers for ALMA Band 6v2**: During FY2024, construction of eight amplifiers for ALMA Band 6v2 using transistors from Diramics was completed. They were characterized at cryogenic temperatures and delivered for use to the Band 6v2 development team, meeting milestone 5.3.3. These amplifiers operate over the frequency range of 3.5–19 GHz (further modifications are being investigated to extend the bandwidth to the goal range of

3.5–20 GHz). The amplifier blocks were designed to meet the connector orientation requirements for integration into the new Band 6v2 cartridge. Another eight amplifiers units are under construction and are scheduled for delivery in Q1 FY2025.



(Left) Interior view of one of the amplifiers built for Band 6v2. (Right) Current progress of the eight additional amplifiers that are under construction.

- **Microwave Models**: The ongoing development of low noise amplifiers using MIC technology at cryogenic temperatures relies on microwave passive components, including capacitors, inductors, and resistors. Accurate modeling of these components is essential for designing amplifiers with enhanced performance. During FY2024, test fixtures for characterizing these components were assembled, and some of the components used in the amplifiers were modeled at room temperature. This is an ongoing effort, that was delayed (milestone 5.3.7) by the immediate effort required for the Diramics MMIC collaboration, in order to meet the upcoming wafer schedule deadlines.



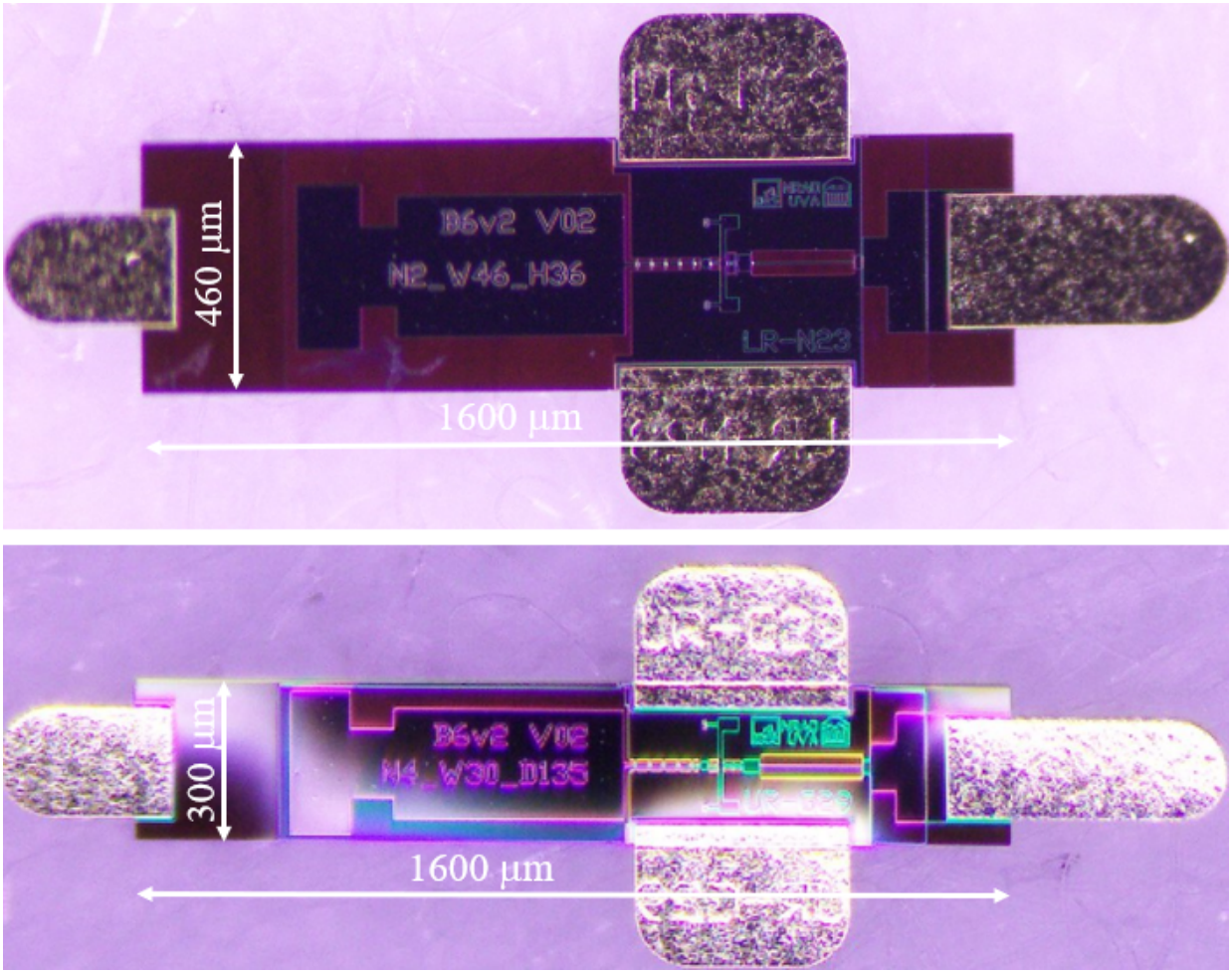
Test blocks built to characterize microwave components.

- **Amplifier Test Set Software**: The amplifier test system hardware and software presented a testing speed bottleneck. The instrumentation upgrade was started in the prior years and completed in FY2024, with acquisition of a new network analyzer and a new noise figure analyzer. Subsequently, the new measurement software was written for gain and noise testing, completing milestone 5.3.15, and it helps to improve test speeds for measurements up to 26 GHz.

Millimeter and Submillimeter Detectors: Following a successful proposal for, and the award of, a multi-year Phase 1 development project for Band 6v2 cartridge development, CDL has embarked upon a Superconductor-Insulator-Superconductor (SIS) receiver technology development plan designed to produce an upgraded Band 6 receiver cartridge as a replacement for the existing cartridge design. The goal is to achieve an essentially flat receiver noise temperature and gain across the expanded RF range from 209–281 GHz, and across a full 4–16 GHz IF band (with a goal towards 4–20 GHz IF range). During FY2024, the following components were developed:

- **Wideband Low-noise SIS Mixers for Band 6v2**: Following the fabrication (by UVA/IFAB), and start of testing of M1 mixers last year, several variants of the mixers were thoroughly characterized this year. The shortcomings of the M1 design were subsequently addressed by making a revised M2 design, which was also fabricated, delivered (again by UVA/IFAB), and incorporated into double sideband (DSB) test blocks and evaluated by the Band 6v2 development team. Selected DSB mixers were subsequently incorporated into the side-band separating configuration and further evaluated for their suitability for use in a Band 6v2 cartridge assembly.

Postdoc Priyanka Mondal and CDL Engineer Jim Muehlberg talk to attendees at the 2024 International Microwave Symposium in Washington, DC.



SIS Mixer chips from M2 design iteration. Mixers were realized as "broad" (top) and "narrow" (bottom) devices.

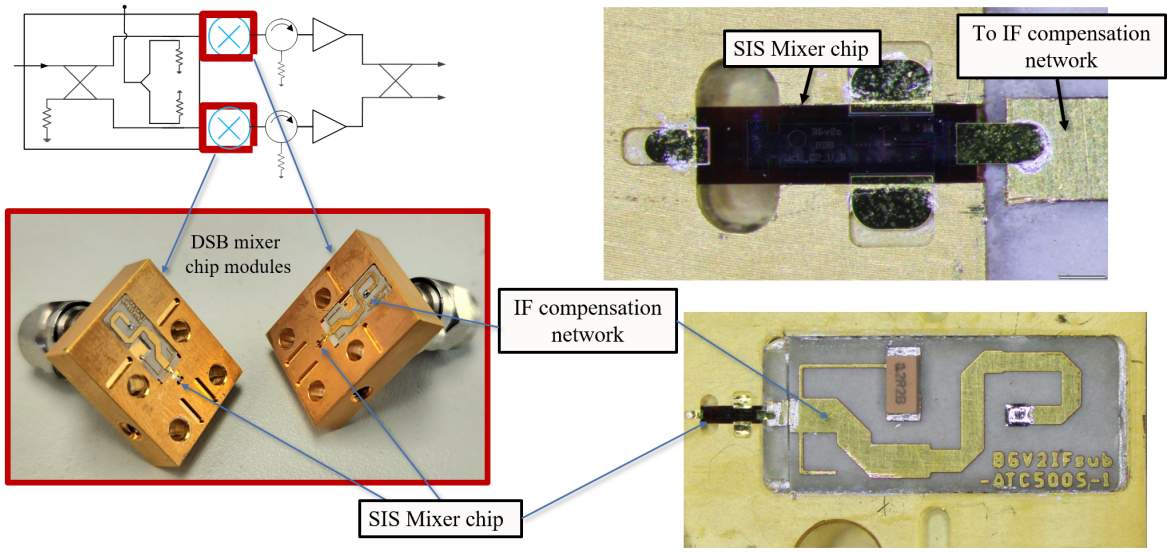


Illustration of two DSB mixer chip modules configured for use in a 2SB mixer assembly.

- **Sideband Separating Mixers for Band 6v2**: The 2SB mixer, consists of two identical DSB mixer chip modules and one RF/LO coupler assembly. An independently testable version of RF/LO coupler assembly was built and evaluated. Its measured performance exhibited excellent agreement with simulation results. Subsequently, prototype 2SB (dual single sideband) mixers were built by attaching Band 6v2 SIS DSB mixer chip modules (with devices from the M2 wafer) to the RF/LO coupler and the completed assemblies characterized in MTS2 (which was itself built last year) for use in the Band 6v2 prototype cartridge.

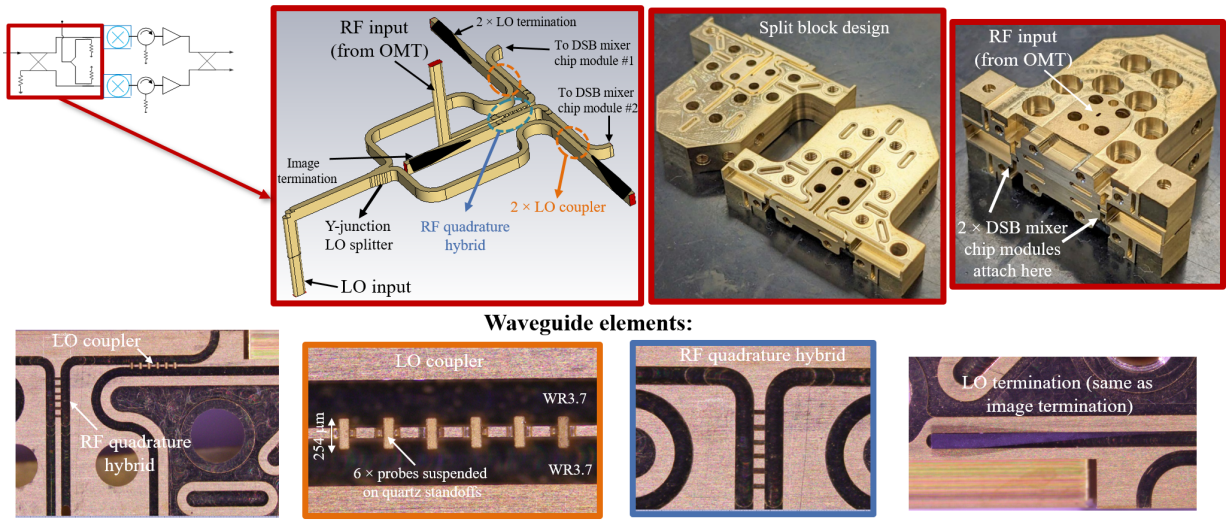
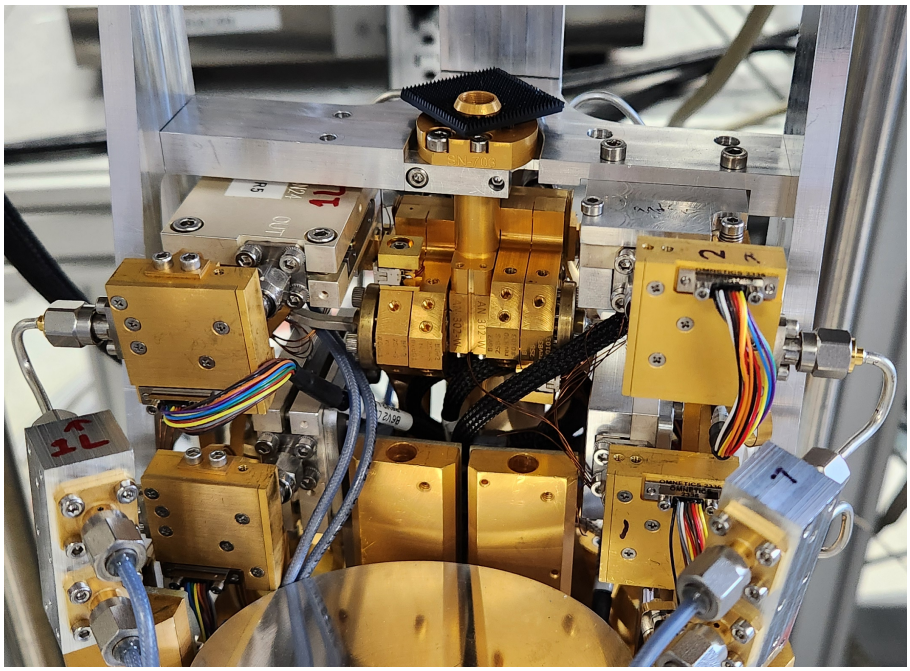


Illustration of the RF and LO coupler block required in conjunction with two DSB mixer blocks in order to implement a 2SB mixer.

- **Improved Orthomode Transducer (OMT)**: As reported in the progress report for last year, three different types of split block OMT designs, including a candidate design from NAOJ were under investigation for their applicability to the new Band 6v2 receiver. In FY2024, OMTs corresponding to one candidate reverse coupler NRAO design and the NAOJ double-ridged design were evaluated in a common test setup for the purpose of design down-selection.

- **Improved Optics**: The Band 6 receiver optics path (a corrugated horn, two ellipsoidal mirrors, two IR filters, and a vacuum window) were analyzed in detail over the extended ALMA Band 6v2 frequency band of 209–281 GHz. It was found that the dielectric IR filters and vacuum window in the optical path cause reflections with varying magnitude over the Band 6 frequency range. These reflected signals converge in close proximity of the horn. They are then reflected off the horn's flange and follow the optical beam path and radiate out of the cartridge. Since the reflected signal is slightly angled with respect to the main beam, this causes a sidelobe close to the main beam. The addition of radio absorptive material (RAM) on the horn's flange mitigated this sidelobe issue.



Photograph of the modified Band 6v2 prototype cartridge showing the added radio absorptive material (black square) around the horn to eliminate the unwanted side-lobe.

The cause of degraded performance of the Band 6v1 design was also studied. The EM analysis of the Band 6 receiver cartridge showed that the two cryogenic ellipsoidal mirrors were not significant contributors to this degradation. Consequently, the same mirrors can be used to meet the specifications of optical system across the moderately extended RF frequency range of Band 6v2, 209–281 GHz. The Band 6v2 feed-horn will also be identical to the Band 6v1 one, except for the waveguide output, which will have a circular cross-section with diameter 1.29 mm, rather than a square-cross section 0.94 mm x 0.94 mm (an alignment pin slot will also be required on the outer Band 6v2 mounting flange that interface with the Band 6v2 OMT).

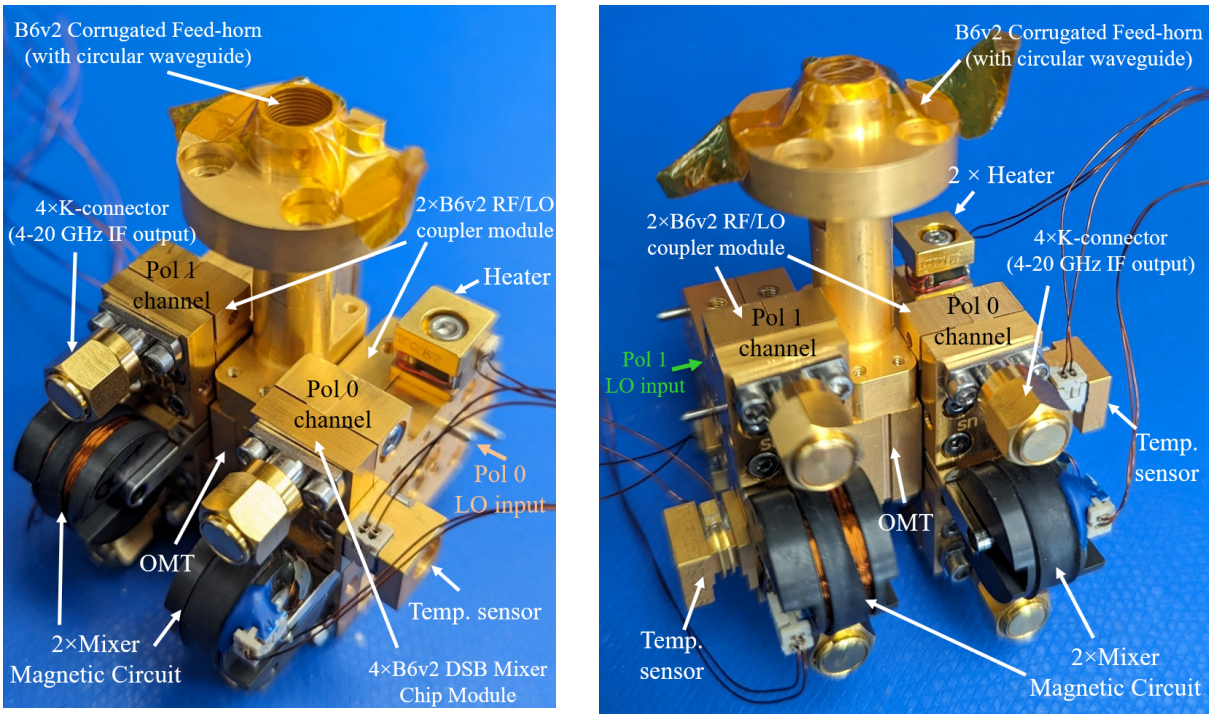
The Band 6v1 IR filters were not previously characterized for their cross-polarization. The Band 6v2 team investigated whether deviations from the ideal elements might explain the observed cross-polarization performance. CDL also performed measurements of the IR filters in the Cartridge Test Set, CTS2. These results, although strictly inconclusive, did not directly implicate the performance of the IR filters. Samples of spare vacuum windows and IR filters were also sent to and characterized by NAOJ, and those results are being analyzed by the Band 6v2 team at NRAO. Those measurements also do not implicate the IR filters. Room temperature measurements with and without the quartz vacuum windows indicate that they are contributing to the degradation in cross-polar performance. Further investigation is ongoing, and requires additional time to resolve the problem.

- **Cryogenic Isolator and Cryogenic IF Hybrid:** These components were not developed at the CDL but were procured from Smithsonian Astrophysical Observatory and Yebes Observatory respectively, and characterized in house for use in the Band 6v2 cartridge.

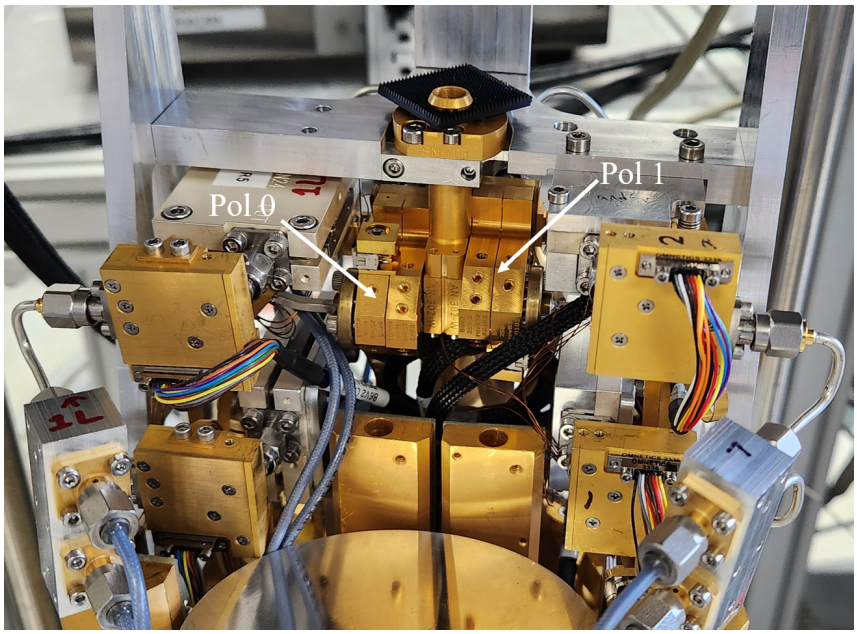
- **Improved Local Oscillator (LO)**: In continuation of the work done in previous years, the LO group delivered another RF source (for use in the Band 6v2 mixer test system) and another Band 6v2 LO source for use in the cartridge test system. Further details are provided under the topic of local oscillators later in this chapter.

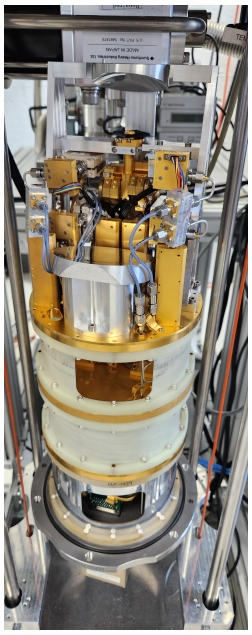
- **Construction and Test of Band 6v2 Prototype Cold Cartridge Assembly**: Following the design and refinement of the prototype Cold Cartridge Assembly (CCA) last year, it was constructed/assembled and evaluated in FY2024. The Band 6v2 CCA incorporated the cryogenic optics modules and the improved Band 6v2 modules previously listed (OMT, 2SB mixers, IF amplifiers) and also the broadband IF isolators and IF hybrids that were sub-contracted and obtained from external sources. This completed milestone 5.3.3.

  The cartridge was subsequently mated with a Band 6v2 Warm Cartridge Assembly containing the LO system and also outfitted with room temperature IF amplifiers to provide additional gain to the signal emanating from the cold cartridge, which addressed milestone 5.3.4. The test software suite for the Cartridge Test System, CTS2, was completely revamped and the Python software code (under version control on a git repository) was tested, debugged, and deployed for use, completing milestone 5.3.17. Subsequently, the prototype Band 6v2 receiver was evaluated using the Cartridge Test System, CTS2, using the new test software.

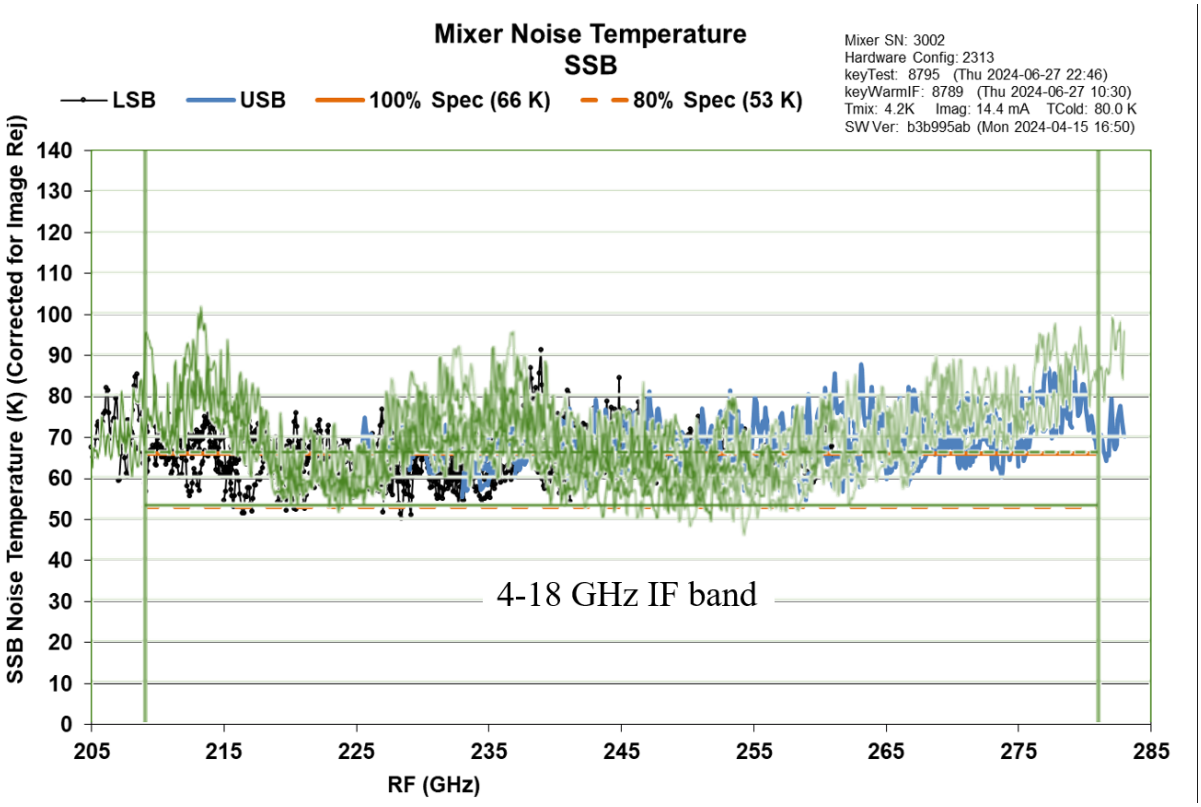


Band 6v2 Dual Polarization Millimeter-Wave Assembly.





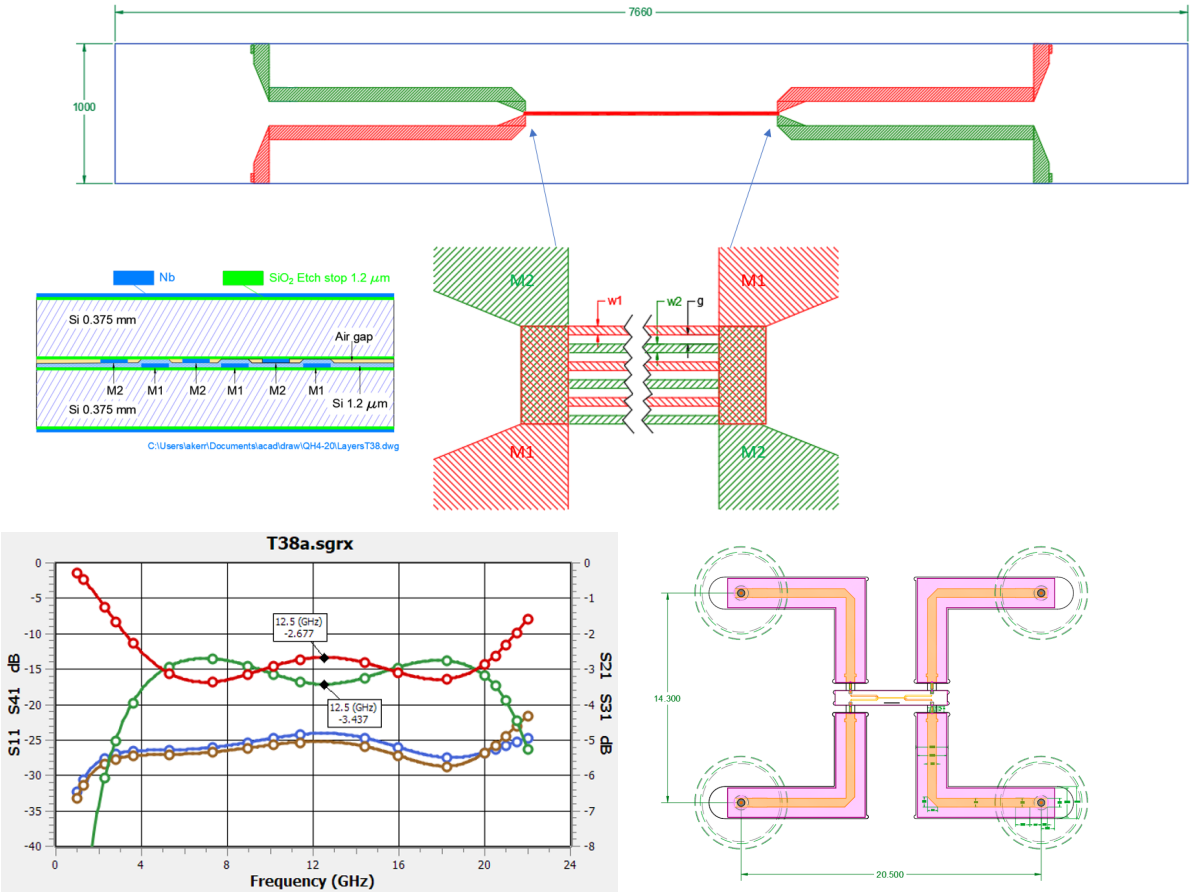
Fully Assembled Prototype Band 6v2 CCA.



Band 6v2 receiver noise performance versus IF. Traces show comparison of MTS2 and CTS2 Band 6v2 Pol 0 measurements.

These results, including the receiver noise performance are as predicted and extremely encouraging. An M3 mixer design was subsequently worked out in order to produce compliant performance from the Band 6v2 receiver (using higher critical current density SIS), and is currently being finalized. It will be fabricated and tested in FY2025.

- **Superconducting 4 – 20 GHz quadrature hybrid**: A 4–20 GHz three-section superconducting quadrature hybrid was designed last year and fabricated at UVA/IFAB this year. Its experimental evaluation has been delayed owing to staff retirement and task handover. The hybrid is small enough to be mounted inside a balanced amplifier block, a configuration which represents an alternative to the baseline Band 6v2 2SB architecture incorporating single ended amplifiers and isolators. Size is critical because each dual-polarization 2SB Band 6v2 cartridge would incorporate four such balanced amplifiers, and the loss must be very small because the balanced amplifiers would be at the point of lowest signal level in the whole system. Another five-section hybrid with improved performance (better amplitude match over 4–20 GHz) was also designed during FY2024, and it awaits finalization of its artwork/layout for fabrication after the three-section version has been evaluated.

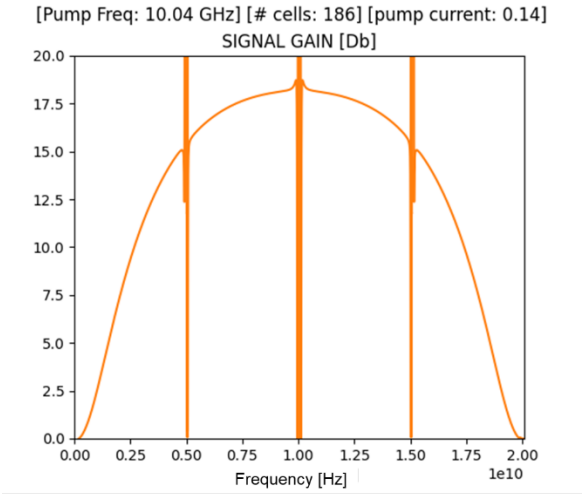


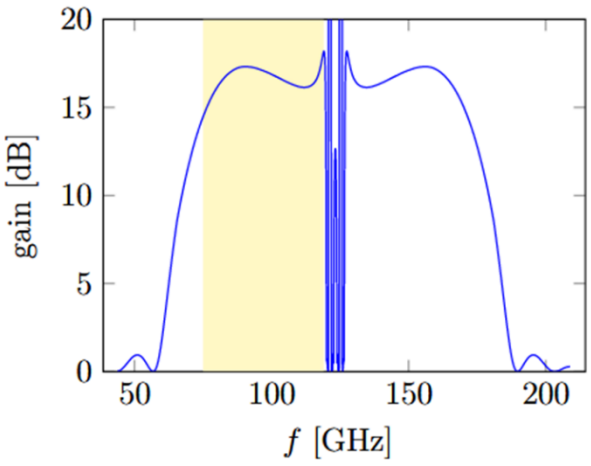
(Top) Artwork/layout of the 3-section superconducting 4–20 GHz quadrature hybrid design. (Bottom left) Predicted performance of the quadrature hybrid design. (Bottom right) Figure depicts the three-section hybrid mounted in the test fixture with 50 Ω Duroid microstrip lines connecting it to coaxial connectors for measurement.

Traveling-wave Kinetic-inductance Parametric (TKIP) Amplifiers: Over the past few years, CDL has embarked upon an effort to design, develop, and test Traveling-Wave Kinetic Inductance Parametric (TKIP) amplifiers to evaluate their suitability for radio astronomy instrumentation. Originally developed by the quantum computing industry, the TKIP amplifier is essentially a long superconducting transmission line whose nonlinear kinetic inductance generates gain over a wide

frequency band when an appropriate pump signal is present. In addition to their wide bandwidth, TKIP amplifiers hold the promise of quantum-limited noise. They appear to be equally well-suited for use as RF front-end amplifiers or as IF amplifiers following SIS mixers. During FY2024, CDL has focused on all three development areas namely; design, fabrication, and testing/characterization of TKIP parametric amplifiers.

- **Design**: Effort continued to improve the in-house developed software tool for simulation and design of TKIPs. Along with the use of a commercial electromagnetic simulator, a high frequency structure simulator (HFSS), and a novel analysis method that was recently published, the design tool was used to complete the following tasks:
    - Perform a systematic comparison of the theoretical performance of TKIPs implemented with different artificial geometries (also known as Floquet structures) that were compatible with the fabrication methods of the collaborating fabricators. The geometries studied were based on coplanar waveguide (CPW), microstrip, and inverted microstrip transmission lines.
    - Design a new version of low-frequency (0 – 20 GHz) artificial CPW TKIPs (below, left panel). Devices based on this design are currently being fabricated at UVA/IFAB.
    - Design an artificial CPW TKIP working in the full W-band (below, right panel). This project involved effort of a co-op graduate student.
    - Compare predicted results from the design tool with those obtained with AWR Design Environment Platform from Cadence. The early/first results demonstrate a good agreement.



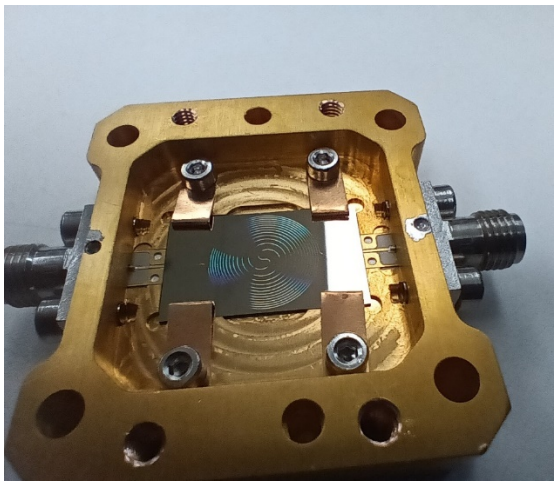


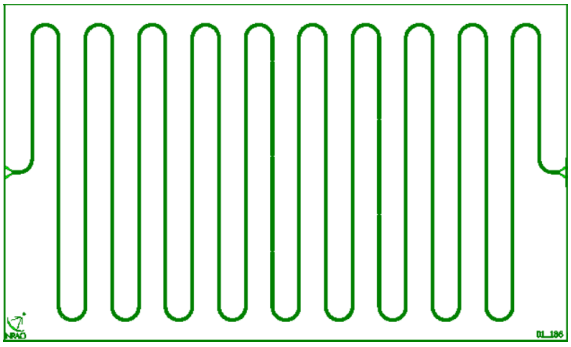
Examples of predicted gain of the TKIPs designed at CDL. (Left) Low-frequency version. (Right) High-frequency version. The shaded area corresponds to the full W-band.

- **Fabrication**: CDL continued collaborating with UVA/IFAB and Delft University of Technology (TU Delft), The Netherlands, for fabrication of TKIPs.
    - Both fabrication collaborators delivered TKIPs fabricated as an artificial-CPW configuration in a spiral form (next page, left panel). After characterization it was found that the spiral arrangement causes self-interactions. This occurs when different portions of the transmission lines that constitute the TKIP are placed in close proximity, a situation

that is exacerbated in the case of CPW lines, so an alternative meander arrangement was explored.

- UVA/IFAB is currently fabricating TKIPs as artificial-CPW TKIPs in a meander configuration which allows more flexibility and reduces risk of interactions between adjacent transmission lines (below, right panel).
- UVA/IFAB also matured their fabrication processes which enables the fabrication of TKIPs as microstrip lines. The main advantage of this type of lines is that, having only one ground plane, it is less prone to self-interactions.

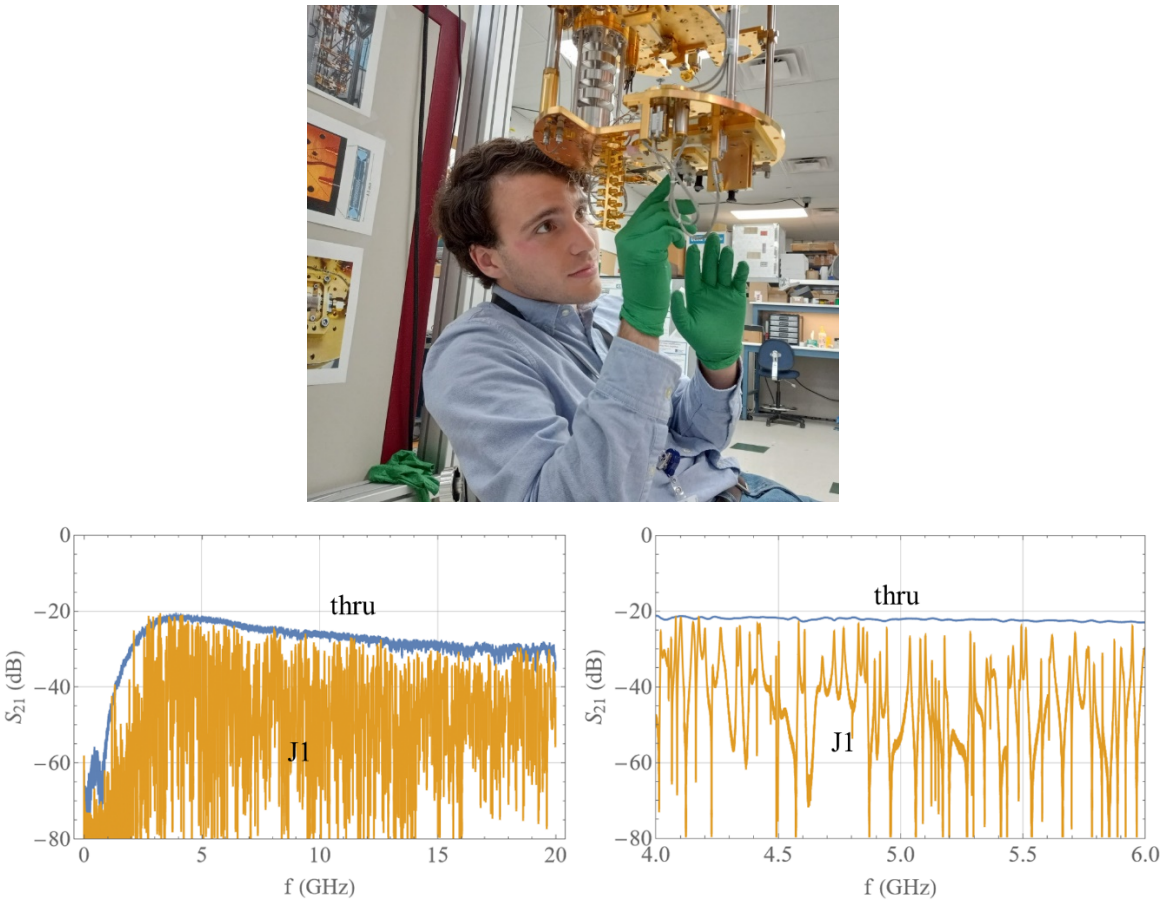




(Left) Device fabricated by TU Delft mounted in a block for characterization. Note that the transmission line that implements the TKIP is configured as a spiral which causes structures on adjacent tracks to be in close proximity. (Right) Close up of the CAD to be used to fabricate a new iteration of amplifiers at UVA. The transmission lines are now configured as meanders allowing more separation between them.

- **Testing/Characterization**: In collaboration with UVA/IFAB, CDL operates a Bluefors dilution refrigerator that allows characterization of amplifiers at milliKelvin temperatures. The setup allows measurement of gain in the low frequency band (DC–20 GHz) and in W-band (75–110 GHz). The following tasks were carried out:

  - The low-frequency setup was upgraded to also enable measurement of noise temperatures. Verification of this extension is ongoing.
  - Assisted UVA/IFAB with the characterization of superconducting resonators. These measurements were used to determine the quality of their fabrication processes.
  - The S-parameters of the TKIPs provided by the fabrication collaborators were measured (next page, top). All samples had similar characteristics— a good transmission plagued by a multitude of resonances (for an example, see next page, bottom). Extensive simulations revealed that this behavior originates from the way the TKIPs are geometrically configured (i.e. as a spiral, as explained earlier).



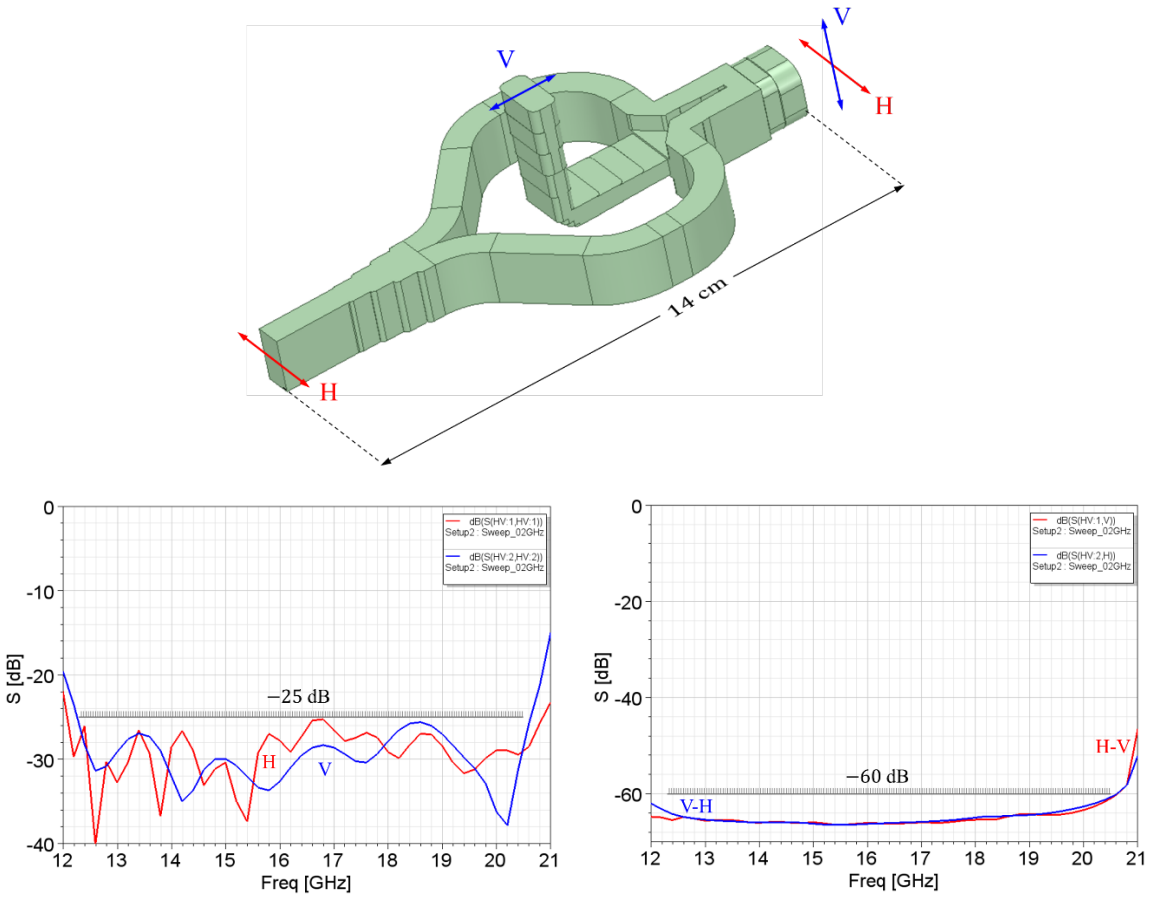
(Top) Co-op graduate student mounting a packaged TKIP for characterization. (Bottom, left) Typical transmission of a TKIP laid out as a tight spiral (orange) compared with the transmission of a reference "thru" line (blue). (Bottom, right) Zoomed-in view shows the presence of a multitude of resonances.

Optics and Electromagnetic Components: The electromagnetic and optics group provided continued analysis and design support for the ALMA and ngVLA projects. For the ngVLA project, final reflector surface optimizations were carried out, and maximum allowed distortions from ideal were calculated. Detailed electromagnetic analyses were performed on the reflector system to determine for example the effects of struts and panel gaps. Various reflector surface treatments were evaluated by means of measurements with the help of the NRC's Herzberg Astronomy and Astrophysics Research Centre (HAA), and the degradation in performance was then determined by analysis. A tolerance study of the MSIP dish is ongoing. This is required for post processing of the holography measurements due early next year.

The ngVLA Band 1 wideband horn was manufactured and measured at Green Bank. The measurement results confirm that the horn performs as predicted. The Band 1 horn is a dielectrically loaded quadruple-ridged flared horn (QRFH) with a 3:1 frequency bandwidth, and has a performance equivalent to that of sub-octave band horns. Additionally, a quick design for a wider frequency band horn (4.3:1) at higher frequency was carried out. Preliminary simulated results indicate that this horn's radiation performance is good over the entire bandwidth of 8–34 GHz, and this could be potential candidate for use on the future wide-band VLBA receivers.

The ngVLA Band 1 wideband horn was manufactured and measured at Green Bank.

Another ongoing design effort for the ngVLA is the development of an OMT for its Band 3 (12.3–20.5 GHz). Two configurations are being studied— turnstile and double-ridge— in order to determine the best candidate to comply with the very demanding requirements. The image below shows a CAD model of the double-ridge design and its predicted performance. An error analysis is currently ongoing, after which fabrication and testing will follow.

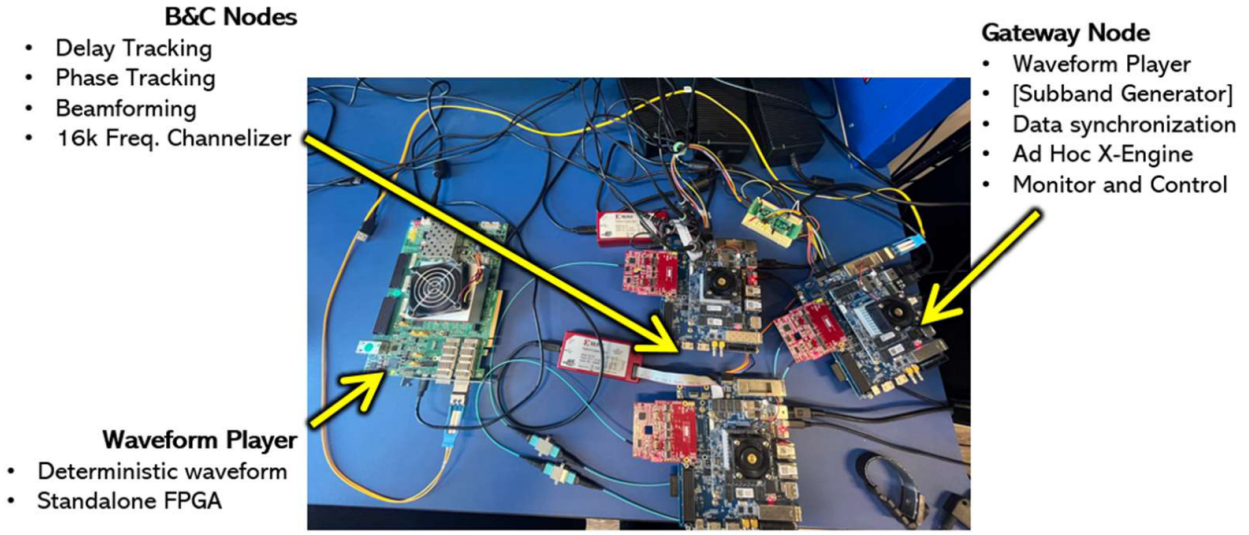


(Top) CAD model of the proposed OMT in double-ridge configuration. (Bottom, left) Reflections at the input port are predicted to be lower than -25 dB in the operational bandwidth. (Bottom, right) Cross-polarization are predicted to below -60 dB.

In addition, the optics and electromagnetics group supported the Black Hole Explorer Mission (BHEX) by doing a preliminary design of a shaped axially symmetric dual reflector system for their space-based segment.

Digital Design: The CDL digital design team is developing a Scalable, Reconfigurable, and Modular (SCREAM) architecture for all future correlator and large Central Signal Processor (CSP) projects.

Phase I of the Beamformer & Channelizer (B&C) project, which involved building a basic two-node demonstrator showcasing beamforming and cross-correlation capabilities, was completed in FY2023. While initial evaluation was completed in FY2023, it was followed up by extensive testing during Q1 FY2024.



The SCREAM prototype that was built in FY2023, and extensively tested in Q1 FY2024 consists of two beamforming and channelizing (B&C) nodes with basic functionality and a control/gateway node (master FPGA with a built in X-engine).

Following Phase I of the SCREAM B&C node development, the digital design team shifted its focus to prepare for and support the Conceptual Design Review of the ngVLA CSP. This review was successfully held in April 2024. The resulting recommendation of a SCREAM-based Central Signal Processor for the ngVLA project marked a major milestone for the digital design group, aligning SCREAM with the broader Observatory efforts.

The digital design team also supported the NSF-led ngVLA system Conceptual Design Review in September 2024, and provided substantial CSP-related documentation for the review.

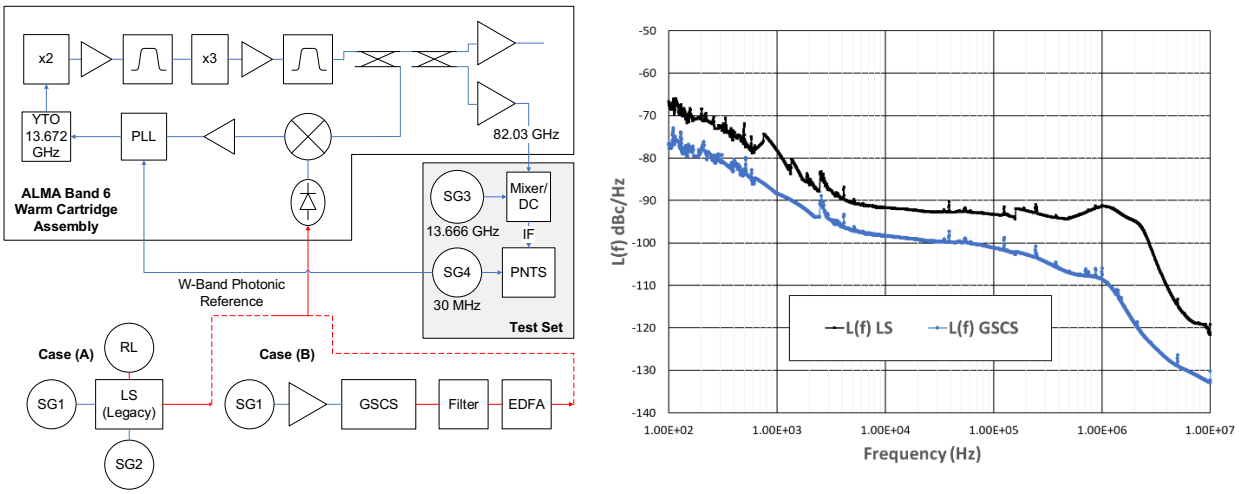
In addition to the B&C component, the design team created a plan for a SCREAM X-node prototype development (completing milestone 5.3.13), including a Work Breakdown Structure (WBS) and a draft schedule. Work was also started on the subarray operation concept for the X-Engine. Due to ngVLA funding constraints, the development of the X-Engine is not expected to begin earlier than FY2026.

The investigation into the SCREAM M&C architecture also made significant progress during FY2024. A draft M&C architecture document was completed, providing details regarding

deployment of logic within the design. It provides an outline as to how the Processing System (embedded processor), Serial Peripheral Interfaces/serial links, and M&C server will collect data from various parts of the system and communicate the commands effectively.

LO Reference and Timing: In FY2024, the ngVLA-funded work included the completion of the conceptual design phase of the LO Reference and Timing, including down select studies of competing architectural options. Following the Conceptual Design Review, a major activity was support for the project-wide NSF-led Programmatic Conceptual Design Review which completed successfully in the Q4 FY2024. Further work involved the ongoing evaluation of custom demonstration units provided by industry to assess the feasibility of the phase-noise and spurious signal-level requirements.

With members of the ALMA Offsite Hardware Support Groups in LO and Photonics, the LO Reference and Timing group investigated a new technique for laser frequency synthesis as part of ALMA's concern for technology obsolescence. This work was published as an IEEE conference paper "Injection-Locked Gain-Switched Comb Source for Radio Astronomy Local Oscillator," demonstrating a potential path to replacing current ALMA Laser Synthesizer with lower cost and complexity and improved phase noise.

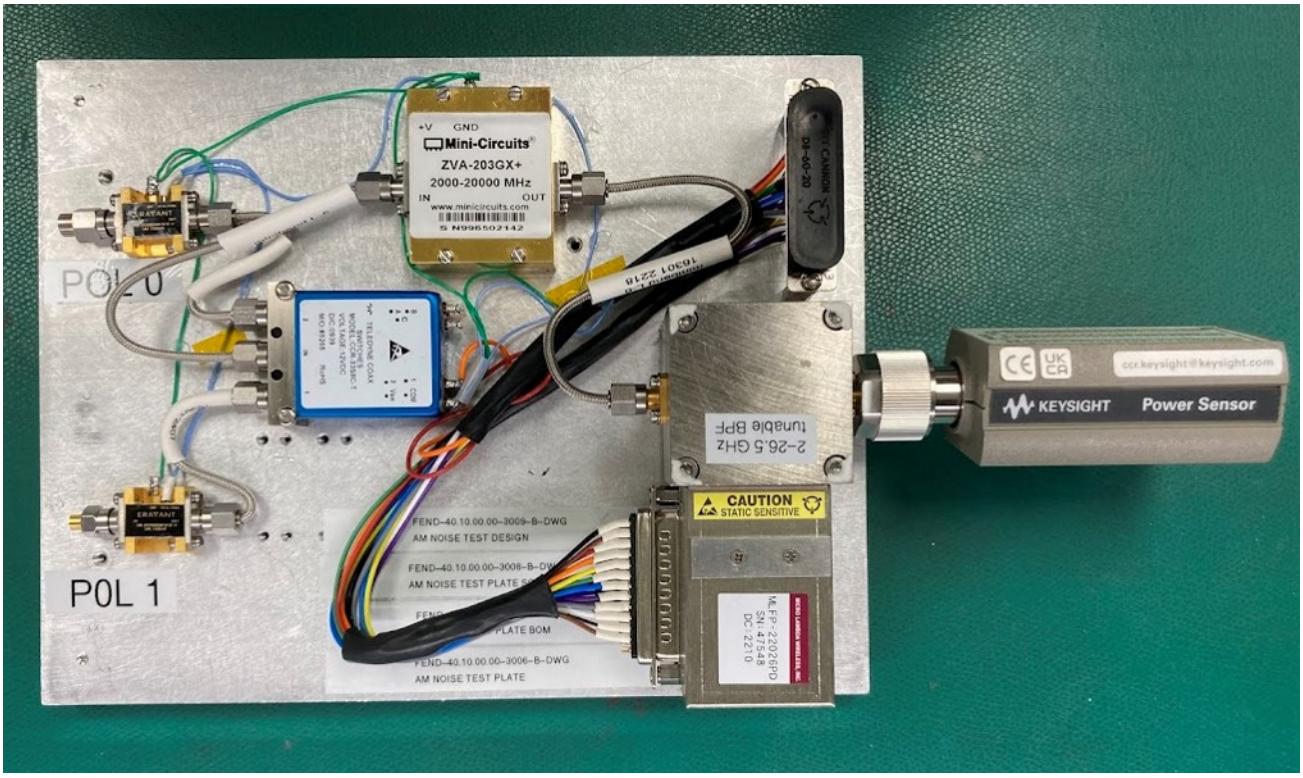


(Left) Phase noise measurement setup to compare the phase noise performance of an ALMA Band 6 LO assembly when locked to (a) the legacy LS system and (b) the GSCS, in turn. SG=signal Generator, PTNS=Phase Noise Test Set, RL=Reference Laser (Right) Phase noise measured at 82 GHz for (a) Legacy Laser Synthesizer (b) Injection Locked Gain-Switched Comb Source. While the phase noise using the legacy Laser Synthesizer was a factor of two poorer (96 fs) than previous reference measurements of 48 fs (reasons are not fully understood, but believed to be due to SG2), however, the phase noise performance with GSCS was notably superior (18 fs).

Specific funded activities and/or milestones for ngVLA/ALMA studies are detailed in those documents/sections.

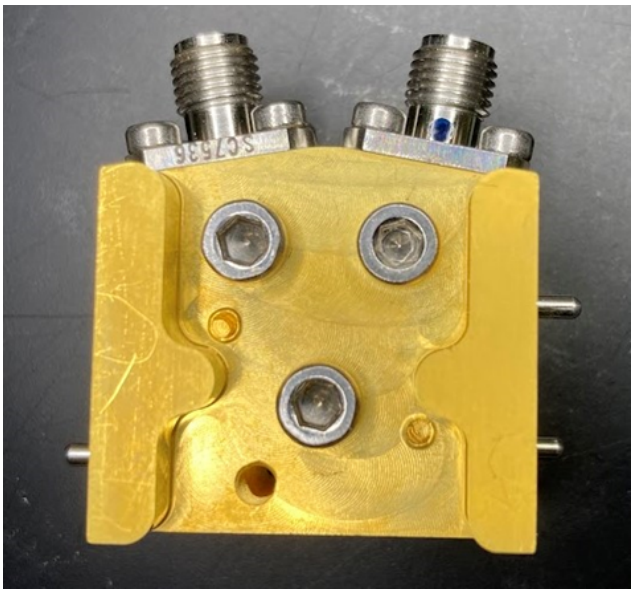
Local Oscillators: Following the ALMA development study to investigate possible improvements to the Band 6 LO Amplitude Modulation (AM) sideband noise, one Band 6v2 RF source, one Band 6v2 LO source, and a Band 6v2 WCA were assembled and delivered to the Band 6 cartridge group in the prior years. In continuation of this work done in previous years, the group delivered another RF source (for use in the Band 6v2 mixer test system) and another Band 6v2 LO source for use in the cartridge test system, the latter completing milestone 5.3.5.

Since the ALMA2030 Roadmap guidelines imply increased IF bandwidth from the present 4–12 GHz, to 4–20 GHz, the LO AM sideband noise screening test set for the extended IF range required of Band 6v2 was packaged and refined into a configuration conforming to that of the legacy 4–12 GHz LO AM sideband noise screening test set. This modification makes it compatible with the standard software and procedures used in WCA testing. This work was a follow up to previous proof-of-concept work executed to demonstrate the feasibility of such measurements over 4–16 GHz.



The extended IF range LO AM sideband noise screening test set for Band 6v2.

Additionally, a postdoctoral Women in Engineering (WiE) fellowship recipient is working with the LO group to evaluate possible alternatives for the power amplifier MMIC used in ALMA Band 10. The current GaAs pHEMT based MMIC power amplifier used in the ALMA Band 10 LO scheme has problems delivering and maintaining sufficient output power across the Band 10 WCA frequency range. A GaN High-Electron-Mobility-Transistors (HEMT) based commercial MMIC was identified and samples procured. A custom assembly was designed and built to evaluate this MMIC and the resulting amplifier performance evaluation is ongoing.

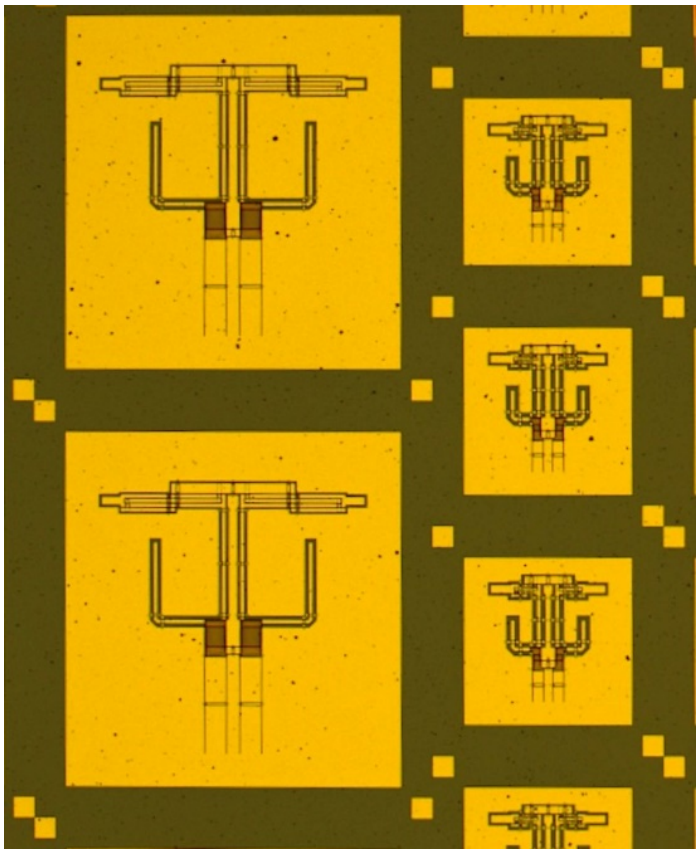


Custom test block manufactured for evaluating the GaN HEMT based MMIC for it suitability as an ALMA Band 10 power amplifier replacement.

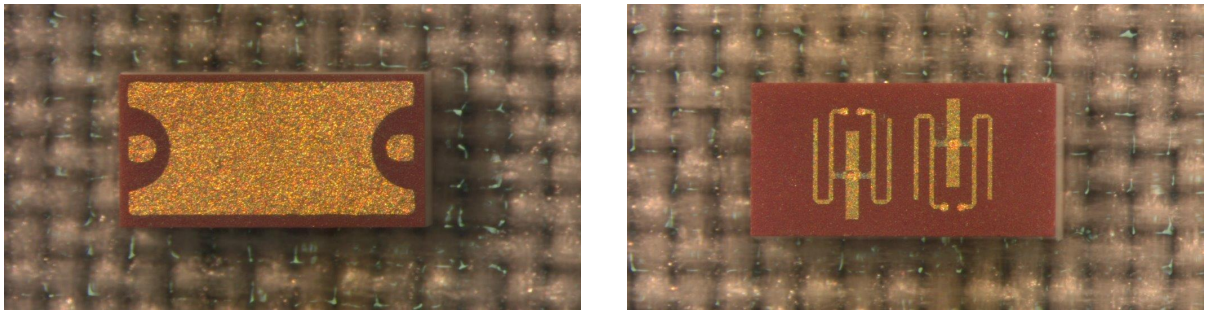
Integrated Receiver Development (IRD): The IRD program aims to develop compact, mass-producible, and field-replaceable Front End hardware for the next generation of radio telescope facilities. Goals include: early digitization as near to the telescope focal point as possible; and relatively seamless integration of analog, digital, and photonic technologies into lightweight, low-overhead, Front End modules. The goal is for the architecture to be optimized to exploit the complementarity of integrated construction techniques and Digital Signal Processing, achieving a level of precision and stability that is unmatched by state-of-the-art radio astronomy receivers. As such, the IRD program is working together closely with the CDL Digital Design team.

The IRD team continued its collaboration with Anritsu to fabricate high-frequency reflectionless filters using advanced thin-film fabrication. Following up on the previous, successful lumped-element designs with 60 GHz cutoff frequency corners (testing of which completed milestone 5.3.8), four new devices were designed, two lumped-element filters with vias (completing milestone 5.3.9) and two transmission-line based designs (completing milestone 5.3.10). The two transmission-line designs were fabricated with predicted passband performance at 70–115 GHz and 200–275 GHz, respectively, and are undergoing initial testing.

The CDL also continued its collaboration with our commercial partner and licensee, Mini-Circuits, Inc., to extend reflectionless filter technology to higher frequency in surface-mountable form using their Low-Temperature Co-Fired Ceramic (LTCC) fabrication capability. This work was funded by a Partnerships for Innovation (PFI) grant from NSF. Some initial technical issues were resolved, and the final prototype was a success.



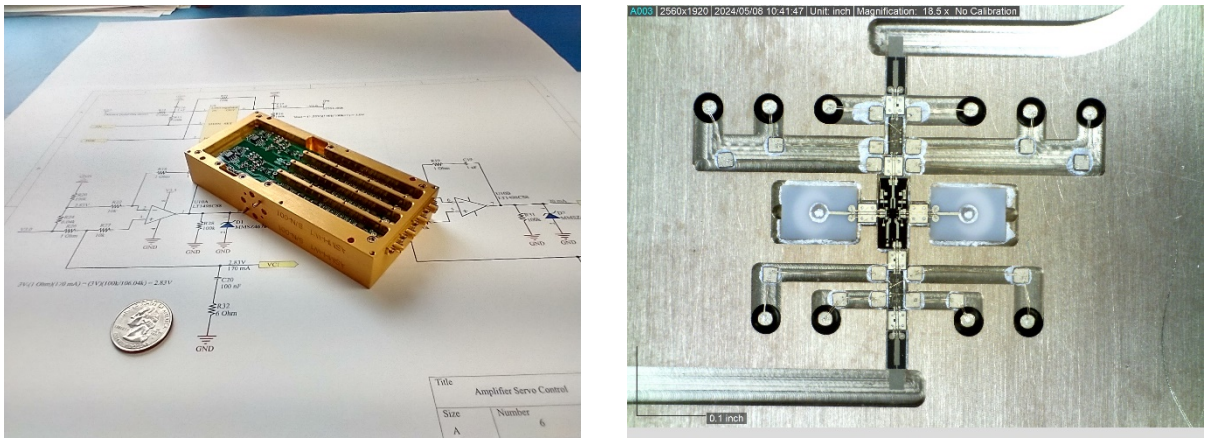
Thin-film, transmission-line reflectionless filters on quartz (circuits on un-diced wafer). The larger circuit has a 70–115 GHz simulated band-pass with up to 200 GHz stop-band absorption, while the smaller circuit has a 200–275 GHz band-pass with stop-band absorption up to 500 GHz.



(a) (b)

LTCC transmission-line reflectionless filters, fabricated under a PFI grant. (a) bottom view (b) top view.

IRD ngVLA: An analog prototype of the Band 6 integrated receiver module was built and tested with good results. The custom anti-alias filter for full ngVLA IF bandwidth requirements was also received and verified, with measurements showing excellent agreement with simulations. Each of the Bands 2 through 6 module designs were updated to incorporate this new filter on the next prototype iteration. (Band 1 has an integrated filter of a unique design.)



(a) (b)

The ngVLA Band 6 analog prototype. (a) Open to baseband PCB. (b) Detail of MMIC cluster.

Finally, in partnership with the Digital Backend (DBE) development team, the IRD group supported integration tests between the previously completed Band 3 prototype module and the prototype DBE development board. Sideband calibration and equalization algorithms were tested successfully.

This description of the IRD team's ngVLA related work, executed by CDL personnel, is only provided for the sake of completeness. The milestones for this effort are incorporated into the ngVLA Annual Progress Report for FY2024.

next generation Radar Designs (ngRD): The next generation radar project is a partnership between the NRAO and Raytheon and led by the Radar Division at the CDL. The goal is to carry out development activities to enable using the Green Bank Telescope to transmit and for the Very Long Baseline Array to receive the reflected radar signals. The effort has been supported by an NSF award from the Mid-Scale Research Infrastructure-1 (MSRI-1) program, titled next generation Radar Designs, with the key deliverable of the concept design for a high-power (500 kW), high-frequency (13.7 GHz; Ku-band) transmitter on the GBT with reception by the VLBA. The project team completed an external conceptual design review in Q1 FY2024 (completing milestone 5.3.11). In response to feedback from the external concept design review, a science advisory council was formed in FY2024 to improve science use cases and requirements flow-down (this addressed milestone 5.3.12). The team provided an annual report to NSF in Q4 FY2024 and was approved for a period of no-cost extension through FY2025. Additional congressionally directed funding for the project through Air Force Research Laboratory is in process and expected to arrive in Q1 FY2025 to support continued design activities for the next two years and toward a preliminary design review.

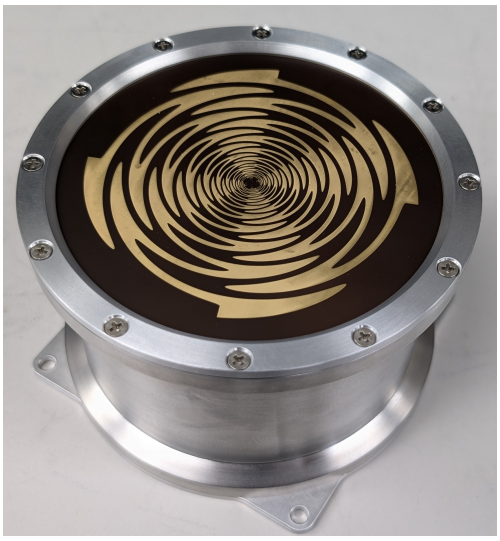
The low-power (700 W), pilot transmitter, previously installed on the GBT in 2020 and 2021, was rebuilt by Raytheon and GBO staff in FY2024 and is being prepared for redeployment on the GBT in Q1 FY2025. Redeployment and use on a quarterly basis will improve the end-to-end concept of operations for a future, high-power radar system. The main upgrade to the pilot system is a timing concept for accurate tracking of the transmitted and received signals allowing for radar ranging measurements and simpler data processing.

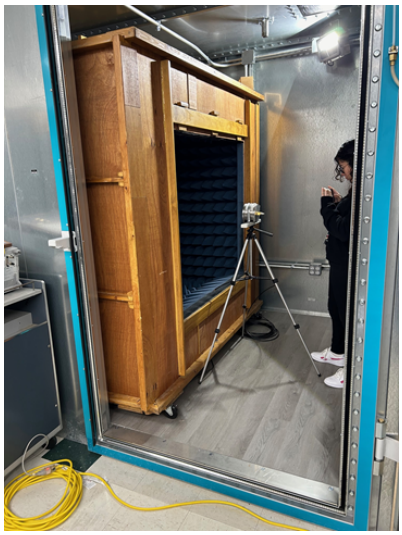
This description of the ngRD team's activities, led by CDL personnel, is only provided for the sake of completeness. The milestones for this effort are incorporated into GBO's Annual Progress Report for FY2024.

Advanced Spectrum Monitor (ASM): The Advanced Spectrum Monitor (ASM) is a system being developed, in phases, at the CDL that can rapidly scan the electromagnetic spectrum over 1–120 GHz and is intended for use by the National Radio Dynamics Zone (NRDZ) initiative, funded by the NSF.

Following the completion of testing of the ASM-1 prototype in FY2023, the ASM-2 project was kicked off in early FY2024 with goals to improve upon the shortcomings of the ASM-1 device and addressing the lessons learned during its construction and deployment. After successfully completing the design review in Q1, work over the past year concentrated on evolving the basic notional design into a practical ASM-2 instrument. The detailed development of the 1–20 GHz sinuous antenna was completed in Q4, culminating in beam pattern and impedance measurements which confirmed expected design performance. Electronic and mechanical designs for the 1–20, 18–30, 28–40, and 38–50 GHz band receivers, down converters, and local oscillator were also completed. Various test assemblies were developed and utilized to evaluate critical components. All components, including the antennas, for 1–50 GHz coverage, were received and the first panel of the four-panel ASM-2 is currently being assembled.

In Q1 FY2025, this prototype panel with local oscillator will be completed and evaluated, and the ASM-2 enclosure design finalized. Panel replication and the enclosure fabrication will take place during Q2 with final assembly and evaluation expected in Q3.





(Left) Completed sinuous antenna for 1 – 20 GHz. (Right) A CDL co-op student from University of Puerto Rico assists in the evaluation of the sinuous antenna.

Phased array feed - one of the many pieces of instrumentation developed at the CDL. Photo by Jeff Hellerman (US NSF / AUI / NSF NRAO).


Walking
Tour

EDUCATION AND PUBLIC OUTREACH

The Education and Public Outreach (EPO) department serves the strategic Observatory goal of broadening public appreciation of and participation in Science, Technology, Engineering, Arts, and Mathematics (STEAM). Barb Gruber, PhD, was hired in November 2024 as the Assistant Director for Education and Public Outreach.

News and Public Information

The news and public information team includes a News and Public Information Manager and a Public Information Officer that cover ALMA, VLA, GBO, VLBA, and ngVLA, along with ODI, the CDL, and the NRQZ. The team also includes a part-time science writer and a part-time social media specialist. Continued emphasis was placed on expanding social media channels and post frequency.

Press and Image Releases, Announcements, and Feature Stories: In addition to the numerous Press and Image Releases published in FY2024, EPO also used Announcements, Feature Stories, and social media channels to publicly celebrate milestones, programs, and staff accomplishments that are significant to the organization but not likely to be picked up as a press release. EPO News and Public Information published 78 news products over FY2024.

- New type of Fast Radio Burst discovered in Green Bank Telescope data
- Five Decades of Groundbreaking Millimeter Astronomy—From Discovering Molecules in Space to Imaging New Solar Systems
- The Baseline #17: Gravitational Lensing: Focusing On The Cosmos
- A Supermassive Black Hole's Strong Magnetic Fields are Revealed in a New Light
- ALMA Observation of Young Star Reveals Details of Dust Grains
- New US & Japan Partnership Will Make the World's Most Powerful Telescope Even More Sensitive
- The People Behind the Very Large Array
- World's Most Powerful Millimeter/Submillimeter Telescope Captures Highest Resolution Observations—Ever
- A Molecule, a Telescope, and Everything: A History of ALMA and Millimeter Astronomy
- ALMA Conference Celebrates 10 Years of Astronomical Discoveries

Members of the public are excited to see the Very Large Array up close at one of the popular Open House sessions hosted by EPO and New Mexico staff. Photo by Jeff Hellerman (US NSF / AUI / NSF NRAO).

- GBT on cover of Nature Astronomy
- Applications now being accepted for 2024 Governor's Schools
- Most sensitive search for intelligent life beyond our galaxy to date
- COSMIC: SETI Institute Unlocks Mysteries of the Universe with Breakthrough Technology at the Very Large Array
- Early Evolution of Planetary Disk Structures Seen for the First Time
- First Recipient of Women in Engineering Fellowship Joins Staff of Central Development Laboratory
- New Details of Supermassive Black Hole's Shadow Revealed
- Astronomers Discover Most Massive Neutron Star—or Least Massive Black Hole
- Massive Gas Clouds Escape Center of Milky Way
- Mystery of Star Formation Revealed by Hearts of Molecular Clouds
- Astronomers Accidentally Discover Dark Primordial Galaxy
- AAS 243 NRAO Press Announcement
- Science Newsletter #AAS243 Special Edition
- NRAO in the press at AAS 243
- Owens Valley: Radio Astronomy in the Land of Sky and Stream
- Learning Shines Brightly at SuperKnova
- Hidden Giants
- Here There Be DRAGNs
- Astronomy is Metal
- Two For One
- ALMA Gets a New Heartbeat
- Astronomers Discover Jupiter-sized Objects Drawn into Each Other's Orbit
- German Astronomers Share Proposed Science for the ngVLA
- NAC Student Researchers Receive Prestigious Chambliss Medals at AAS 243
- Telescopes Show the Milky Way's Black Hole is Ready for a Kick
- Special Talk: Flashes in the Sky—The Mystery of Fast Radio Bursts
- Can Astronomers Use Radar to Spot a Cataclysmic Asteroid?
- Astronomers & Engineers Use a Grid of Computers at a National Scale to Study the Universe 300 Times Faster
- Astronomers Unveil Strong Magnetic Fields Spiraling at the Edge of Milky Way's Central Black Hole
- Dr. Patricia (Trish) Henning: Leading the Way in Radio Astronomy
- National Radio Astronomy Observatory Shines at New Mexico Governor's STEM Challenge
- NRAO and SpaceX Coordinate to Protect Radio Astronomy
- Radio Observations of Compact Symmetric Objects Shed New Light on Black Hole Phenomenon
- Eclipses and Exoplanets
- Broadband Will Bring High-Speed Internet Connectivity to the National Radio Quiet Zone
- ALMA Reveals Jupiter's Moon Io has been Volcanically Active for Billions of Years
- Associated Universities, Inc. and the National Radio Astronomy Observatory celebrate success of Chilean students in pursuit of STEM careers
- NRAO Supports International Symposium for the Future of Science in the Caribbean
- Orion's Erupting Star System Reveals Its Secrets

- Protecting ALMA's Skies
- Stellar Explosions and Cosmic Chemistry
- The Very Large Array to Host Spring Open House Event on April 20, 2024
- AUI Announces 2024 Scholarship Recipients
- Mobile Planetariums Bring the Stars to You
- NAC Alum Awarded NSF Graduate Research Fellowship
- Spotted: 'Death Star' Black Holes in Action
- 2024 Jansky Fellows Awarded
- ALMA Observations Reveal New Insights into Planet Formation in Binary Star Systems
- Engineers Descend upon DC for International Microwave Symposium, NRAO Will Exhibit, Scientist to Receive Pioneer Award
- Invisible Realms Revealed: Radio Technology Expands Frontiers of Astronomy and Medicine
- It's Twins! Astronomers Discover Parallel Disks and Jets Erupting From a Pair of Young Stars
- NRAO and GBO Have Lots to Share at AAS 244
- Supermassive Black Hole Appears to Grow Like a Baby Star
- While Aiming for Massive Gas Cloud, Astronomers Spot Differences in Thickness of Milky Way Galaxy
- Green Bank Observatory Inspires Blenko Glass
- AUI and the NSF NRAO Announce the Recipients of the 2024 AUI Board of Trustees NAC Bridge Scholarship Award
- Old Data, New Tricks Discover Pulsar in Galactic Plane
- Telescope Tag-Team Discovers Galactic Cluster's Bizarre Secrets
- NSF GBO and NRAO at the International Astronomy Union General Assembly XXXII
- Astronomers Make Highest-Resolution Observations Ever from Earth
- Astronomers, Satellite Internet Provider Develop New System to Share the Sky
- Plasma Bubbles and the "Engine" of Fast Radio Bursts
- Precision Measurements Offer Clues to Magnetar's Cosmic Origin
- Unlock the Secrets of the Invisible Radio Universe with SuperKnova®
- ALMA Detects Hallmark "Wiggle" of Gravitational Instability in Planet-Forming Disk
- ALMA's New Observing Cycle Kicks Off October 1st
- NRAO Part of New AI Institutes Launched by U.S. National Science Foundation and Simons Foundation
- United Nations Secretary-General Visits ALMA

Blogs are an opportunity to give voice to diverse participants and provide an informal avenue to promote stories and information about the Observatory and the people connected to it and were published quarterly.

Above - Here There Be DRAGNs blog post by Brian Koberlein, January 09, 2024

Left - How to Safely View the Eclipse, blog post by Barbara Gruber, March 15, 2024

Spanish Translation: Most ALMA science press products were translated into Spanish and distributed in both languages on Eureka Alert, NewsWise, and on the NRAO public website (right).

Sistema estelar en erupción de Orión revela sus secretos

ALMA arroja luces sobre misterio astronómico de 88 años

Representación artística de la vista a gran escala de FU Ori. En la imagen se aprecian los grandes chorros generados por la interacción entre los fuertes vientos estelares provenientes de la erupción y el envoltorio de gas y polvo remanente a partir del cual se formó la estrella. Al chocar con fuerza contra dicho envoltorio, el viento estelar arrastra el gas de CO detectado por ALMA. Créditos: NSF/NRAO/S. Dagnello

Media Outreach: Media outreach included efforts included over 70 requests from the press/media, which were answered by through background and one-on-one interactions. The American Astronomical Society met in January and June and the IAU in August (below). The News and Public Information. A large, for-profit media shoot was conducted at the VLA in February, and the site will be featured in a streaming series to air on Apple TV, by the award-winning director Vince Gilligan. The News and Public Information staff prepared scientists for over half a dozen press conferences and at the January and June AAS conferences, and special presentations and interviews at the February AAAS conference.

The U.S. National Science Foundation National Radio Astronomy Observatory at the International Astronomy Union General Assembly XXXII

August 5, 2024 at 4:25 am | News Release

The International Astronomy Union (IAU) is General Assembly XXXII in Cape Town, South Africa, August 6 – 15, 2024. This event is one of the world's largest international gatherings of astronomers, and the U.S. National Science Foundation National Radio Astronomy Observatory (NSF NRAO) and the Green Bank Observatory (NSF GBO) will share their latest science and resources through presentations and exhibits.

Communications Training: EPO team members continue to offer public speaking and media communications training and coaching. The News Manager was included in HR's new manager training to reinforce that they should always reach out to the PIOs for media training before talking with the press. In addition to this broad staff training, individuals were coached before their press conferences.

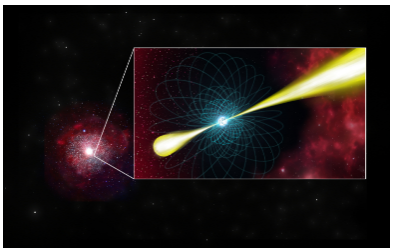
Liaison with ALMA Partners: As part of the NRAO collaboration with the ALMA partners, the EPO Public Information Office coordinated its ALMA media relations efforts with the partners and the JAO through monthly telecons. This ensured the broadest possible exposure for ALMA news while maintaining the autonomy and individual outreach goals for each partner.

VLBA Photo Essay: EPO coordinated with VLBA operations to continue a series of essays about the various VLBA sites. Due to budget restraints, one site was visited in Q4 FY2024 to capture photo content for the blog. The blog will be published in Q1 FY2025.

Social Media: Social media provided a platform for unique content and amplified the distribution of new content on the NRAO public website and press products. In addition to regular blogs on the NRAO public website, three social media platforms are maintained: Facebook, Twitter, and Instagram, each with a different format and audience, and NRAO added a presence on LinkedIn. All platforms demonstrated growth throughout FY2024.

Multimedia Engagement

A dedicated, creative team of animators, artists, illustrators, designers, writers, and web developers designed and developed unique multimedia materials, in support of the news and information page, social media, and STEAM efforts, as well as creating new products that were distributed through the public-facing website, school programs, and the VLA Visitor Center. The artists in the multimedia group created engaging, vibrant, and informative visuals to support the press and image releases.

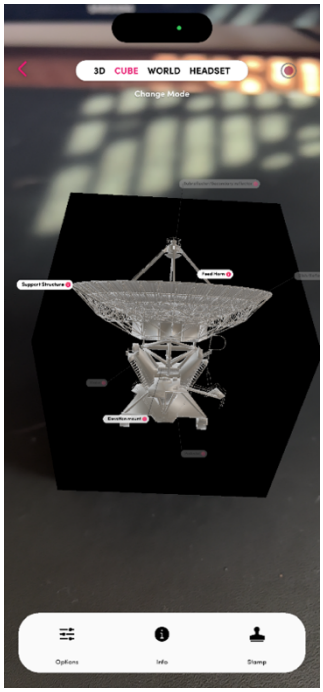


Above - Artist's illustration of a millisecond pulsar. Credit: B. Saxton US NSF/AUI/NSF NRAO

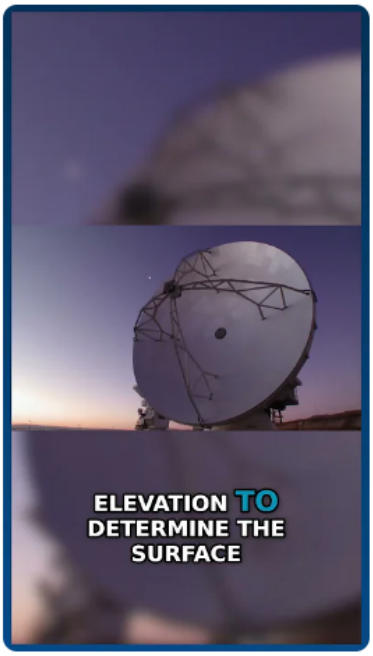
Left - Panoramic ALMA photo. Credit: Bettymaya Foott (US NSF / AUI / NSF NRAO)

ALMA Photography: Building on the success of the VLA legacy photography effort, the Art Director visited ALMA along with astrophotographer Bettymaya Foott to capture daytime and nighttime photography for the NRAO's portfolio. These fresh images create opportunities for social media to highlight this facility. The photoshoot was completed by Q4 and was coordinated with the JAO. Social media campaign featuring images and videos will follow in FY2025. Some video footage of the site was also captured.

Virtual Reality (VR): EPO continues to support and maintain VR products through hardware and software updates and provide content support for STEAM Ed and outreach uses of VR. EPO expanded the products to include 3D models into Merge Cube, an Augmented Reality platform used in classrooms (right). Using this product allows students to experience the NRAO's antennas using their own phones and devices without the need for expensive VR goggles and equipment.



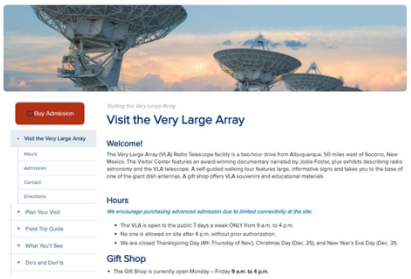
Exploring the Crab Nebula's Mysterious Past



Holography Testing: Perfecting Reflective Surfaces

OZMA@50 Unlocking the Mystery of Space Artifacts

Short Form Video Content: The Multimedia Team created short form video content in reels and shorts format. The NRAO Shorts are 30–60 seconds long and were created from existing completed video projects, as well as by adapting "Ask an Astronomer" questions using a diverse group of staff as on-camera talent. The purpose of the project was to create engaging and informative video content that can be easily shared on social media platforms, such as Instagram and YouTube. Subjects were determined in collaboration with the social media team.



Website Updates, Maintenance, and Analytics: EPO maintained the public website through consistent software updates to enhance front end and back-end efficiency and security. Industry standards were deployed for search engine optimization to ensure web outreach efforts were effective and as broad as possible. Public web pages were updated throughout the year. The focus of the VLASS page was updated to highlight the discoveries that resulted from multiple epochs. The major revisions on the Outreach and Events page saw the addition of two additional programs, Learning Labs and Storytime, the descriptions of which remain hidden from public view until new STEAM Ed staff are on board to support.

STEAM Education and Outreach

The NRAO STEAM Education team designs teaching and learning experiences for K-grey learners, with the exception of authentic research experiences for undergraduates that are managed by colleagues in SSR. Initiatives for FY2024 included the following. The STEAM Education team experienced high vacancies and hiring challenges with all

three full-time positions remaining open from early July through the end of the fiscal year. Leveraging the part-time tour guides, EPO was able to continue to support all reserved guided tours. While the volume has decreased with the resumption of in person programming the Virtual tours remain a popular alternative for those groups who are unable to physically visit the NRAO's facilities.

VLA Tours and Open House: As the NRAO's most accessible facility, tours of the VLA are a priority offering. Public tour offerings include Self-guided tours which are the norm along with guided tours, which were expanded to be offered every Saturday. Additional private guided tours are offered by reservation for educational groups and special interest groups. Open houses (above) were hosted in October and April with over 500 attendees at each. Planning and execution were done in collaboration with NM Ops.

Solar Eclipse Outreach: Developed a pinhole viewer, wrote two blogs titled How to Safely View the Eclipse and Eclipses and Exoplanets, conducted a Teacher Professional Development workshop for Charlottesville City Schools teachers, and engaged over 4000 visitors to the National Mall during the April 8, 2024, eclipse (right).

Staff Outreach Tracking: STEAM Ed continued to distribute a Google Form to capture participation of staff in outreach events other than those organized by the NRAO. The form asks for information about the organization and/or contact who reached out to them, age group(s) they are working with, and if they require EPO support (materials, swag, training). STEAM Ed shared this form Observatory-wide and tracks wider audiences and engagement metrics.

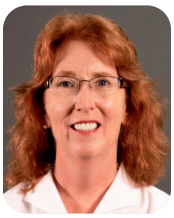
Stakeholder Engagement with Local Communities: The STEAM Ed Education Specialists in Charlottesville and Socorro continued to engage with their local schools and educators to assess their needs and determine how STEAM Ed can best support them with NRAO resources (e.g., classroom visits, lesson plans, after-school activities, field trips, etc).

Sister Cities and Observatories: This NRAO-funded program partners two high school students and a teacher near the VLA in New Mexico with two high school students and a teacher near the ALMA site in northern Chile in a joint cultural/learning exchange, using a scientific experiment as a connecting thread of inquiry. This program was on hiatus through COVID. Discussions occurred on whether to move forward with this program, ultimately deciding to explore other options which would engage a larger number of individuals.

MANAGEMENT AND ADMINISTRATION

The NRAO organization in 2024 consisted of departments, which were made up of divisions and groups. This organization emphasizes Observatory-wide management and coordination in key areas, including Program Management, Data Management and Software, Education & Public Outreach, Science Support & Research, Administration and Budget, the Director's Office, and Science Communications,

Phil Jewell continued as Assistant Director for the North American ALMA department. Jewell oversees the NA ALMA Science Center and the ALMA Development Program, coordinates the ALMA maintenance program, and is the face of ALMA to the North American scientific community. Jewell also continued in a part-time role as the NRAO Deputy Director.



The New Mexico Operations department, based in Socorro, was led by Assistant Director Trish Henning. New Mexico Operations includes all NRAO staff engaged in the operation, maintenance, calibration, performance, and further development of the scientific capabilities of the Jansky VLA and the VLBA.

Faye Giles, Assistant Director for Human Resources, directs Observatory-wide human resources policies and programs, including compensation, benefits, recruiting, employment, employee relations, organizational development, performance management and training.

The Program Management department (PMD) led by Assistant Director Diane Paulson provides program and project management support and systems engineering services to NRAO project leaders and PIs. The PM department strives to provide visibility, transparency, and consistency in reporting within NRAO and externally to NSF and outside partners or customers; identify and provide resources for program management and systems engineering needs across all NRAO projects; review new projects for alignment in supporting the Observatory's long-term strategic goals; and compile deliverables.

Assistant Director Barbara Gruber leads the Education & Public Outreach department. The NRAO EPO program provides major components of the public's return-on-investment, marshaling NRAO resources in support of Science, Technology, Engineering, Art, and Math (STEAM) education. EPO also inform the science-interested public about the Observatory, its facilities, and the latest technical and scientific achievements of its users and staff.

The Data Management and Software (DMS) department led by Assistant Director Jeff Kern manages data archiving at NRAO, including access, distribution, provisioning, and operations. DMS manages the data reduction pipeline infrastructure implementation and technical operation; high-performance computing platform definition, acquisition, and operation; and network provisioning to the external community and between sites. DMS also has primary responsibility for all user-facing and telescope software.

The Central Development Laboratory (CDL) led by Assistant Director Bert Hawkins supports the evolution of NRAO's existing facilities and provides the technology and expertise needed to build the next generation of radio astronomy instruments. CDL accomplishes this through development of the enabling technologies: low-noise amplifiers, millimeter and submillimeter detectors, optics and electromagnetic components, including feeds and phased arrays.

Based in Charlottesville and led by Assistant Director Laura Lockledge, the Administration department provides the administrative and non-programmatic services to NRAO; including: business services, contracts and procurement, environmental safety and security, management and information systems, and technology transfer. Jason Jennings is the Charlottesville-based Assistant Director for the NRAO Budget Department, leading a team of fiscal and accounting experts.

Assistant Director Anthony Remijan leads the Science Support & Research (SSR) department. SSR is responsible for the Observatory's scientific interface to the NRAO user community. This Observatory-wide department also coordinates, aligns, and manages the collective efforts of scientific staff in Charlottesville and Socorro.

The NRAO / AUI Office of Chilean Affairs (OCA) supports the interests of the Observatory and its parent organization, AUI, in Chile, particularly the North American participation in ALMA. Led by Assistant Director Paulina Bocaz, OCA provides ALMA with legal, payroll, and travel support, and provides the legal and institutional support for numerous contracts and procurements for ALMA Operations in Chile.

The Science Communications Office (SciCom) led by Brian Kent is also attached to the Director's Office and is responsible for communicating NRAO science, accomplishments, priorities, and plans to the science community, the NSF, and other key external stakeholders. The office leads the NRAO exhibitions at science, engineering, and technical conferences worldwide.

The NRAO Chief Scientist, Chris Carilli, reports to the Director about the Observatory's scientific mission and community requirements. The guidance provided by the Chief Scientist bridges all the telescope facilities of the NRAO and collaborations with other major facilities around the world.

Workforce Management

Human Resources, in collaboration with Budget, partnered with the Assistant Directors to update the Observatory Workforce Management Plan (WMP). The WMP defines the Observatory's workforce environment, articulates the future workforce environment, and outlines planned transition activities necessary to move from the present to the envisioned future.

Green Bank Observatory Reintegration: Green Bank Observatory separated from the NRAO in 2017 under direction of the NSF. Since that time, several administrative functions have operated under a Service Level Agreement (SLA) with NRAO and GBO for services such as telescope time allocation, library services, IT support, human resources, administrative services of contracts and procurement, safety, management information systems, budget, and international spectrum management. With the ending of GBO's current CSA in FY2024, the reintegration, from an HR perspective, has seen no noticeable impact to staff.

Some departments and disciplines such as Budget, Software Development, Public Relations and Project Management were re-integrated in FY2023 to begin the transition. NRAO Human Resources helped guide the remaining decisions around the workforce re-integration by working with GBO and NRAO management to assess which positions and departments would need to be restructured and realigned by Q4 FY2024, preparing the new agreement and structure to begin in FY2025.

A continued aggressive hiring strategy to fill critical roles will involve leaning on a multitude of strategies including telecommuting agreements, remote workers, apprenticeships, short-term assignments that are assigned to project work, co-ops, and the recruitment of early career candidates with a focus on training. GBO will work with various state agencies, technical trade schools, and universities to identify candidates and strategies for these efforts.

Training and Development

Developing the next generation of Observatory leaders is paramount to future success. The generational switch in the next five to ten years could leave the organization with a leadership void as today's leaders exit the workplace, and the next generation of leaders is needed to step into these roles.

Mental Health First Aid: HR offered Mental Health First Aid (MHFA) sessions across the Observatories. MHFA is a skills-based training course that teaches participants to identify, understand, and respond to mental health and substance use challenges. The training gave staff the skills needed to reach out and provide initial help and support to employees who may be developing a mental health or substance use problem or experiencing a crisis. Mental Health First Aid training was implemented in a tiered approach beginning with the Observatory's Ombuds representatives and then offered to the management groups. An Observatory staff member has been trained to deliver these programs. Additional opportunities for staff to be trained as trainers of MHFA through the Observatory's Professional Development funding was available. Results from the 2022 Employee Climate Survey found two-thirds of staff indicated that their job produced a large amount of personal stress. To address stress management, HR provide a set of tools to recognize and respond to the challenges our employees experienced.

Emtrain Online Training Platform: In FY2024, Human Resources implemented the Emtrain training platform used for initiatives such as Unconscious Bias training for search committee members and the annual required Preventing Harassment, Bullying and Discrimination course for all employees. Emtrain was selected as the new platform as the platform can accommodate state by state compliance requirements for specific training. The platform was implemented in FY2023

with introductory use for search committee members and new employee compliance training. The platform has many DE&I learning modules that were explored during FY2024 as well as the launch of the annual mandatory Preventing Harassment, Bullying, and Discrimination training.

Re-envisioning Succession Planning: Human Resources reviewed and evaluated Succession Planning across the Observatories as a follow up from the annual Observatory Leadership Cohort program. While Succession Planning had been addressed in past years, the HR department reviewed internal documentation and processes. The new HRIS (Dayforce) has a robust Succession Planning module that will be deployed in CY2025.

Observatory Leadership Cohort (OLC) planning: The success of the OLC program has been remarkable. The Observatories are proud of the three previous cohorts who have successfully completed the year-long program. The OLC III concluded with project presentations and graduation in April 2023. Planning for the OLC IV was completed and the first workshop took place in October 2024 in Charlottesville and Green Bank.

Total Rewards: NRAO HR works closely with AUI Benefits to develop total rewards programs to attract, recruit, retain, and reward employees. Compensation/Benefits and HR are constantly reviewing and benchmarking available programs for competitiveness and employee engagement. Additionally, HR assists with benefits enrollment processes to ensure benefits plans are administered accurately and efficiently.

Retirement Provider Review: The AUI Retirement Committee, in partnership with the Retirement Broker, completed a thorough review of the multi-vendor retirement providers to ensure compliance and efficiency of recordkeepers on behalf of participants and plan sponsors. The committee reviewed and researched efficiencies around administration and fiduciary responsibilities surrounding liabilities of having multi-vendor availability. A single vendor was selected as the Retirement Plan Record Keeper. This initiative required a great deal of planning due to the compliance and fiduciary complexities. The transition was a huge success and HR will continue to monitor the transition.

Performance Management System Review: The NRAO's performance management software service contract was set to end in August 2024. The decisions and timeline of AUI's Enterprise Resourcing Planning (ERP)/HRIS project determined the scope and direction of this goal. Research was conducted to evaluate whether the ERP / HRIS would include the necessary performance management functionality. HR decided to continue with the current system through the end of the contract period and continue to evaluate the functionality in the new HRIS (Dayforce) in CY2025.

Recruitment/Employment: The Recruitment/Employment function of the HR department is the first point of contact prospective employees experience with the NRAO. The strategies and tactics deployed in the recruitment and hiring of qualified candidates are key in contributing to NRAO's commitment in achieving the overall mission of the Observatories.

Implementation of Automated Reference Checks: In an effort to improve efficiency, NRAO HR has identified processes that could be automated. In Spring 2023, the recruitment team evaluated several automated reference check systems and selected Refnow as a suitable and affordable option with a very high return on investment. The NRAO recruitment team fully implemented the use of the Refnow system and automated reference checks.

Explore Features of the Current Applicant Tracking System to Improve Offer Processes: While many process improvements have been implemented in the Jobvite Applicant Tracking

System (ATS), the Observatory still relies on manual processes to approve and extend offers of employment. The recruitment team explored the feasibility of implementing an automated workflow process to document offer approvals and record offer communication. This was implemented in FY2024.

Evaluate Opportunities to Collect Stakeholder Feedback Regarding Recruitment and Hiring Process: In Spring 2023, the Observatory Leadership Cohort (OLC) identified collection of feedback from new hires and hiring managers as an opportunity to improve processes. By collecting feedback, the recruitment team was able to fully understand the needs of their stakeholders and evaluate possible areas of improvement. This had led to improved processes and greater efficiencies.

NRAO administrative staff visit the Robert C. Byrd Green Bank Telescope in West Virginia.

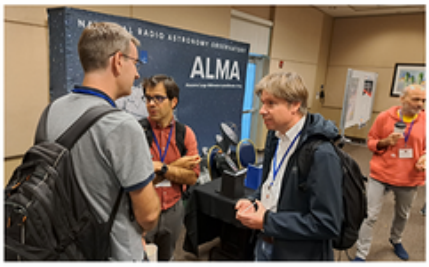
SCIENCE COMMUNICATIONS

The Science Communications Office (SciCom) collaborated with the Observatory's scientific staff, senior management, and Director's Office to communicate the NRAO vision, science, accomplishments, and plans to the U.S. and international science communities, NRAO/AUI staff, and key external stakeholders, including NRAO advisory committees and the NSF.

AAS New Orleans exhibition, where NRAO talks to members of the science community.

Our Community of Scientists and Engineers

SciCom/NRAO is a sponsor of the annual international Astronomical Data Analysis and Software Systems (ADASS) conference that focuses on cutting edge computing in the astronomical sciences. The November meeting of ADASS was hosted by the University of Arizona in Tucson, Arizona. Eighteen participants from NRAO and ALMA attended, giving invited talks and contributed research posters. The NRAO exhibition displays and literature were available to scientists and software engineers at the meeting.



ADASS Exhibition in Tucson


Student talks at AAS New Orleans

The winter AAS conference was held in New Orleans, Louisiana from 12–16 January 2024. The NRAO and GBO sponsored three special event proposals. The first session was on ALMA as a high-z powerhouse and the impact of the Wideband Sensitivity Upgrade. The second session informed the astronomical community about ngVLA and Space Weather on Other Worlds. The third session examined GBT Science with Large Surveys of the ISM and Star Formation. In addition to the NRAO exhibit displays, the Observatory hosted a Town Hall reception so that meeting attendees could interact with NRAO staff and learn about the latest science capabilities. The NRAO and AUI also participated in the REU and Grad Student Fair event with new displays and material. The NRAO exhibition was front and center in the exhibition hall and was well received by the AAS, NSF, and conference attendees.

SciCom and NRAO sponsored a large, centralized exhibit at the American Association for the Advancement of Science (AAAS) annual conference in Denver, Colorado from 15-17 February 2024. As a prominent display representing the astrophysical sciences, the NRAO was able to showcase facilities and science to the broader scientific community. NRAO had an accepted proposal for a special science session entitled “Astronomical Radar: Exploring the Solar System and Defending Planet Earth.” The session featured a variety of speakers from the radar astronomy community, including Edgard Rivera-Valentin (Johns Hopkins), Marina Brozovic (NASA JPL), and Patrick Taylor (NRAO).

AAAS with Dr. Patrick Taylor in Denver, Colorado.

Staff from NRAO at the University of the West Indies

The NRAO and SciCom were invited to a conference sponsored by the Simons Foundation and the University of the West Indies, St. Augustine (UWI), on Trinidad and Tobago, 10-14 March, 2024. The NRAO worked with undergraduate students and Professor Shirin Haque (UWI) on an introduction to radio astronomy, focusing on open-access data from the NRAO VLA Sky Survey with conference participants.

SciCom brought the NRAO exhibition displays to downtown Charlottesville for the International Symposium on Space Terahertz Technology (ISSTT) from 8-11 April, 2024. This conference was sponsored by the NRAO Central Development Laboratory and Virginia Diodes, Inc. and focused on instrumentation and engineering development.

ISSTT exhibit in Charlottesville

AAS exhibition in Madison, Wisconsin

The summer 2024 American Astronomical Society meeting took place 8–14 June, 2024 in Madison, Wisconsin. SciCom organized NRAO and GBO participation at this AAS for the multi-day Exhibition as well as the Student and REU Fair events.

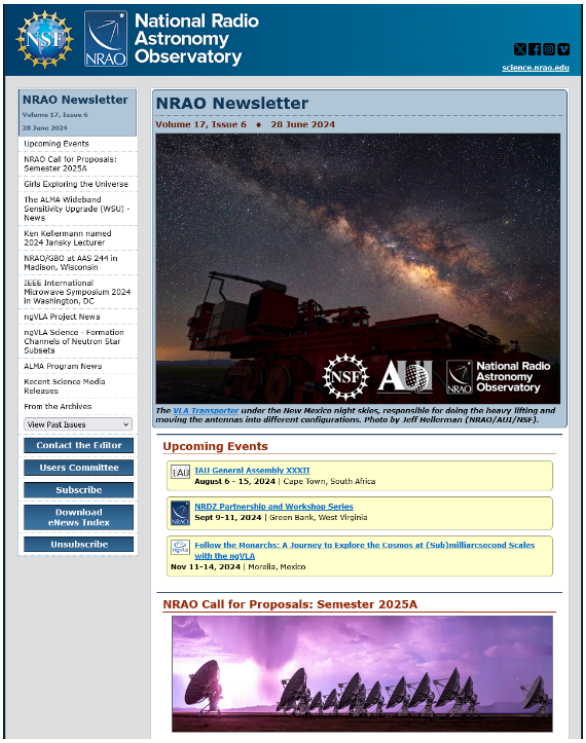
SciCom and CDL collaborated for a new conference this year in Washington, D.C.— the International Microwave Symposium (IMS). Over 7000 attendees from industry and academia exhibited from 17-21 June 2024. The NRAO also participated in hosting the local high school student education program.

IMS exhibition in Washington, DC

Students in Cape Town, South Africa

The International Astronomical Union (IAU) held its General Assembly conference in Cape Town, South Africa, 4–17 August 2024. The NRAO and SciCom provided media for the IAU Focus Meeting "Atomic to Molecular Gas from IR to Radio" in conjunction with the ngVLA community. SciCom organized the multi-day NRAO Exhibition at the front of the IAU Cape Town exhibit hall. NRAO hosted local Cape Town middle students on two occasions during the meeting, to share information about telescopes and radio astronomy.

SciCom also revamped the monthly NRAO Science Newsletter with a new design to match the look and feel of the NRAO web presence. This Science Newsletter is distributed to 10,000 subscribers on a monthly basis. This online newsletter has information on new science, facility updates, conference events, history, media, and software.



The New NRAO Science Newsletter

ADMINISTRATION

The Observatory Administration Services (Admin) department provides administrative, management, and non-programmatic services to the Observatory. The NRAO reorganized the department in 2023, including the Budget division and releasing the Environmental Health and Security division. Admin areas of responsibility include Budget; Business Services; Contracts and Procurement (CAP); CIS (See Section 9); Management Information Services (MIS); the Technology Transfer Office (TTO); and Events Coordination.

Budget

The Budget division manages, conducts, and develops the Observatory-wide budgeting activities for NRAO, including North American ALMA Operations and coordination with budgeting activities of the OCA and the JAO in Chile. It monitors for cash flow, budget conformance, and develops recommendations for adjustments; defines, manages, and monitors Internal Common Cost (ICC) recovery; coordinates detailed financial analysis and research, and performs any special research and other projects as required. The division monitors budget status and ledger reports and assists project managers and budgeting entities in submitting accurate and viable budget proposals. Consistency of sound Observatory practices and procedures is ensured while adopting best practices applicable to Federally Funded Research and Development Centers (FFRDC).

Cost Estimating and Project Support: The Budget division works closely with the Project Management Department to appropriately cost and track project budgets. The department also maintains a set of estimation and budgeting tools for use in project development.

Budget Operations: The annual budget cycle consists of loading the budget prepared in the prior year, monitoring that budget through a series of forecasts and monthly financial reports, taking action as required and in collaboration with the departments, and reporting on budget progress at the quarterly status updates (QSU). The prior year (FY2023) will be closed and any remaining balances reallocated to FY2024. Closeout includes preparation of audit materials and final rate submissions. Preparation for the coming fiscal year occurs through initial discussions with NSF at the Spring Budget meeting and the preparation of preliminary budget figures for the departments culminating in the annual Budget Summit where the Observatory reviews planned actions and marginal resource allocations for the coming year.

Internal Common Costs (ICC): The Budget division creates, documents, and maintains the Observatory Indirect Cost (IDC) rates, of which there are presently two. This includes collecting costs and cost descriptions, developing and administering the rates, and preparing the annual preliminary and final rate submissions to AUI and NSF for review and approval. As the absolute level of activity grows among the AUI Observatories, the rate pools and functions will increase proportionally.

Enterprise Resource Planning (ERP): AUI has announced their intention to replace the JD Edwards ERP system with a system that will provide better support to the NRAO/GBO programs. The Budget division will participate as needed in the selection, development, implementation, and training of a new ERP, as required. This comprises adapting policies, procedures, and practices, including the definition of the ICC pools in the new system.

Budget Training: In FY2022, Human Resources established a new manager training program. The Budget Department participates in this program in addition to providing ad hoc training opportunities for new and developing staff.

Business Services

Observatory Risk Management: The Administration Department works closely with the EHS department and AUI to implement an insurance program appropriate to AUI/NRAO/GBO's risk profile, resource availability, and CSA requirements. The group will also deliver the annual insurance renewal process in Q1 for the new insurance year. In Q2, the group performs the annual audit of the worker's compensation program. This will be the first program to be placed with a new insurance broker, Lockton. This will entail significant preparation and assistance in program marketing.

Facilities Management: A new area of emphasis for the department is the development of a cross-Observatory facilities management function. This function will work to build an inventory of physical plant assets, use a common vocabulary to describe the condition of the assets, and work with the sites to characterize and prioritize replacement/mitigation needs. Sustainability, energy conservation, and planning to meet future demands will drive the replacement and maintenance strategies. This function will work closely and collaboratively with the site plant managers, EHS, and AUI fixed asset management.

Contracts and Procurement

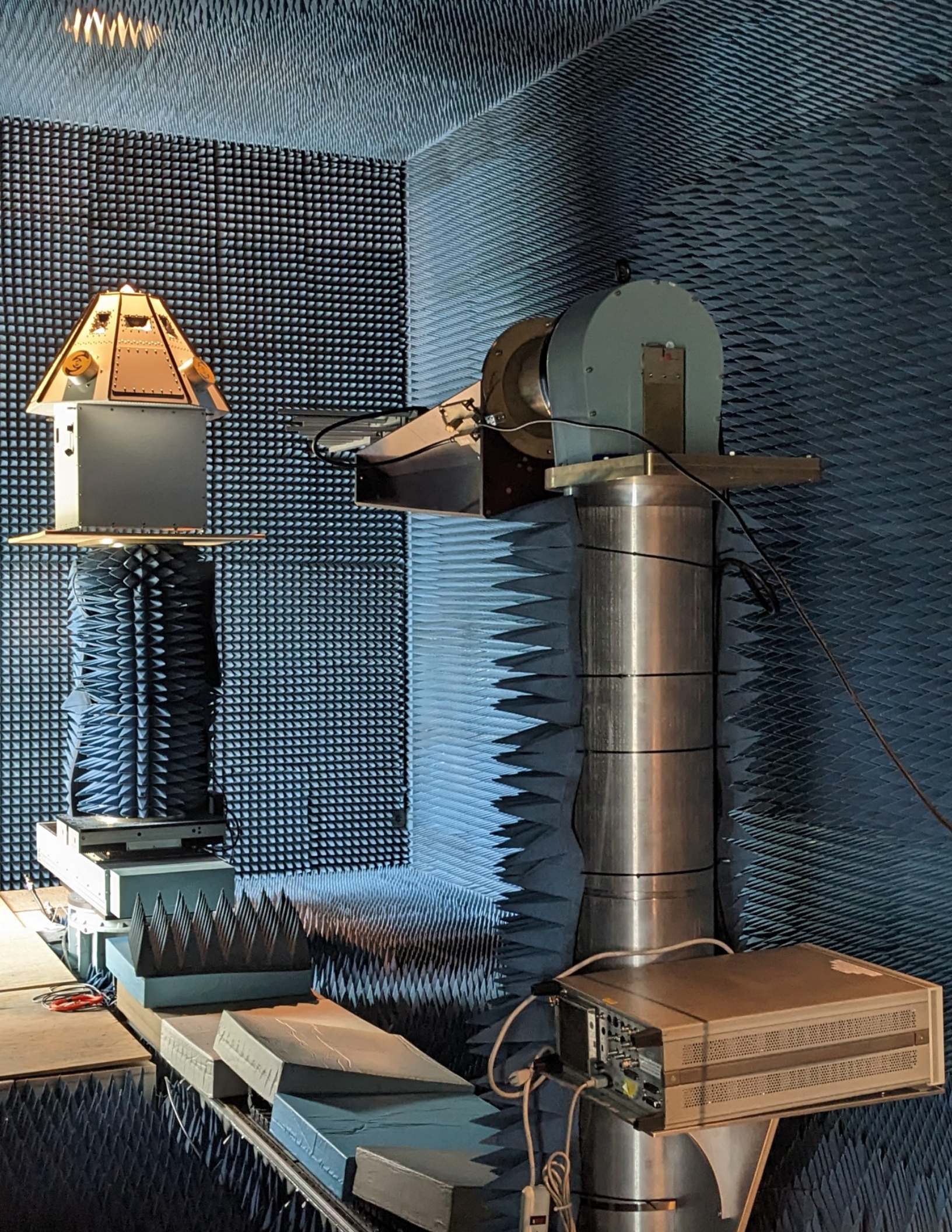
CAP procures products and services in an efficient manner, utilizing competition to obtain the best product at the lowest price consistent with the specifications, performance, and delivery schedule. The goal is for the result of all procurements to provide the best overall value to NRAO. The division has a procurement manual in place incorporating 2 Code of Federal Regulations (CFR) Part 200 regulations to promote a common understanding of procurement objectives and to ensure uniform interpretation of Cooperative Agreement requirements, NRAO policies, and other government laws and regulations. These policies provide a basis for establishing management control and serve as a document for standard procedures for procurements and developing contracts. The division has procurement staff at each of the sites and staff that manage outside funding awards and export compliance.

Management Information Systems (MIS)

MIS is committed to successful business/financial systems and business continuity for AUI/NRAO. MIS' role is for the support of and responsibility for the Enterprise Resource Planning (ERP) software and related systems. This includes the Oracle J.D. Edwards ERP software. These systems support a variety of areas, including, but not limited to: AUI Fiscal and Payroll, Human Resources, benefits, reporting, procurement, employee self-service, and Electronic TimeKeeping (ETK).

Technology Transfer Office

The Technology Transfer Office's (TTO) main objectives are designed to meet the mission and purpose of the NRAO, the NSF, and the directives from the U.S. Congress and U.S. Executive branches to support commercialization of federally funded research and technology development. These objectives are to actively seek entrepreneurs and new product development teams to commercialize Intellectual Property (IP), and to engage industry for broader scientific and commercial collaboration.



SPECTRUM MANAGEMENT

Electromagnetic Spectrum Management (ESM) is the process of managing the use of radio spectrum in order to minimize harmful interference while ensuring that the spectrum is used most efficiently and with the greatest benefit. The means by which spectrum management endeavors to implement its goals are: allocation of frequency bands to radio services; writing rules for the compatible use of allocated bands; and making interference-free frequency assignments to individual transmitters within the allocated frequency bands.

Effective spectrum management is becoming increasingly important as the use of wireless communication grows rapidly. Spectrum allocations and spectrum rules are formulated at both national and international levels. The NRAO participates in national and international spectrum management to protect and improve upon observing conditions for all astronomers and has done so since its inception. In the coming decades, as the radio spectrum becomes increasingly crowded at ever higher frequencies, the NRAO will need to remain aware of threats, and to build internal and external (cooperative) capabilities to use the spectrum in flexible ways.

The ability to observe without harmful radio frequency interference (RFI) is fundamental to NRAO science. The NRAO undertakes a variety of activities directed at understanding existing and emerging RFI sources and maintaining a clean electromagnetic environment at and around its facilities. Activities include testing of installed equipment, formulating rules regarding operation of installed and visiting equipment, and mitigating or remediating externally interfering sources. The main areas of activity for Spectrum Management at the NRAO are: (1) Site Spectrum Management, (2) National and International Spectrum Management, (3) efforts related to the NRDZ Project, and (4) the regular monitoring and concurrence duties of the National Radio Quiet Zone (NRQZ) and the Puerto Rico Coordination Zone (PRCZ) carried out by the Zone Regulatory Services (ZRS) Coordinator.

Site Spectrum Management

The VLA, VLBA, and GBO carry out regular RFI monitoring of their respective sites. Regular monitoring and cataloging of RFI signals are essential to understanding the status and changes to local RFI conditions. In addition, the Zone Regulatory Services (ZRS) Coordinator carries out all coordination activities as described in Section 16.4 below.

Regular RFI monitoring is carried out at all NRAO sites, with bi-weekly, full spectrum (1–50 GHz) scans at the VLA, and regular weekly scans (as receivers are available) at the GBT. The VLBA also carries out regular RFI scans, and Spectrum Management is in discussion about the best way to include the VLBA RFI scans in the growing database of RFI information.

RFI Mitigation Activities at Sites: The NM Operations Interference Protection Group (NM-IPG) coordinates spectrum usage for the VLA and VLBA sites. Activities at the VLA site, links to resources for observers, RFI scans of the spectrum, etc., are described in the NRAO Radio Frequency Guides. Similar RFI monitoring resources exist for the VLBA antennas. The GBO likewise has an active Interference Protection Group (GBO-IPG) that is charged with monitoring local RFI conditions. ALMA has several scientists that are assigned to RFI issues at the Atacama, Chile site.

The Spectrum Management team tests the Advanced Spectrum Monitor (ASM-2) in the chamber at Green Bank. Photo courtesy of Chris De Pree (US NSF / AUI / NSF NRAO).

Some of the activities carried out by the NM-IPG and GBO-IPG include:

- Responding to requests for Special Temporary Authority submitted through the NSF from the National Telecommunications and Information Administration (NTIA).
- Informing external spectrum users at the U.S. Space Command (GPS-L3), the tethered aerostat radar system (TARS) sites, and other military and commercial shared-spectrum users of NRAO and the National Astronomy and Ionosphere Center (NAIC) planned spectrum usage each month.
- Monitoring site spectrum conditions using telescope observations and external monitoring equipment, and reviewing the resulting spectral plots and observer reports to detect new, unknown RF emissions. Detections in spectrum allocated to radio astronomy trigger source identification and technical discussions with the responsible spectrum user.
- Performing radio frequency emissions tests on incoming commercial or NRAO-designed equipment and reviewing the results to determine interference potential. Equipment found to exceed the detrimental limits are either rejected, modified, shielded, or resubmitted for redesign.

Coordinated RFI Monitoring: Communication between these IPG groups is essential, and the NRAO has organized an RFI Working Group that meets twice a year, once in October and once in March to discuss issues of interest to all sites. These meetings involve staff from the GBO, the VLA, ALMA, and NRAO headquarters in Charlottesville. These bi-annual meetings have served as valuable opportunities for scientists and engineers from all sites to have regular communication.

In January 2024, NRAO Spectrum Management launched a new RFI Journal Club that meets once per month and is open to both internal and external audiences. This Zoom-based meeting has featured speakers from NRAO and other institutions engaged in RFI studies. These monthly events are organized by representatives, one each from GBO, the VLA, and Charlottesville.

National and International Spectrum Management

National Issues: The NRAO comments on matters arising at the Federal Communications Commission (FCC). In a busy FY2024, NRAO submitted six filings mostly related to the nascent development of satellite direct to cell communications that employ satellite signals 30–50 dB stronger than other radiocommunication applications like internet broadband and GPS. The NRAO participated in the domestic mirror of International Telecommunication Union Radiocommunication (ITU-R) Working Party 7D for radio astronomy, hosted by NSF, and other working parties hosted at FCC and NTIA. There is a continuing interaction with the National Academies Committee on Radio Frequencies (CORF), one of whose members is an NRAO staffer, and a presentation at their annual open meeting in May. CORF will meet at the NRAO headquarters in Fall 2024 and also tour the GBO site. The NRAO spectrum manager is an active member of the AAS Committee on the Protection of Astronomy and the Space Environment (COMPASSE).

International Activities: The NRAO spectrum manager is the chair of IUCAF, the Scientific Committee on Frequency Allocations for Radio Astronomy and Space Science that reports to the International Science Council, IAU, URSI and COSPAR. IUCAF provided technical studies and treaty text for issues of concern to radio astronomy under agenda items at the World Radiocommunication Conference (WRC-23) in Dubai in November-December 2023 and contributed to ITU-R working party meetings preparing for WRC-27 in Geneva and Kazakhstan. The NRAO spectrum manager is a member of the Lunar-Martian Spectrum Group at the Space

Frequency Coordination Group where national space agencies convene to synchronize their approaches to issues of spectrum management in support of space missions and lunar radio astronomy in the Shielded Zone of the Moon. NRAO presented a status update of its Operational Data Sharing (ODS) system at the IAU 385 in Fall 2023, and at the IAU General Assembly in Summer 2024.

National Radio Dynamic Zone (NRDZ) Related Activities

The U.S. National Science Foundation has funded research into the dynamic use of spectrum since 2020, and NRAO currently has several active grants that support this work. Spectrum work in support of the NRDZ project primarily includes a Spectrum Innovation Initiative grant (SII-NRDZ), and a SWIFT-SAT grant. These grants support (1) a better understanding of the RFI environment of NRAO radio astronomy sites (VLA and GBT), (2) continued development of the Advanced Spectrum Monitor (ASM-2; this work is described in the CDL section), (3) an assessment of the impact of satellite constellations on NRAO radio astronomy sites, and (4) the development of Operational Data Sharing (ODS), a pilot program that informs SpaceX/Starlink in real time about the current status of our telescopes.

RFI Environment: In the past year, NRAO has increased the frequency of RFI scans, particularly those made at the VLA. Currently, RFI scans in New Mexico are made every two weeks, covering the full operational frequency range of the telescope (1-50 GHz). These data are now regularly calibrated and processed to be viewable in an adapted version of the GBT RFI GUI, used to search GBT RFI scans. A Spectrum Software Engineer has been hired who will develop a unified RFI GUI that will be able to view multiple datasets, including the GBT, the VLA, and data from the CHIME outrigger.

Advanced Spectrum Monitor: The ASM-2 is a direction-finding spectrum monitoring device that covers 1-50 GHz. Its progress is described in detail in the CDL section.

Impact of Satellite Constellations: NRAO has performed regular tests to gauge the impact of satellite constellations on the normal operations of NRAO telescopes. Most recently, NRAO carried out tests of SpaceX's new Supplemental Coverage from Space (SCS) system at the VLA (July 2024) and GBT (September 2024). Analysis of these tests is ongoing. Spectrum Management has also had regular (monthly) meetings with Amazon-Kuiper as they develop their satellite broadband system.

Operational Data Sharing (ODS): ODS became fully operational at the VLA site in August 2024. Soon after the start of ODS operations, SpaceX began sharing data related to its engagement of Telescope Boresight Avoidance. The fundamentals of the system are described in a recent paper (Nhan et al, 2024), and NRAO and SpaceX continue to work together to make the system operational at the GBT in the NRQZ.

Zone Regulatory Services (ZRS)

The National Radio Quiet Zone (NRQZ) was established by the Federal Communications Commission (FCC) in 1958 to minimize possible harmful interference to the NRAO in Green Bank, WV and the radio receiving facilities for the United States Navy in Sugar Grove, WV. The NRQZ encloses a land area of ~13,000 square miles, mostly in Virginia and West Virginia. The Zone Regulatory Services (ZRS) Coordinator oversees both the National Radio Quiet Zone (NRQZ) and the Puerto Rico Coordination Zone (PRCZ). The ZRS Coordinator analyzes all incoming NRQZ coordination requests and is in regular contact with the GBO Interference Protection Group (GB-IPG), meeting biweekly and updating other members of the group about current and upcoming NRQZ

activities. The coordinator also attends monthly NM-IPG meetings (mentioned above), and meets regularly with the PRCZ Program Administrator, who works remotely in Puerto Rico.

The NRQZ office is continuing its reconfiguration of the concurrence application process from an email-based system to a web-based system, supplemented by a short-term NRQZ helpdesk which became operational in Q1 FY2024. Internal and external documentation on the NRQZ process was completed in Q2, and computational and archiving machines were moved to NRAO-CV. The NRQZ office is continuing to develop the web-based system. NRAO tested early versions of this new system in Q4 FY2024, with plans to roll out an external facing pilot by Q2 FY2025.

In FY2024, the NRQZ office began the process to visualize completed and outstanding applications around GBO, with a focus on applicants and a number of analyses per application. In all, 429 applications were received in FY2024, of which 40% were cellular, both dropping slightly from the previous two years. Of these 429 applications, there were around 40,000 individual sites or technologies to be analyzed. On average, there are approximately 8 propagation studies to be run per application, however several water meter projects and distributed antenna systems were received in FY2024, resulting in thousands of studies per application. Of these 429 applications received in FY2024, 350 have been completed, resulting in a letter of concurrence, with the remaining 79 either awaiting additional engineering from applicants or closed on the applicant's request.

David Bordenave talks about a new antenna design at the 2024 AAS conference.

DIRECTOR'S OFFICE

The NRAO Director's Office establishes, refines, and disseminates the mission, vision and overall strategic goals of NRAO through a proactive and continuous assessment of needs and priorities of the organization and the scientific community. The Director's Office plays a major role in formulating and executing national priorities for research in radio astronomy and other areas of astronomy, and strives to grow the radio astronomy community and improve the scientific relevance of radio techniques and observations.

Observatory Leadership

The NRAO Director provided strong leadership to the Observatory's management team, working with the senior staff to ensure that the Observatory's science mission and operational requirements were translated into the specific plans and deliverables and executed effectively, including appropriate delegation of roles, resources and responsibilities throughout the organization. The Director's Office nurtured collaboration among NRAO staff, communicating openly with staff at all levels, seeking input, creating an environment of trust across the Observatory, and providing positive feedback in a timely and constructive manner. The Director managed the Observatory on a day-to-day basis, facilitating issue resolution between functional areas and departments, and routinely monitoring organization performance.

The Director and Director's Office staff prepared for and executed internal and external Observatory reviews and were responsible for the production of appropriate information to all stakeholders in a timely manner, enabling quantitative insight to Observatory performance, including NSF deliverables.

The Director's Office developed support throughout FY2024 for the NRAO program within the scientific community and with funding agencies, the U.S. Congress, and local, state, federal and non-governmental organizations. The Director's Office developed and maintained strategic relationships with national and international agencies, partners, governments, industry and other private sector entities, and all other stakeholders or customers relevant to the Observatory.

Working with the AUI Executive and Board, the Director helped develop and implement AUI's vision for the NRAO scientific mission and organizational management. The Director informed the AUI Board of Trustees about all NRAO strategic and policy issues through regular and appropriate communications, bringing emerging issues forward in a timely fashion.

To continue to facilitate the alignment of AUI Corporate priorities and operational priorities, the NRAO performed joint capacity planning for the initiatives which are considered key, reviewing the risks, critical activities and the timing, milestones and resources required. In this way, the NRAO increased the mutual understanding of each entity's needs, clarified direction, and generated consensus and teamwork.

The Director's Office represented the NRAO and the North American science community interests to the ALMA Director's Council and the ALMA Board in FY2024. The Director's Office organized the annual NRAO Users Committee and ALMA North American Science Advisory Committee meetings. New Users Committee members were recruited from the community and appointed. Director's Office personnel met with each of the AUI Board of Trustees and the AUI Executive Committee semi-annually.

Advancement: Next Generation Learning Center at the VLA

Please note: All Advancement activities are supported by AUI Corporate funding, and all costs are clearly segregated away from Cooperative Support Agreement funds. These activities are described here for informative purposes only.

The Advancement Office's first priority is building a successful fundraising program, the primary goal of which is to raise construction funding for the next generation Learning Center at the VLA (ngLC). Based on estimates from PMD, the cost of the ngLC is now projected to exceed $25 million. When inviting prospective donors to contribute, the ngLC is the project for which we ask first. If a donor's priorities and goals are not aligned with the ngLC, other giving opportunities are shared, including: Project RADIAL, NRAO Partnerships with our Native Neighbors Initiative, the Ham Radio Project, and the Central Development Lab Women in Engineering Program.

Expand Membership Program (Members as donors model): In consultation with the NRAO New Mexico Business Division and EPO, Advancement created a membership program through which visitors to the VLA are invited to contribute to the ngLC at the VLA. Membership is promoted through direct mail and email campaigns with a contracted direct mail/multi-channel marketing firm. Best practices in non-profit direct mail are being followed in determining how often to ask, how much to ask for, and how best to follow up on direct mail solicitations with email. In FY2024, campaigns are planned for each quarter, including a year-end giving appeal.

Cultivate High Capacity Prospects: All visitor data is screened to identify major gift prospects. High capacity individuals receive more personal communications and are provided opportunities for in-person engagement. In addition, contacts at major corporations and foundations also receive tailored, systematic communication. The Director of Advancement is managing a portfolio of 150 top prospects, a dynamic list that changes as prospects roll off when they indicate they are not interested and new prospects are identified. While only 150 prospects are in the Director's portfolio, an additional ~500 individuals fall into the top tier of the wealth screening categories. This broader group will receive invitations to travel opportunities and regional gatherings.

Regional Cultivation Events: The NRAO will invite high-capacity prospects to cultivation events at the VLA and in other locations where we have concentrations of donor prospects. These are "get acquainted" events, kept intentionally to 25–40 or fewer guests, where we share information about the impact of the NRAO as well as the campaign for the ngLC. These are not ask events; rather they have a featured "draw"— a scientist with a recent exciting discovery or result, for example— that is of great interest to the target audience. The day after the event, each attendee is contacted by phone to assess whether they are interested in moving forward with giving. If so, one-on-one visits by Zoom or in person are scheduled.

Small Group Travel Opportunities: High capacity donor prospects receive invitations to small group travel tours. The first trip occurred in 2024 to Santiago, Calama, and ALMA. Guests pay for all of their expenses. The primary goal of the tours is to build relationships with these individuals that lead to a gift solicitation.

One-on-one Visits: The best way to raise major gifts with the highest return on investment is by building relationships through face to face visits and regular personal communication. Once a donor prospect is qualified, the next step is a visit.

Recruit Campaign Leadership (lead donors) for ngLC campaign: High capacity individuals with keen interest in the NRAO, the VLA, and the ngLC will be invited to join the campaign leadership group. These individuals are also the campaign's lead donors.

Seek State and Federal Funds: Advancement will continue to engage State Executive and Legislative representatives and seek state support in the 2024 session, and continue to engage the New Mexico Congressional Delegation and submit another Congressionally Directed Spending Request in FY2024.

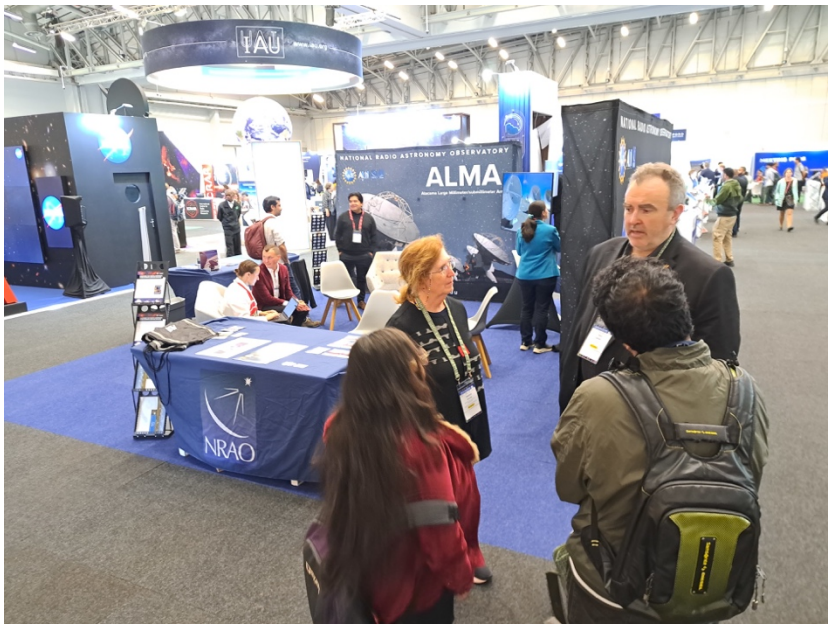
Maintain And Expand Visitor Communications: All visitors receive a series of welcome emails. After that visitor journey is completed, they then receive a recurring digital newsletter. In addition, we will collect email addresses through the NRAO public site as well as through targeted posts on social media pushing followers to a link where they can subscribe to the NRAO Science Newsletter.

Promote Visiting the VLA: To increase the number of visitors coming to the VLA, Advancement is spending funds on advertising. Paid search ads with Google is the priority as it directly reaches the target audience. In addition, in consultation with EPO, Advancement will place limited select high-impact print ads. Decisions about where and how to advertise are based on where our visitors come from. One third is from the greater Albuquerque region. Print advertising is focused on this audience. Two thirds come from 47 states and are tourists to New Mexico. Google paid search ads reach this audience.

Support Relationship Building With Target Communities: Advancement will maintain relationships with the New Mexico STEAM ecosystem by:

- Continuing to support the NRAO Partnerships with our Native Natives Initiative;
- Sponsor and attend the New Mexico Governor's STEAM Challenge; and
- Continue to engage with the Northern NM STEAM Consortium.

Tony Beasley and Trish Henning talk about NRAO to students at the IAU Cape Town Conference.



OBSERVATORY METRICS

NRAO Telescope Usage

The following tables and charts provide a detailed accounting of the use of the NRAO telescopes—ALMA, VLA, VLBA, and GBT—for October 1, 2023 through September 30, 2024. The total available time at each telescope in FY2024 was [366 days * 24 hours/day] = 8,784 hours. NRAO North American telescope time use is carefully monitored and tracked in the following categories:

- **Scheduled**: Planned hours of observing time for peer-reviewed science proposals and sponsored projects.
    - **Observing**[1] = Actual hours of observing.
    - **Downtime** = Hours lost during scheduled observing.

  Scheduled hours = [**Observing** hours + **Downtime** hours]

- **Maintenance**: Actual hours of planned service of infrastructure, structure, electronics, and software.

- **Test**: Actual hours for test observations unrelated to peer-reviewed science proposals.

- **Unscheduled**: Actual idle hours owing to gaps between observing programs that cannot be scheduled, failed peer-reviewed science observations, and downtime of the entire telescope due to weather.

- **Shutdown**: Actual shutdown hours, usually for a holiday or major equipment work.

ALMA observing time is shown in the table (next page); the above telescope time categories for ALMA were unavailable at the time of reporting.

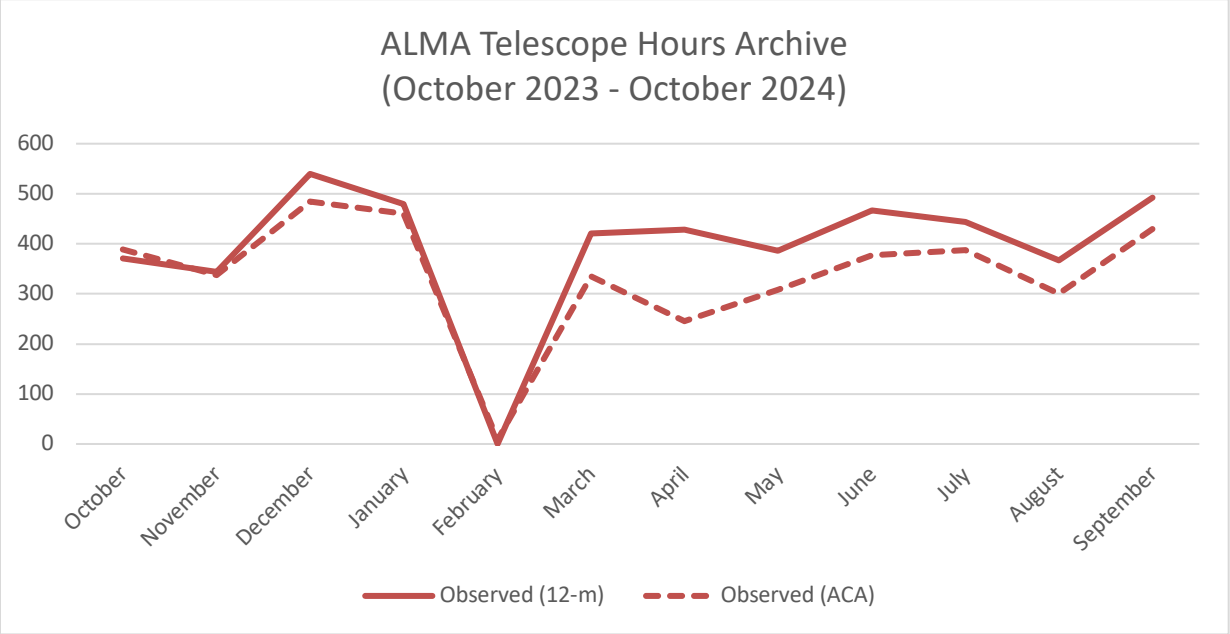
Dusk falls at the Very Large Array in New Mexico. Photo by Robert Betchel (US NSF / AUI / NSF NRAO).

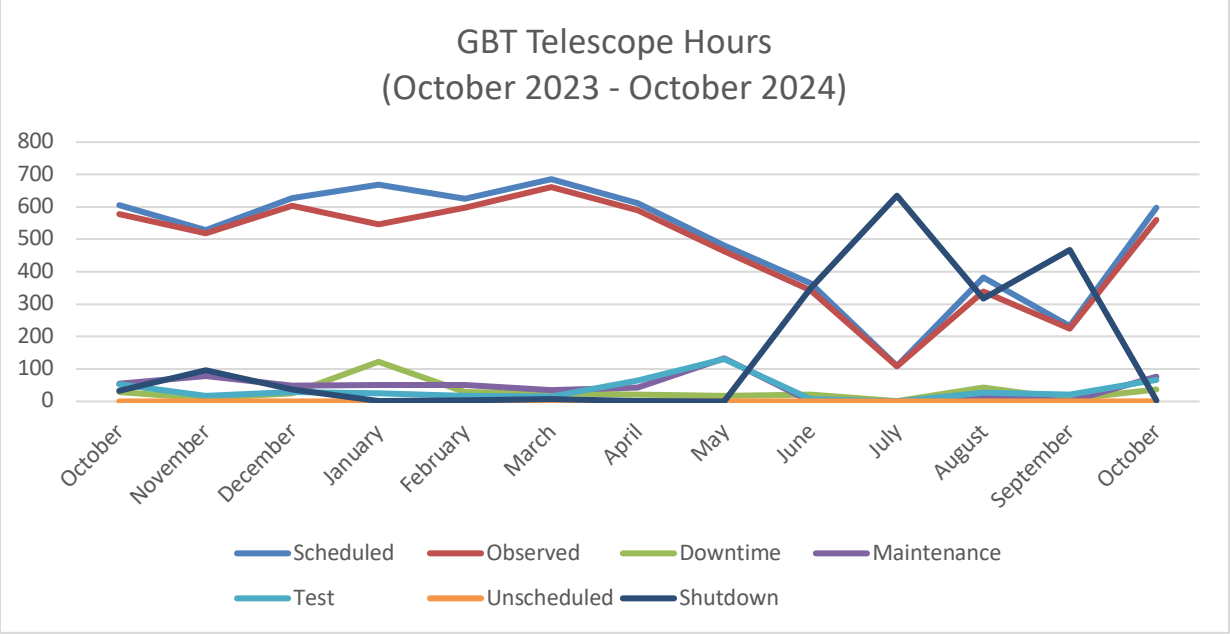
[1] Observing may include non-astronomical observing of sponsored projects. In this appendix, confidential sponsored projects are identified as “Closed” or “Unspecified.”

Category	GBT	VLA	VLBA	ALMA
Scheduled	5922.0	6191.3	5250.2	
Observing	5574.3	5930.8	4786.8	
Downtime	347.8	259.4	463.4	
12-m Observing	-	-	-	4738.1
ACA Observing	-	-	-	4061.8
Maintenance	511.5	480.4	1040.2	
Test	406.3	1606.8	747.4	
Unscheduled	-	363.6	1664.3	
Shutdown	1944.3	141.8	81.9	
Total Hours per year	**8784.0**	**8784.0**	**8784.0**	**-**

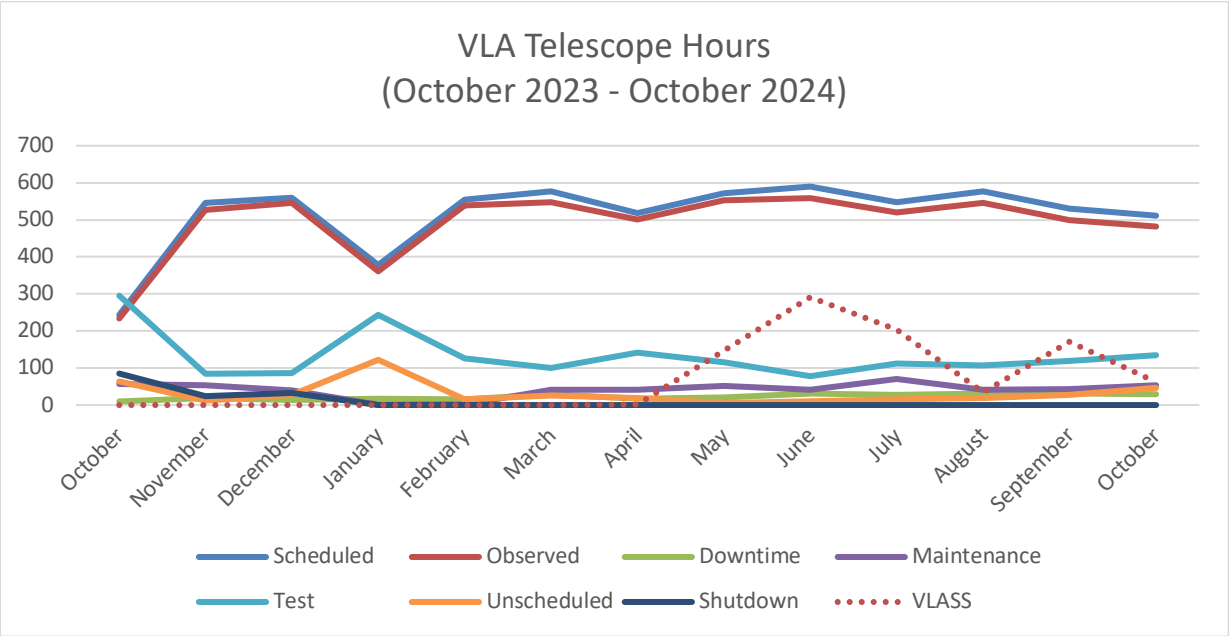
The St. Croix VLBA Station in the U.S. Virgin Islands. Photo by Jeff Hellerman (US NSF / AUI / NSF NRAO).

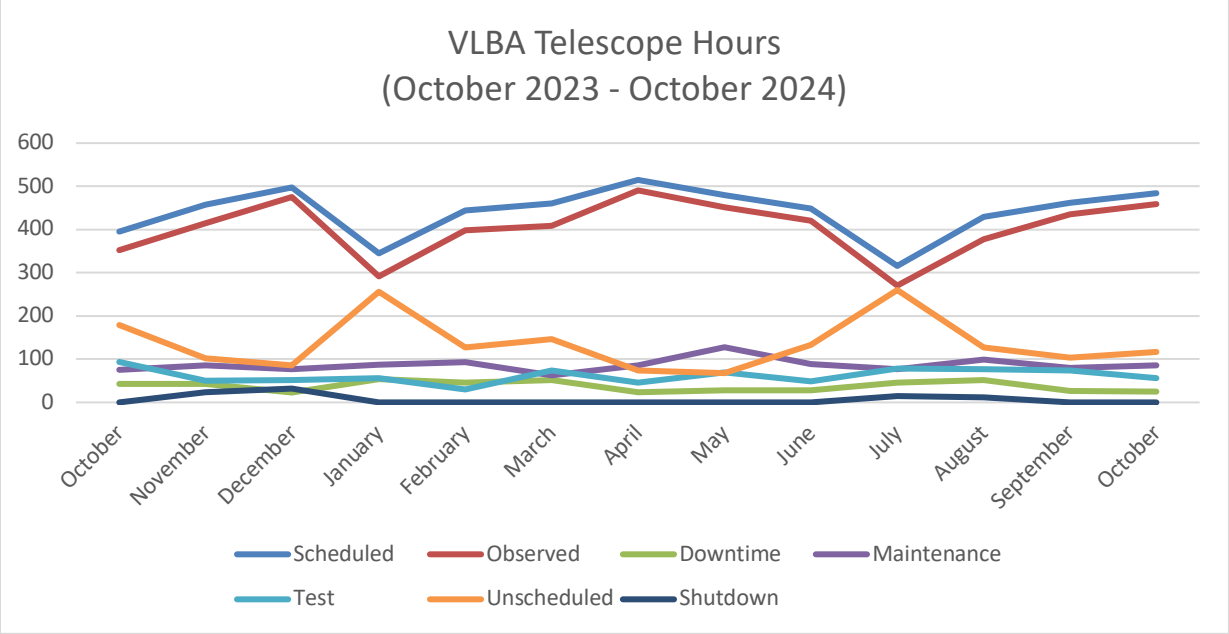
The following chart shows ALMA observing time. *Observed (12-m)* is the time spent on science observing by the 12-m array. *Observed (Atacama Compact Array, or ACA)* is the time spent on science observing by the ACA.





In the following chart, *VLASS* is the time spent observing for the VLA Sky Survey and is a subset of *Observed*.



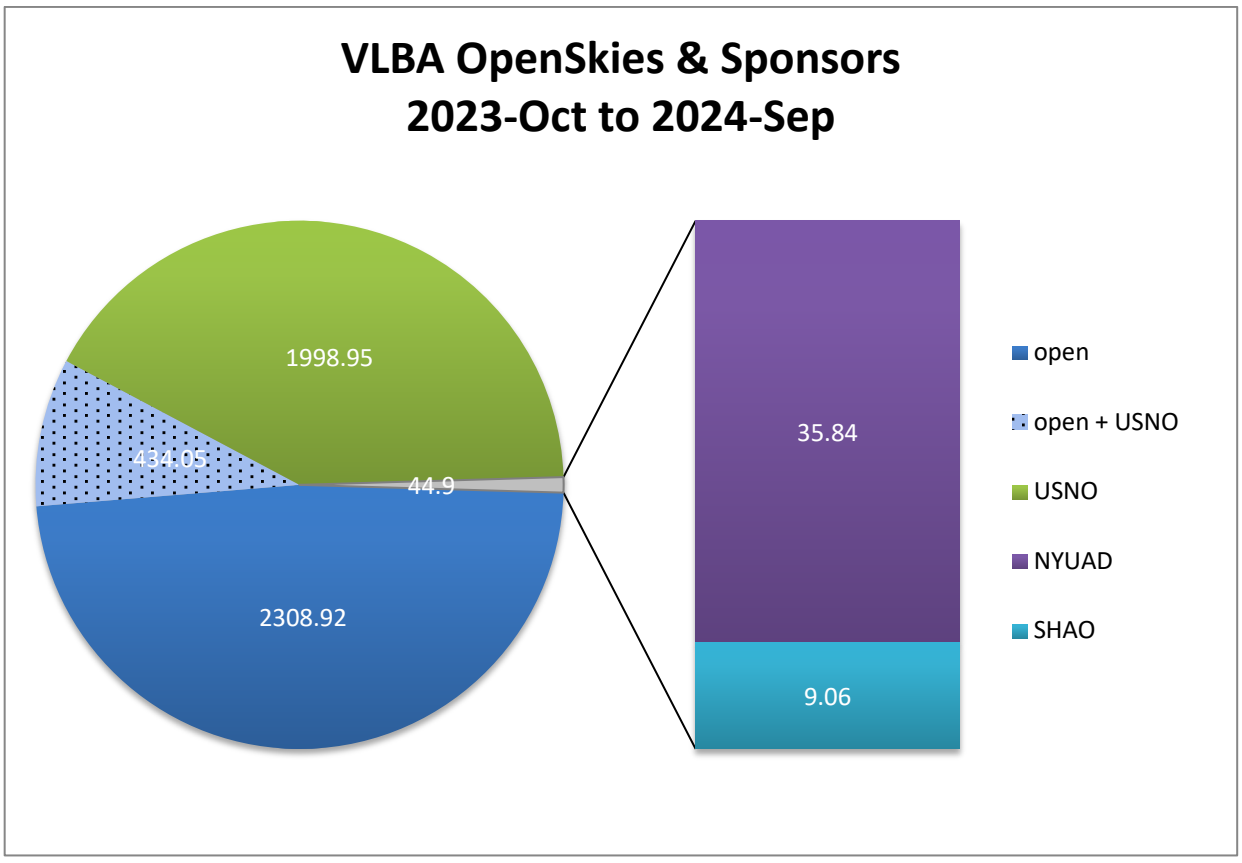


NRAO Telescope Open Skies Usage

The majority of telescope time is competitively awarded by the NRAO for the scientific use of its telescopes on the basis of scientific merit and technical feasibility. However, a significant amount of telescope time is also awarded to sponsored projects, which are specially funded or approved via Memoranda of Understanding (MoU) with the NRAO. The charts indicate the number of hours assigned to competitively awarded time (Open Skies), and to time awarded under sponsorship and MoUs. No ALMA or VLA sponsored observing took place in FY2024. “Open + USNO” in the VLBA bar of pie chart denotes time sponsored by the USNO but permitted for Open Skies observing.

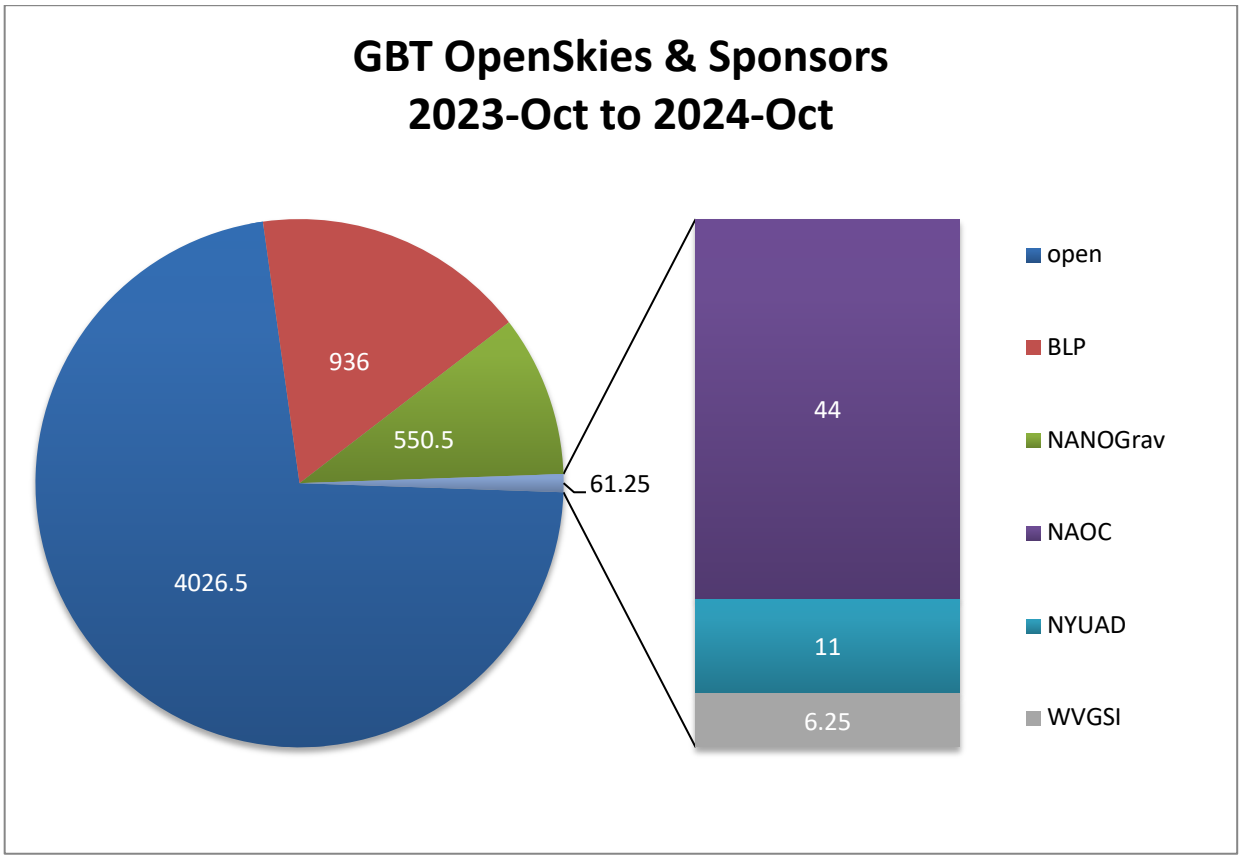
VLBA FY2023 Sponsors:

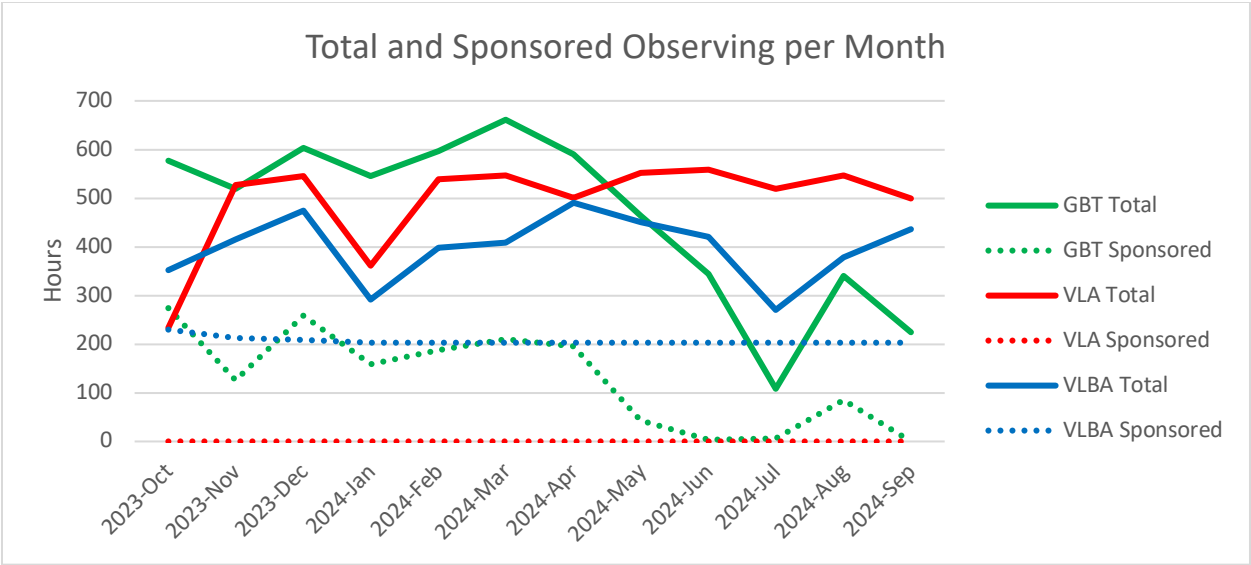
NYUAD	New York University Abu Dhabi, United Arab Emirates
SHAO	Shanghai Astronomical Observatory, China
USNO	United States Naval Observatory, USA



GBT FY2023 Sponsors:

BLP	Breakthrough Listen
NANOGrav	NANOGrav Collaboration
NAOC	National Astronomical Observatories, Chinese Academy of Sciences
NYUAD	New York University Abu Dhabi
WVGSI	West Virginia Governor's School STEM Institute





NRAO Telescope Usage by Principal Investigator

The following table and charts provide a detailed accounting (hours and percentages) of the FY2024 use of ALMA, VLA, VLBA, and GBT by: (a) domestic (U.S.) and foreign based (non-U.S.) Principal Investigators (Pis); (b) and by the astronomical community, graduate students, and NRAO staff. Only observing hours serviced by the North American (NA) Executive are included for ALMA.

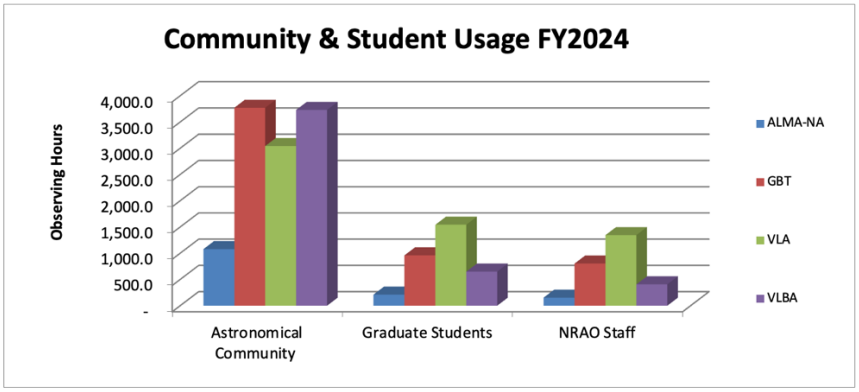
	U.S.	Foreign	Unknown
ALMA-NA	1,272.8	170.4	-
GBT	4,413.0	1,120.5	40.8
VLA	2,985.7	2,945.1	-
VLBA	2,903.6	1,883.3	-

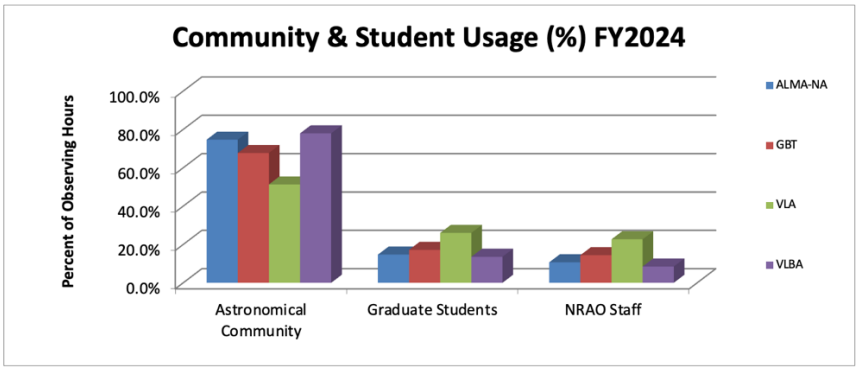
	U.S.	Foreign	Unknown
ALMA-NA	88.2%	11.8%	0.0%
GBT	79.2%	20.1%	0.7%
VLA	50.3%	49.7%	0.0%
VLBA	60.7%	39.3%	0.0%

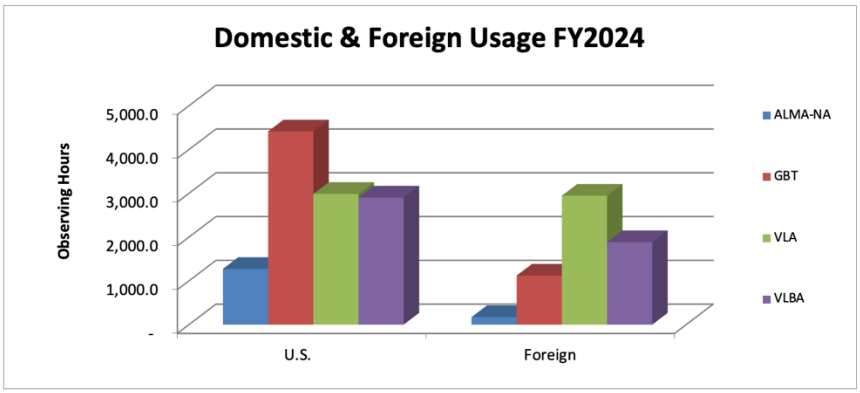
	Astronomical Community	Graduate Students	NRAO Staff
ALMA-NA	1,077.2	212.0	154.1
GBT	3,771.5	959.0	803.0
VLA	3,042.7	1,542.8	1,345.3
VLBA	3,730.5	649.5	406.7

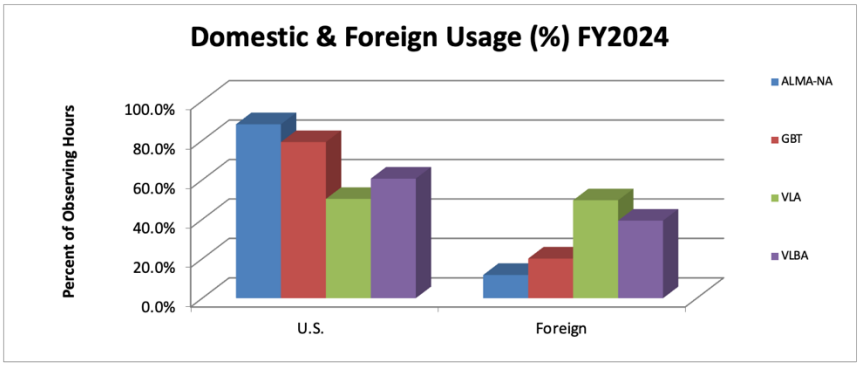
	Astronomical Community	Graduate Students	NRAO Staff
ALMA-NA	74.6%	14.7%	10.7%
GBT	67.7%	17.2%	14.4%
VLA	51.3%	26.0%	22.7%
VLBA	77.9%	13.6%	8.5%

Fresh snowfall around the ALMA antennas. Photo by Pablo Carrillo (ALMA).


Community & Student Usage FY2024
Observing Hours
4,000.0
3,500.0
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
-
Astronomical Community
Graduate Students
NRAO Staff
ALMA-NA
GBT
VLA
VLBA


Community & Student Usage (%) FY2024
Percent of Observing Hours
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
Astronomical Community
Graduate Students
NRAO Staff
ALMA-NA
GBT
VLA
VLBA


Domestic & Foreign Usage FY2024
Observing Hours
5,000.0
4,000.0
3,000.0
2,000.0
1,000.0
-
U.S.
Foreign
ALMA-NA
GBT
VLA
VLBA


Domestic & Foreign Usage (%) FY2024
Percent of Observing Hours
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
U.S.
Foreign
ALMA-NA
GBT
VLA
VLBA

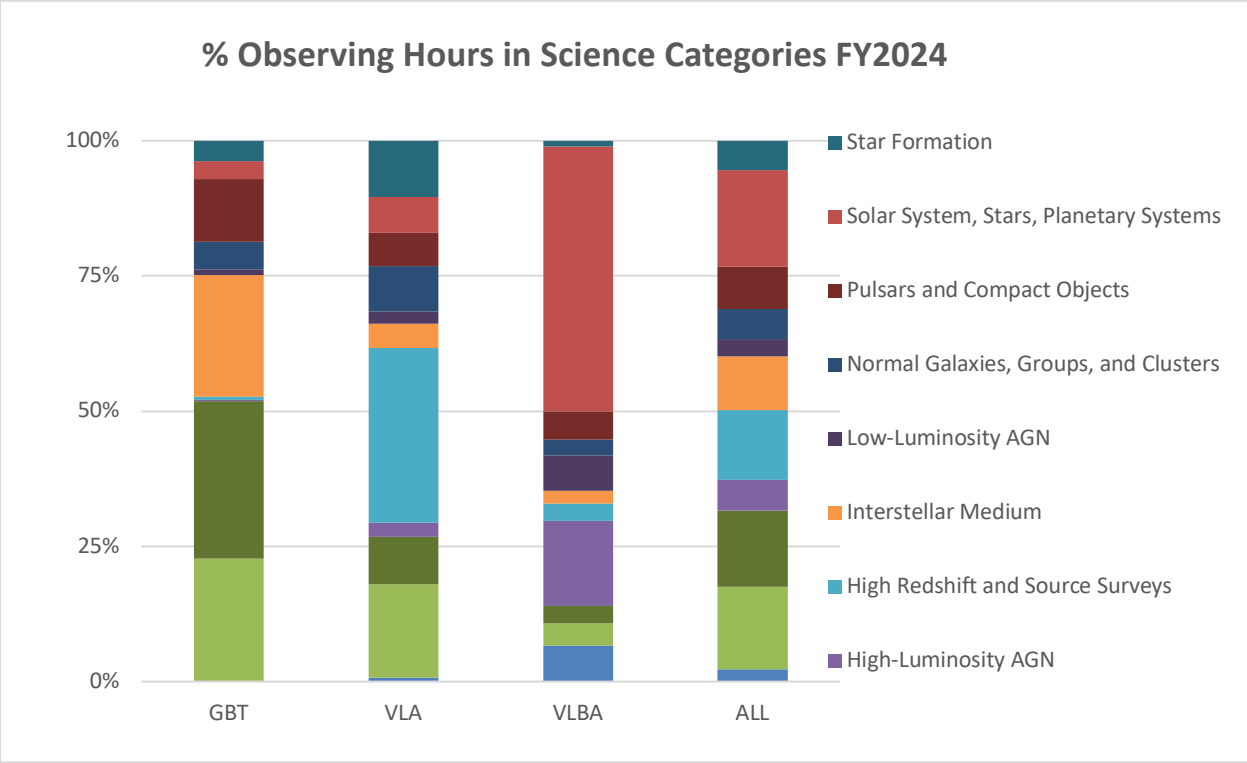
NRAO Telescope Usage by Science Category

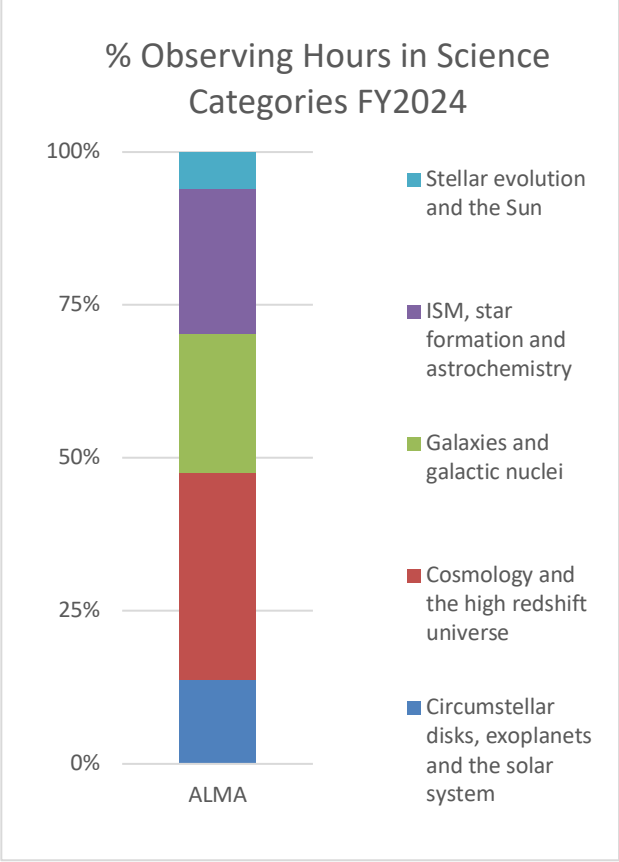
The following tables and charts provide a detailed accounting of NRAO observing hours for ALMA, GBT, VLA, and VLBA that supported peer-reviewed science in each of the science categories employed by the NRAO proposal evaluation and time allocation process, and in the five categories used by the ALMA process.

	GBT	VLA	VLBA
Active Galactic Nuclei	0.0%	0.8%	6.7%
Extragalactic Structure	22.8%	17.3%	4.1%
Gravitational Waves and Energetic Transients	29.0%	8.7%	3.2%
High Redshift and Source Surveys	0.7%	32.3%	3.3%
Interstellar Medium	22.4%	4.5%	2.3%
Normal Galaxies, Groups, and Clusters	5.0%	8.4%	2.8%
Pulsars and Compact Objects	11.7%	6.1%	5.3%
Solar System, Stars, Planetary Systems	3.3%	6.6%	48.9%
Star Formation	3.7%	10.4%	1.1%
Unspecified	1.4%	5.0%	22.3%

	ALMA
Circumstellar disks, exoplanets and the solar system	13.9%
Cosmology and the high redshift universe	33.7%
Galaxies and galactic nuclei	22.7%
ISM, star formation and astrochemistry	23.8%
Stellar evolution and the Sun	6.0%

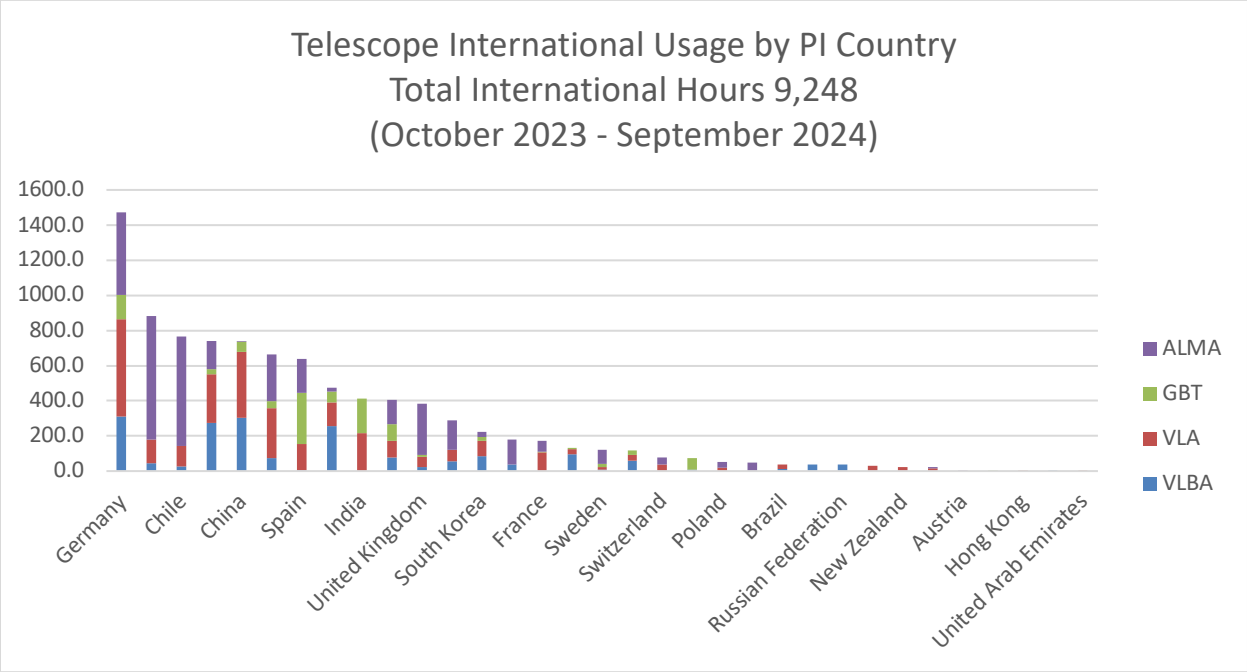
NGC 3627 imaged by the PHANGS Survey with ALMA. Credit: ALMA (ESO/NAOJ/NSF NRAO/ESA/NASA).


% Observing Hours in Science Categories FY2024
100%
75%
50%
25%
0%
GBT
VLA
VLBA
ALL
Star Formation
Solar System, Stars, Planetary Systems
Pulsars and Compact Objects
Normal Galaxies, Groups, and Clusters
Low-Luminosity AGN
Interstellar Medium
High Redshift and Source Surveys
High-Luminosity AGN

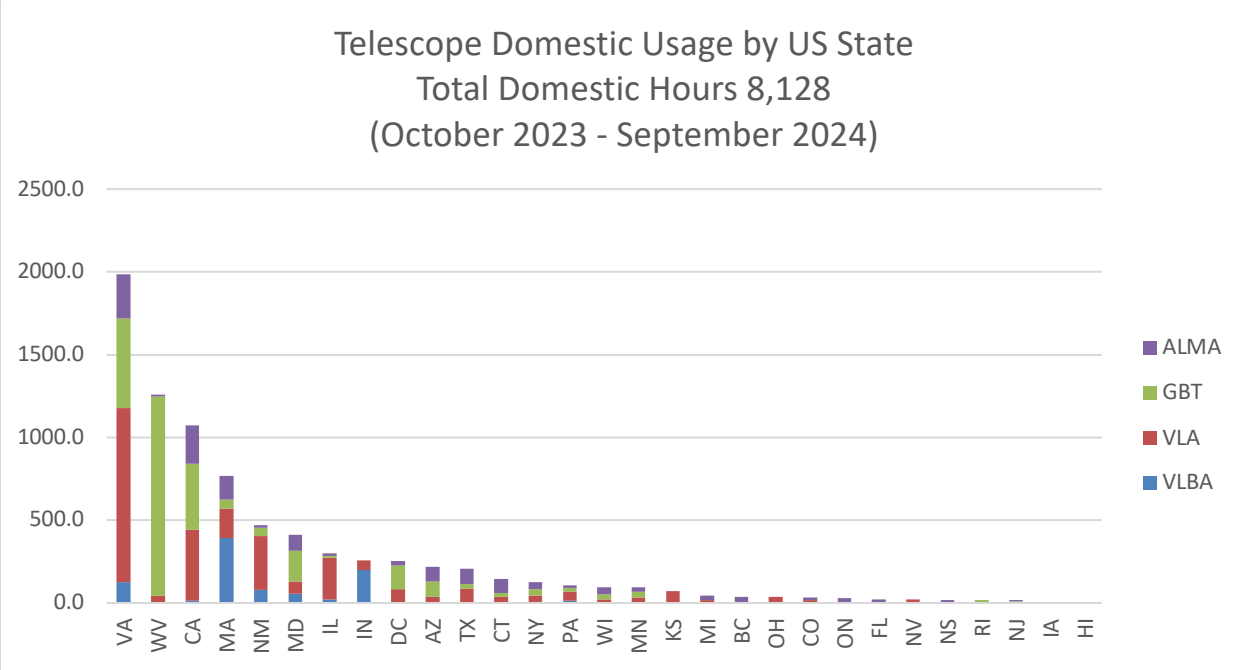

% Observing Hours in Science Categories FY2024
100%
75%
50%
25%
0%
ALMA
Stellar evolution and the Sun
ISM, star formation and astrochemistry
Galaxies and galactic nuclei
Cosmology and the high redshift universe
Circumstellar disks, exoplanets and the solar system

NRAO Telescope Usage by PI's Country and U.S. state

The following figure lists the FY2024 observing hours at NRAO telescopes that were allocated to foreign-based (non-U.S.) PIs by country.



The following figure shows the distribution of the hours by the PI's U.S. state of residence. This includes Puerto Rico and the District of Columbia.



Observing Proposals Submitted for NRAO Semesters 2024B and 2025A

The following tables and chart describe the community response to the NRAO Calls for Proposals for Semesters 2024B and 2025A. The first table lists the distribution of science categories for the proposals submitted to the GBT, VLA, and VLBA. The second table provides the total number of Regular and Large proposals submitted to GBT, VLA, VLBA, and the Global 3mm VLBI Array (GMVA). Sponsored proposal and dissertation proposal numbers for each telescope are listed immediately underneath this table. Sponsored proposals are allocated observing time outside of the community-based and peer-reviewed NRAO Time Allocation Process. The final table describes the proposal over-subscription pressure (time requested/time available) for each telescope and for all NRAO instruments. The chart illustrates the percentage of 2024B and 2025A proposals that fell in each science category for each telescope and in total.

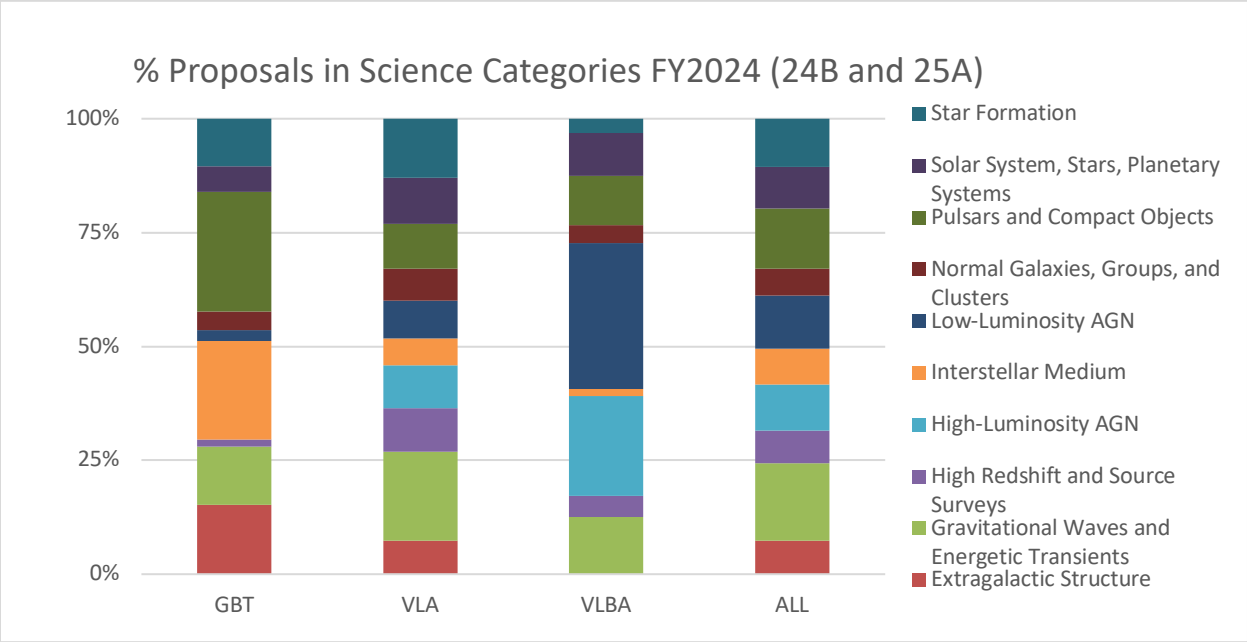
	GBT	VLA	VLBA
Extragalactic Structure	15.2%	7.3%	0.0%
Gravitational Waves and Energetic Transients	12.8%	19.5%	12.5%
High Redshift and Source Surveys	1.6%	9.6%	4.7%
High-Luminosity AGN	0.0%	9.4%	21.9%
Interstellar Medium	21.6%	5.9%	1.6%
Low-Luminosity AGN	2.4%	8.2%	32.0%
Normal Galaxies, Groups, and Clusters	4.0%	7.1%	3.9%
Pulsars and Compact Objects	26.4%	9.9%	10.9%
Solar System, Stars, Planetary Systems	5.6%	10.1%	9.4%
Star Formation	10.4%	12.9%	3.1%
Unspecified	0.0%	0.0%	0.0%

Proposal Counts by Type	Regular	Large	Total
GBT	105	9	114
VLA	358	11	369
VLBA	110	5	115
GMVA	19	0	19
All Instruments	592	25	617

Additional Sponsored: 1
(0 GBT, 0 VLA, 1 VLBA)

Number Requested for Dissertation: 111
(98 Regular, 13 Large)
(22 GBT, 72 VLA, 17 VLBA, 0 GMVA)

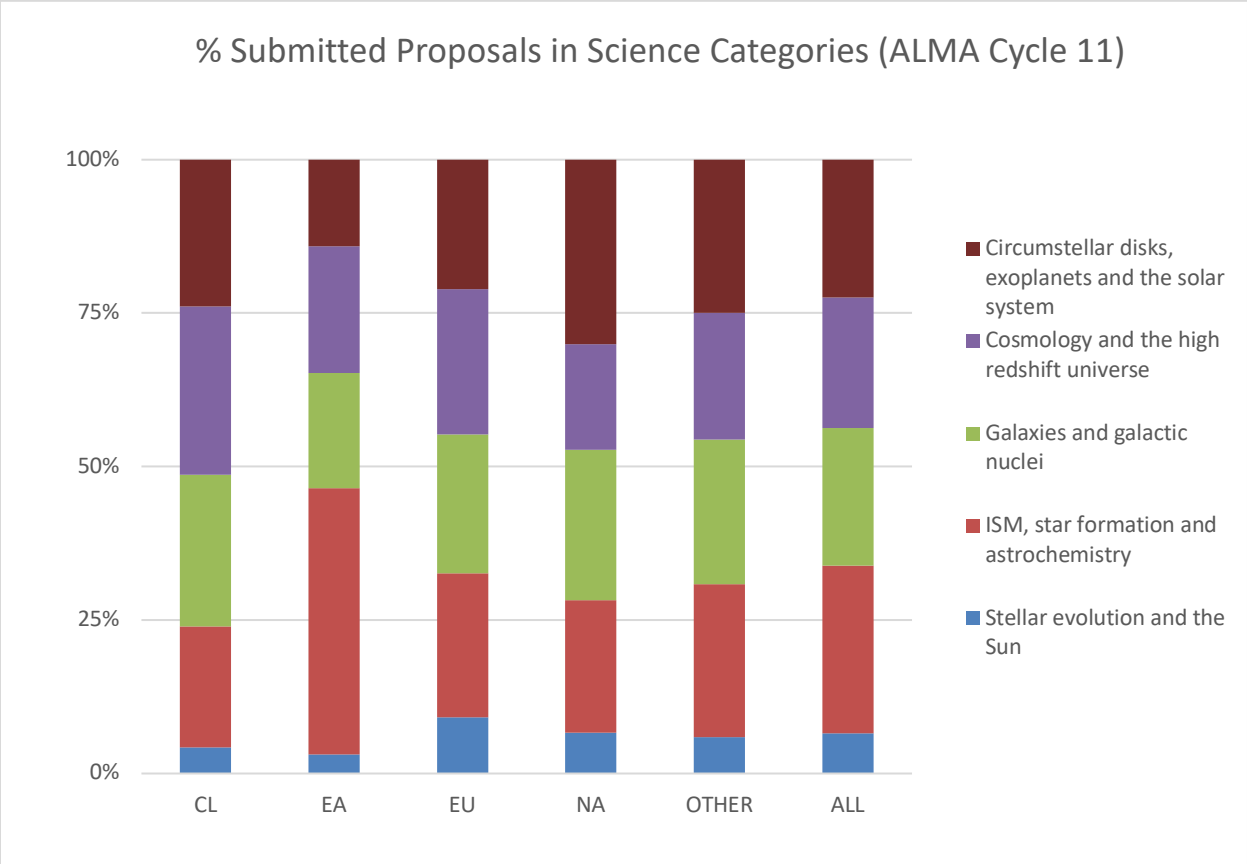
Proposal Pressure	24B	25A	Total
GBT	6.3	1.5	4.0
VLA	2.6	2.9	2.8
VLBA	2.4	2.3	2.3
All NRAO Instruments	4.0	2.4	3.2

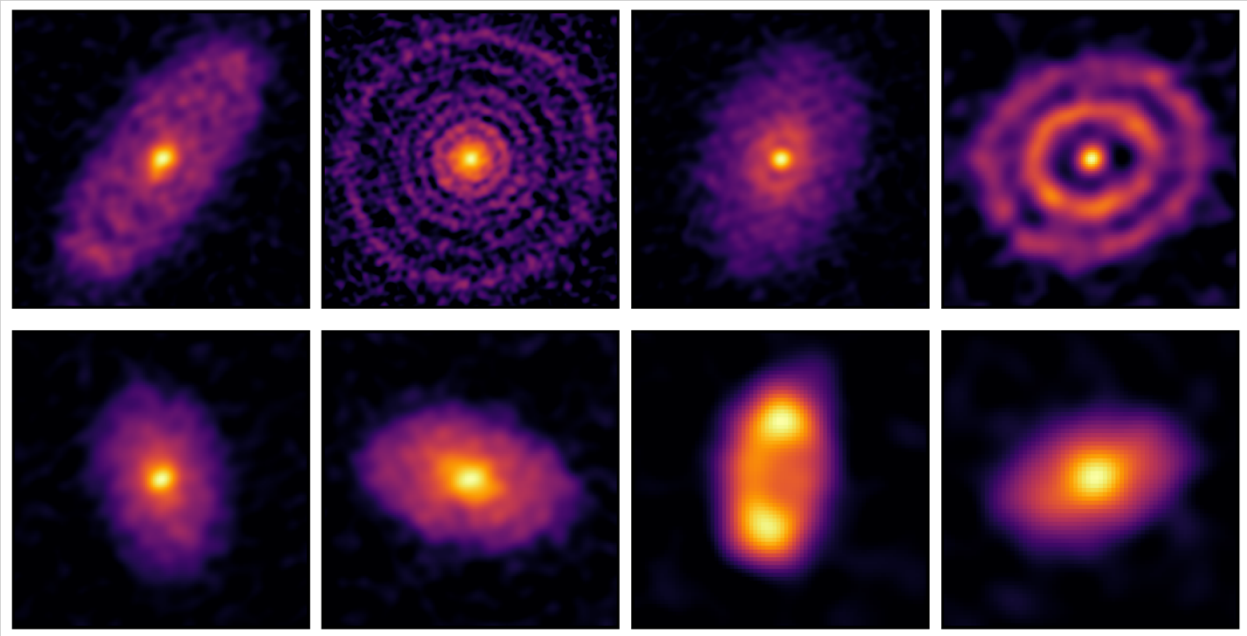


Observing Proposals Submitted for ALMA Cycle 11

The following tables and chart characterize the community response to the ALMA Call for Proposals for Cycle 11. The first table lists the distribution of proposed science categories for the submitted proposals. The second table provides the total number of proposals by executive. The number of proposals submitted and accepted for review was 1714 for the Cycle 11 call. The chart illustrates the percentage of Cycle 11 proposals that fell in each science category for each executive and in total. The over-subscription proposal pressure (time requested/time available) for the Cycle 11 call was 4.1.

	CL	EA	EU	NA	OTHER	ALL
Circumstellar disks, exoplanets and the solar system	24%	14%	21%	30%	25%	22%
Cosmology and the high redshift universe	27%	21%	24%	17%	21%	21%
Galaxies and galactic nuclei	25%	19%	23%	24%	24%	22%
ISM, star formation and astrochemistry	20%	43%	23%	22%	25%	27%
Stellar evolution and the Sun	4%	3%	9%	7%	6%	7%

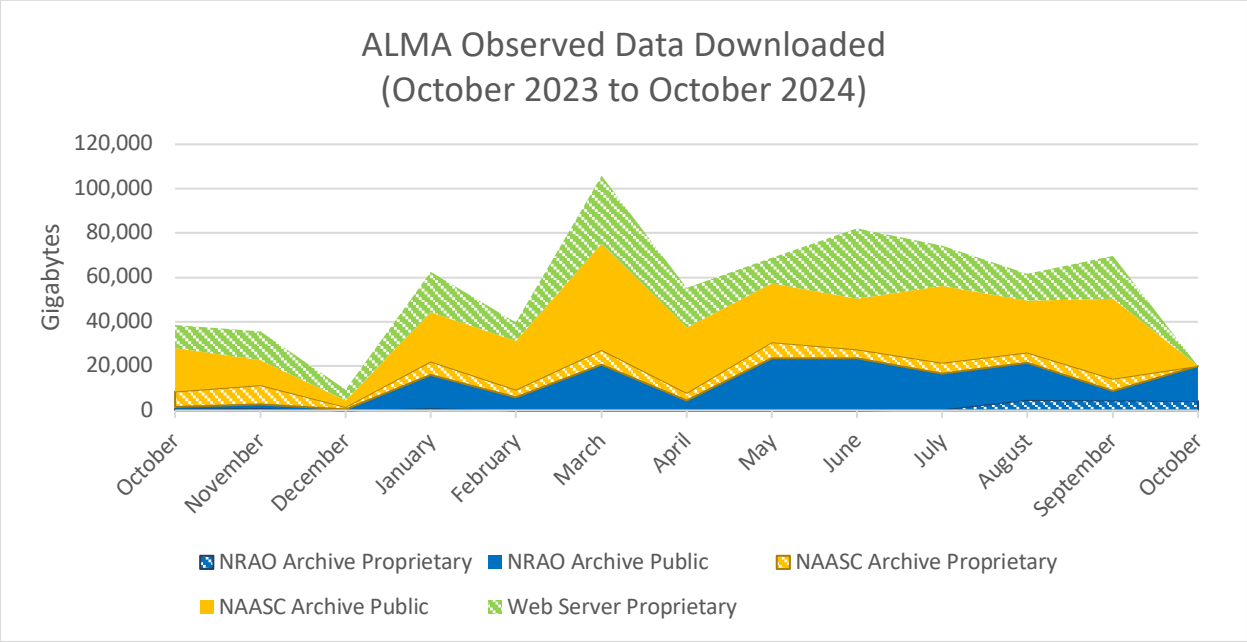




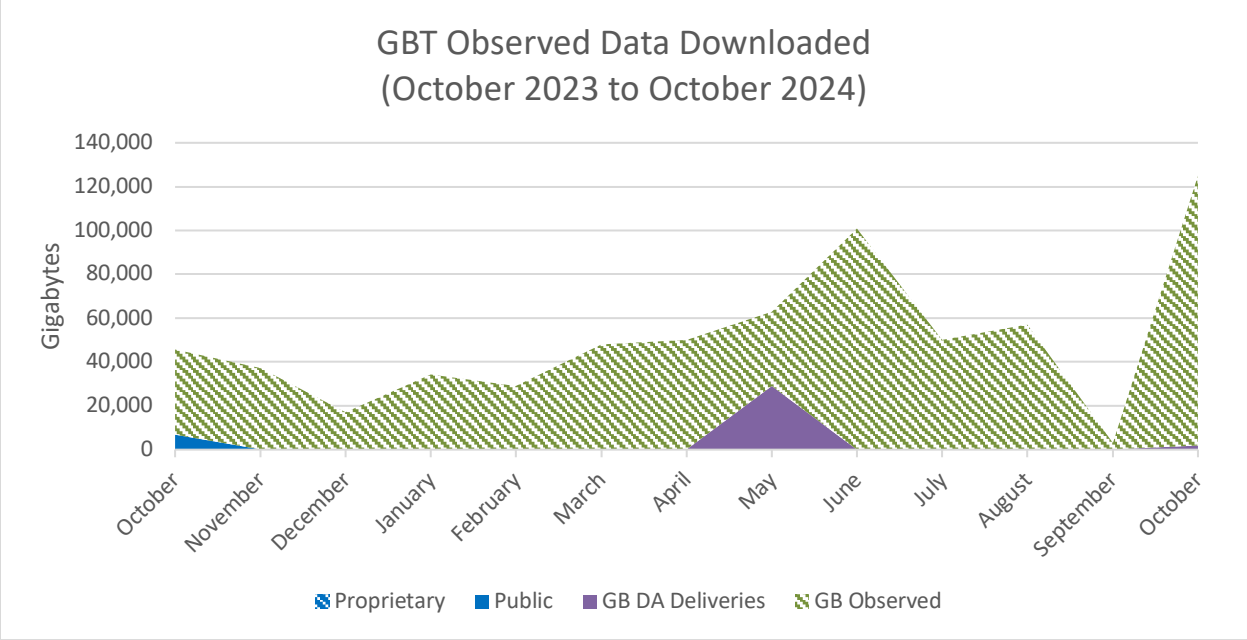
Images captured by ALMA's most extended antenna configuration reveal surprisingly rich disk structures in the sigma Ori cluster. Credit: ALMA (ESO/JAO/NAOJ/NSF NRAO), J. Huang et al.

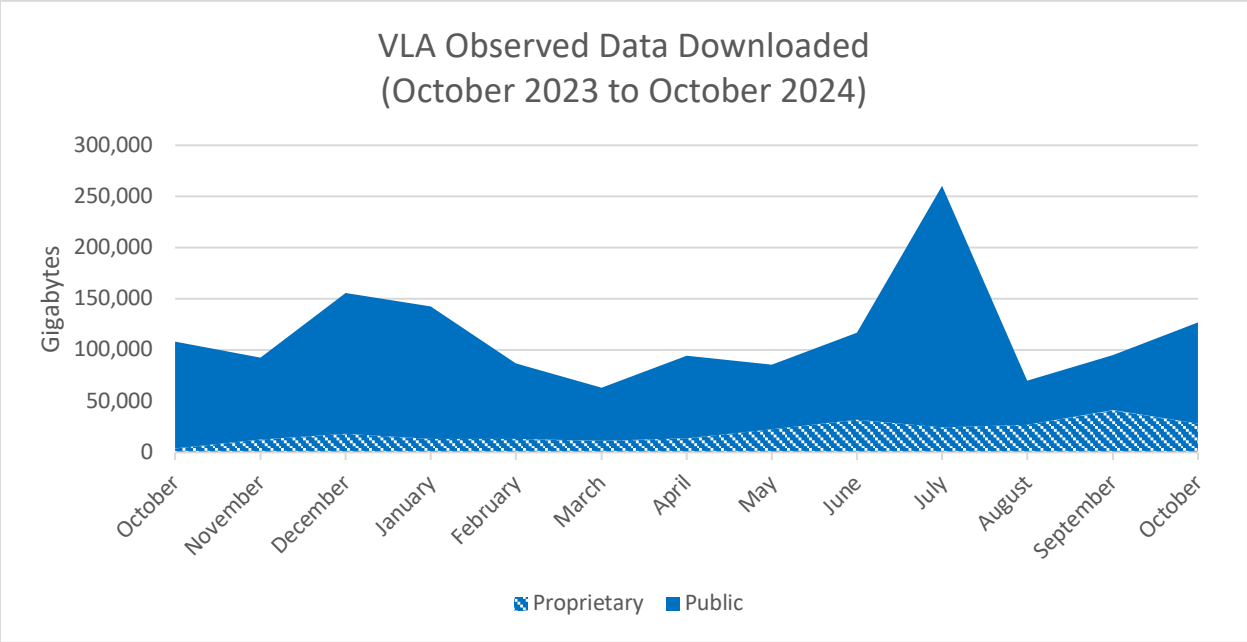
Archive Data Retrievals

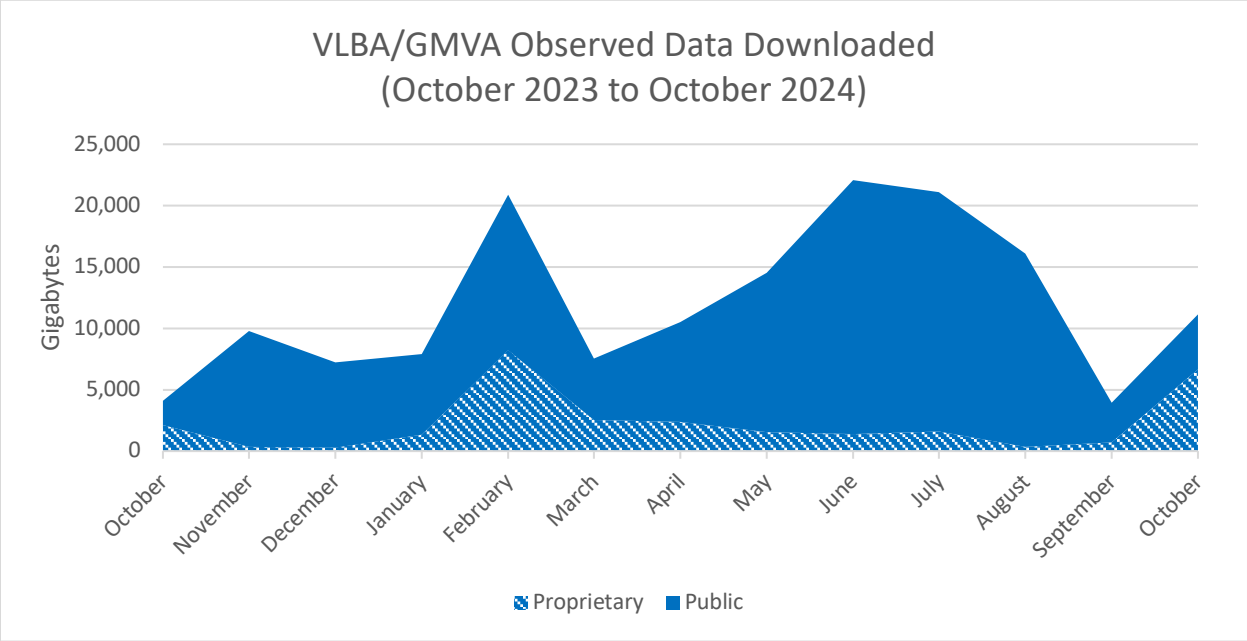
The following chart describes the data volume retrieved from the North American ALMA Archives in FY2024. Fully processed science data for ALMA is being delivered directly to ALMA observers via a Web server; the sum of archive and web server downloads is shown in the plot blow.



Most GBT data, especially private data, is accessed directly from the local disks in Green Bank, not from the archive. The volume of data served is estimated by the total volume of observed astronomy data, *GBT Observed*. In addition, the GBO data analysts deliver data shown here as *GB DA Deliveries*.




VLA Observed Data Downloaded
(October 2023 to October 2024)
300,000
250,000
200,000
150,000
100,000
50,000
0
Gigabytes
October
November
December
January
February
March
April
May
June
July
August
September
October
Proprietary
Public


VLBA/GMVA Observed Data Downloaded
(October 2023 to October 2024)
25,000
20,000
15,000
10,000
5,000
0
Gigabytes
October
November
December
January
February
March
April
May
June
July
August
September
October
Proprietary
Public

APPENDIX A: REFEREED PUBLICATIONS

Abadi, Mario G.; Castelletti, Gabriela; Supan, Leonardo; Kassim, Namir E.; Lazio, Joseph W. "One size fits all: Insights into extrinsic thermal absorption based on the similarity of supernova remnant radio-continuum spectra," Astronomy and Astrophysics, 684, A54, 2024.

Abbasi, R.; Ackermann, M.; Adams, J.; Agarwalla, S. K.; Aguilar, J. A.; Ahlers, M.; Alameddine, J. M.; Amin, N. M.; Andeen, K.; Argüelles, C.; Ashida, Y.; Athanasiadou, S.; Ausborm, L.; Axani, S. N.; Bai, X.; Balagopal, V. A.; Baricevic, M.; Barwick, S. W.; Bash, S.; Basu, V.; Bay, R.; Beatty, J. J.; Tjus, J. Becker; Beise, J.; Bellenghi, C.; Benning, C.; Benzvi, S.; Berley, D.; Bernardini, E.; Besson, D. Z.; Blaufuss, E.; Bloom, L.; Blot, S.; Bontempo, F.; Motzkin, J. Y. Book; Meneguolo, C. Boscolo; Böser, S.; Botner, O.; Böttcher, J.; Braun, J.; Brinson, B.; Brostean-Kaiser, J.; Brusa, L.; Burley, R. T.; Butterfield, D.; Campana, M. A.; Caracas, I.; Carloni, K.; Carpio, J.; Chattopadhyay, S.; Chau, N.; Chen, Z.; Chirkin, D.; Choi, S.; Clark, B. A.; Coleman, A.; Collin, G. H.; Connolly, A.; Conrad, J. M.; Corley, R.; Cowen, D. F.; Dave, P.; De Clercq, C.; Delaunay, J. J.; Delgado, D.; Deng, S.; Desai, A.; Desiati, P.; De Vries, K. D.; De Wasseige, G.; Deyoung, T.; Diaz, A.; Díaz-Vélez, J. C.; Dierichs, P.; Dittmer, M.; Domi, A.; Draper, L.; Dujmovic, H.; Durnford, D.; Dutta, K.; Duvernois, M. A.; Ehrhardt, T.; Eidenschink, L.; Eimer, A.; Eller, P.; Ellinger, E.; El Mentawi, S.; Elsässer, D.; Engel, R.; Erpenbeck, H.; Evans, J.; Evenson, P. A.; Fan, K. L.; Fang, K.; Farrag, K.; Fazely, A. R.; Fedynitch, A.; Feigl, N.; Fiedlschuster, S.; Finley, C.; Fischer, L.; Fox, D.; Franckowiak, A.; Fukami, S.; Fürst, P.; Gallagher, J.; Ganster, E.; Garcia, A.; Garcia, M.; Garg, G.; Genton, E.; Gerhardt, L.; Ghadimi, A.; Girard-Carillo, C.; Glaser, C.; Glüsenkamp, T.; Gonzalez, J. G.; Goswami, S.; Granados, A.; Grant, D.; Gray, S. J.; Gries, O.; Griffin, S.; Griswold, S.; Groth, K. M.; Guevel, D.; Günther, C.; Gutjahr, P.; Ha, C.; Haack, C.; Hallgren, A.; Halve, L.; Halzen, F.; Hamdaoui, H.; Minh, M. Ha; Handt, M.; Hanson, K.; Hardin, J.; Harnisch, A. A.; Hatch, P.; Haungs, A.; Häußler, J.; Helbing, K.; Hellrung, J.; Hermannsgabner, J.; Heuermann, L.; Heyer, N.; Hickford, S.; Hidvegi, A.; Hill, C.; Hill, G. C.; Hoffman, K. D.; Hori, S.; Hoshina, K.; Hostert, M.; Hou, W.; Huber, T.; Hultqvist, K.; Hünnefeld, M.; Hussain, R.; Hymon, K.; Ishihara, A.; Iwakiri, W.; Jacquart, M.; Jain, S.; Janik, O.; Jansson, M.; Japaridze, G. S.; Jeong, M.; Jin, M.; Jones, B. J. P.; Kamp, N.; Kang, D.; Kang, W.; Kang, X.; Kappes, A.; Kappesser, D.; Kardum, L.; Karg, T.; Karl, M.; Karle, A.; Katil, A.; Katz, U.; Kauer, M.; Kelley, J. L.; Khanal, M.; Khatee Zathul, A.; Kheirandish, A.; Kiryluk, J.; Klein, S. R.; Kochocki, A.; Koirala, R.; Kolanoski, H.; Kontrimas, T.; Köpke, L.; Kopper, C.; Koskinen, D. J.; Koundal, P.; Kovacevich, M.; Kowalski, M.; Kozynets, T.; Krishnamoorthi, J.; Kruiswijk, K.; Krupczak, E.; Kumar, A.; Kun, E.; Kurahashi, N.; Lad, N.; Lagunas Gualda, C.; Lamoureux, M.; Larson, M. J.; Latseva, S.; Lauber, F.; Lazar, J. P.; Lee, J. W.; Leonard Deholton, K.; Leszczyńska, A.; Liao, J.; Lincetto, M.; Liu, Y. T.; Liubarska, M.; Love, C.; Lu, L.; Lucarelli, F.; Luszczak, W.; Lyu, Y.; Madsen, J.; Magnus, E.; Mahn, K. B. M.; Makino, Y.; Manao, E.; Mancina, S.; Marie Sainte, W.; Mariş, I. C.; Marka, S.; Marka, Z.; Marsee, M.; Martinez-Soler, I.; Maruyama, R.; Mayhew, F.; Mcnally, F.; Mead, J. V.; Meagher, K.; Mechbal, S.; Medina, A.; Meier, M.; Merckx, Y.; Merten, L.; Micallef, J.; Mitchell, J.; Montaruli, T.; Moore, R. W.; Morii, Y.; Morse, R.; Moulai, M.; Mukherjee, T.; Naab, R.; Nagai, R.; Nakos, M.; Naumann, U.; Necker, J.; Negi, A.; Neste, L.; Neumann, M.; Niederhausen, H.; Nisa, M. U.; Noda, K.; Noell, A.; Novikov, A.; Obertacke Pollmann, A.; O'Dell, V.; Oeyen, B.; Olivas, A.; Orsoe, R.; Osborn, J.; O'Sullivan, E.; Palusova, V.; Pandya, H.; Park, N.; Parker, G. K.; Paudel, E. N.; Paul, L.; Pérez De Los Heros, C.; Pernice, T.; Peterson, J.; Pizzuto, A.; Plum, M.; Pontén, A.; Popovych, Y.; Prado Rodriguez, M.; Pries, B.; Procter-Murphy, R.; Przybylski, G. T.; Raab, C.; Rack-Helleis, J.; Ravn, M.; Rawlins, K.; Rechav, Z.; Rehman, A.; Reichherzer, P.; Resconi, E.; Reusch, S.; Rhode, W.; Riedel, B.; Rifaie, A.; Roberts, E. J.; Robertson, S.; Rodan, S.; Roellinghoff, G.; Rongen, M.; Rosted, A.; Rott, C.; Ruhe, T.; Ruohan, L.; Ryckbosch, D.; Safa, I.; Saffer, J.; Salazar-Gallegos, D.; Sampathkumar, P.; Sandrock, A.; Santander, M.; Sarkar, S.; Sarkar, S.; Savelberg, J.; Savina, P.; Schaile, P.; Schaufel, M.; Schieler, H.; Schindler, S.; Schlickmann, L.; Schlüter, B.; Schlüter, F.; Schmeisser, N.; Schmidt, T.; Schneider, J.; Schröder, F. G.; Schumacher, L.; Sclafani, S.; Seckel, D.; Seikh, M.; Seo, M.; Seunarine, S.; Sevle Myhr, P.; Shah, R.; Shefali, S.; Shimizu, N.; Silva, M.; Skrzypek, B.; Smithers, B.; Snihur, R.; Soedingrekso, J.; Søgaard, A.; Soldin, D.; Soldin, P.; Sommani, G.; Spannfellner, C.; Spiczak, G. M.; Spiering, C.; Stamatikos, M.; Stanev, T.; Stezelberger, T.; Stürwald, T.; Stuttard, T.; Sullivan, G. W.; Taboada, I.; Ter-Antonyan, S.; Terliuk, A.; Thiesmeyer, M.; Thompson, W. G.; Thwaites, J.; Tilav, S.; Tollefson, K.; Tönnis, C.; Toscano, S.; Tosi, D.; Trettin, A.; Turcotte, R.; Twagirayezu, J. P.; Unland Elorrieta, M. A.; Upadhyay, A. K.; Upshaw, K.; Vaidyanathan, A.; Valtonen-Mattila, N.; Vandenbroucke, J.; Van Eijndhoven, N.; Vannerom, D.; Van Santen, J.; Vara, J.; Varsi, F.; Veitch-Michaelis, J.; Venugopal, M.; Vereecken, M.; Vergara Carrasco, S.; Verpoest, S.; Veske, D.; Vijai, A.; Walck, C.; Wang, A.; Weaver, C.; Weigel, P.; Weindl, A.; Weldert, J.; Wen, A. Y.; Wendt, C.; Werthebach, J.; Weyrauch, M.; Whitehorn, N.; Wiebusch, C. H.; Williams, D. R.; Witthaus, L.; Wolf, A.; Wolf, M.; Wrede, G.; Xu, X. W.; Yanez, J. P.; Yildizci, E.; Yoshida, S.; Young, R.; Yu, S.; Yuan, T.; Zhang, Z.; Zhelnin, P.; Zilberman, P.; Zimmerman, M. "Probing the Connection between IceCube Neutrinos and MOJAVE AGN," The Astrophysical Journal, 973, 97, 2024.

Abraham, Zulema; Beaklini, Pedro P. B.; Aleman, Isabel; Sahai, Raghvendra; Zijlstra, Albert; Akras, Stavros; Gonçalves, Denise R.; Ueta, Toshiya "ALMA Detection of Masers and Dasars in the Hydrogen Recombination Lines of the Planetary Nebula Mz3," The Astrophysical Journal, 974, 250, 2024.

Abraham, Zulema; Takeda, Larissa; Beaklini, Pedro P. B.; Diaz, Marcos; Page, Kim L.; Chomiuk, Laura; Linford, Justin D. "A two-component clumpy model for the shell evolution of classical novae: the case of V5668 Sgr," Monthly Notices of the Royal Astronomical Society, 527, 7482, 2024.

Aditya, J. N. H. S.; Yoon, Hyein; Allison, James R.; An, Tao; Chhetri, Rajan; Curran, Stephen J.; Darling, Jeremy; Emig, Kimberly L.; Glowacki, Marcin; Kerrison, Emily; Koribalski, Bärbel S.; Mahony, Elizabeth K.; Moss, Vanessa A.; Morgan, John; Sadler, Elaine M.; Soria, Roberto; Su, Renzhi; Weng, Simon; Whiting, Matthew "The FLASH pilot survey: an H I absorption search against MRC 1-Jy radio sources," Monthly Notices of the Royal Astronomical Society, 527, 8511, 2024.

Adscheid, Sylvia; Magnelli, Benjamin; Liu, Daizhong; Bertoldi, Frank; Delvecchio, Ivan; Gruppioni, Carlotta; Schinnerer, Eva; Traina, Alberto; Béthermin, Matthieu; Gkogkou, Athanasia "A^{3}COSMOS and A^{3}GOODSS: Continuum source catalogues and multi-band number counts," Astronomy and Astrophysics, 685, A1, 2024.

Agazie, G.; Antoniadis, J.; Anumarlapudi, A.; Archibald, A. M.; Arumugam, P.; Arumugam, S.; Arzoumanian, Z.; Askew, J.; Babak, S.; Bagchi, M.; Bailes, M.; Bak Nielsen, A.-S.; Baker, P. T.; Bassa, C. G.; Bathula, A.; Bécsy, B.; Berthereau, A.; Bhat, N. D. R.; Blecha, L.; Bonetti, M.; Bortolas, E.; Brazier, A.; Brook, P. R.; Burgay, M.; Burke-Spolaor, S.; Burnette, R.; Caballero, R. N.; Cameron, A.; Case, R.; Chalumeau, A.; Champion, D. J.; Chanlaridis, S.; Charisi, M.; Chatterjee, S.; Chatziioannou, K.; Cheeseboro, B. D.; Chen, S.; Chen, Z.-C.; Cognard, I.; Cohen, T.; Coles, W. A.; Cordes, J. M.; Cornish, N. J.; Crawford, F.; Cromartie, H. T.; Crowter, K.; Curyło, M.; Cutler, C. J.; Dai, S.; Dandapat, S.; Deb, D.; Decesar, M. E.; Degan, D.; Demorest, P. B.; Deng, H.; Desai, S.; Desvignes, G.; Dey, L.; Dhanda-Batra, N.; Di Marco, V.; Dolch, T.; Drachler, B.; Dwivedi, C.; Ellis, J. A.; Falxa, M.; Feng, Y.; Ferdman, R. D.; Ferrara, E. C.; Fiore, W.; Fonseca, E.; Franchini, A.; Freedman, G. E.; Gair, J. R.; Garver-Daniels, N.; Gentile, P. A.; Gersbach, K. A.; Glaser, J.; Good, D. C.; Goncharov, B.; Gopakumar, A.; Graikou, E.; Griessmeier, J.-M.; Guillemot, L.; Gültekin, K.; Guo, Y. J.; Gupta, Y.; Grunthal, K.; Hazboun, J. S.; Hisano, S.; Hobbs, G. B.; Hourihane, S.; Hu, H.; Iraci, F.; Islo, K.; Izquierdo-Villalba, D.; Jang, J.; Jawor, J.; Janssen, G. H.; Jennings, R. J.; Jessner, A.; Johnson, A. D.; Jones, M. L.; Joshi, B. C.; Kaiser, A. R.; Kaplan, D. L.; Kapur, A.; Kareem, F.; Karuppusamy, R.; Keane, E. F.; Keith, M. J.; Kelley, L. Z.; Kerr, M.; Key, J. S.; Kharbanda, D.; Kikunaga, T.; Klein, T. C.; Kolhe, N.; Kramer, M.; Krishnakumar, M. A.; Kulkarni, A.; Laal, N.; Lackeos, K.; Lam, M. T.; Lamb, W. G.; Larsen, B. B.; Lazio, T. J. W.; Lee, K. J.; Levin, Y.; Lewandowska, N.; Littenberg, T. B.; Liu, K.; Liu, T.; Liu, Y.; Lommen, A.; Lorimer, D. R.; Lower, M. E.; Luo, J.; Luo, R.; Lynch, R. S.; Lyne, A. G.; Ma, C.-P.; Maan, Y.; Madison, D. R.; Main, R. A.; Manchester, R. N.; Mandow, R.; Mattson, M. A.; Mcewen, A.; Mckee, J. W.; Mclaughlin, M. A.; Mcmann, N.; Meyers, B. W.; Meyers, P. M.; Mickaliger, M. B.; Miles, M.; Mingarelli, C. M. F.; Mitridate, A.; Natarajan, P.; Nathan, R. S.; Ng, C.; Nice, D. J.; Niţu, I. C.; Nobleson, K.; Ocker, S. K.; Olum, K. D.; Osłowski, S.; Paladi, A. K.; Parthasarathy, A.; Pennucci, T. T.; Perera, B. B. P.; Perrodin, D.; Petiteau, A.; Petrov, P.; Pol, N. S.; Porayko, N. K.; Possenti, A.; Prabu, T.; Quelquejay Leclere, H.; Radovan, H. A.; Rana, P.; Ransom, S. M.; Ray, P. S.; Reardon, D. J.; Rogers, A. F.; Romano, J. D.; Russell, C. J.; Samajdar, A.; Sanidas, S. A.; Sardesai, S. C.; Schmiedekamp, A.; Schmiedekamp, C.; Schmitz, K.; Schult, L.; Sesana, A.; Shaifullah, G.; Shannon, R. M.; Shapiro-Albert, B. J.; Siemens, X.; Simon, J.; Singha, J.; Siwek, M. S.; Speri, L.; Spiewak, R.; Srivastava, A.; Stairs, I. H.; Stappers, B. W.; Stinebring, D. R.; Stovall, K.; Sun, J. P.; Surnis, M.; Susarla, S. C.; Susobhanan, A.; Swiggum, J. K.; Takahashi, K.; Tarafdar, P.; Taylor, J.; Taylor, S. R.; Theureau, G.; Thrane, E.; Thyagarajan, N.; Tiburzi, C.; Toomey, L.; Turner, J. E.; Unal, C.; Vallisneri, M.; Van Der Wateren, E.; Van Haasteren, R.; Vecchio, A.; Venkatraman Krishnan, V.; Verbiest, J. P. W.; Vigeland, S. J.; Wahl, H. M.; Wang, S.; Wang, Q.; Witt, C. A.; Wang, J.; Wang, L.; Wayt, K. E.; Wu, Z.; Young, O.; Zhang, L.; Zhang, S.; Zhu, X.-J.; Zic, A.; International Pulsar Timing Array Collaboration "Comparing Recent Pulsar Timing Array Results on the Nanohertz Stochastic Gravitational-wave Background," The Astrophysical Journal, 966, 105, 2024.

Agazie, Gabriella; Anumarlapudi, Akash; Archibald, Anne M.; Arzoumanian, Zaven; Baier, Jeremy; Baker, Paul T.; Bécsy, Bence; Blecha, Laura; Brazier, Adam; Brook, Paul R.; Burke-Spolaor, Sarah; Burnette, Rand; Case, Robin; Casey-Clyde, J. Andrew; Charisi, Maria; Chatterjee, Shami; Cohen, Tyler; Cordes, James M.; Cornish, Neil J.; Crawford, Fronefield; Cromartie, H. Thankful; Crowter, Kathryn; Decesar, Megan E.; Degan, Dallas; Demorest, Paul B.; Dolch, Timothy; Drachler, Brendan; Ferrara, Elizabeth C.; Fiore, William; Fonseca, Emmanuel; Freedman, Gabriel E.; Garver-Daniels, Nate;

Gentile, Peter A.; Glaser, Joseph; Good, Deborah C.; Gültekin, Kayhan; Hazboun, Jeffrey S.; Jennings, Ross J.; Johnson, Aaron D.; Jones, Megan L.; Kaiser, Andrew R.; Kaplan, David L.; Kelley, Luke Zoltan; Kerr, Matthew; Key, Joey S.; Laal, Nima; Lam, Michael T.; Lamb, William G.; Lazio, T. Joseph W.; Lewandowska, Natalia; Liu, Tingting; Lorimer, Duncan R.; Luo, Jing; Lynch, Ryan S.; Ma, Chung-Pei; Madison, Dustin R.; Mcewen, Alexander; Mckee, James W.; Mclaughlin, Maura A.; Mcmann, Natasha; Meyers, Bradley W.; Mingarelli, Chiara M. F.; Mitridate, Andrea; Natarajan, Priyamvada; Ng, Cherry; Nice, David J.; Ocker, Stella Koch; Olum, Ken D.; Pennucci, Timothy T.; Perera, Benetge B. P.; Pol, Nihan S.; Radovan, Henri A.; Ransom, Scott M.; Ray, Paul S.; Romano, Joseph D.; Saffer, Alexander; Sardesai, Shashwat C.; Schmiedekamp, Ann; Schmiedekamp, Carl; Schmitz, Kai; Shapiro-Albert, Brent J.; Siemens, Xavier; Simon, Joseph; Siwek, Magdalena S.; Stairs, Ingrid H.; Stinebring, Daniel R.; Stovall, Kevin; Sun, Jerry P.; Susobhanan, Abhimanyu; Swiggum, Joseph K.; Taylor, Jacob A.; Taylor, Stephen R.; Turner, Jacob E.; Unal, Caner; Vallisneri, Michele; Vigeland, Sarah J.; Wahl, Haley M.; Witt, Caitlin A.; Young, Olivia; Nanograv Collaboration "The NANOGrav 15 yr Data Set: Search for Transverse Polarization Modes in the Gravitational-wave Background," The Astrophysical Journal, 964, L14, 2024.

Agazie, Gabriella; Arzoumanian, Zaven; Baker, Paul T.; Bécsy, Bence; Blecha, Laura; Blumer, Harsha; Brazier, Adam; Brook, Paul R.; Burke-Spolaor, Sarah; Burnette, Rand; Case, Robin; Casey-Clyde, J. Andrew; Charisi, Maria; Chatterjee, Shami; Cohen, Tyler; Cordes, James M.; Cornish, Neil J.; Crawford, Fronefield; Cromartie, H. Thankful; Decesar, Megan E.; Degan, Dallas; Demorest, Paul B.; Dolch, Timothy; Drachler, Brendan; Ellis, Justin A.; Ferdman, Robert D.; Ferrara, Elizabeth C.; Fiore, William; Fonseca, Emmanuel; Freedman, Gabriel E.; Garver-Daniels, Nate; Gentile, Peter A.; Glaser, Joseph; Good, Deborah C.; Gültekin, Kayhan; Hazboun, Jeffrey S.; Jennings, Ross J.; Johnson, Aaron D.; Jones, Megan L.; Kaiser, Andrew R.; Kaplan, David L.; Kelley, Luke Zoltan; Key, Joey S.; Laal, Nima; Lam, Michael T.; Lamb, William G.; W. Lazio, T. Joseph; Lewandowska, Natalia; Liu, Tingting; Lorimer, Duncan R.; Luo, Jing; Lynch, Ryan S.; Ma, Chung-Pei; Madison, Dustin R.; Mcewen, Alexander; Mckee, James W.; Mclaughlin, Maura A.; Meyers, Patrick M.; Mingarelli, Chiara M. F.; Mitridate, Andrea; Ng, Cherry; Nice, David J.; Ocker, Stella Koch; Olum, Ken D.; Pennucci, Timothy T.; Pol, Nihan S.; Ransom, Scott M.; Ray, Paul S.; Romano, Joseph D.; Sardesai, Shashwat C.; Schmitz, Kai; Siemens, Xavier; Simon, Joseph; Siwek, Magdalena S.; Sosa Fiscella, Sophia V.; Spiewak, Renée; Stairs, Ingrid H.; Stinebring, Daniel R.; Stovall, Kevin; Sun, Jerry P.; Swiggum, Joseph K.; Taylor, Jacob; Taylor, Stephen R.; Turner, Jacob E.; Unal, Caner; Vallisneri, Michele; Vigeland, Sarah J.; Wahl, Haley M.; Witt, Caitlin A.; Young, Olivia; The Nanograv Collaboration "The NANOGrav 12.5 yr Data Set: Search for Gravitational Wave Memory," The Astrophysical Journal, 963, 61, 2024.

Agazie, Gabriella; Arzoumanian, Zaven; Baker, Paul T.; Bécsy, Bence; Blecha, Laura; Blumer, Harsha; Brazier, Adam; Brook, Paul R.; Burke-Spolaor, Sarah; Casey-Clyde, J. Andrew; Charisi, Maria; Chatterjee, Shami; Cheeseboro, Belinda D.; Cohen, Tyler; Cordes, James M.; Cornish, Neil J.; Crawford, Fronefield; Cromartie, H. Thankful; Decesar, Megan E.; Demorest, Paul B.; Dey, Lankeswar; Dolch, Timothy; Ellis, Justin A.; Ferdman, Robert D.; Ferrara, Elizabeth C.; Fiore, William; Fonseca, Emmanuel; Freedman, Gabriel E.; Garver-Daniels, Nate; Gentile, Peter A.; Glaser, Joseph; Good, Deborah C.; Gopakumar, Achamveedu; Gültekin, Kayhan; Hazboun, Jeffrey S.; Jennings, Ross J.; Johnson, Aaron D.; Jones, Megan L.; Kaiser, Andrew R.; Kaplan, David L.; Kelley, Luke Zoltan; Key, Joey S.; Laal, Nima; Lam, Michael T.; Lamb, William G.; W. Lazio, T. Joseph; Lewandowska, Natalia; Liu, Tingting; Lorimer, Duncan R.; Luo, Jing; Lynch, Ryan S.; Ma, Chung-Pei; Madison, Dustin R.; Mcewen, Alexander; Mckee, James W.; Mclaughlin, Maura A.; Meyers, Patrick M.; Mingarelli, Chiara M. F.; Mitridate, Andrea; Ng, Cherry; Nice, David J.; Ocker, Stella Koch; Olum, Ken D.; Pennucci, Timothy T.; Pol, Nihan S.; Radovan, Henri A.; Ransom, Scott M.; Ray, Paul S.; Romano, Joseph D.; Sardesai, Shashwat C.; Schmitz, Kai; Siemens, Xavier; Simon, Joseph; Siwek, Magdalena S.; Sosa Fiscella, Sophia V.; Spiewak, Renée; Stairs, Ingrid H.; Stinebring, Daniel R.; Stovall, Kevin; Susobhanan, Abhimanyu; Swiggum, Joseph K.; Taylor, Stephen R.; Turner, Jacob E.; Unal, Caner; Vallisneri, Michele; Vigeland, Sarah J.; Witt, Caitlin A.; Young, Olivia; Nanograv Collaboration "The NANOGrav 12.5 yr Data Set: A Computationally Efficient Eccentric Binary Search Pipeline and Constraints on an Eccentric Supermassive Binary Candidate in 3C 66B," The Astrophysical Journal, 963, 144, 2024.

Ai, Tsung-Han; Liu, Chun-Fan; Shang, Hsien; Johnstone, Doug; Krasnopolsky, Ruben "A Unified Model for Bipolar Outflows from Young Stars: Kinematic and Mixing Structures in HH 30," The Astrophysical Journal, 964, 147, 2024.

Alaguero, Antoine; Cuello, Nicolás; Ménard, François; Ceppi, Simone; Ribas, Álvaro; Nealon, Rebecca; Vioque, Miguel; Izquierdo, Andrés; Miley, James; Macías, Enrique; Price, Daniel J. "V892 Tau: A tidally perturbed circumbinary disc in a triple stellar system," Astronomy and Astrophysics, 687, A311, 2024.

Alatalo, Katherine; Petric, Andreea O.; Lanz, Lauranne; Rowlands, Kate; U, Vivian; Larson, Kirsten L.; Armus, Lee; Barcos-Muñoz, Loreto; Evans, Aaron S.; Koda, Jin; Luo, Yuanze; Medling, Anne M.; Nyland, Kristina E.; Otter, Justin A.; Patil, Pallavi; Peñaloza, Fernando; Salim, Diane; Sanders, David B.; Sazonova, Elizaveta; Skarbinski, Maya; Song, Yiqing; Treister, Ezequiel; Urry, C. Meg "Characterizing the Molecular Gas in Infrared Bright Galaxies with CARMA," The Astrophysical Journal, 975, 241, 2024.

Albert, A.; Alves, S.; André, M.; Ardid, M.; Ardid, S.; Aubert, J.-J.; Aublin, J.; Baret, B.; Basa, S.; Becherini, Y.; Belhorma, B.; Bendahman, M.; Benfenati, F.; Bertin, V.; Biagi, S.; Bissinger, M.; Boumaaza, J.; Bouta, M.; Bouwhuis, M. C.; Brânzaş, H.; Bruijn, R.; Brunner, J.; Busto, J.; Caiffi, B.; Calvo, D.; Campion, S.; Capone, A.; Caramete, L.; Carenini, F.; Carr, J.; Carretero, V.; Celli, S.; Cerisy, L.; Chabab, M.; Cherkaoui El Moursli, R.; Chiarusi, T.; Circella, M.; Coelho, J. A. B.; Coleiro, A.; Coniglione, R.; Coyle, P.; Creusot, A.; Cruz, A. S. M.; Díaz, A. F.; De Martino, B.; Distefano, C.; Di Palma, I.; Domi, A.; Donzaud, C.; Dornic, D.; Drouhin, D.; Eberl, T.; Van Eeden, T.; Van Eijk, D.; El Hedri, S.; El Khayati, N.; Enzenhöfer, A.; Fermani, P.; Ferrara, G.; Filippini, F.; Fusco, L.; Gagliardini, S.; García, J.; Gatius Oliver, C.; Gay, P.; Geißelbrecht, N.; Glotin, H.; Gozzini, R.; Gracia Ruiz, R.; Graf, K.; Guidi, C.; Haegel, L.; Hallmann, S.; Van Haren, H.; Heijboer, A. J.; Hello, Y.; Hernández-Rey, J. J.; Hößl, J.; Hofestädt, J.; Huang, F.; Illuminati, G.; James, C. W.; Jisse-Jung, B.; De Jong, M.; De Jong, P.; Kadler, M.; Kalekin, O.; Katz, U.; Kouchner, A.; Kovalev, Y. A.; Kovalev, Y. Y.; Kreykenbohm, I.; Kulikovskiy, V.; Lahmann, R.; Lamoureux, M.; Lazo, A.; Lefèvre, D.; Leonora, E.; Levi, G.; Le Stum, S.; Lopez-Coto, D.; Loucatos, S.; Maderer, L.; Manczak, J.; Marcelin, M.; Margiotta, A.; Marinelli, A.; Martínez-Mora, J. A.; Migliozzi, P.; Moussa, A.; Muller, R.; Navas, S.; Nezri, E.; Fearraigh, B. Ó.; Oukacha, E.; Păun, A.; Păvălaş, G. E.; Peña-Martínez, S.; Perrin-Terrin, M.; Pestel, V.; Piattelli, P.; Plavin, A.; Poirè, C.; Popa, V.; Pradier, T.; Pushkarev, A.; Randazzo, N.; Real, D.; Reck, S.; Riccobene, G.; Romanov, A.; Sánchez-Losa, A.; Saina, A.; Salesa Greus, F.; Samtleben, D. F. E.; Sanguineti, M.; Sapienza, P.; Schnabel, J.; Schumann, J.; Schüssler, F.; Seneca, J.; Spurio, M.; Stolarczyk, Th.; Taiuti, M.; Tayalati, Y.; Tingay, S. J.; Troitsky, S.; Vallage, B.; Vannoye, G.; Van Elewyck, V.; Viola, S.; Vivolo, D.; Wilms, J.; Zavatarelli, S.; Zegarelli, A.; Zornoza, J. D.; Zúñiga, J.; (Antares Collaboration); Hovatta, T.; Kiehlmann, S.; Liodakis, I.; Pavlidou, V.; Readhead, A. C. S.; (Ovro Collaboration) "Searches for Neutrinos in the Direction of Radio-bright Blazars with the ANTARES Telescope," The Astrophysical Journal, 964, 3, 2024.

Algaba, J. C.; Baloković, M.; Chandra, S.; Cheong, W.-Y.; Cui, Y.-Z.; D'Ammando, F.; Falcone, A. D.; Ford, N. M.; Giroletti, M.; Goddi, C.; Gurwell, M. A.; Hada, K.; Haggard, D.; Jorstad, S.; Kaur, A.; Kawashima, T.; Kerby, S.; Kim, J.-Y.; Kino, M.; Kravchenko, E. V.; Lee, S.-S.; Lu, R.-S.; Markoff, S.; Michail, J.; Neilsen, J.; Nowak, M. A.; Principe, G.; Ramakrishnan, V.; Ripperda, B.; Sasada, M.; Savchenko, S. S.; Sheridan, C.; Akiyama, K.; Alberdi, A.; Alef, W.; Anantua, R.; Asada, K.; Azulay, R.; Bach, U.; Baczko, A.-K.; Ball, D.; Bandyopadhyay, B.; Barrett, J.; Bauböck, M.; Benson, B. A.; Bintley, D.; Lackburn, L.; Blundell, R.; Bouman, K. L.; Bower, G. C.; Boyce, H.; Bremer, M.; Brissenden, R.; Britzen, S.; Broderick, A. E.; Broguiere, D.; Bronzwaer, T.; Bustamante, S.; Carlstrom, J. E.; Chael, A.; Chan, C. -K.; Chang, D. O.; Chatterjee, K.; Chatterjee, S.; Chen, M.-T.; Chen, Y.; Cheng, X.; Cho, I.; Christian, P.; Conroy, N. S.; Conway, J. E.; Crawford, T. M.; Crew, G. B.; Cruz-Osorio, A.; Dahale, R.; Davelaar, J.; De Laurentis, M.; Deane, R.; Dempsey, J.; Desvignes, G.; Dexter, J.; Dhruv, V.; Dihingia, I. K.; Doeleman, S. S.; Dzib, S. A.; Eatough, R. P.; Emami, R.; Falcke, H.; Farah, J.; Fish, V. L.; Fomalont, E.; Ford, H. A.; Foschi, M.; Fraga-Encinas, R.; Freeman, W. T.; Friberg, P.; Fromm, C. M.; Fuentes, A.; Galison, P.; Gammie, C. F.; García, R.; Gentaz, O.; Georgiev, B.; Gold, R.; Gómez-Ruiz, A. I.; Gómez, J. L.; Gu, M.; Hesper, R.; Heumann, D.; Ho, L. C.; Ho, P.; Honma, M.; Huang, C. -W. L.; Huang, L.; Hughes, D. H.; Ikeda, S.; Impellizzeri, C. M. V.; Inoue, M.; Issaoun, S.; James, D. J.; Jannuzi, B. T.; Janssen, M.; Jeter, B.; Jiang, W.; Jiménez-Rosales, A.; Johnson, M. D.; Jones, A. C.; Joshi, A. V.; Jung, T.; Karuppusamy, R.; Keating, G. K.; Kettenis, M.; Kim, D.-J.; Kim, J.; Kim, J.; Koay, J. Y.; Kocherlakota, P.; Kofuji, Y.; Koch, P. M.; Koyama, S.; Kramer, C.; Kramer, J. A.; Kramer, M.; Krichbaum, T. P.; Kuo, C.-Y.; La Bella, N.; Levis, A.; Li, Z.; Lico, R.; Lindahl, G.; Lindqvist, M.; Lisakov, M.; Liu, J.; Liu, K.; Liuzzo, E.; Lo, W.-P.; Lobanov, A. P.; Loinard, L.; Lonsdale, C. J.; Lowitz, A. E.; Macdonald, N. R.; Mao, J.; Marchili, N.; Marrone, D. P.; Marscher, A. P.; Martí-Vidal, I.; Matsushita, S.; Matthews, L. D.; Medeiros, L.; Menten, K. M.; Mizuno, I.; Mizuno, Y.; Montgomery, J.; Moran, J. M.; Moriyama, K.; Moscibrodzka, M.; Mulaudzi, W.; Müller, C.; Müller, H.; Mus, A.; Musoke, G.; Myserlis, I.; Nagai, H.; Nagar, N. M.; Nair, D. G.; Nakamura, M.; Narayanan, G.; Natarajan, I.; Nathanail, A.; Navarro Fuentes, S.; Ni, C.; Oh, J.; Okino, H.; Olivares, H.; Oyama, T.; Özel, F.; Palumbo, D. C. M.; Filippos Paraschos, G.; Park, J.; Parsons, H.; Patel, N.; Pen, U.-L.; Pesce, D. W.; Piétu, V.; Popstefanija, A.; Porth, O.; Prather, B.; Psaltis, D.; Pu, H.-Y.; Rao, R.; Rawlings, M. G.; Raymond, A. W.; Rezzolla, L.; Ricarte, A.; Roelofs, F.; Romero-Cañizales, C.; Ros, E.; Roshanineshat, A.; Rottmann, H.; Roy, A. L.; Ruiz, I.; Ruszczyk, C.; Rygl, K. L. J.; Sánchez, S.; Sánchez-Argüelles, D.; Sánchez-Portal, M.; Satapathy, K.; Savolainen, T.; Schloerb, F. P.; Schonfeld, J.; Schuster, K.-F.; Shao, L.; Shen, Z.; Small, D.; Sohn, B. W.; Soohoo, J.; Sosapanta Salas, L. D.; Souccar, K.; Stanway, J. S.; Sun, H.; Tazaki, F.; Tetarenko, A. J.; Tiede, P.; Tilanus, R. P. J.; Titus, M.; Toma, K.; Torne, P.; Toscano, T.; Traianou, E.; Trent, T.; Trippe, S.; Turk, M.; Van Bemmel, I.; Van Langevelde, H. J.; Van Rossum, D. R.; Vos, J.; Wagner, J.; Ward-Thompson, D.; Wardle, J.; Washington, J. E.; Weintroub, J.; Wharton, R.; Wielgus, M.; Wiik, K.; Witzel, G.; Wondrak, M. F.; Wong, G. N.; Wu, Q.; Yadlapalli, N.; Yamaguchi, P.; Yfantis, A.; Yoon, D.; Young, A.; Younsi, Z.; Yu, W.; Yuan, F.; Yuan, Y.-F.; Zensus, J. A.; Zhang, S.; Zhao, G.-Y.; Zhao, S.-S.; Bellazzini, R.; Berenji, B.; Bissaldi, E.; Blandford, R. D.; Bonino, R.;

Bruel, P.; Cameron, R. A.; Caraveo, P. A.; Cavazzuti, E.; Cheung, C. C.; Ciprini, S.; Cristarella Orestano, P.; Cutini, S.; Di Lalla, N.; Dinesh, A.; Di Venere, L.; Domínguez, A.; Fegan, S. J.; Franckowiak, A.; Fukazawa, Y.; Fusco, P.; Gargano, F.; Gasbarra, C.; Germani, S.; Giliberti, M.; Grenier, I. A.; Hays, E.; Horan, D.; Kuss, M.; Larsson, S.; Liodakis, I.; Longo, F.; Loparco, F.; Lovellette, M. N.; Maldera, S.; Mazziotta, M. N.; Mereu, I.; Michelson, P. F.; Mirabal, N.; Mizuno, T.; Monzani, M. E.; Morselli, A.; Negro, M.; Omodei, N.; Orlando, E.; Persic, M.; Rainò, S.; Rani, B.; Reimer, A.; Reimer, O.; Sánchez-Conde, M.; Saz Parkinson, P. M.; Sgrò, C.; Siskind, E. J.; Spinelli, P.; Suson, D. J.; Tajima, H.; Torres, D. F.; Zaharijas, G.; Aharonian, F.; Ait Benkhali, F.; Aschersleben, J.; Ashkar, H.; Backes, M.; Barbosa Martins, V.; Batzofin, R.; Becherini, Y.; Berge, D.; Böttcher, M.; Boisson, C.; Bolmont, J.; De Bony De Lavergne, M.; Borowska, J.; Bouyahiaoui, M.; Bradascio, F.; Brose, R.; Brown, A.; Bruno, B.; Bulik, T.; Burger-Scheidlin, C.; Casanova, S.; Cecil, R.; Celic, J.; Cerruti, M.; Chand, T.; Chen, A.; Chibueze, J.; Chibueze, O.; Cotter, G.; Damascene Mbarubucyeye, J.; Devin, J.; Djuvsland, J.; Dmytriiev, A.; Einecke, S.; Ernenwein, J.-P.; Feijen, K.; Fontaine, G.; Funk, S.; Gabici, S.; Glawion, D.; Glicenstein, J. F.; Goswami, P.; Grolleron, G.; Haerer, L.; Heß, B.; Holch, T. L.; Holler, M.; Horns, D.; Huang, Zhiqiu; Jamrozy, M.; Jankowsky, F.; Jung-Richardt, I.; Kasai, E.; Katarzyński, K.; Khatoon, R.; Khélifi, B.; Kluźniak, W.; Komin, Nu.; Kosack, K.; Kundu, A.; Lang, R. G.; Le Stum, S.; Leitl, F.; Lemière, A.; Lemoine-Goumard, M.; Lenain, J.-P.; Leuschner, F.; Luashvili, A.; Mackey, J.; Malyshev, D.; Martí-Devesa, G.; Marx, R.; Meyer, M.; Mitchell, A.; Moderski, R.; Moghadam, M. O.; Mohrmann, L.; Montanari, A.; Moulin, E.; De Naurois, M.; Niemiec, J.; O'Brien, P.; Ohm, S.; De Ona Wilhelmi, E.; Ostrowski, M.; Panny, S.; Panter, M.; Pensec, U.; Pita, S.; Pühlhofer, G.; Quirrenbach, A.; Ravikularaman, S.; Reimer, A.; Reimer, O.; Reville, B.; Reis, I.; Ren, H.; Rieger, F.; Roellinghoff, G.; Rudak, B.; Ruiz-Velasco, E.; Sabri, K.; Sahakian, V.; Salzmann, H.; Santangelo, A.; Sasaki, M.; Schäfer, J.; Schüssler, F.; Schutte, H. M.; Shapopi, J. N. S.; Sharma, A.; Sol, H.; Spencer, S.; Stawarz, Ł.; Steppa, C.; Streil, K.; Suzuki, H.; Takahashi, T.; Tanaka, T.; Taylor, A. M.; Terrier, R.; Tluczykont, M.; Tsirou, M.; Van Eldik, C.; Vecchi, M.; Wach, T.; Wagner, S. J.; Wierzcholska, A.; Zacharias, M.; Zdziarski, A. A.; Zech, A.; Żywucka, N.; Abe, S.; Abhir, J.; Abhishek, A.; Acciari, V. A.; Aguasca-Cabot, A.; Agudo, I.; Aniello, T.; Ansoldi, S.; Antonelli, L. A.; Arbet Engels, A.; Arcaro, C.; Artero, M.; Asano, K.; Babić, A.; Barres De Almeida, U.; Barrio, J. A.; Batković, I.; Bautista, A.; Baxter, J.; Becerra González, J.; Bednarek, W.; Bernardini, E.; Bernete, J.; Berti, A.; Besenrieder, J.; Bigongiari, C.; Biland, A.; Blanch, O.; Bonnoli, G.; Bošnjak, Ž.; Bronzini, E.; Burelli, I.; Busetto, G.; Campoy-Ordaz, A.; Carosi, A.; Carosi, R.; Carretero-Castrillo, M.; Castro-Tirado, A. J.; Cerasole, D.; Ceribella, G.; Chai, Y.; Cifuentes, A.; Colombo, E.; Contreras, J. L.; Cortina, J.; Covino, S.; D'Amico, G.; D'Elia, V.; Da Vela, P.; Dazzi, F.; De Angelis, A.; De Lotto, B.; De Menezes, R.; Delfino, M.; Delgado, J.; Delgado Mendez, C.; Di Pierro, F.; Di Tria, R.; Di Venere, L.; Dominis Prester, D.; Donini, A.; Dorner, D.; Doro, M.; Elsaesser, D.; Escudero, J.; Fariña, L.; Fattorini, A.; Foffano, L.; Font, L.; Fröse, S.; Fukami, S.; Fukazawa, Y.; García López, R. J.; Garczarczyk, M.; Gasparyan, S.; Gaug, M.; Giesbrecht Paiva, J. G.; Giglietto, N.; Giordano, F.; Gliwny, P.; Godinović, N.; Gradetzke, T.; Grau, R.; Green, D.; Green, J. G.; Günther, P.; Hadasch, D.; Hahn, A.; Hassan, T.; Heckmann, L.; Herrera Llorente, J.; Hrupec, D.; Imazawa, R.; Ishio, K.; Jiménez Martínez, I.; Jormanainen, J.; Kayanoki, T.; Kerszberg, D.; Kluge, G. W.; Kobayashi, Y.; Kouch, P. M.; Kubo, H.; Kushida, J.; Láinez, M.; Lamastra, A.; Leone, F.; Lindfors, E.; Lombardi, S.; López-Coto, R.; López-Moya, M.; López-Oramas, A.; Loporchio, S.; Lorini, A.; Lyard, E.; Machado De Oliveira Fraga, B.; Majumdar, P.; Makariev, M.; Maneva, G.; Manganaro, M.; Mangano, S.; Mannheim, K.; Mariotti, M.; Martínez, M.; Martínez-Chicharro, M.; Mas-Aguilar, A.; Mazin, D.; Menchiari, S.; Mender, S.; Miceli, D.; Miener, T.; Miranda, J. M.; Mirzoyan, R.; Molero González, M.; Molina, E.; Mondal, H. A.; Moralejo, A.; Morcuende, D.; Nakamori, T.; Nanci, C.; Neustroev, V.; Nickel, L.; Nievas Rosillo, M.; Nigro, C.; Nikolić, L.; Nilsson, K.; Nishijima, K.; Njoh Ekoume, T.; Noda, K.; Nozaki, S.; Ohtani, Y.; Okumura, A.; Otero-Santos, J.; Paiano, S.; Paneque, D.; Paoletti, R.; Paredes, J. M.; Peresano, M.; Persic, M.; Pihet, M.; Pirola, G.; Podobnik, F.; Prada Moroni, P. G.; Prandini, E.; Priyadarshi, C.; Ribó, M.; Rico, J.; Righi, C.; Sahakyan, N.; Saito, T.; Saturni, F. G.; Schmidt, K.; Schmuckermaier, F.; Schubert, J. L.; Schweizer, T.; Sciaccaluga, A.; Silvestri, G.; Sitarek, J.; Sliusar, V.; Sobczynska, D.; Spolon, A.; Stamerra, A.; Strišković, J.; Strom, D.; Strzys, M.; Suda, Y.; Suutarinen, S.; Tajima, H.; Takahashi, M.; Takeishi, R.; Tavecchio, F.; Temnikov, P.; Terauchi, K.; Terzić, T.; Teshima, M.; Truzzi, S.; Tutone, A.; Ubach, S.; Van Scherpenberg, J.; Vazquez Acosta, M.; Ventura, S.; Verna, G.; Viale, I.; Vigorito, C. F.; Vitale, V.; Vovk, I.; Walter, R.; Will, M.; Wunderlich, C.; Yamamoto, T.; Acharyya, A.; Adams, C. B.; Bangale, P.; Bartkoske, J. T.; Benbow, W.; Christiansen, J. L.; Duerr, A.; Errando, M.; Feng, Q.; Foote, J.; Fortson, L.; Furniss, A.; Hanlon, W.; Hervet, O.; Hinrichs, C. E.; Holder, J.; Humensky, T. B.; Jin, W.; Johnson, M. N.; Kaaret, P.; Kertzman, M.; Kieda, D.; Kleiner, T. K.; Korzoun, N.; Krennrich, F.; Kumar, S.; Lang, M. J.; Lundy, M.; Maier, G.; Mcgrath, C. E.; Millard, M. J.; Mooney, C. L.; Moriarty, P.; Mukherjee, R.; Ning, W.; O'Brien, S.; Ong, R. A.; Pohl, M.; Pueschel, E.; Quinn, J.; Ragan, K.; Reynolds, P. T.; Ribeiro, D.; Roache, E.; Ryan, J. L.; Sadeh, I.; Saha, L.; Santander, M.; Sembroski, G. H.; Shang, R.; Splettstoesser, M.; Talluri, A. K.; Tucci, J. V.; Valverde, J.; Vassiliev, V. V.; Williams, D. A.; Wong, S. L.; Chen, Z.; Cui, L.; Hirota, T.; Li, B.; Li, G.; Liu, Q.; Liu, X.; Liu, Z.; Ma, J.; Niinuma, K.; Ro, H.; Sakai, N.; Sawada-Satoh, S.; Wajima, K.; Wang, J.; Wang, N.; Xia, B.; Yan, H.; Yonekura, Y.; Zhang, H.; Zhao, R.; Zhong, W. "Broadband multi-wavelength properties of M87 during the 2018 EHT campaign including a very high energy flaring episode," Astronomy and Astrophysics, 692, A140, 2024.

Algera, Hiddo S. B.; Inami, Hanae; De Looze, Ilse; Ferrara, Andrea; Hirashita, Hiroyuki; Aravena, Manuel; Bakx, Tom; Bouwens, Rychard; Bowler, Rebecca A. A.; Da Cunha, Elisabete; Dayal, Pratika; Fudamoto, Yoshinobu; Hodge, Jacqueline; Hygate, Alexander; Van Leeuwen, Ivana; Nanayakkara, Themiya; Palla, Marco; Pallottini, Andrea; Rowland, Lucie; Smit, Renske; Sommovigo, Laura; Stefanon, Mauro; Vijayan, Aswin P.; Van Der Werf, Paul "Accurate simultaneous constraints on the dust mass, temperature, and emissivity index of a galaxy at redshift 7.31," Monthly Notices of the Royal Astronomical Society, 533, 3098, 2024.

Algera, Hiddo S. B.; Inami, Hanae; Sommovigo, Laura; Fudamoto, Yoshinobu; Schneider, Raffaella; Graziani, Luca; Dayal, Pratika; Bouwens, Rychard; Aravena, Manuel; Da Cunha, Elisabete; Ferrara, Andrea; Hygate, Alexander P. S.; Van Leeuwen, Ivana; De Looze, Ilse; Palla, Marco; Pallottini, Andrea; Smit, Renske; Stefanon, Mauro; Topping, Michael; Van Der Werf, Paul P. "Cold dust and low [O III]/[C II] ratios: an evolved star-forming population at redshift 7," Monthly Notices of the Royal Astronomical Society, 527, 6867, 2024.

Allen, Veronica; Cordiner, Martin A.; Adande, Gilles; Charnley, Steven B.; Kuan, Yi-Jehng; Wirström, Eva "High-resolution Study of the Outflow Activity and Chemical Environment of Chamaeleon-MMS1," The Astrophysical Journal, 971, 187, 2024.

Allingham, David; Jackson, James Michael; Hogge, Taylor; Whitaker, John Scott; Patterson, Philippa; Killerby-Smith, Nicholas; Askew, Jacob; Vandenberg, Thomas "The Curated ATCA Census of High-Mass Clumps (CACHMC) Legacy Survey," Publications of the Astronomical Society of Australia, 41, e079, 2024.

Alonso, Elena R.; Insausti, Aran; Kolesniková, Lucie; León, Iker; Mcguire, Brett A.; Shingledecker, Christopher N.; Agúndez, Marcelino; Cernicharo, José; Rivilla, Víctor M.; Cabezas, Carlos; Jiménez-Serra, Izaskun; Martín-Pintado, Jesús; Guillemin, Jean-Claude "Synthesis and Spectroscopic Characterization of Interstellar Candidate Ethynyl Thiocyanate: HCCSCN," The Astrophysical Journal, 976, 95, 2024.

Alsaberi, Rami Z. E.; Filipović, M. D.; Dai, S.; Sano, H.; Kothes, R.; Payne, J. L.; Bozzetto, L. M.; Brose, R.; Collischon, C.; Crawford, E. J.; Haberl, F.; Hill, T.; Kavanagh, P. J.; Knies, J.; Leahy, D.; Macgregor, P. J.; Maggi, P.; Maitra, C.; Manojlović, P.; Martín, S.; Matthew, C.; Ralph, N. O.; Rowell, G.; Ruiter, A. J.; Sasaki, M.; Seitenzahl, I. R.; Tokuda, K.; Tothill, N. F. H.; Urošević, D.; Van Loon, J. Th; Velović, V.; Vogt, F. P. A. "ATCA study of Small Magellanic Cloud supernova remnant 1E 0102.2-7219," Monthly Notices of the Royal Astronomical Society, 527, 1444, 2024.

Álvarez-Gutiérrez, R. H.; Stutz, A. M.; Sandoval-Garrido, N.; Louvet, F.; Motte, F.; Galván-Madrid, R.; Cunningham, N.; Sanhueza, P.; Bonfand, M.; Bontemps, S.; Gusdorf, A.; Ginsburg, A.; Csengeri, T.; Reyes, S. D.; Salinas, J.; Baug, T.; Bronfman, L.; Busquet, G.; Díaz-González, D. J.; Fernandez-Lopez, M.; Guzmán, A.; Koley, A.; Liu, H.-L.; Olguin, F. A.; Valeille-Manet, M.; Wyrowski, F. "ALMA-IMF: XIII. N_2H^+ kinematic analysis of the intermediate protocluster G353.41," Astronomy and Astrophysics, 689, A74, 2024.

An, Fangxia; Vaccari, M.; Best, P. N.; Ocran, E. F.; Ishwara-Chandra, C. H.; Taylor, A. R.; Leslie, S. K.; Röttgering, H. J. A.; Kondapally, R.; Haskell, Paul; Collier, J. D.; Bonato, M. "Radio spectral properties of star-forming galaxies between 150 and 5000 MHz in the ELAIS-N1 field," Monthly Notices of the Royal Astronomical Society, 528, 5346, 2024.

Andati, Lexy A. L.; Baidoo, Lerato M.; Ramaila, Athanaseus J. T.; Smirnov, Oleg M.; Makhathini, Sphesihle; Perley, Richard A. "A spectropolarimetric study of the radio galaxy Pictor A using MeerKAT," Monthly Notices of the Royal Astronomical Society, 529, 1626, 2024.

Anderson, Dana E.; Cleeves, L. Ilsedore; Blake, Geoffrey A.; Qi, Chunhua; Bergin, Edwin A.; Carpenter, John M.; Schwarz, Kamber R.; Thilenius, Claire; Zhang, Ke "Molecular Gas Tracers in Young and Old Protoplanetary Disks," The Astrophysical Journal, 966, 84, 2024.

Anderson, G. E.; Schroeder, G.; Van Der Horst, A. J.; Rhodes, L.; Rowlinson, A.; Bahramian, A.; Chastain, S. I.; Gompertz, B. P.; Hancock, P. J.; Laskar, T.; Leung, J. K.; Wijers, R. A. M. J. "The Early Radio Afterglow of Short GRB 230217A," The Astrophysical Journal, 975, L13, 2024.

Anderson, L. D.; Luisi, Matteo; Liu, B.; Linville, Dylan J.; Benjamin, Robert A.; Hurley-Walker, Natasha; Mcclure-Griffiths, N. M.; Zucker, Catherine "The Galactic Center Lobe as an H II Region," The Astrophysical Journal, 969, 43, 2024.

Anna-Thomas, Reshma; Burke-Spolaor, Sarah; Law, Casey J.; Schinzel, F. K.; Aggarwal, Kshitij; Bower, Geoffrey C.; Connor, Liam; Demorest, Paul B. "An Unidentified Fermi Source Emitting Radio Bursts in the Galactic Bulge," The Astrophysical Journal, 974, 72, 2024.

Anumarlapudi, Akash; Dobie, Dougal; Kaplan, David L.; Murphy, Tara; Horesh, Assaf; Lenc, Emil; Driessen, Laura; Duchesne, Stefan W.; Dykaar, Hannah; Gaensler, B. M.; Galvin, Timothy J.; Grundy, Joe; Heald, George; Hotan, Aidan W.; Huynh, Minh; Leung, James K.; Mcconnell, David; Moss, Vanessa A.; Pritchard, Joshua; Raja, Wasim; Rose, Kovi; Sivakoff, Gregory; Wang, Yuanming; Wang, Ziteng; Wieringa, Mark H.; Whiting, Matthew T. "Radio Afterglows from Tidal Disruption Events: An Unbiased Sample from ASKAP RACS," The Astrophysical Journal, 974, 241, 2024.

Aravena, M.; Heintz, K.; Dessauges-Zavadsky, M.; Oesch, P.; Algera, H.; Bouwens, R.; Da Cunha, E.; Dayal, P.; De Looze, I.; Ferrara, A.; Fudamoto, Y.; Gonzalez, V.; Graziani, L.; Hygate, A. P. S.; Inami, H.; Pallottini, A.; Schneider, R.; Schouws, S.; Sommovigo, L.; Topping, M.; Van Der Werf, P.; Palla, M. "The ALMA Reionization Era Bright Emission Line Survey: The molecular gas content of galaxies at z 7," Astronomy and Astrophysics, 682, A24, 2024.

Archer, Haylee N.; Hunter, Deidre A.; Elmegreen, Bruce G.; Rubio, Monica; Cigan, Phil; Windhorst, Rogier A.; Cortés, Juan R.; Jansen, Rolf A. "Probing the Relationship Between Early Star Formation and CO in the Dwarf Irregular Galaxy WLM with JWST," The Astronomical Journal, 167, 274, 2024.

Armante, M.; Gusdorf, A.; Louvet, F.; Motte, F.; Pouteau, Y.; Lesaffre, P.; Galván-Madrid, R.; Dell'Ova, P.; Bonfand, M.; Nony, T.; Brouillet, N.; Cunningham, N.; Ginsburg, A.; Men'Shchikov, A.; Bontemps, S.; Díaz-González, D.; Csengeri, T.; Fernández-López, M.; González, M.; Herpin, F.; Liu, H.-L.; Sanhueza, P.; Stutz, A. M.; Valeille-Manet, M. "ALMA-IMF. X. The core population in the evolved W33-Main (G012.80) protocluster," Astronomy and Astrophysics, 686, A122, 2024.

Arnaudova, M. I.; Das, S.; Smith, D. J. B.; Hardcastle, M. J.; Hatch, N.; Trager, S. C.; Smith, R. J.; Drake, A. B.; Mcgarry, J. C.; Shenoy, S.; Stott, J. P.; Knapen, J. H.; Hess, K. M.; Duncan, K. J.; Gloudemans, A.; Best, P. N.; García-Benito, R.; Kondapally, R.; Balcells, M.; Couto, G. S.; Abrams, D. C.; Aguado, D.; Aguerri, J. A. L.; Barrena, R.; Benn, C. R.; Bensby, T.; Berlanas, S. R.; Bettoni, D.; Cano-Infantes, D.; Carrera, R.; Concepción, P. J.; Dalton, G. B.; D'Ago, G.; Dee, K.; Domínguez-Palmero, L.; Drew, J. E.; Escott, E. L.; Fariña, C.; Fossati, M.; Fumagalli, M.; Gafton, E.; Gribbin, F. J.; Hughes, S.; Iovino, A.; Jin, S.; Lewis, I. J.; Longhetti, M.; Méndez-Abreu, J.; Mercurio, A.; Molaeinezhad, A.; Molinari, E.; Monguió, M.; Murphy, D. N. A.; Picó, S.; Pieri, M. M.; Ridings, A. W.; Romero-Gómez, M.; Schallig, E.; Shimwell, T. W.; Skvarč, J.; Stuik, R.; Vallenari, A.; Van Der Hulst, J. M.; Walton, N. A.; Worley, C. C. "WEAVE First Light Observations: Origin and Dynamics of the Shock Front in Stephan's Quintet," Monthly Notices of the Royal Astronomical Society, 535, 2269, 2024.

Arribas, Santiago; Perna, Michele; Rodríguez Del Pino, Bruno; Lamperti, Isabella; D'Eugenio, Francesco; Pérez-González, Pablo G.; Jones, Gareth C.; Crespo Gómez, Alejandro; Curti, Mirko; Lim, Seunghwan; Álvarez-Márquez, Javier; Bunker, Andrew J.; Carniani, Stefano; Charlot, Stéphane; Jakobsen, Peter; Maiolino, Roberto; Übler, Hannah; Willott, Chris J.; Böker, Torsten; Chevallard, Jacopo; Circosta, Chiara; Cresci, Giovanni; Kumari, Nimisha; Parlanti, Eleonora; Scholtz, Jan; Venturi, Giacomo; Witstok, Joris "GA-NIFS: The core of an extremely massive protocluster at the epoch of reionisation probed with JWST/NIRSpec," Astronomy and Astrophysics, 688, A146, 2024.

Arshakian, T. G.; Hambardzumyan, L. A.; Pushkarev, A. B.; Homan, D. C. "Studies of stationary features in jets: BL Lacertae: II. Trajectory reversals and superluminal speeds on sub-parsec scales," Astronomy and Astrophysics, 692, A127, 2024.

Aru, M.-L.; Maucó, K.; Manara, C. F.; Haworth, T. J.; Ballering, N.; Boyden, R.; Campbell-White, J.; Facchini, S.; Rosotti, G. P.; Winter, A.; Miotello, A.; Mcleod, A. F.; Robberto, M.; Petr-Gotzens, M. G.; Ballabio, G.; Vicente, S.; Ansdell, M.; Cleeves, L. I. "A tell-tale tracer for externally irradiated protoplanetary disks: Comparing the [C I] 8727 Å line and ALMA observations in proplyds," Astronomy and Astrophysics, 692, A137, 2024.

Ashley, Trisha; Fox, Andrew J.; Lockman, Felix J.; Wakker, Bart P.; Richter, Philipp; French, David M.; Moss, Vanessa A.; Mcclure-Griffiths, Naomi M. "The Metallicities of Five Small High-velocity Clouds," The Astrophysical Journal, 961, 94, 2024.

Assani, K. D.; Harsono, D.; Ramsey, J. P.; Li, Z.-Y.; Bjerkeli, P.; Pontoppidan, K. M.; Tychoniec, Ł.; Calcutt, H.; Kristensen, L. E.; Jørgensen, J. K.; Plunkett, A.; Van Gelder, M. L.; Francis, L. "The asymmetric bipolar [Fe II] jet and H_2 outflow of TMC1A resolved with the JWST NIRSpec Integral Field Unit," Astronomy and Astrophysics, 688, A26, 2024.

Ayanabha, D.; Narang, Mayank; Puravankara, Manoj; Shridharan, B.; Tyagi, H.; Banerjee, Bihan; Nayak, Prasanta K.; Surya, Arun "Demography of Stellar Radio Population within 500 pc: A VLASS-Gaia DR3 Study," The Astronomical Journal, 168, 288, 2024.

Aydi, E.; Chomiuk, L.; Strader, J.; Sokolovsky, K. V.; Williams, R. E.; Buckley, D. A. H.; Ederoclite, A.; Izzo, L.; Kyer, R.; Linford, J. D.; Kniazev, A.; Metzger, B. D.; Mikołajewska, J.; Molaro, P.; Molina, I.; Mukai, K.; Munari, U.; Orio, M.; Panurach, T.; Shappee, B. J.; Shen, K. J.; Sokoloski, J. L.; Urquhart, R.; Walter, F. M. "Revisiting the classics: on the evolutionary origin of the 'Fe II' and 'He/N' spectral classes of novae," Monthly Notices of the Royal Astronomical Society, 527, 9303, 2024.

Baczko, Anne-Kathrin; Kadler, Matthias; Ros, Eduardo; Fromm, Christian M.; Wielgus, Maciek; Perucho, Manel; Krichbaum, Thomas P.; Baloković, Mislav; Blackburn, Lindy; Chan, Chi-Kwan; Issaoun, Sara; Janssen, Michael; Ricci, Luca; Akiyama, Kazunori; Albentosa-Ruíz, Ezequiel; Alberdi, Antxon; Alef, Walter; Algaba, Juan Carlos; Anantua, Richard; Asada, Keiichi; Azulay, Rebecca; Bach, Uwe; Ball, David; Bandyopadhyay, Bidisha; Barrett, John; Bauböck, Michi; Benson, Bradford A.; Bintley, Dan; Blundell, Raymond; Bouman, Katherine L.; Bower, Geoffrey C.; Boyce, Hope; Bremer, Michael; Brinkerink, Christiaan D.; Brissenden, Roger; Britzen, Silke; Broderick, Avery E.; Broguiere, Dominique; Bronzwaer, Thomas; Bustamante, Sandra; Byun, Do-Young; Carlstrom, John E.; Ceccobello, Chiara; Chael, Andrew; Chang, Dominic O.; Chatterjee, Koushik; Chatterjee, Shami; Chen, Ming-Tang; Chen, Yongjun; Cheng, Xiaopeng; Cho, Ilje; Christian, Pierre; Conroy, Nicholas S.; Conway, John E.; Cordes, James M.; Crawford, Thomas M.; Crew, Geoffrey B.; Cruz-Osorio, Alejandro; Cui, Yuzhu; Dahale, Rohan; Davelaar, Jordy; De Laurentis, Mariafelicia; Deane, Roger; Dempsey, Jessica; Desvignes, Gregory; Dexter, Jason; Dhruv, Vedant; Dihingia, Indu K.; Doeleman, Sheperd S.; Dougall, Sean Taylor; Dzib, Sergio A.; Eatough, Ralph P.; Emami, Razieh; Falcke, Heino; Farah, Joseph; Fish, Vincent L.; Fomalont, Edward; Alyson Ford, H.; Foschi, Marianna; Fraga-Encinas, Raquel; Freeman, William T.; Friberg, Per; Fuentes, Antonio; Galison, Peter; Gammie, Charles F.; García, Roberto; Gentaz, Olivier; Georgiev, Boris; Goddi, Ciriaco; Gold, Roman; Gómez-Ruiz, Arturo I.; Gómez, José L.; Gu, Minfeng; Gurwell, Mark; Hada, Kazuhiro; Haggard, Daryl; Haworth, Kari; Hecht, Michael H.; Hesper, Ronald; Heumann, Dirk; Ho, Luis C.; Ho, Paul; Honma, Mareki; Huang, Chih-Wei L.; Huang, Lei; Hughes, David H.; Violette Impellizzeri, C. M.; Inoue, Makoto; James, David J.; Jannuzi, Buell T.; Jeter, Britton; Jiang, Wu; Jiménez-Rosales, Alejandra; Johnson, Michael D.; Jorstad, Svetlana; Joshi, Abhishek V.; Jung, Taehyun; Karami, Mansour; Karuppusamy, Ramesh; Kawashima, Tomohisa; Keating, Garrett K.; Kettenis, Mark; Kim, Dong-Jin; Kim, Jae-Young; Kim, Jongsoo; Kim, Junhan; Kino, Motoki; Koay, Jun Yi; Kocherlakota, Prashant; Kofuji, Yutaro; Koyama, Shoko; Kramer, Carsten; Kramer, Joana A.; Kramer, Michael; Kuo, Cheng-Yu; La Bella, Noemi; Lauer, Tod R.; Lee, Daeyoung; Lee, Sang-Sung; Leung, Po Kin; Levis, Aviad; Li, Zhiyuan; Lico, Rocco; Lindahl, Greg; Lindqvist, Michael; Lisakov, Mikhail; Liu, Jun; Liu, Kuo; Liuzzo, Elisabetta; Lo, Wen-Ping; Lobanov, Andrei P.; Loinard, Laurent; Lonsdale, Colin J.; Lowitz, Amy E.; Lu, Ru-Sen; Macdonald, Nicholas R.; Mao, Jirong; Marchili, Nicola; Markoff, Sera; Marrone, Daniel P.; Marscher, Alan P.; Martí-Vidal, Iván; Matsushita, Satoki; Matthews, Lynn D.; Medeiros, Lia; Menten, Karl M.; Michalik, Daniel; Mizuno, Izumi; Mizuno, Yosuke; Moran, James M.; Moriyama, Kotaro; Moscibrodzka, Monika; Mulaudzi, Wanga; Müller, Cornelia; Müller, Hendrik; Mus, Alejandro; Musoke, Gibwa; Myserlis, Ioannis; Nadolski, Andrew; Nagai, Hiroshi; Nagar, Neil M.; Nair, Dhanya G.; Nakamura, Masanori; Narayanan, Gopal; Natarajan, Iniyan; Nathanail, Antonios; Fuentes, Santiago Navarro; Neilsen, Joey; Neri, Roberto; Ni, Chunchong; Noutsos, Aristeidis; Nowak, Michael A.; Oh, Junghwan; Okino, Hiroki; Sánchez, Héctor Raúl Olivares; Ortiz-León, Gisela N.; Oyama, Tomoaki; Özel, Feryal; Palumbo, Daniel C. M.; Paraschos, Georgios Filippos; Park, Jongho; Parsons, Harriet; Patel, Nimesh; Pen, Ue-Li; Pesce, Dominic W.; Piétu, Vincent; Plambeck, Richard; Popstefanija, Aleksandar; Porth, Oliver; Pötzl, Felix M.; Prather, Ben; Preciado-López, Jorge A.; Principe, Giacomo; Psaltis, Dimitrios; Pu, Hung-Yi; Ramakrishnan, Venkatessh; Rao, Ramprasad; Rawlings, Mark G.; Raymond, Alexander W.; Ricarte, Angelo; Ripperda, Bart; Roelofs, Freek; Rogers, Alan; Romero-Cañizales, Cristina; Roshanineshat, Arash; Rottmann, Helge; Roy, Alan L.; Ruiz, Ignacio; Ruszczyk, Chet; Rygl, Kazi L. J.; Sánchez, Salvador; Sánchez-Argüelles, David; Sánchez-Portal, Miguel; Sasada, Mahito; Satapathy, Kaushik; Savolainen, Tuomas; Peter Schloerb, F.; Schonfeld, Jonathan; Schuster, Karl-Friedrich; Shao, Lijing; Shen, Zhiqiang; Small, Des; Sohn, Bong Won; Soohoo, Jason; Salas, León David Sosapanta; Souccar, Kamal; Stanway, Joshua S.; Sun, He; Tazaki, Fumie; Tetarenko, Alexandra J.; Tiede, Paul; Tilanus, Remo P. J.; Titus, Michael; Torne, Pablo; Toscano, Teresa; Traianou, Efthalia; Trent, Tyler; Trippe, Sascha; Turk, Matthew; Van Bemmel, Ilse; Van Langevelde, Huib Jan; Van Rossum, Daniel R.; Vos, Jesse; Wagner, Jan; Ward-Thompson, Derek; Wardle, John; Washington, Jasmin E.; Weintroub, Jonathan; Wharton, Robert; Wiik, Kaj; Witzel, Gunther; Wondrak, Michael F.; Wong, George N.; Wu, Qingwen; Yadlapalli, Nitika; Yamaguchi, Paul; Yfantis, Aristomenis; Yoon, Doosoo; Young, André; Young, Ken; Younsi, Ziri; Yu, Wei; Yuan, Feng; Yuan, Ye-Fei; Anton Zensus, J.; Zhang, Shuo; Zhao, Guang-Yao "The putative center in NGC 1052," Astronomy and Astrophysics, 692, A205, 2024.

Baghel, Janhavi; Kharb, P.; Hovatta, T.; Ho, Luis C.; Harrison, C.; Lindfors, E.; Silpa, S.; Gulati, S. "Investigating Differences in the Palomar-Green Blazar Population Using Polarization," The Astrophysical Journal, 977, 192, 2024.

Bagul, Atharva; Ogle, Patrick; Antonucci, Robert; Maloney, Philip; Lopez Rodriguez, Enrique "Cygnus A obscuring torus: ionized, atomic, or molecular?," Monthly Notices of the Royal Astronomical Society, 527, 2371, 2024.

Bait, Omkar; Borthakur, Sanchayeeta; Schaerer, Daniel; Momjian, Emmanuel; Sebastian, Biny; Saldana-Lopez, Alberto; Flury, Sophia R.; Chisholm, John; Marques-Chaves, Rui; Jaskot, Anne E.; Ferguson, Harry C.; Worseck, Gabor; Ji, Zhiyuan; Komarova, Lena; Trebitsch, Maxime; Hayes, Matthew J.; Pentericci, Laura; Ostlin, Goran; Thuan, Trinh; Amorín, Ricardo O.; Wang, Bingjie; Xu, Xinfeng; Sargent, Mark T. "Low-redshift Lyman Continuum Survey (LzLCS). Radio continuum properties of low-z Lyman continuum emitters," Astronomy and Astrophysics, 688, A198, 2024.

Bakx, T. J. L. C.; Amvrosiadis, A.; Bendo, G. J.; Algera, H. S. B.; Serjeant, S.; Bonavera, L.; Borsato, E.; Chen, X.; Cox, P.; González-Nuevo, J.; Hagimoto, M.; Harrington, K. C.; Ivison, R. J.; Kamieneski, P.; Marchetti, L.; Riechers, D. A.; Tsukui, T.; Van Der Werf, P. P.; Yang, C.; Zavala, J. A.; Andreani, P.; Berta, S.; Cooray, A. R.; De Zotti, G.; Eales, S.; Ikeda, R.; Knudsen, K. K.; Mitsuhashi, I.; Negrello, M.; Neri, R.; Omont, A.; Scott, D.; Tamura, Y.; Temi, P.; Urquhart, S. A. "A novel high-z submm galaxy efficient line survey in ALMA bands 3 through 8 - an ANGELS pilot," Monthly Notices of the Royal Astronomical Society, 535, 1533, 2024.

Bakx, Tom J. L. C.; Algera, Hiddo S. B.; Venemans, Bram; Sommovigo, Laura; Fujimoto, Seiji; Carniani, Stefano; Hagimoto, Masato; Hashimoto, Takuya; Inoue, Akio K.; Salak, Dragan; Serjeant, Stephen; Vallini, Livia; Eales, Stephen; Ferrara, Andrea; Fudamoto, Yoshinobu; Imamura, Chihiro; Inoue, Shigeki; Knudsen, Kirsten K.; Matsuo, Hiroshi; Sugahara, Yuma; Tamura, Yoichi; Taniguchi, Akio; Yamanaka, Satoshi "Gas conditions of a star-formation selected sample in the first billion years," Monthly Notices of the Royal Astronomical Society, 532, 2270, 2024.

Bakx, Tom J. L. C.; Berta, S.; Dannerbauer, H.; Cox, P.; Butler, K. M.; Hagimoto, M.; Hughes, D. H.; Riechers, D. A.; Van Der Werf, P. P.; Yang, C.; Baker, A. J.; Beelen, A.; Bendo, G. J.; Borsato, E.; Buat, V.; Cooray, A. R.; Dunne, L.; Dye, S.; Eales, S.; Gavazzi, R.; Harris, A. I.; Ismail, D.; Ivison, R. J.; Jones, B.; Krips, M.; Lehnert, M. D.; Marchetti, L.; Messias, H.; Negrello, M.; Neri, R.; Omont, A.; Perez-Fournon, I.; Nanni, A.; Chartab, N.; Serjeant, S.; Stanley, F.; Tamura, Y.; Urquhart, S. A.; Vlahakis, C.; Weiß, A.; Young, A. J. "A dusty protocluster surrounding the binary galaxy HerBS-70 at z = 2.3," Monthly Notices of the Royal Astronomical Society, 530, 4578, 2024.

Bakx, Tom J. L. C.; Gray, Bethany S.; González-Nuevo, Joaquin; Bonavera, Laura; Amvrosiadis, Aristeidis; Eales, Stephen; Hagimoto, Masato; Serjeant, Stephen "FLASH: Faint Lenses from Associated Selection with Herschel," Monthly Notices of the Royal Astronomical Society, 527, 8865, 2024.

Ballieux, F. J.; Callingham, J. R.; Röttgering, H. J. A.; Slob, M. M. "Comparing extragalactic megahertz-peaked spectrum and gigahertz-peaked spectrum sources," Astronomy and Astrophysics, 689, A264, 2024.

Balser, Dana S.; Wenger, Trey V. "The Metallicity-Electron Temperature Relationship in H II Regions," The Astrophysical Journal, 964, 47, 2024.

Bañados, Eduardo; Khusanova, Yana; Decarli, Roberto; Momjian, Emmanuel; Walter, Fabian; Connor, Thomas; Carilli, Christopher L.; Mazzucchelli, Chiara; Rojas-Ruiz, Sofía; Venemans, Bram P. "[C II] Properties and Far-infrared Variability of a z = 7 Blazar," The Astrophysical Journal, 977, L46, 2024.

Bañados, Eduardo; Momjian, Emmanuel; Connor, Thomas; Belladitta, Silvia; Decarli, Roberto; Mazzucchelli, Chiara; Venemans, Bram P.; Walter, Fabian; Wang, Feige; Xie, Zhang-Liang; Barth, Aaron J.; Eilers, Anna-Christina; Fan, Xiaohui; Khusanova, Yana; Schindler, Jan-Torge; Stern, Daniel; Yang, Jinyi; Andika, Irham Taufik; Carilli, Christopher L.; Farina, Emanuele P.; Fabian, Andrew; Hennawi, Joseph F.; Pensabene, Antonio; Rojas-Ruiz, Sofía "A blazar in the epoch of reionization," Nature Astronomy, 9, 293-301, 2024.

Bangale, P.; Bhattacharyya, B.; Camilo, F.; Clark, C. J.; Cognard, I.; Decesar, M. E.; Ferrara, E. C.; Gentile, P.; Guillemot, L.; Hessels, J. W. T.; Johnson, T. J.; Kerr, M.; Mclaughlin, M. A.; Nieder, L.; Ransom, S. M.; Ray, P. S.; Roberts, M. S. E.; Roy, J.; Sanpa-Arsa, S.; Theureau, G.; Wolff, M. T. "A 350 MHz Green Bank Telescope Survey of Unassociated Fermi LAT Sources: Discovery and Timing of 10 Millisecond Pulsars," The Astrophysical Journal, 966, 161, 2024.

Bania, T. M.; Balser, Dana S.; Wenger, Trey V.; Ireland, Spencer J.; Anderson, L. D.; Luisi, Matteo "The Most Sensitive Radio Recombination Line Measurements Ever Made of the Galactic Warm Ionized Medium," The Astrophysical Journal, 972, 192, 2024.

Bao, Min; Harada, Nanase; Kohno, Kotaro; Yoshimura, Yuki; Egusa, Fumi; Nishimura, Yuri; Tanaka, Kunihiko; Nakanishi, Kouichiro; Martín, Sergio; Mangum, Jeffrey G.; Sakamoto, Kazushi; Muller, Sébastien; Bouvier, Mathilde; Colzi, Laura; Emig, Kimberly L.; Meier, David S.; Henkel, Christian; Humire, Pedro; Huang, Ko-Yun; Rivilla, Víctor M.; Van Der Werf, Paul; Viti, Serena "Physical properties of the southwest outflow streamer in the starburst galaxy NGC 253 with ALCHEMI," Astronomy and Astrophysics, 687, A43, 2024.

Baron, Dalya; Sandstrom, Karin M.; Rosolowsky, Erik; Egorov, Oleg V.; Klessen, Ralf S.; Leroy, Adam K.; Boquien, Médéric; Schinnerer, Eva; Belfiore, Francesco; Groves, Brent; Chastenet, Jérémy; Dale, Daniel A.; Blanc, Guillermo A.; Méndez-Delgado, José E.; Koch, Eric W.; Grasha, Kathryn; Chevance, Mélanie; Thilker, David A.; Colombo, Dario; Williams, Thomas G.; Pathak, Debosmita; Sutter, Jessica; Brown, Toby; Wu, John F.; Peek, Josh E. G.; Emsellem, Eric; Larson, Kirsten L.; Neumann, Justus "PHANGS-ML: Dissecting Multiphase Gas and Dust in Nearby Galaxies Using Machine Learning," The Astrophysical Journal, 968, 24, 2024.

Barr, Ewan D.; Dutta, Arunima; Freire, Paulo C. C.; Cadelano, Mario; Gautam, Tasha; Kramer, Michael; Pallanca, Cristina; Ransom, Scott M.; Ridolfi, Alessandro; Stappers, Benjamin W.; Tauris, Thomas M.; Venkatraman Krishnan, Vivek; Wex, Norbert; Bailes, Matthew; Behrend, Jan; Buchner, Sarah; Burgay, Marta; Chen, Weiwei; Champion, David J.; Chen, C. -H. Rosie; Corongiu, Alessandro; Geyer, Marisa; Men, Y. P.; Padmanabh, Prajwal Voraganti; Possenti, Andrea "A pulsar in a binary with a compact object in the mass gap between neutron stars and black holes," Science, 383, 275, 2024.

Barsony, Mary; Ressler, Michael E.; Le Gouellec, Valentin J. M.; Tychoniec, Łukasz; Van Gelder, Martijn L. "Resolving Twin Jets and Twin Disks with JWST and ALMA: The Young WL 20 Multiple System," The Astrophysical Journal, 973, 42, 2024.

Barth, Nicholas; Privon, George C.; Ezzeddine, Rana; Evans, Aaron S.; Treister, Ezequiel "Stellar Abundances at the Center of Early-type Galaxies with Fine Structure," The Astrophysical Journal, 968, 127, 2024.

Bayandina, O. S.; Burns, R. A.; Caratti O Garatti, A.; Kurtz, S. E.; Moscadelli, L.; Shakhvorostova, N. N.; Sobolev, A. M.; Tanabe, Y.; Val'Tts, I. E.; Yonekura, Y. "Star formation in G11.497-1.485: Two-epoch VLA study of a 6.7 GHz methanol maser flare," Astronomy and Astrophysics, 684, A86, 2024.

Behrens, Erica; Mangum, Jeffrey G.; Viti, Serena; Holdship, Jonathan; Huang, Ko-Yun; Bouvier, Mathilde; Butterworth, Joshua; Eibensteiner, Cosima; Harada, Nanase; Martín, Sergio; Sakamoto, Kazushi; Muller, Sebastien; Tanaka, Kunihiko; Colzi, Laura; Henkel, Christian; Meier, David S.; Rivilla, Víctor M.; Van Der Werf, Paul P. "Neural Network Constraints on the Cosmic-Ray Ionization Rate and Other Physical Conditions in NGC 253 with ALCHEMI Measurements of HCN and HNC," The Astrophysical Journal, 977, 38, 2024.

Beilis, Dan; Beck, Sara C.; Lacy, John; Turner, Jean L.; Liu, Hauyu Baobab; Ho, Paul T. P.; Consiglio, S. Michelle "The radio-infrared nebula in II Zw 40: clusters forming in colliding elongated clouds," Monthly Notices of the Royal Astronomical Society, 535, 1052, 2024.

Beltrán, M. T.; Padovani, M.; Galli, D.; Áñez-López, N.; Girart, J. M.; Cesaroni, R.; Dall'Olio, D.; Anglada, G.; Law, C. Y.; Lorenzani, A.; Moscadelli, L.; Sánchez-Monge, Á.; Osorio, M.; Zhang, Q. "Self-similarity of the magnetic field at different scales: The case of G31.41+0.31," Astronomy and Astrophysics, 686, A281, 2024.

Benítez-Llambay, Alejandro; Dutta, Rajeshwari; Fumagalli, Michele; Navarro, Julio F. "Examining the Nature of the Starless Dark Matter Halo Candidate Cloud-9 with Very Large Array Observations," The Astrophysical Journal, 973, 61, 2024.

Benke, P.; Gokus, A.; Lisakov, M.; Gurvits, L. I.; Eppel, F.; Heßdörfer, J.; Kadler, M.; Kovalev, Y. Y.; Ros, E.; Rösch, F. "Very-long-baseline interferometry study of the flaring blazar TXS 1508+572 in the early Universe," Astronomy and Astrophysics, 689, A43, 2024.

Beom, Minje; Walterbos, René A. M.; Bizyaev, Dmitry "SDSS. IV. MaNGA: The Impact of the Acquisition of Gas with Opposite Angular Momentum on the Evolution of Galaxies," The Astronomical Journal, 168, 197, 2024.

Bergin, Edwin A.; Bosman, Arthur; Teague, Richard; Calahan, Jenny; Willacy, Karen; Cleeves, L. Ilsedore; Schwarz, Kamber; Zhang, Ke; Bruderer, Simon "The Carbon Isotopic Ratio and Planet Formation," The Astrophysical Journal, 965, 147, 2024.

Bergner, Jennifer B.; Sturm, J. A.; Piacentino, Elettra L.; Mcclure, M. K.; Öberg, Karin I.; Boogert, A. C. A.; Dartois, E.; Drozdovskaya, M. N.; Fraser, H. J.; Harsono, Daniel; Ioppolo, Sergio; Law, Charles J.; Lis, Dariusz C.; Mcguire, Brett A.; Melnick, Gary J.; Noble, Jennifer A.; Palumbo, M. E.; Pendleton, Yvonne J.; Perotti, Giulia; Qasim, Danna; Rocha, W. R. M.; Van Dishoeck, E. F. "JWST Ice Band Profiles Reveal Mixed Ice Compositions in the HH 48 NE Disk," The Astrophysical Journal, 975, 166, 2024.

Berkhout, Lindsay M.; Jacobs, Daniel C.; Abdurashidova, Zuhra; Adams, Tyrone; Aguirre, James E.; Alexander, Paul; Ali, Zaki S.; Baartman, Rushelle; Balfour, Yanga; Beardsley, Adam P.; Bernardi, Gianni; Billings, Tashalee S.; Bowman, Judd D.; Bradley, Richard F.; Bull, Philip; Burba, Jacob; Byrne, Ruby; Carey, Steven; Carilli, Chris L.; Chen, Kai-Feng; Cheng, Carina; Choudhuri, Samir; Deboer, David R.; De Lera Acedo, Eloy; Dexter, Matt; Dillon, Joshua S.; Dynes, Scott; Eksteen, Nico; Ely, John; Ewall-Wice, Aaron; Fagnoni, Nicolas; Fritz, Randall; Furlanetto, Steven R.; Gale-Sides, Kingsley; Garsden, Hugh; Gehlot, Bharat Kumar; Ghosh, Abhik; Glendenning, Brian; Gorce, Adelie; Gorthi, Deepthi; Greig, Bradley; Grobbelaar, Jasper; Halday, Ziyaad; Hazelton, Bryna J.; Hewitt, Jacqueline N.; Hickish, Jack; Huang, Tian; Josaitis, Alec; Julius, Austin; Kariseb, Maccalvin; Kern, Nicholas S.; Kerrigan, Joshua; Kim, Honggeun; Kittiwisit, Piyanat; Kohn, Saul A.; Kolopanis, Matthew; Lanman, Adam; La Plante, Paul; Liu, Adrian; Loots, Anita; Ma, Yin-Zhe; Edward Macmahon, David Harold; Malan, Lourence; Malgas, Cresshim; Malgas, Keith; Marero, Bradley; Martinot, Zachary E.; Mesinger, Andrei; Molewa, Mathakane; Morales, Miguel F.; Mosiane, Tshegofalang; Murray, Steven G.; Neben, Abraham R.; Nikolic, Bojan; Nunhokee, Chuneeta Devi; Nuwegeld, Hans; Parsons, Aaron R.; Pascua, Robert; Patra, Nipanjana; Pieterse, Samantha; Qin, Yuxiang; Rath, Eleanor; Razavi-Ghods, Nima; Riley, Daniel; Robnett, James; Rosie, Kathryn; Santos, Mario G.; Sims, Peter; Singh, Saurabh; Storer, Dara; Swarts, Hilton; Tan, Jianrong; Thyagarajan, Nithyanandan; Van Wyngaarden, Pieter; Williams, Peter K. G.; Zheng, Haoxuan; Xu, Zhilei "Hydrogen Epoch of Reionization Array (HERA) Phase II Deployment and Commissioning," Publications of the Astronomical Society of the Pacific, 136, 045002, 2024.

Berné, Olivier; Habart, Emilie; Peeters, Els; Schroetter, Ilane; Canin, Amélie; Sidhu, Ameek; Chown, Ryan; Bron, Emeric; Haworth, Thomas J.; Klaassen, Pamela; Trahin, Boris; Van De Putte, Dries; Alarcón, Felipe; Zannese, Marion; Abergel, Alain; Bergin, Edwin A.; Bernard-Salas, Jeronimo; Boersma, Christiaan; Cami, Jan; Cuadrado, Sara; Dartois, Emmanuel; Dicken, Daniel; Elyajouri, Meriem; Fuente, Asunción; Goicoechea, Javier R.; Gordon, Karl D.; Issa, Lina; Joblin, Christine; Kannavou, Olga; Khan, Baria; Lacinbala, Ozan; Languignon, David; Le Gal, Romane; Maragkoudakis, Alexandros; Meshaka, Raphael; Okada, Yoko; Onaka, Takashi; Pasquini, Sofia; Pound, Marc W.; Robberto, Massimo; Röllig, Markus; Schefter, Bethany; Schirmer, Thiébaut; Simmer, Thomas; Tabone, Benoit; Tielens, Alexander G. G. M.; Vicente, Sílvia; Wolfire, Mark G.; Pdrs4All Team†; Aleman, Isabel; Allamandola, Louis; Auchettl, Rebecca; Baratta, Giuseppe Antonio; Baruteau, Clément; Bejaoui, Salma; Bera, Partha P.; Black, John H.; Boulanger, Francois; Bouwman, Jordy; Brandl, Bernhard; Brechignac,

Philippe; Brünken, Sandra; Buragohain, Mridusmita; Burkhardt, Andrew; Candian, Alessandra; Cazaux, Stéphanie; Cernicharo, Jose; Chabot, Marin; Chakraborty, Shubhadip; Champion, Jason; Colgan, Sean W. J.; Cooke, Ilsa R.; Coutens, Audrey; Cox, Nick L. J.; Demyk, Karine; Meyer, Jennifer Donovan; Engrand, Cécile; Foschino, Sacha; García-Lario, Pedro; Gavilan, Lisseth; Gerin, Maryvonne; Godard, Marie; Gottlieb, Carl A.; Guillard, Pierre; Gusdorf, Antoine; Hartigan, Patrick; He, Jinhua; Herbst, Eric; Hornekaer, Liv; Jäger, Cornelia; Janot-Pacheco, Eduardo; Kaufman, Michael; Kemper, Francisca; Kendrew, Sarah; Kirsanova, Maria S.; Knight, Collin; Kwok, Sun; Labiano, Álvaro; Lai, Thomas S.-Y.; Lee, Timothy J.; Lefloch, Bertrand; Le Petit, Franck; Li, Aigen; Linz, Hendrik; Mackie, Cameron J.; Madden, Suzanne C.; Mascetti, Joëlle; Mcguire, Brett A.; Merino, Pablo; Micelotta, Elisabetta R.; Morse, Jon A.; Mulas, Giacomo; Neelamkodan, Naslim; Ohsawa, Ryou; Paladini, Roberta; Palumbo, Maria Elisabetta; Pathak, Amit; Pendleton, Yvonne J.; Petrignani, Annemieke; Pino, Thomas; Puga, Elena; Rangwala, Naseem; Rapacioli, Mathias; Ricca, Alessandra; Roman-Duval, Julia; Roueff, Evelyne; Rouillé, Gaël; Salama, Farid; Sales, Dinalva A.; Sandstrom, Karin; Sarre, Peter; Sciamma-O'Brien, Ella; Sellgren, Kris; Shannon, Matthew J.; Simonnin, Adrien; Shenoy, Sachindev S.; Teyssier, David; Thomas, Richard D.; Togi, Aditya; Verstraete, Laurent; Witt, Adolf N.; Wootten, Alwyn; Ysard, Nathalie; Zettergren, Henning; Zhang, Yong; Zhang, Ziwei E.; Zhen, Junfeng "A far-ultraviolet-driven photoevaporation flow observed in a protoplanetary disk," Science, 383, 988, 2024.

Berteaud, J.; Calore, F.; Clavel, M.; Marvil, J.; Hyman, S.; Schinzel, F. K.; Kerr, M. "Multiwavelength identification of millisecond pulsar candidates in the Galactic bulge," Astronomy and Astrophysics, 690, A330, 2024.

Bertola, E.; Circosta, C.; Ginolfi, M.; Mainieri, V.; Vignali, C.; Calistro Rivera, G.; Ward, S. R.; Lopez, I. E.; Pensabene, A.; Alexander, D. M.; Bischetti, M.; Brusa, M.; Cappi, M.; Comastri, A.; Contursi, A.; Cicone, C.; Cresci, G.; Dadina, M.; D'Amato, Q.; Feltre, A.; Harrison, C. M.; Kakkad, D.; Lamperti, I.; Lanzuisi, G.; Mannucci, F.; Marconi, A.; Perna, M.; Piconcelli, E.; Puglisi, A.; Ricci, F.; Scholtz, J.; Tozzi, G.; Vietri, G.; Zamorani, G.; Zappacosta, L. "KASHz+SUPER: Evidence of cold molecular gas depletion in AGN hosts at cosmic noon," Astronomy and Astrophysics, 691, A178, 2024.

Beskin, V. S.; Khalilov, T. I.; Nokhrina, E. E.; Pashchenko, I. N.; Kravchenko, E. V. "On the M87 jet structure near the central engine," Monthly Notices of the Royal Astronomical Society, 528, 6046, 2024.

Bešlić, I.; Barnes, A. T.; Bigiel, F.; Jiménez-Donaire, M. J.; Usero, A.; Henshaw, J. D.; Faesi, C.; Leroy, A. K.; Rosolowsky, E.; Den Brok, J. S.; Chevance, M.; Eibensteiner, C.; Grasha, K.; Klessen, R. S.; Kruijssen, J. M. D.; Liu, D.; Meidt, S.; Neumann, J.; Neumann, L.; Pan, H.; Puschnig, J.; Querejeta, M.; Schinnerer, E.; Williams, T. G. "The properties and kinematics of HCN emission across the closest starburst galaxy NGC 253 observed with ALMA," Astronomy and Astrophysics, 689, A122, 2024.

Beuchert, Tobias; Middleton, Matthew J.; Soria, Roberto; Miller-Jones, James C. A.; Dauser, Thomas; Roberts, Timothy P.; Sathyaprakash, Rajath; Markoff, Sera "Exploring the case for hard-X-ray beaming in NGC 6946 X-1," Monthly Notices of the Royal Astronomical Society, 534, 645, 2024.

Bhalotia, Vanshree; Huber, Daniel; Van Saders, Jennifer L.; Metcalfe, Travis S.; Stassun, Keivan G.; White, Timothy R.; Børsen-Koch, Víctor Aguirre; Ball, Warrick H.; Basu, Sarbani; Serenelli, Aldo M.; Sawczynec, Erica; Guzik, Joyce A.; Howard, Andrew W.; Isaacson, Howard "A New Asteroseismic Kepler Benchmark Constrains the Onset of Weakened Magnetic Braking in Mature Sun-like Stars," The Astrophysical Journal, 970, 166, 2024.

Bhardwaj, Mohit; Michilli, Daniele; Kirichenko, Aida Yu.; Modilim, Obinna; Shin, Kaitlyn; Kaspi, Victoria M.; Andersen, Bridget C.; Cassanelli, Tomas; Brar, Charanjot; Chatterjee, Shami; Cook, Amanda M.; Dong, Fengqiu Adam; Fonseca, Emmanuel; Gaensler, B. M.; Ibik, Adaeze L.; Kaczmarek, J. F.; Lanman, Adam E.; Leung, Calvin; Masui, K. W.; Pandhi, Ayush; Pearlman, Aaron B.; Petroff, Emily; Pleunis, Ziggy; Prochaska, J. Xavier; Rafiei-Ravandi, Masoud; Sand, Ketan R.; Scholz, Paul; Smith, Kendrick M. "Host Galaxies for Four Nearby CHIME/FRB Sources and the Local Universe FRB Host Galaxy Population," The Astrophysical Journal, 971, L51, 2024.

Bhattacharya, Rajorshi; Medina, Brandon M.; Pihlström, Ylva M.; Sjouwerman, Loránt O.; Lewis, Megan O.; Sahai, Raghvendra; Stroh, Michael C.; Quiroga-Nuñez, Luis Henry; Van Langevelde, Huib Jan; Claussen, Mark J.; Weller, Rachel "Distance Estimate Method for Asymptotic Giant Branch Stars Using Infrared Spectral Energy Distributions," The Astrophysical Journal, 969, 109, 2024.

Bhukta, Netai; Manik, Souvik; Pal, Sabyasachi; Mondal, Sushanta K. "Discovery of Giant Radio Sources from TGSS Alternative Data Release 1: Radio, Optical, and Infrared Properties," The Astrophysical Journal Supplement Series, 273, 30, 2024.

Bi, Yan-Chen; Wu, Yu-Mei; Chen, Zu-Cheng; Huang, Qing-Guo "Constraints on the velocity of gravitational waves from the NANOGrav 15-year data set," Physical Review D, 109, L061101, 2024.

Bian, S. B.; Wu, Y. W.; Xu, Y.; Reid, M. J.; Li, J. J.; Zhang, B.; Menten, K. M.; Moscadelli, L.; Brunthaler, A. "On the Structure of the Sagittarius Spiral Arm in the Inner Milky Way," The Astronomical Journal, 167, 267, 2024.

Bianchin, Marina; U, Vivian; Song, Yiqing; Lai, Thomas S.-Y.; Remigio, Raymond P.; Barcos-Muñoz, Loreto; Díaz-Santos, Tanio; Armus, Lee; Inami, Hanae; Larson, Kirsten L.; Evans, Aaron S.; Böker, Torsten; Kader, Justin A.; Linden, Sean T.; Charmandaris, Vassilis; Malkan, Matthew A.; Rich, Jeff; Bohn, Thomas; Medling, Anne M.; Stierwalt, Sabrina; Mazzarella, Joseph M.; Law, David R.; Privon, George C.; Aalto, Susanne; Appleton, Philip; Brown, Michael J. I.; Buiten, Victorine A.; Finnerty, Luke; Hayward, Christopher C.; Howell, Justin; Iwasawa, Kazushi; Kemper, Francisca; Marshall, Jason; Mckinney, Jed; Müller-Sánchez, Francisco; Murphy, Eric J.; Van Der Werf, Paul P.; Sanders, David B.; Surace, Jason "GOALS-JWST: Gas Dynamics and Excitation in NGC 7469 Revealed by NIRSpec," The Astrophysical Journal, 965, 103, 2024.

Bij, Akanksha; Fissel, Laura M.; Bonne, Lars; Schneider, Nicola; Berthoud, Marc; Lee, Dennis; Novak, Giles A.; Sadavoy, Sarah I.; Pillai, Thushara G. S.; Cunningham, Maria; Jones, Paul; Simon, Robert "Magnetic Field Alignment Relative to Multiple Tracers in the High-mass Star-forming Region RCW 36," The Astrophysical Journal, 975, 267, 2024.

Bischetti, Manuela; Choi, Hyunseop; Fiore, Fabrizio; Feruglio, Chiara; Carniani, Stefano; D'Odorico, Valentina; Bañados, Eduardo; Chen, Huanqing; Decarli, Roberto; Gallerani, Simona; Hlavacek-Larrondo, Julie; Lai, Samuel; Leighly, Karen M.; Mazzucchelli, Chiara; Perreault-Levasseur, Laurence; Tripodi, Roberta; Walter, Fabian; Wang, Feige; Yang, Jinyi; Zanchettin, Maria Vittoria; Zhu, Yongda "Multiphase Black Hole Feedback and a Bright [C II] Halo in a LoBAL Quasar at z ~ 6.6," The Astrophysical Journal, 970, 9, 2024.

Biswas, Ayan; Wade, Gregg A.; Chandra, Poonam; Petit, Veronique; Das, Barnali; Shultz, Matthew E. "XMM-Newton Perspective of the Unique Magnetic Binary-ϵ Lupi," The Astrophysical Journal, 974, 182, 2024.

Biswas, Siddhartha; Mondal, Soumen; Hoque, Ariful; Panja, Alik; Baug, Tapas; Das, Ramkrishna "Star Formation in the H II Region Sh2-87: Evidence of Global Hierarchical Collapse," The Astrophysical Journal, 961, 176, 2024.

Bizyaev, Dmitry "The neutral hydrogen mass in galaxies estimated via optical spectroscopy," Monthly Notices of the Royal Astronomical Society, 528, L146, 2024.

Blanchard, Peter K.; Villar, V. Ashley; Chornock, Ryan; Laskar, Tanmoy; Li, Yijia; Leja, Joel; Pierel, Justin; Berger, Edo; Margutti, Raffaella; Alexander, Kate D.; Barnes, Jennifer; Cendes, Yvette; Eftekhari, Tarraneh; Kasen, Daniel; Lebaron, Natalie; Metzger, Brian D.; Muzerolle Page, James; Rest, Armin; Sears, Huei; Siegel, Daniel M.; Yadavalli, S. Karthik "JWST detection of a supernova associated with GRB 221009A without an r-process signature," Nature Astronomy, 8, 774, 2024.

Blomme, R.; Rauw, G.; Volpi, D.; Nazé, Y.; Abdul-Masih, M. "The colliding-wind binary HD 168112," Astronomy and Astrophysics, 687, A106, 2024.

Bohn, Thomas; Inami, Hanae; Togi, Aditya; Armus, Lee; Lai, Thomas S.-Y.; Barcos-Munoz, Loreto; Song, Yiqing; Linden, S. T.; Surace, Jason; Bianchin, Marina; U, Vivian; Evans, Aaron S.; Böker, Torsten; Malkan, Matthew A.; Larson, Kirsten L.; Stierwalt, Sabrina; Buiten, Victorine A.; Charmandaris, Vassilis; Diaz-Santos, Tanio; Howell, Justin H.; Privon, George C.; Ricci, Claudio; Van Der Werf, Paul P.; Aalto, Susanne; Hayward, Christopher C.; Kader, Justin A.; Mazzarella, Joseph M.; Muller-Sanchez, Francisco; Sanders, David B. "GOALS-JWST: The Warm Molecular Outflows of the Merging Starburst Galaxy NGC 3256," The Astrophysical Journal, 977, 36, 2024.

Bolatto, Alberto D.; Levy, Rebecca C.; Tarantino, Elizabeth; Boyer, Martha L.; Fisher, Deanne B.; Cronin, Serena A.; Leroy, Adam K.; Klessen, Ralf S.; Smith, J. D.; Berg, Danielle A.; Böker, Torsten; Boogaard, Leindert A.; Ostriker, Eve C.; Thompson, Todd A.; Ott, Juergen; Lenkić, Laura; Lopez, Laura A.; Dale, Daniel A.; Veilleux, Sylvain; Van Der Werf, Paul P.; Glover, Simon C. O.; Sandstrom, Karin M.; Skillman, Evan D.; Chisholm, John; Villanueva, Vicente; Lai, Thomas S.-Y.; Lopez, Sebastian; Mills, Elisabeth A. C.; Emig, Kimberly L.; Armus, Lee; Mayya, Divakara; Meier, David S.; De Looze, Ilse; Herrera-Camus, Rodrigo; Walter, Fabian; Relaño, Mónica; Koziol, Hannah B.; Marvil, Joshua; Jiménez-Donaire, María J.; Martini, Paul "JWST Observations of Starbursts: Polycyclic Aromatic Hydrocarbon Emission at the Base of the M82 Galactic Wind," The Astrophysical Journal, 967, 63, 2024.

Bonfand, M.; Csengeri, T.; Bontemps, S.; Brouillet, N.; Motte, F.; Louvet, F.; Ginsburg, A.; Cunningham, N.; Galván-Madrid, R.; Herpin, F.; Wyrowski, F.; Valeille-Manet, M.; Stutz, A. M.; Di Francesco, J.; Gusdorf, A.; Fernández-López, M.; Lefloch, B.; Liu, H.-L.; Sanhueza, P.; Álvarez-Gutiérrez, R. H.; Olguin, F.; Nony, T.; Lopez-Sepulcre, A.; Dell'Ova, P.; Pouteau, Y.; Jeff, D.; Chen, H. -R. V.; Armante, M.; Towner, A.; Bronfman, L.; Kessler, N. "ALMA-IMF. XI. The sample of hot core candidates: A rich population of young high-mass protostars unveiled by the emission of methyl formate," Astronomy and Astrophysics, 687, A163, 2024.

Bonnefoy, Léa E.; Lellouch, Emmanuel; Le Gall, Alice; Lestrade, Jean-François; Moreno, Raphaël; Butler, Bryan; Boissier, Jérémie; Leyrat, Cédric; Sultana, Robin; Cavalié, Thibault; Gurwell, Mark; Moullet, Arielle; Ladjelate, Bilal; Ponthieu, Nicolas "Microwave spectra of the leading and trailing hemispheres of Iapetus," Icarus, 411, 115950, 2024.

Boogaard, Leindert A.; Gillman, Steven; Melinder, Jens; Walter, Fabian; Colina, Luis; Östlin, Göran; Caputi, Karina I.; Iani, Edoardo; Pérez-González, Pablo; Van Der Werf, Paul; Greve, Thomas R.; Wright, Gillian; Alonso-Herrero, Almudena; Álvarez-Márquez, Javier; Annunziatella, Marianna; Bik, Arjan; Bosman, Sarah; Costantin, Luca; Crespo Gómez, Alejandro; Dicken, Dan; Eckart, Andreas; Hjorth, Jens; Jermann, Iris; Labiano, Alvaro; Langeroodi, Danial; Meyer, Romain A.; Moutard, Thibaud; Peißker, Florian; Pye, John P.; Rinaldi, Pierluigi; Tikkanen, Tuomo V.; Topinka, Martin; Henning, Thomas "MIDIS: JWST/MIRI Reveals the Stellar

Structure of ALMA-selected Galaxies in the Hubble Ultra Deep Field at Cosmic Noon," The Astrophysical Journal, 969, 27, 2024.
Booth, Alice S.; Drozdovskaya, Maria N.; Temmink, Milou; Nomura, Hideko; Van Dishoeck, Ewine F.; Keyte, Luke; Law, Charles J.; Leemker, Margot; Van Der Marel, Nienke; Notsu, Shota; Öberg, Karin; Walsh, Catherine "Measuring the ^{34}S and ^{33}S Isotopic Ratios of Volatile Sulfur during Planet Formation," The Astrophysical Journal, 975, 72, 2024.
Booth, Alice S.; Leemker, Margot; Van Dishoeck, Ewine F.; Evans, Lucy; Ilee, John D.; Kama, Mihkel; Keyte, Luke; Law, Charles J.; Van Der Marel, Nienke; Nomura, Hideko; Notsu, Shota; Öberg, Karin; Temmink, Milou; Walsh, Catherine "An ALMA Molecular Inventory of Warm Herbig Ae Disks. I. Molecular Rings, Asymmetries, and Complexity in the HD 100546 Disk," The Astronomical Journal, 167, 164, 2024.
Booth, Alice S.; Temmink, Milou; Van Dishoeck, Ewine F.; Evans, Lucy; Ilee, John D.; Kama, Mihkel; Keyte, Luke; Law, Charles J.; Leemker, Margot; Van Der Marel, Nienke; Nomura, Hideko; Notsu, Shota; Öberg, Karin; Walsh, Catherine "An ALMA Molecular Inventory of Warm Herbig Ae Disks. II. Abundant Complex Organics and Volatile Sulphur in the IRS 48 Disk," The Astronomical Journal, 167, 165, 2024.
Bordiu, C.; Filipović, M. D.; Umana, G.; Cotton, W. D.; Buemi, C.; Bufano, F.; Camilo, F.; Cavallaro, F.; Cerrigone, L.; Dai, S.; Hopkins, A. M.; Ingallinera, A.; Jarrett, T.; Koribalski, B.; Lazarević, S.; Leto, P.; Loru, S.; Lundqvist, P.; Mackey, J.; Norris, R. P.; Payne, J.; Rowell, G.; Riggi, S.; Rizzo, J. R.; Ruggeri, A. C.; Shabala, S.; Smeaton, Z. J.; Trigilio, C.; Velović, V. "MeerKAT reveals a ghostly thermal radio ring towards the Galactic Centre," Astronomy and Astrophysics, 690, A53, 2024.
Borkar, A.; Grossová, R.; Svoboda, J.; Moravec, E.; Kouroumpatzakis, K.; Boorman, P. G.; Adamcová, B.; Mingo, B.; Ehle, M. "Radio properties of green pea galaxies," Astronomy and Astrophysics, 687, A137, 2024.
Borlaff, Alejandro S.; Marcum, Pamela M.; Temi, Pasquale; Chamba, Nushkia; Chojnowski, S. Drew; Lopez-Rodriguez, Enrique; Siemiginowska, Aneta; Laine, Seppo; Koekemoer, Anton M.; Sanderson, Kelly N.; Dijeau, Audrey F.; Prescott, Moire K. M.; Proudfit, Leslie; Fanelli, Michael N. "SAUNAS. II. Discovery of Cross-shaped X-Ray Emission and a Rotating Circumnuclear Disk in the Supermassive S0 Galaxy NGC 5084," The Astrophysical Journal, 977, 238, 2024.
Borsato, E.; Marchetti, L.; Negrello, M.; Corsini, E. M.; Wake, D.; Amvrosiadis, A.; Baker, A. J.; Bakx, T. J. L. C.; Beelen, A.; Berta, S.; Beyer, A.; Clements, D. L.; Cooray, A.; Cox, P.; Dannerbauer, H.; De Zotti, G.; Dye, S.; Eales, S. A.; Enia, A.; Farrah, D.; Gonzalez-Nuevo, J.; Hughes, D. H.; Ismail, D.; Jin, S.; Lapi, A.; Lehnert, M. D.; Neri, R.; Pérez-Fournon, I.; Riechers, D. A.; Rodighiero, G.; Scott, D.; Serjeant, S.; Stanley, F.; Urquhart, S.; Van Der Werf, P.; Vaccari, M.; Wang, L.; Yang, C.; Young, A. "Characterization of Herschel-selected strong lens candidates through HST and sub-mm/mm observations," Monthly Notices of the Royal Astronomical Society, 528, 6222, 2024.
Boschini, Matteo; Gerosa, Davide; Salafia, Om Sharan; Dotti, Massimo "Astrophysical and relativistic modeling of the recoiling black hole candidate in quasar 3C 186," Astronomy and Astrophysics, 686, A245, 2024.
Boutan, C.; Laroque, B. H.; Lentz, E.; Oblath, N. S.; Taubman, M. S.; Tedeschi, J.; Yang, J.; Jones, A. M.; Braine, T.; Crisosto, N.; Rosenberg, L. J.; Rybka, G.; Will, D.; Zhang, D.; Kimes, S.; Ottens, R.; Bartram, C.; Bowring, D.; Cervantes, R.; Chou, A. S.; Knirck, S.; Mitchell, D. V.; Sonnenschein, A.; Wester, W.; Khatiwada, R.; Carosi, G.; Du, N.; Durham, S.; O'Kelley, S. R.; Woollett, N.; Duffy, L. D.; Bradley, R.; Clarke, J.; Siddiqi, I.; Agrawal, A.; Dixit, A. V.; Gleason, J. R.; Hipp, A. T.; Jois, S.; Sikivie, P.; Sullivan, N. S.; Tanner, D. B.; Buckley, J. H.; Gaikwad, C.; Henriksen, E. A.; Hoffman, J.; Murch, K. W.; Harrington, P. M.; Daw, E. J.; Perry, M. G.; Hilton, G. C.; Admx Collaboration "Axion Dark Matter eXperiment: Run 1A analysis details," Physical Review D, 109, 012009, 2024.
Bouvier, M.; Viti, S.; Behrens, E.; Butterworth, J.; Huang, K.-Y.; Mangum, J. G.; Harada, N.; Martín, S.; Rivilla, V. M.; Muller, S.; Sakamoto, K.; Yoshimura, Y.; Tanaka, K.; Nakanishi, K.; Herrero-Illana, R.; Colzi, L.; Gorski, M. D.; Henkel, C.; Humire, P. K.; Meier, D. S.; Van Der Werf, P. P.; Yan, Y. T. "An ALCHEMI inspection of sulphur-bearing species towards the central molecular zone of NGC 253," Astronomy and Astrophysics, 689, A64, 2024.
Bowler, R. A. A.; Inami, H.; Sommovigo, L.; Smit, R.; Algera, H. S. B.; Aravena, M.; Barrufet, L.; Bouwens, R.; Da Cunha, E.; Cullen, F.; Dayal, P.; De Looze, I.; Dunlop, J. S.; Fudamoto, Y.; Mauerhofer, V.; Mclure, R. J.; Stefanon, M.; Schneider, R.; Ferrara, A.; Graziani, L.; Hodge, J. A.; Nanayakkara, T.; Palla, M.; Schouws, S.; Stark, D. P.; Van Der Werf, P. P. "The ALMA REBELS survey: obscured star formation in massive Lyman-break galaxies at z= 4-8 revealed by the IRX-B and M⋆ relations," Monthly Notices of the Royal Astronomical Society, 527, 5808, 2024.
Boyden, Ryan D.; Eisner, Josh A. "Constraining Free-Free Emission and Photoevaporative Mass-loss Rates for Known Proplyds and New VLA-identified Candidate Proplyds in NGC 1977," The Astrophysical Journal, 967, 103, 2024.
Brennan, Aoife; Matrà, Luca; Marino, Sebastián; Wilner, David; Qi, Chunhua; Hughes, A. Meredith; Roberge, Aki; Hales, Antonio S.; Redfield, Seth "Low CI/CO abundance ratio revealed by HST UV spectroscopy of CO-rich debris discs," Monthly Notices of the Royal Astronomical Society, 531, 4482, 2024.
Britzen, S.; Kovačević, A. B.; Zajaček, M.; Popović, L. Č.; Pashchenko, I. N.; Kun, E.; Pánis, R.; Jaron, F.; Plšek, T.; Tursunov, A.; Stuchlík, Z. "ICECUBE AGN neutrino candidate PKS 1717+177: dark deflector bends nuclear jet," Monthly Notices of the Royal Astronomical Society, 535, 2742, 2024.
Broderick, Jess W.; Seymour, Nicholas; Drouart, Guillaume; Knight, Dyllon; Afonso, José M.; De Breuck, Carlos; Galvin, Timothy J.; Hedge, Alexander J.; Lehnert, Matthew D.; Noirot, Gaël; Shabala, Stanislav S.; Turner, Ross J.; Vernet, Joël "The GLEAMing of the first supermassive black holes: III. Radio sources with ultra-faint host galaxies," Publications of the Astronomical Society of Australia, 41, e071, 2024.
Brown, Katie; Chamma, Mohammed A.; Rajabi, Fereshteh; Kumar, Aishwarya; Rajabi, Hosein; Houde, Martin "Validating the sub-burst slope law: a comprehensive multisource spectro-temporal analysis of repeating fast radio bursts," Monthly Notices of the Royal Astronomical Society, 529, L152, 2024.
Brozović, Marina; Benner, Lance A. M.; Naidu, Shantanu P.; Moskovitz, Nicholas; Giorgini, Jon D.; Virkki, Anne K.; Marshall, Sean E.; Dover, Lord R.; Rożek, Agata; Lowry, Stephen C.; Warner, Brian D.; Taylor, Patrick A.; Rivera-Valentin, Edgard G.; Lister, Timothy A.; Chatelain, Joseph P.; Busch, Michael W.; Magri, Christopher; Jao, Joseph S.; Snedeker, Lawrence G.; Lawrence, Kenneth J. "Radar and Optical Observations and Physical Modeling of Binary Near-Earth Asteroid 2018 EB," The Planetary Science Journal, 5, 123, 2024.
Brunetti, Nathan; Wilson, Christine D.; He, Hao; Sun, Jiayi; Leroy, Adam K.; Rosolowsky, Erik; Bemis, Ashley; Bigiel, Frank; Groves, Brent; Saito, Toshiki; Schinnerer, Eva "Cloud-scale molecular gas properties of the ANTENNAE merger: a comparative study with PHANGS-ALMA galaxies and NGC 3256," Monthly Notices of the Royal Astronomical Society, 530, 597, 2024.
Bruni, Gabriele; Piro, Luigi; Yang, Yuan-Pei; Quai, Salvatore; Zhang, Bing; Palazzi, Eliana; Nicastro, Luciano; Feruglio, Chiara; Tripodi, Roberta; O'Connor, Brendan; Gardini, Angela; Savaglio, Sandra; Rossi, Andrea; Nicuesa Guelbenzu, Ana M.; Paladino, Rosita "A nebular origin for the persistent radio emission of fast radio bursts," Nature, 632, 1014, 2024.
Brunken, Nashanty G. C.; Rocha, Will R. M.; Van Dishoeck, Ewine F.; Gutermuth, Robert; Tyagi, Himanshu; Slavicinska, Katerina; Nazari, Pooneh; Megeath, S. Thomas; Evans, Neal J., Ii; Narang, Mayank; Manoj, P.; Rubinstein, Adam E.; Watson, Dan M.; Looney, Leslie W.; Linnartz, Harold; Caratti O Garatti, Alessio; Beuther, Henrik; Linz, Hendrik; Klaassen, Pamela; Poteet, Charles A.; Federman, Samuel; Anglada, Guillem; Atnagulov, Prabhani; Bourke, Tyler L.; Fischer, William J.; Furlan, Elise; Green, Joel; Habel, Nolan; Hartmann, Lee; Karnath, Nicole; Osorio, Mayra; Muzerolle Page, James; Pokhrel, Riwaj; Rahatgaonkar, Rohan; Sheehan, Patrick; Stanke, Thomas; Stutz, Amelia M.; Tobin, John J.; Tychoniec, Lukasz; Wolk, Scott; Yang, Yao-Lun "JWST observations of $^{13}CO_2$ ice. Tracing the chemical environment and thermal history of ices in protostellar envelopes," Astronomy and Astrophysics, 685, A27, 2024.
Bruno, L.; Brienza, M.; Zanichelli, A.; Gitti, M.; Ubertosi, F.; Rajpurohit, K.; Venturi, T.; Dallacasa, D. "From 100 MHz to 10 GHz: Unveiling the spectral evolution of the X-shaped radio galaxy in Abell 3670," Astronomy and Astrophysics, 690, A160, 2024.
Bruno, L.; Venturi, T.; Dallacasa, D.; Brienza, M.; Ignesti, A.; Brunetti, G.; Riseley, C. J.; Rossetti, M.; Gastaldello, F.; Botteon, A.; Rudnick, L.; Van Weeren, R. J.; Shulevski, A.; Lal, D. V. "Ageing and dynamics of the tailed radio galaxies in Abell 2142," Astronomy and Astrophysics, 690, A329, 2024.
Brzycki, Bryan; Siemion, Andrew P. V.; De Pater, Imke; Choza, Carmen; Croft, Steve; Gajjar, Vishal; Drew, Jamie; Lacki, Brian C.; Price, Danny C.; Sheikh, Sofia Z. "The Breakthrough Listen Search for Intelligent Life: Galactic Center Search for Scintillated Technosignatures," The Astronomical Journal, 168, 284, 2024.
Budaiev, Nazar; Ginsburg, Adam; Jeff, Desmond; Goddi, Ciriaco; Meng, Fanyi; Sánchez-Monge, Álvaro; Schilke, Peter; Schmiedeke, Anika; Yoo, Taehwa "Protostellar Cores in Sagittarius B2 N and M," The Astrophysical Journal, 961, 4, 2024.
Buiten, Victorine A.; Van Der Werf, Paul P.; Viti, Serena; Armus, Lee; Barr, Andrew G.; Barcos-Muñoz, Loreto; Evans, Aaron S.; Inami, Hanae; Linden, Sean T.; Privon, George C.; Song, Yiqing; Rich, Jeffrey A.; Aalto, Susanne; Appleton, Philip N.; Böker, Torsten; Charmandaris, Vassilis; Diaz-Santos, Tanio; Hayward, Christopher C.; Lai, Thomas S.-Y.; Medling, Anne M.; Ricci, Claudio; U, Vivian "GOALS-JWST: Mid-infrared Molecular Gas Excitation Probes the Local Conditions of Nuclear Star Clusters and the Active Galactic Nucleus in the LIRG VV 114," The Astrophysical Journal, 966, 166, 2024.
Burgay, M.; Nieder, L.; Clark, C. J.; Freire, P. C. C.; Buchner, S.; Thongmeearkom, T.; Turner, J. D.; Carli, E.; Cognard, I.; Grießmeier, J.-M.; Karuppusamy, R.; I Bernadich, M. C.; Possenti, A.; Venkatraman Krishnan, V.; Breton, R. P.; Barr, E. D.; Stappers, B. W.; Kramer, M.; Levin, L.; Ransom, S. M.; Padmanabh, P. V. "Radio and gamma-ray timing of TRAPUM L-band Fermi pulsar survey discoveries," Astronomy and Astrophysics, 691, A315, 2024.
Busch, Laura A.; Belloche, Arnaud; Garrod, Robin T.; Müller, Holger S. P.; Menten, Karl M. "Shocking Sgr B2 (N1) with its own outflow. A new perspective on segregation between O- and N-bearing molecules," Astronomy and Astrophysics, 681, A104, 2024.
Busch, Michael P. "First Extragalactic Detection of Thermal Hydroxyl (OH) 18 cm Emission in M31 Reveals Abundant CO-faint Molecular Gas," The Astrophysical Journal, 967, 148, 2024.

Butterfield, Natalie O.; Chuss, David T.; Guerra, Jordan A.; Morris, Mark R.; Paré, Dylan; Wollack, Edward J.; Dowell, C. Darren; Hankins, Matthew J.; Karpovich, Kaitlyn; Siah, Javad; Staguhn, Johannes; Zweibel, Ellen "SOFIA/HAWC+ Far-Infrared Polarimetric Large Area CMZ Exploration Survey. I. General Results from the Pilot Program," The Astrophysical Journal, 963, 130, 2024.
Butterfield, Natalie O.; Guerra, Jordan A.; Chuss, David T.; Morris, Mark R.; Paré, Dylan M.; Wollack, Edward J.; Costa, Allison H.; Hankins, Matthew J.; Mackey, Scott C.; Staguhn, Johannes; Zweibel, Ellen "SOFIA/HAWC+ Far-infrared Polarimetric Large Area CMZ Exploration Survey. II. Detection of a Magnetized Dust Ring in the Galactic Center," The Astrophysical Journal, 968, 63, 2024.
Butterworth, J.; Viti, S.; Van Der Werf, P. P.; Mangum, J. G.; Martín, S.; Harada, N.; Emig, K. L.; Muller, S.; Sakamoto, K.; Yoshimura, Y.; Tanaka, K.; Herrero-Illana, R.; Colzi, L.; Rivilla, V. M.; Huang, K. Y.; Bouvier, M.; Behrens, E.; Henkel, C.; Yan, Y. T.; Meier, D. S.; Zhou, D. "Molecular isotopologue measurements toward super star clusters and the relation to their ages in NGC 253 with ALCHEMI," Astronomy and Astrophysics, 686, A31, 2024.
Byrne, Alex N.; Xue, Ci; Van Voorhis, Troy; Mcguire, Brett A. "Sensitivity analysis of aromatic chemistry to gas-phase kinetics in a dark molecular cloud model," Physical Chemistry Chemical Physics (Incorporating Faraday Transactions), 26, 26734, 2024.
Caccianiga, A.; Ighina, L.; Moretti, A.; Brivio, R.; Belladitta, S.; Dallacasa, D.; Spingola, C.; Marchã, M. J.; Antón, S. "Obscuration in high-redshift jetted quasi-stellar objects," Astronomy and Astrophysics, 684, A98, 2024.
Cacciapuoti, L.; Macias, E.; Gupta, A.; Testi, L.; Miotello, A.; Espaillat, C.; Küffmeier, M.; Van Terwisga, S.; Tobin, J.; Grant, S.; Manara, C. F.; Segura-Cox, D.; Wendeborn, J.; Klessen, R. S.; Maury, A. J.; Lebreuilly, U.; Hennebelle, P.; Molinari, S. "A dusty streamer infalling onto the disk of a class I protostar. ALMA dual-band constraints on grain properties and the mass-infall rate," Astronomy and Astrophysics, 682, A61, 2024.
Calcino, Josh; Norfolk, Brodie J.; Price, Daniel J.; Hilder, Thomas; Speedie, Jessica; Pinte, Christophe; Garg, Himanshi; Teague, Richard; Hall, Cassandra; Stadler, Jochen "Observational signatures of circumbinary discs - II. Kinematic signatures in velocity residuals," Monthly Notices of the Royal Astronomical Society, 534, 2904, 2024.
Caleb, M.; Lenc, E.; Kaplan, D. L.; Murphy, T.; Men, Y. P.; Shannon, R. M.; Ferrario, L.; Rajwade, K. M.; Clarke, T. E.; Giacintucci, S.; Hurley-Walker, N.; Hyman, S. D.; Lower, M. E.; Mcsweeney, Sam; Ravi, V.; Barr, E. D.; Buchner, S.; Flynn, C. M. L.; Hessels, J. W. T.; Kramer, M.; Pritchard, J.; Stappers, B. W. "An emission-state-switching radio transient with a 54-minute period," Nature Astronomy, 8, 1159, 2024.
Cano-González, M.; Schödel, R.; Alberdi, A.; Moldón, J.; Pérez-Torres, M.; Najarro, F.; Gallego-Calvente, A. T. "A multi-frequency, multi-epoch radio continuum study of the Arches cluster with the Very Large Array," Astronomy and Astrophysics, 692, A23, 2024.
Capetti, Alessandro; Balmaverde, Barbara "The radio properties of z > 3.5 quasars: Are most high-redshift radio-loud active galactic nuclei obscured?," Astronomy and Astrophysics, 689, A174, 2024.
Carvalho, Adolfo S.; Pérez, Laura M.; Sierra, Anibal; Mellado, Maria Jesus; Hillenbrand, Lynne A.; Andrews, Sean; Benisty, Myriam; Birnstiel, Tilman; Carpenter, John M.; Guzmán, Viviana V.; Huang, Jane; Isella, Andrea; Kurtovic, Nicolas; Ricci, Luca; Wilner, David J. "A Dust-trapping Ring in the Planet-hosting Disk of Elias 2-24," The Astrophysical Journal, 971, 129, 2024.
Castellano, Marco; Napolitano, Lorenzo; Fontana, Adriano; Roberts-Borsani, Guido; Treu, Tommaso; Vanzella, Eros; Zavala, Jorge A.; Arrabal Haro, Pablo; Calabrò, Antonello; Llerena, Mario; Mascia, Sara; Merlin, Emiliano; Paris, Diego; Pentericci, Laura; Santini, Paola; Bakx, Tom J. L. C.; Bergamini, Pietro; Cupani, Guido; Dickinson, Mark; Filippenko, Alexei V.; Glazebrook, Karl; Grillo, Claudio; Kelly, Patrick L.; Malkan, Matthew A.; Mason, Charlotte A.; Morishita, Takahiro; Nanayakkara, Themiya; Rosati, Piero; Sani, Eleonora; Wang, Xin; Yoon, Ilsang "JWST NIRSpec Spectroscopy of the Remarkable Bright Galaxy GHZ2/GLASS-z12 at Redshift 12.34," The Astrophysical Journal, 972, 143, 2024.
Catán, V.; González-López, J.; Solimano, M.; Barrientos, L. F.; Afruni, A.; Aravena, M.; Bayliss, M.; Hernández, J. A.; Ledoux, C.; Mahler, G.; Sharon, K.; Tejos, N. "Molecular gas budget of strongly magnified low-mass star-forming galaxies at cosmic noon," Astronomy and Astrophysics, 692, A215, 2024.
Cathey, Jared; Gonzalez, Anthony H.; Lower, Sidney; Phadke, Kedar A.; Spilker, Justin; Aravena, Manuel; Bayliss, Matthew; Birkin, Jack E.; Birrer, Simon; Chapman, Scott; Dahle, Håkon; Hayward, Christopher C.; Hezaveh, Yashar; Hill, Ryley; Hutchison, Taylor A.; Kim, Keunho J.; Mahler, Guillaume; Marrone, Daniel P.; Narayanan, Desika; Navarre, Alexander; Reuter, Cassie; Rigby, Jane R.; Sharon, Keren; Solimano, Manuel; Sulzenauer, Nikolaus; Vieira, Joaquin; Vizgan, David "TEMPLATES: Characterization of a Merger in the Dusty Lensing SPT0418-47 System," The Astrophysical Journal, 967, 11, 2024.
Cendes, Y.; Berger, E.; Alexander, K. D.; Chornock, R.; Margutti, R.; Metzger, B.; Wieringa, M. H.; Bietenholz, M. F.; Hajela, A.; Laskar, T.; Stroh, M. C.; Terreran, G. "Ubiquitous Late Radio Emission from Tidal Disruption Events," The Astrophysical Journal, 971, 185, 2024.
Cerrigone, Luciano; Umana, Grazia; Trigilio, Corrado; Menten, Karl M.; Bordiu, Cristobal; Ingallinera, Adriano; Leto, Paolo; Buemi, Carla S.; Bufano, Filomena; Cavallaro, Francesco; Loru, Sara; Riggi, Simone "The distance to CRL 618 through its radio expansion parallax," Monthly Notices of the Royal Astronomical Society, 529, 1579, 2024.
Cesaroni, R.; Moscadelli, L.; Caratti O Garatti, A.; Eislöffel, J.; Fedriani, R.; Neri, R.; Ray, T.; Sanna, A.; Stecklum, B. "Radio outburst from a massive (proto)star. III. Unveiling the bipolarity of the radio jet from S255IR NIRS 3," Astronomy and Astrophysics, 683, L15, 2024.
Chahine, Layal; Ceccarelli, Cecilia; De Simone, Marta; Chandler, Claire J.; Codella, Claudio; Podio, Linda; López-Sepulcre, Ana; Sakai, Nami; Loinard, Laurent; Bouvier, Mathilde; Caselli, Paola; Vastel, Charlotte; Bianchi, Eleonora; Cuello, Nicolás; Fontani, Francesco; Johnstone, Doug; Sabatini, Giovanni; Hanawa, Tomoyuki; Zhang, Ziwei E.; Aikawa, Yuri; Busquet, Gemma; Caux, Emmanuel; Durán, Aurore; Herbst, Eric; Ménard, François; Segura-Cox, Dominique; Svoboda, Brian; Balucani, Nadia; Charnley, Steven; Dulieu, François; Evans, Lucy; Fedele, Davide; Feng, Siyi; Hama, Tetsuya; Hirota, Tomoya; Isella, Andrea; Jímenez-Serra, Izaskun; Lefloch, Bertrand; Maud, Luke T.; Maureira, María José; Miotello, Anna; Moellenbrock, George; Nomura, Hideko; Oba, Yasuhiro; Ohashi, Satoshi; Okoda, Yuki; Oya, Yoko; Pineda, Jaime; Rimola, Albert; Sakai, Takeshi; Shirley, Yancy; Testi, Leonardo; Viti, Serena; Watanabe, Naoki; Watanabe, Yoshimasa; Zhang, Yichen; Yamamoto, Satoshi "Multiple chemical tracers finally unveil the intricate NGC 1333 IRAS 4A outflow system. FAUST XVI," Monthly Notices of the Royal Astronomical Society, 531, 2653, 2024.
Chahine, Layal; Ceccarelli, Cecilia; De Simone, Marta; Chandler, Claire J.; Codella, Claudio; Podio, Linda; López-Sepulcre, Ana; Svoboda, Brian; Sabatini, Giovanni; Sakai, Nami; Loinard, Laurent; Vastel, Charlotte; Balucani, Nadia; Rimola, Albert; Ugliengo, Piero; Aikawa, Yuri; Bianchi, Eleonora; Bouvier, Mathilde; Caselli, Paola; Charnley, Steven; Cuello, Nicolás; Hanawa, Tomoyuki; Johnstone, Doug; Maureira, Maria José; Ménard, Francois; Shirley, Yancy; Testi, Leonardo; Yamamoto, Satoshi "FAUST XIX. D_2CO in the outflow cavities of NGC 1333 IRAS 4A: recovering the physical structure of its original prestellar core," Monthly Notices of the Royal Astronomical Society, 534, L48, 2024.
Chakraborty, Joheen; Arcodia, Riccardo; Kara, Erin; Miniutti, Giovanni; Giustini, Margherita; Tetarenko, Alexandra J.; Rhodes, Lauren; Franchini, Alessia; Bonetti, Matteo; Burdge, Kevin B.; Goodwin, Adelle J.; Maccarone, Thomas J.; Merloni, Andrea; Ponti, Gabriele; Remillard, Ronald A.; Saxton, Richard D. "Testing EMRI Models for Quasi-periodic Eruptions with 3.5 yr of Monitoring eRO-QPE1," The Astrophysical Journal, 965, 12, 2024.
Chamberlain, Katie; Besla, Gurtina; Patel, Ekta; Rodriguez-Gomez, Vicente; Torrey, Paul; Martin, Garreth; Johnson, Kelsey; Kallivayalil, Nitya; Patton, David; Pearson, Sarah; Privon, George; Stierwalt, Sabrina "A Physically Motivated Framework to Compare Pair Fractions of Isolated Low- and High-mass Galaxies across Cosmic Time," The Astrophysical Journal, 962, 162, 2024.
Chandola, Yogesh; Li, Di; Tsai, Chao-Wei; Li, Guodong; Peng, Yingjie; Zuo, Pei; Mcintyre, Travis; Ma, Yin-Zhe; Stern, Daniel; Griffith, Roger; Jarrett, Thomas; Eisenhardt, Peter; Balkowski, Chantal "H I content of selected mid-infrared bright, starburst blue compact dwarf galaxies," Monthly Notices of the Royal Astronomical Society, 527, 603, 2024.
Chandra, Poonam; Chevalier, Roger A.; Maeda, Keiichi; Ray, Alak K.; Nayana, A. J. "Chandra's Insights into SN 2023ixf," The Astrophysical Journal, 963, L4, 2024.
Chang, Yu-Ling; Lan, Ting-Wen; Prochaska, J. Xavier; Napolitano, Lucas; Anand, Abhijeet; Aguilar, J.; Ahlen, S.; Brooks, D.; Claybaugh, T.; De La Macorra, A.; Dey, Arjun; Doel, P.; Gontcho A Gontcho, S.; Guy, J.; Juneau, S.; Kisner, T.; Lambert, A.; Landriau, M.; Le Guillou, L.; Manera, M.; Martini, P.; Meisner, A.; Miquel, R.; Moustakas, J.; Myers, A. D.; Nie, J.; Poppett, C.; Rezaie, M.; Rossi, G.; Sanchez, E.; Schubnell, M.; Seo, H.; Sprayberry, D.; Tarlé, G.; Weaver, B. A.; Zou, H. "Probing the Impact of Radio-mode Feedback on the Properties of the Cool Circumgalactic Medium," The Astrophysical Journal, 974, 191, 2024.
Chang, Zhe; Kuang, Yu-Ting; Wu, Di; Zhou, Jing-Zhi; Zhu, Qing-Hua "New constraints on primordial non-Gaussianity from missing two-loop contributions of scalar induced gravitational waves," Physical Review D, 109, L041303, 2024.
Chapman, Scott C.; Hill, Ryley; Aravena, Manuel; Archipley, Melanie; Babul, Arif; Burgoyne, James; Canning, Rebecca E. A.; Deane, Roger P.; De Breuck, Carlos; Gonzalez, Anthony H.; Hayward, Christopher C.; Kim, Seon Woo; Malkan, Matt; Marrone, Dan P.; Mcintyre, Vincent; Murphy, Eric; Pass, Emily; Perry, Ryan W.; Phadke, Kedar A.; Rennehan, Douglas; Reuter, Cassie; Rotermund, Kaja M.; Scott, Douglas; Seymour, Nick; Solimano, Manuel; Spilker, Justin; Stark, Anthony A.; Sulzenauer, Nikolaus; Tothill, Nick; Vieira, Joaquin D.; Vizgan, David; Wang, George; Weiss, Axel "Brightest Cluster Galaxy Formation in the z = 4.3 Protocluster SPT 2349-56: Discovery of a Radio-loud Active Galactic Nucleus," The Astrophysical Journal, 961, 120, 2024.
Charbonneau, Rebecca "Why did Earth's first radio message to alien civilizations leave out half of humanity?," Nature, 635, 279, 2024.
Charles, N.; Kern, N. S.; Pascua, R.; Bernardi, G.; Bester, L.; Smirnov, O.; Acedo, E. D. L.; Abdurashidova, Z.; Adams, T.; Aguirre, J. E.; Baartman, R.; Beardsley, A. P.; Berkhout, L. M.; Billings, T. S.; Bowman, J. D.; Bull, P.; Burba, J.; Byrne, R.; Carey, S.; Chen, K.; Choudhuri, S.; Cox, T.; Deboer, D. R.; Dexter, M.; Dillon, J. S.; Dynes, S.; Eksteen, N.; Ely, J.; Ewall-Wice, A.; Fritz, R.; Furlanetto, S. R.; Gale-Sides, K.; Garsden, H.; Gehlot, B. K.; Ghosh, A.; Gorce, A.; Gorthi, D.; Halday, Z.; Hazelton, B. J.; Hewitt, J. N.;

Hickish, J.; Huang, T.; Jacobs, D. C.; Josaitis, A.; Kerrigan, J.; Kittiwisit, P.; Kolopanis, M.; Lanman, A.; Liu, A.; Ma, Y.-Z.; Macmahon, D. H. E.; Malan, L.; Malgas, K.; Malgas, C.; Marero, B.; Martinot, Z. E.; Mcbride, L.; Mesinger, A.; Mohamed-Hinds, N.; Molewa, M.; Morales, M. F.; Murray, S.; Nikolic, B.; Nuwegeld, H.; Parsons, A. R.; Patra, N.; Plante, P. L.; Qin, Y.; Rath, E.; Razavi-Ghods, N.; Riley, D.; Robnett, J.; Rosie, K.; Santos, M. G.; Sims, P.; Singh, S.; Storer, D.; Swarts, H.; Tan, J.; Wilensky, M. J.; Williams, P. K. G.; Wyngaarden, P. V.; Zheng, H. "Mitigating calibration errors from mutual coupling with time-domain filtering of 21 cm cosmological radio observations," Monthly Notices of the Royal Astronomical Society, 534, 3349, 2024.

Chen, Che-Yu; Friesen, Rachel; Li, Jialu; Schmiedeke, Anika; Frayer, David; Li, Zhi-Yun; Tobin, John; Looney, Leslie W.; Offner, Stella; Mundy, Lee G.; Harris, Andrew I.; Church, Sarah; Ostriker, Eve C.; Pineda, Jaime E.; Hsieh, Tien-Hao; Lam, Ka Ho "Dynamics in Star-forming Cores (DiSCo): Project Overview and the First Look toward the B1 and NGC 1333 Regions in Perseus," Monthly Notices of the Royal Astronomical Society, 527, 10279-10293, 2024.

Chen, En; Chen, Xi; Chen, Xuepeng; Fang, Min; He, Qianru "Multiple collisions in N59 bubble: sequential cloud-cloud collisions," Monthly Notices of the Royal Astronomical Society, 535, 419, 2024.

Chen, Guangwen; Bendo, George J.; Fuller, Gary A.; Zhang, Hong-Xin; Kong, Xu "Radio-to-submillimetre spectral energy distributions of NGC 1365," Monthly Notices of the Royal Astronomical Society, 530, 819, 2024.

Chen, Jianhang; Lopez-Rodriguez, Enrique; Ivison, R. J.; Geach, James E.; Dye, Simon; Liu, Xiaohui; Bendo, George "A kiloparsec-scale ordered magnetic field in a galaxy at z = 5.6," Astronomy and Astrophysics, 692, A34, 2024.

Chen, Li; Qin, Sheng-Li; Liu, Tie; Liu, Hong-Li; Liu, Sheng-Yuan; Liu, Meizhu; Shi, Hongqiong; Li, Chuanshou; Tang, Mengyao; Zhang, Tianwei; Tatematsu, Ken'Ichi; Li, Xiaohu; Xu, Fengwei; Wu, Yuefang; Yang, Dongting "ALMA High-resolution Spectral Survey of Thioformaldehyde (H_2CS) toward Massive Protoclusters," The Astrophysical Journal, 962, 13, 2024.

Chen, Michael Chun-Yuan; Di Francesco, James; Friesen, Rachel K.; Pineda, Jaime E.; Caselli, Paola; Ginsburg, Adam; Kirk, Helen; Punanova, Anna; The Gas Collaboration "Filament Accretion and Fragmentation in the Perseus Molecular Cloud," The Astrophysical Journal, 977, 135, 2024.

Chen, Michael Chun-Yuan; Fissel, Laura M.; Sadavoy, Sarah I.; Rosolowsky, Erik; Doi, Yasuo; Arzoumanian, Doris; Bastien, Pierre; Coudé, Simon; Di Francesco, James; Friesen, Rachel; Furuya, Ray S.; Hwang, Jihye; Inutsuka, Shu-Ichiro; Johnstone, Doug; Karoly, Janik; Kwon, Jungmi; Kwon, Woojin; Le Gouellec, Valentin J. M.; Liu, Hong-Li; Mairs, Steve; Onaka, Takashi; Pattle, Kate; Rawlings, Mark G.; Tahani, Mehrnoosh; Tamura, Motohide; Wang, Jia-Wei; Bistro Team "Relative alignments between magnetic fields, velocity gradients, and dust emission gradients in NGC 1333," Monthly Notices of the Royal Astronomical Society, 533, 1938, 2024.

Chen, Qingxiang; Sharon, Chelsea E.; Algera, Hiddo S. B.; Baker, Andrew J.; Keeton, Charles R.; Lutz, Dieter; Liu, Daizhong; Young, Anthony J.; Tagore, Amitpal S.; Rivera, Jesus; Hicks, Erin K. S.; Allam, Sahar S.; Tucker, Douglas L. "Comparisons between Resolved Star Formation Rate and Gas Tracers in the Strongly Lensed Galaxy SDSS J0901+1814 at Cosmic Noon," The Astrophysical Journal, 972, 147, 2024.

Chen, Sina; Kharb, Preeti; Silpa, Sasikumar; Nandi, Sumana; Berton, Marco; Järvelä, Emilia; Laor, Ari; Behar, Ehud; Foschini, Luigi; Vietri, Amelia; Gu, Minfeng; La Mura, Giovanni; Crepaldi, Luca; Zhou, Minhua "A Large Jet Narrow-line Seyfert 1 Galaxy: Observations from Parsec to 100 kpc Scales," The Astrophysical Journal, 963, 32, 2024.

Chen, Sina; Laor, Ari; Behar, Ehud; Baldi, Ranieri D.; Gelfand, Joseph D.; Kimball, Amy E.; Mchardy, Ian M.; Orosz, Gabor; Paragi, Zsolt "Windy or Not: Radio Parsec-scale Evidence for a Broad-line Region Wind in Radio-quiet Quasars," The Astrophysical Journal, 975, 35, 2024.

Chen, Y.; Luo, B.; Brandt, W. N.; Zuo, Wenwen; Dix, Cooper; Ha, Trung; Matthews, Brandon; Paul, Jeremiah D.; Plotkin, Richard M.; Shemmer, Ohad "Rest-frame Optical Spectroscopy of Ten z ~ 2 Weak Emission-line Quasars," The Astrophysical Journal, 972, 191, 2024.

Chen, Y.; Rocha, W. R. M.; Van Dishoeck, E. F.; Van Gelder, M. L.; Nazari, P.; Slavicinska, K.; Francis, L.; Tabone, B.; Ressler, M. E.; Klaassen, P. D.; Beuther, H.; Boogert, A. C. A.; Gieser, C.; Kavanagh, P. J.; Perotti, G.; Le Gouellec, V. J. M.; Majumdar, L.; Güdel, M.; Henning, Th. "JOYS+: The link between the ice and gas of complex organic molecules: Comparing JWST and ALMA data of two low-mass protostars," Astronomy and Astrophysics, 690, A205, 2024.

Chen, Z.; Dannerbauer, H.; Lehnert, M. D.; Emonts, B. H. C.; Gu, Q.; Allison, J. R.; Champagne, J. B.; Hatch, N.; Indermüehle, B.; Norris, R. P.; Pérez-Martínez, J. M.; Röttgering, H. J. A.; Serra, P.; Seymour, N.; Shimakawa, R.; Thomson, A.; Casey, C. M.; De Breuck, C.; Drouart, G.; Kodama, T.; Koyama, Y.; Urbina, C. Lagos; Macgregor, P.; Miley, G.; Rodríguez-Espinosa, J. M.; Sánchez-Portal, M.; Ziegler, B. "COALAS II. Extended molecular gas reservoirs are common in a distant, forming galaxy cluster," Monthly Notices of the Royal Astronomical Society, 527, 8950, 2024.

Chen, Zhi-Fu; Chen, Zhe-Geng; Peng, Xing-Long; Huang, Wei-Rong "Narrow [O III] Emission Lines as a Potential Proxy for the Evolutionary Stage of Quasars," The Astrophysical Journal, 974, 277, 2024.

Chen, Zu-Cheng; Li, Shou-Long; Wu, Puxun; Yu, Hongwei "NANOGrav hints for first-order confinement-deconfinement phase transition in different QCD-matter scenarios," Physical Review D, 109, 043022, 2024.

Chen, Zu-Cheng; Wu, Yu-Mei; Bi, Yan-Chen; Huang, Qing-Guo "Search for nontensorial gravitational-wave backgrounds in the NANOGrav 15-year dataset," Physical Review D, 109, 084045, 2024.

Cheng, Xiaopeng; Sohn, Bong Won "Two Radio Cores in GPS J1543-0757: A New Dual Supermassive Black Hole System?," The Astrophysical Journal, 974, 155, 2024.

Cheng, Yu; Lu, Xing; Sanhueza, Patricio; Liu, Hauyu Baobab; Zhang, Qizhou; Galván-Madrid, Roberto; Wang, Ke; Nakamura, Fumitaka; Liu, Tie; Feng, Siyi; Li, Shanghuo; Jiao, Sihan; Tanaka, Kei E. I.; Liu, Xunchuan; Li, Pak Shing; Luo, Qiuyi; Gu, Qilao; Lin, Yuxin; Guzmán, Andrés E. "Investigations of Massive Filaments and Star Formation (INFANT). I. Core Identification and Core Mass Function," The Astrophysical Journal, 967, 56, 2024.

Cheng, Yun-Ting; Chang, Tzu-Ching; Lidz, Adam "Is the Radio Source Dipole from NVSS Consistent with the Cosmic Microwave Background and ΛCDM?," The Astrophysical Journal, 965, 32, 2024.

Cheong, Whee Yeon; Lee, Sang-Sung; Kim, Sang-Hyun; Kang, Sincheol; Kim, Jae Young; Rani, Bindu; Readhead, Anthony C. S.; Kiehlmann, Sebastian; Lähteenmäki, Anne; Tornikoski, Merja; Tammi, Joni; Ramakrishnan, Venkatessh; Agudo, Iván; Fuentes, Antonio; Traianou, Efthalia; Escudero, Juan; Thum, Clemens; Myserlis, Ioannis; Casadio, Carolina; Gurwell, Mark "A near magnetic-to-kinetic energy equipartition flare from the relativistic jet in AO 0235 + 164 during 2013-2019," Monthly Notices of the Royal Astronomical Society, 527, 882, 2024.

Chiang, I-Da; Sandstrom, Karin M.; Chastenet, Jérémy; Bolatto, Alberto D.; Koch, Eric W.; Leroy, Adam K.; Sun, Jiayi; Teng, Yu-Hsuan; Williams, Thomas G. "Resolved Measurements of the CO-to-H_2 Conversion Factor in 37 Nearby Galaxies," The Astrophysical Journal, 964, 18, 2024.

Chilufya, J.; Hardcastle, M. J.; Pierce, J. C. S.; Croston, J. H.; Mingo, B.; Zheng, X.; Baldi, R. D.; Röttgering, H. J. A. "The nature of compact radio-loud AGN: a systematic look at the LOFAR AGN population," Monthly Notices of the Royal Astronomical Society, 529, 1472, 2024.

Chime/Frb Collaboration; Amiri, Mandana; Andersen, Bridget C.; Andrew, Shion; Bandura, Kevin; Bhardwaj, Mohit; Boyle, P. J.; Brar, Charanjot; Breitman, Daniela; Cassanelli, Tomas; Chawla, Pragya; Cook, Amanda M.; Curtin, Alice P.; Dobbs, Matt; Dong, Fengqiu Adam; Eadie, Gwendolyn; Fonseca, Emmanuel; Gaensler, B. M.; Giri, Utkarsh; Herrera-Martin, Antonio; Hopkins, Hans; Ibik, Adaeze L.; Joseph, Ronniy C.; Kaczmarek, J. F.; Kader, Zarif; Kaspi, Victoria M.; Lanman, Adam E.; Lazda, Mattias; Leung, Calvin; Liu, Siqi; Masui, Kiyoshi W.; Mckinven, Ryan; Mena-Parra, Juan; Merryfield, Marcus; Michilli, Daniele; Ng, Cherry; Nimmo, Kenzie; Noble, Gavin; Pandhi, Ayush; Patel, Chitrang; Pearlman, Aaron B.; Pen, Ue-Li; Petroff, Emily; Pleunis, Ziggy; Rafiei-Ravandi, Masoud; Rahman, Mubdi; Ransom, Scott M.; Sand, Ketan R.; Scholz, Paul; Shah, Vishwangi; Shin, Kaitlyn; Shpunarska, Yuliya; Siegel, Seth R.; Smith, Kendrick; Stairs, Ingrid; Stenning, David C.; Vanderlinde, Keith; Wang, Haochen; White, Henry; Wulf, Dallas "Updating the First CHIME/FRB Catalog of Fast Radio Bursts with Baseband Data," The Astrophysical Journal, 969, 145, 2024.

Cho, Ilje; Gómez, José L.; Lico, Rocco; Zhao, Guang-Yao; Traianou, Efthalia; Dahale, Rohan; Fuentes, Antonio; Toscano, Teresa; Foschi, Marianna; Kovalev, Yuri Y.; Lobanov, Andrei; Pushkarev, Alexander B.; Gurvits, Leonid I.; Kim, Jae-Young; Lisakov, Mikhail; Voitsik, Petr; Myserlis, Ioannis; Pötzl, Felix; Ros, Eduardo "Unveiling the bent-jet structure and polarization of OJ 287 at 1.7 GHz with space VLBI," Astronomy and Astrophysics, 683, A248, 2024.

Choi, Woorak; Bureau, Martin; Liu, Lijie; Cappellari, Michele; Davis, Timothy A.; Gensior, Jindra; Liang, Fu-Heng; Lu, Anan; Moon, Sanghyuk; Ruffa, Ilaria; Williams, Thomas G.; Chung, Aeree "WISDOM Project - XXI. Giant molecular clouds in the central region of the barred spiral galaxy NGC 613: a steep size-linewidth relation," Monthly Notices of the Royal Astronomical Society, 531, 4045, 2024.

Choudhury, Spandan; Pineda, Jaime E.; Caselli, Paola; Chen, Michael Chun-Yuan; Offner, Stella S. R.; Valdivia-Mena, Maria Teresa "Infall of material onto the filaments in Barnard 5," Astronomy and Astrophysics, 683, A77, 2024.

Chown, Ryan; Sidhu, Ameek; Peeters, Els; Tielens, Alexander G. G. M.; Cami, Jan; Berné, Olivier; Habart, Emilie; Alarcón, Felipe; Canin, Amélie; Schroetter, Ilane; Trahin, Boris; Van De Putte, Dries; Abergel, Alain; Bergin, Edwin A.; Bernard-Salas, Jeronimo; Boersma, Christiaan; Bron, Emeric; Cuadrado, Sara; Dartois, Emmanuel; Dicken, Daniel; El-Yajouri, Meriem; Fuente, Asunción; Goicoechea, Javier R.; Gordon, Karl D.; Issa, Lina; Joblin, Christine; Kannavou, Olga; Khan, Baria; Lacinbala, Ozan; Languignon, David; Le Gal, Romane; Maragkoudakis, Alexandros; Meshaka, Raphael; Okada, Yoko; Onaka, Takashi; Pasquini, Sofia; Pound, Marc W.; Robberto, Massimo; Röllig, Markus; Schefter, Bethany; Schirmer, Thiébaut; Vicente, Sílvia; Wolfire, Mark G.; Zannese, Marion; Aleman, Isabel; Allamandola, Louis; Auchettl, Rebecca; Baratta, Giuseppe Antonio; Bejaoui, Salma; Bera, Partha P.; Black, John H.; Boulanger, François; Bouwman, Jordy; Brandl, Bernhard; Brechignac, Philippe; Brünken, Sandra; Buragohain, Mridusmita; Burkhardt, Andrew; Candian, Alessandra; Cazaux, Stéphanie; Cernicharo, Jose; Chabot, Marin; Chakraborty, Shubhadip; Champion, Jason; Colgan, Sean W. J.; Cooke, Ilsa R.; Coutens, Audrey; Cox, Nick L. J.; Demyk, Karine; Meyer, Jennifer Donovan; Foschino, Sacha;

García-Lario, Pedro; Gavilan, Lisseth; Gerin, Maryvonne; Gottlieb, Carl A.; Guillard, Pierre; Gusdorf, Antoine; Hartigan, Patrick; He, Jinhua; Herbst, Eric; Hornekaer, Liv; Jäger, Cornelia; Janot-Pacheco, Eduardo; Kaufman, Michael; Kemper, Francisca; Kendrew, Sarah; Kirsanova, Maria S.; Klaassen, Pamela; Kwok, Sun; Labiano, Álvaro; Lai, Thomas S.-Y.; Lee, Timothy J.; Lefloch, Bertrand; Le Petit, Franck; Li, Aigen; Linz, Hendrik; Mackie, Cameron J.; Madden, Suzanne C.; Mascetti, Joëlle; Mcguire, Brett A.; Merino, Pablo; Micelotta, Elisabetta R.; Misselt, Karl; Morse, Jon A.; Mulas, Giacomo; Neelamkodan, Naslim; Ohsawa, Ryou; Omont, Alain; Paladini, Roberta; Palumbo, Maria Elisabetta; Pathak, Amit; Pendleton, Yvonne J.; Petrignani, Annemieke; Pino, Thomas; Puga, Elena; Rangwala, Naseem; Rapacioli, Mathias; Ricca, Alessandra; Roman-Duval, Julia; Roser, Joseph; Roueff, Evelyne; Rouillé, Gaël; Salama, Farid; Sales, Dinalva A.; Sandstrom, Karin; Sarre, Peter; Sciamma-O'Brien, Ella; Sellgren, Kris; Shenoy, Sachindev S.; Teyssier, David; Thomas, Richard D.; Togi, Aditya; Verstraete, Laurent; Witt, Adolf N.; Wootten, Alwyn; Zettergren, Henning; Zhang, Yong; Zhang, Ziwei E.; Zhen, Junfeng "PDRs4All. IV. An embarrassment of riches: Aromatic infrared bands in the Orion Bar," Astronomy and Astrophysics, 685, A75, 2024.

Choza, Carmen; Bautista, Daniel; Croft, Steve; Siemion, Andrew P. V.; Brzycki, Bryan; Bhattaram, Krishnakumar; Czech, Daniel; De Pater, Imke; Gajjar, Vishal; Isaacson, Howard; Lacker, Kevin; Lacki, Brian; Lebofsky, Matthew; Macmahon, David H. E.; Price, Danny; Schoultz, Sarah; Sheikh, Sofia; Varghese, Savin Shynu; Morgan, Lawrence; Drew, Jamie; Worden, S. Pete "The Breakthrough Listen Search for Intelligent Life: Technosignature Search of 97 Nearby Galaxies," The Astronomical Journal, 167, 10, 2024.

Chrimes, A. A.; Coppejans, D. L.; Jonker, P. G.; Levan, A. J.; Groot, P. J.; Mummery, A.; Stanway, E. R. "Multi-wavelength observations of the luminous fast blue optical transient AT 2023fhn: Up to ~200 days post-explosion," Astronomy and Astrophysics, 691, A329, 2024.

Chrimes, A. A.; Jonker, P. G.; Levan, A. J.; Coppejans, D. L.; Gaspari, N.; Gompertz, B. P.; Groot, P. J.; Malesani, D. B.; Mummery, A.; Stanway, E. R.; Wiersema, K. "AT2023fhn (the Finch): a luminous fast blue optical transient at a large offset from its host galaxy," Monthly Notices of the Royal Astronomical Society, 527, L47, 2024.

Christy, Collin T.; Alexander, Kate D.; Margutti, Raffaella; Wieringa, Mark; Cendes, Yvette; Chornock, Ryan; Laskar, Tanmoy; Berger, Edo; Bietenholz, Michael; Coppejans, Deanne L.; De Colle, Fabio; Eftekhari, Tarraneh; Holoien, Thomas W.-S.; Matsumoto, Tatsuya; Miller-Jones, James C. A.; Ramirez-Ruiz, Enrico; Saxton, Richard; Van Velzen, Sjoert "The Peculiar Radio Evolution of the Tidal Disruption Event ASASSN-19bt," The Astrophysical Journal, 974, 18, 2024.

Chuang, Yo-Ling; Kuan, Yi-Jehng; Charnley, Steven B. "Tentative detection of cyclopropenylidene in comets," Monthly Notices of the Royal Astronomical Society, 534, 3439, 2024.

Cigan, Phil; Makarov, Valeri V.; Secrest, Nathan J.; Gordon, David; Johnson, Megan C.; Lambert, Sebastien "Metrics of Astrometric Variability in the International Celestial Reference Frame. I. Statistical Analysis and Selection of the Most Variable Sources," The Astrophysical Journal Supplement Series, 274, 28, 2024.

Codella, C.; Podio, L.; De Simone, M.; Ceccarelli, C.; Ohashi, S.; Chandler, C. J.; Sakai, N.; Pineda, J. E.; Segura-Cox, D. M.; Bianchi, E.; Cuello, N.; López-Sepulcre, A.; Fedele, D.; Caselli, P.; Charnley, S.; Johnstone, D.; Zhang, Z. E.; Maureira, M. J.; Zhang, Y.; Sabatini, G.; Svoboda, B.; Jiménez-Serra, I.; Loinard, L.; Mercimek, S.; Murillo, N.; Yamamoto, S. "FAUST XII. Accretion streamers and jets in the VLA 1623-2417 protocluster," Monthly Notices of the Royal Astronomical Society, 528, 7383, 2024.

Cohn, Jonathan H.; Curliss, Maeve; Walsh, Jonelle L.; Kabasares, Kyle M.; Boizelle, Benjamin D.; Barth, Aaron J.; Gebhardt, Karl; Gültekin, Kayhan; Buote, David A.; Darling, Jeremy; Baker, Andrew J.; Ho, Luis C. "Modeling ALMA Observations of the Warped Molecular Gas Disk in the Red Nugget Relic Galaxy NGC 384," The Astrophysical Journal, 975, 179, 2024.

Columba, G.; Rigliaco, E.; Gratton, R.; Mesa, D.; D'Orazi, V.; Ginski, C.; Engler, N.; Williams, J. P.; Bae, J.; Benisty, M.; Birnstiel, T.; Delorme, P.; Dominik, C.; Facchini, S.; Menard, F.; Pinilla, P.; Rab, C.; Ribas, Á.; Squicciarini, V.; Van Holstein, R. G.; Zurlo, A. "Disk Evolution Study Through Imaging of Nearby Young Stars (DESTINYS): HD 34700 A unveils an inner ring," Astronomy and Astrophysics, 681, A19, 2024.

Colzi, L.; Martín-Pintado, J.; Zeng, S.; Jiménez-Serra, I.; Rivilla, V. M.; Sanz-Novo, M.; Martín, S.; Zhang, Q.; Lu, X. "Excitation and spatial study of a prestellar cluster towards G+0.693-0.027 in the Galactic centre," Astronomy and Astrophysics, 690, A121, 2024.

Comerford, Julia M.; Nevin, Rebecca; Negus, James; Barrows, R. Scott; Eracleous, Michael; Müller-Sánchez, Francisco; Roy, Namrata; Stemo, Aaron; Storchi-Bergmann, Thaisa; Wylezalek, Dominika "An Excess of Active Galactic Nuclei Triggered by Galaxy Mergers in MaNGA Galaxies of Stellar Mass ~10^{11} $M_{\odot}$," The Astrophysical Journal, 963, 53, 2024.

Cordiner, M. A.; Darnell, K.; Bockelée-Morvan, D.; Roth, N. X.; Biver, N.; Milam, S. N.; Charnley, S. B.; Boissier, J.; Bonev, B. P.; Qi, C.; Crovisier, J.; Remijan, A. J. "Evidence for Surprising Heavy Nitrogen Isotopic Enrichment in Comet 46P/Wirtanen's Hydrogen Cyanide," The Planetary Science Journal, 5, 221, 2024.

Cordiner, Martin; Thelen, Alexander; Cavalie, Thibault; Cosentino, Richard; Fletcher, Leigh N.; Gurwell, Mark; De Kleer, Katherine; Kuan, Yi-Jehng; Lellouch, Emmanuel; Moullet, Arielle; Nixon, Conor; De Pater, Imke; Teanby, Nicholas; Butler, Bryan; Charnley, Steven; Milam, Stefanie; Moreno, Raphael; Booth, Mark; Klaassen, Pamela; Cicone, Claudia; Mroczkowski, Tony; Di Mascolo, Luca; Johnstone, Doug; Van Kampen, Eelco; Lee, Minju; Liu, Daizhong; Maccarone, Thomas; Saintonge, Amelie; Smith, Matthew; Wedemeyer, Sven "Atacama Large Aperture Submillimeter Telescope (AtLAST) science: Planetary and cometary atmospheres," Open Research Europe, 4, 78, 2024.

Cortés, Paulo C.; Girart, Josep M.; Sanhueza, Patricio; Liu, Junhao; Martín, Sergio; Stephens, Ian W.; Beuther, Henrik; Koch, Patrick M.; Fernández-López, M.; Sánchez-Monge, Álvaro; Wang, Jia-Wei; Morii, Kaho; Li, Shanghuo; Saha, Piyali; Zhang, Qizhou; Rebolledo, David; Zapata, Luis A.; Kang, Ji-Hyun; Jiao, Wenyu; Kim, Jongsoo; Cheng, Yu; Hwang, Jihye; Chung, Eun Jung; Choudhury, Spandan; Lyo, A. -Ran; Olguin, Fernando "MagMaR III-Resisting the Pressure, Is the Magnetic Field Overwhelmed in NGC6334I?," The Astrophysical Journal, 972, 115, 2024.

Cotton, W. D.; Filipović, M. D.; Camilo, F.; Indebetouw, R.; Alsaberi, R. Z. E.; Anih, J. O.; Baker, M.; Bastian, T. S.; Bojičić, I.; Carli, E.; Cavallaro, F.; Crawford, E. J.; Dai, S.; Haberl, F.; Levin, L.; Luken, K.; Pennock, C. M.; Rajabpour, N.; Stappers, B. W.; Van Loon, J. Th; Zijlstra, A. A.; Buchner, S.; Geyer, M.; Goedhart, S.; Serylak, M. "The MeerKAT 1.3 GHz Survey of the Small Magellanic Cloud," Monthly Notices of the Royal Astronomical Society, 529, 2443, 2024.

Cotton, W. D.; Kothes, R.; Camilo, F.; Chandra, P.; Buchner, S.; Nyamai, M. "MeerKAT 1.3 GHz Observations of Supernova Remnants," The Astrophysical Journal Supplement Series, 270, 21, 2024.

Crowe, S.; Fedriani, R.; Tan, J. C.; Whittle, M.; Zhang, Y.; Caratti O Garatti, A.; Farias, J. P.; Gautam, A.; Telkamp, Z.; Rothberg, B.; Grudić, M.; Andersen, M.; Cosentino, G.; Garcia-Lopez, R.; Rosero, V.; Tanaka, K.; Pinna, E.; Rossi, F.; Miller, D.; Agapito, G.; Plantet, C.; Ghose, E.; Christou, J.; Power, J.; Puglisi, A.; Briguglio, R.; Brusa, G.; Taylor, G.; Zhang, X.; Mazzoni, T.; Bonaglia, M.; Esposito, S.; Veillet, C. "Near-infrared observations of outflows and young stellar objects in the massive star-forming region AFGL 5180," Astronomy and Astrophysics, 682, A2, 2024.

Cui, Jiantong; Gu, Qiusheng; Shi, Yong "Massive red spiral galaxies in SDSS-IV MaNGA survey," Monthly Notices of the Royal Astronomical Society, 528, 2391, 2024.

Cui, Quan-Ling; Zhang, Chuan-Peng; Wang, Jun-Jie "Multiwavelength Observations of the Infrared Dust Bubble N75 and its Surroundings," Research in Astronomy and Astrophysics, 24, 045023, 2024.

Curiel, Salvador; Ortiz-León, Gisela N.; Mioduszewski, Amy J.; Arenas-Martinez, Anthony B. "Precise Mass, Orbital Motion, and Stellar Properties of the M-dwarf Binary LP 349-25AB," The Astrophysical Journal, 967, 112, 2024.

Da Silva, Patrícia; Combes, Françoise "Multiple-scale gas infall through gravity torques on Milky Way twins," Astronomy and Astrophysics, 691, A58, 2024.

D'Abrusco, Raffaele; Gomez, Monique; Grothkopf, Uta; Hunt, Sharon; Kneale, Ruth; Konuma, Mika; Novacescu, Jenny; Rebull, Luisa; Scire, Elena; Scott, Erin; Shaw, Richard; Thompson, Donna; Utley, Lance; Wilkinson, Christopher; Winkelman, Sherry "Assessing your Observatory's Impact: Best Practices in Establishing and Maintaining Observatory Bibliographies," The Open Journal of Astrophysics, 7, 85, 2024.

Daly, Ruth A.; Donahue, Megan; O'Dea, Christopher P.; Sebastian, Biny; Haggard, Daryl; Lu, Anan "New black hole spin values for Sagittarius A* obtained with the outflow method," Monthly Notices of the Royal Astronomical Society, 527, 428, 2024.

Danilovich, T.; Malfait, J.; Van De Sande, M.; Montargès, M.; Kervella, P.; De Ceuster, F.; Coenegrachts, A.; Millar, T. J.; Richards, A. M. S.; Decin, L.; Gottlieb, C. A.; Pinte, C.; De Beck, E.; Price, D. J.; Wong, K. T.; Bolte, J.; Menten, K. M.; Baudry, A.; De Koter, A.; Etoka, S.; Gobrecht, D.; Gray, M.; Herpin, F.; Jeste, M.; Lagadec, E.; Maes, S.; Mcdonald, I.; Marinho, L.; Müller, H. S. P.; Pimpanuwat, B.; Plane, J. M. C.; Sahai, R.; Wallström, S. H. J.; Yates, J.; Zijlstra, A. "Chemical tracers of a highly eccentric AGB-main-sequence star binary," Nature Astronomy, 8, 308, 2024.

Dartois, E.; Noble, J. A.; Caselli, P.; Fraser, H. J.; Jiménez-Serra, I.; Maté, B.; Mcclure, M. K.; Melnick, G. J.; Pendleton, Y. J.; Shimonishi, T.; Smith, Z. L.; Sturm, J. A.; Taillard, A.; Wakelam, V.; Boogert, A. C. A.; Drozdovskaya, M. N.; Erkal, J.; Harsono, D.; Herrero, V. J.; Ioppolo, S.; Linnartz, H.; Mcguire, B. A.; Perotti, G.; Qasim, D.; Rocha, W. R. M. "Spectroscopic sizing of interstellar icy grains with JWST," Nature Astronomy, 8, p. 359-367, 2024.

Das, Barnali; Chandra, Poonam; Petit, Véronique "Coherent Radio Emission from Main-sequence Radio Pulse Emitters: A New Stellar Diagnostic to Probe 3D Magnetospheric Structures," The Astrophysical Journal, 974, 267, 2024.

Das, S.; Kurtovic, N. T.; Flock, M. "From traffic jams to roadblocks: The outer regions of TW Hya with ALMA Band 8," Astronomy and Astrophysics, 689, A104, 2024.

Das, Sanskriti; Rickel, Mary; Leroy, Adam; Pingel, Nickolas M.; Pisano, D. J.; Heald, George; Mathur, Smita; Kingsbury, Joshua; Sardone, Amy "Detection of diffuse H I emission in the circumgalactic medium of NGC 891 and NGC 4565 - II," Monthly Notices of the Royal Astronomical Society, 527, 10358-10375, 2024.

Das, Swagat R.; Merello, Manuel; Bronfman, Leonardo; Liu, Tie; Garay, Guido; Stutz, Amelia; Mardones, Diego; Zhou, Jian-Wen; Sanhueza, Patricio; Liu, Hong-Li; Vázquez-Semadeni, Enrique; Gómez, Gilberto C.; Palau, Aina; Tej, Anandmayee; Xu, Feng-Wei; Baug, Tapas; Dewangan,

Lokesh K.; He, Jinhua; Zhu, Lei; Li, Shanghuo; Juvela, Mika; Saha, Anindya; Issac, Namitha; Hwang, Jihye; Nazeer, Hafiz; Toth, L. Viktor "ATOMS: ALMA three-millimetre observations of massive star-forming regions-XVII. High-mass star-formation through a large-scale collapse in IRAS 15394-5358," Monthly Notices of the Royal Astronomical Society, 534, 3832, 2024.

De Blok, W. J. G.; Healy, J.; Maccagni, F. M.; Pisano, D. J.; Bosma, A.; English, J.; Jarrett, T.; Marasco, A.; Meurer, G. R.; Veronese, S.; Bigiel, F.; Chemin, L.; Fraternali, F.; Holwerda, B. W.; Kamphuis, P.; Klöckner, H. R.; Kleiner, D.; Leroy, A. K.; Mogotsi, M.; Oman, K. A.; Schinnerer, E.; Verdes-Montenegro, L.; Westmeier, T.; Wong, O. I.; Zabel, N.; Amram, P.; Carignan, C.; Combes, F.; Brinks, E.; Dettmar, R. J.; Gibson, B. K.; Jozsa, G. I. G.; Koribalski, B. S.; Mcgaugh, S. S.; Oosterloo, T. A.; Spekkens, K.; Schröder, A. C.; Adams, E. A. K.; Athanassoula, E.; Bershady, M. A.; Beswick, R. J.; Blyth, S.; Elson, E. C.; Frank, B. S.; Heald, G.; Henning, P. A.; Kurapati, S.; Loubser, S. I.; Lucero, D.; Meyer, M.; Namumba, B.; Oh, S.-H.; Sardone, A.; Sheth, K.; Smith, M. W. L.; Sorgho, A.; Walter, F.; Williams, T.; Woudt, P. A.; Zijlstra, A. "MHONGOOSE: A MeerKAT nearby galaxy H I survey," Astronomy and Astrophysics, 688, A109, 2024.

De Isídio, Natanael G.; Menéndez-Delmestre, K.; Gonçalves, T. S.; Grossi, M.; Rodrigues, D. C.; Garavito-Camargo, N.; Araujo-Carvalho, A.; Beaklini, P. P. B.; Cavalcante-Coelho, Y.; Cortesi, A.; Quiroga-Nuñez, L. H.; Randriamampandry, T. "Dark Matter Distribution in Milky Way analog Galaxies," The Astrophysical Journal, 971, 69, 2024.

De Kleer, Katherine; Cambioni, Saverio; Butler, Bryan; Shepard, Michael "Surface Properties of the Kalliope-Linus System from ALMA and VLA Data," The Planetary Science Journal, 5, 230, 2024.

De Kleer, Katherine; Hughes, Ery C.; Nimmo, Francis; Eiler, John; Hofmann, Amy E.; Luszcz-Cook, Statia; Mandt, Kathy "Isotopic evidence of long-lived volcanism on Io," Science, 384, 682, 2024.

De La Parra, P. V.; Readhead, A. C. S.; Herbig, T.; Kiehlmann, S.; Lister, M. L.; Pavlidou, V.; Reeves, R. A.; Siemiginowska, A.; Sullivan, A. G.; Surti, T.; Synani, A.; Tassis, K.; Taylor, G. B.; Wilkinson, P. N.; Aller, M. F.; Blandford, R. D.; Globus, N.; Lawrence, C. R.; Molina, B.; O'Neill, S.; Pearson, T. J. "The Radio Spectra of High-luminosity Compact Symmetric Objects: Implications for Studies of Compact Jetted Active Galactic Nuclei," The Astrophysical Journal, 977, 195, 2024.

De Regt, S.; Ginski, C.; Kenworthy, M. A.; Caceres, C.; Garufi, A.; Gledhill, T. M.; Hales, A. S.; Huelamo, N.; Kóspál, Á.; Millar-Blanchaer, M. A.; Pérez, S.; Schreiber, M. R. "Polarimetric differential imaging with VLT/NACO. A comprehensive PDI pipeline for NACO data (PIPPIN)," Astronomy and Astrophysics, 684, A73, 2024.

De Rubeis, E.; Stuardi, C.; Bonafede, A.; Vazza, F.; Van Weeren, R. J.; De Gasperin, F.; Brüggen, M. "Magnetic fields in the outskirts of PSZ2 G096.88+24.18 from a depolarization analysis of radio relics," Astronomy and Astrophysics, 691, A23, 2024.

De Simone, M.; Podio, L.; Chahine, L.; Codella, C.; Chandler, C. J.; Ceccarelli, C.; López-Sepulcre, A.; Loinard, L.; Svoboda, B.; Sakai, N.; Johnstone, D.; Ménard, F.; Aikawa, Y.; Bouvier, M.; Sabatini, G.; Miotello, A.; Vastel, C.; Cuello, N.; Bianchi, E.; Caselli, P.; Caux, E.; Hanawa, T.; Herbst, E.; Segura-Cox, D.; Zhang, Z.; Yamamoto, S. "FAUST. XV. A disc wind mapped by CH_3OH and SiO in the inner 300 au of the NGC 1333 IRAS 4A2 protostar," Astronomy and Astrophysics, 686, L13, 2024.

De Wet, Simon; Laskar, Tanmoy; Groot, Paul J.; Barniol Duran, Rodolfo; Berger, Edo; Bhandari, Shivani; Eftekhari, Tarraneh; Guidorzi, Cristiano; Kobayashi, Shiho; Perley, Daniel A.; Sari, Re'Em; Schroeder, Genevieve "A Millimeter Rebrightening in GRB 210702A," The Astrophysical Journal, 974, 279, 2024.

Deane, Roger P.; Radcliffe, Jack F.; Njeri, Ann; Akoto-Danso, Alexander; Bernardi, Gianni; Smirnov, Oleg M.; Beswick, Rob; Garrett, Michael A.; Jarvis, Matt J.; Whittam, Imogen H.; Bourke, Stephen; Paragi, Zsolt "The VLBA CANDELS GOODS-North Survey. I - Survey Design, Processing, Data Products, and Source Counts," Monthly Notices of the Royal Astronomical Society, 529, 2428, 2024.

Decarli, Roberto; Loiacono, Federica; Farina, Emanuele Paolo; Dotti, Massimo; Lupi, Alessandro; Meyer, Romain A.; Mignoli, Marco; Pensabene, Antonio; Strauss, Michael A.; Venemans, Bram; Yang, Jinyi; Walter, Fabian; Wolf, Julien; Bañados, Eduardo; Blecha, Laura; Bosman, Sarah; Carilli, Chris L.; Comastri, Andrea; Connor, Thomas; Costa, Tiago; Eilers, Anna-Christina; Fan, Xiaohui; Gilli, Roberto; Jun, Hyunsung D.; Liu, Weizhe; Marshall, Madeline A.; Mazzucchelli, Chiara; Neeleman, Marcel; Onoue, Masafusa; Overzier, Roderik; Pudoka, Maria Anne; Riechers, Dominik A.; Rix, Hans-Walter; Schindler, Jan-Torge; Trakhtenbrot, Benny; Trebitsch, Maxime; Vestergaard, Marianne; Volonteri, Marta; Wang, Feige; Zhang, Huanian; Zou, Siwei "A quasar-galaxy merger at z ~ 6.2: Rapid host growth via the accretion of two massive satellite galaxies," Astronomy and Astrophysics, 689, A219, 2024.

Decin, L.; Richards, A. M. S.; Marchant, P.; Sana, H. "ALMA detection of CO rotational line emission in red supergiant stars of the massive young star cluster RSGC1. Determination of a new mass-loss rate prescription for red supergiants," Astronomy and Astrophysics, 681, A17, 2024.

Deconto-Machado, A.; Del Olmo, A.; Marziani, P. "Exploring the links between quasar winds and radio emission along the main sequence at high redshift," Astronomy and Astrophysics, 691, A15, 2024.

Deka, P. P.; Gupta, N.; Chen, H. W.; Johnson, S. D.; Noterdaeme, P.; Combes, F.; Boettcher, E.; Balashev, S. A.; Emig, K. L.; Józsa, G. I. G.; Klöckner, H.-R.; Krogager, J. -. K.; Momjian, E.; Petitjean, P.; Rudie, G. C.; Wagenveld, J.; Zahedy, F. S. "MALS discovery of a rare H I 21 cm absorber at z ~ 1.35: Origin of the absorbing gas in powerful active galactic nuclei," Astronomy and Astrophysics, 687, A50, 2024.

Deka, P. P.; Gupta, N.; Jagannathan, P.; Sekhar, S.; Momjian, E.; Bhatnagar, S.; Wagenveld, J.; Klöckner, H.-R.; Jose, J.; Balashev, S. A.; Combes, F.; Hilton, M.; Borgaonkar, D.; Chatterjee, A.; Emig, K. L.; Gaunekar, A. N.; Józsa, G. I. G.; Klutse, D. Y.; Knowles, K.; Krogager, J.-K.; Mohapatra, A.; Moodley, K.; Muller, Sébastien; Noterdaeme, P.; Petitjean, P.; Salas, P.; Sikhosana, S. "The MeerKAT Absorption Line Survey (MALS) Data Release. I. Stokes I Image Catalogs at 1-1.4 GHz," The Astrophysical Journal Supplement Series, 270, 33, 2024.

Deleon, Aaron P.; Marshall, Sean E.; Becker, Tracy M.; Pravec, Petr; Howell, Ellen S.; Nolan, Michael C.; Virkki, Anne K.; Rivera-Valentín, Edgard G.; Taylor, Patrick A.; Bolin, Bryce T.; Aponte-Hernández, Beth; Cabrera, Israel; Kušnirák, Peter; Hornoch, Kamil; Kučáková, Hana "Physical and Mutual Orbit Characteristics of Near-Earth Binary Asteroid (163693) Atira," The Planetary Science Journal, 5, 235, 2024.

Dell'Ova, P.; Motte, F.; Gusdorf, A.; Pouteau, Y.; Men'Shchikov, A.; Díaz-González, D.; Galván-Madrid, R.; Lesaffre, P.; Didelon, P.; Stutz, A. M.; Towner, A. P. M.; Marsh, K.; Whitworth, A.; Armante, M.; Bonfand, M.; Nony, T.; Valeille-Manet, M.; Bontemps, S.; Csengeri, T.; Cunningham, N.; Ginsburg, A.; Louvet, F.; Álvarez-Gutiérrez, R. H.; Brouillet, N.; Salinas, J.; Sanhueza, P.; Nakamura, F.; Nguyen Luong, Q.; Baug, T.; Fernández-López, M.; Liu, H.-L.; Olguin, F. "ALMA-IMF. XII. Point-process mapping of 15 massive protoclusters," Astronomy and Astrophysics, 687, A217, 2024.

Demachi, Fumika; Fukui, Yasuo; Yamada, Rin I.; Tachihara, Kengo; Hayakawa, Takahiro; Tokuda, Kazuki; Fujita, Shinji; Kobayashi, Masato I. N.; Muraoka, Kazuyuki; Konishi, Ayu; Tsuge, Kisetsu; Onishi, Toshikazu; Kawamura, Akiko "Giant molecular clouds and their type classification in M 74: Toward understanding star formation and cloud evolution," Publications of the Astronomical Society of Japan, 76, 1059, 2024.

Demorest, P. B.; Goss, W. M. "The discovery of millisecond pulsars: Don Backer and the response to the unexpected," Journal of Astronomical History and Heritage, 27, 465, 2024.

Dent, W. R. F.; Harper, G. M.; Richards, A. M. S.; Kervella, P.; Matthews, L. D. "Detection of Rydberg Lines from the Atmosphere of Betelgeuse," The Astrophysical Journal, 966, L13, 2024.

Derkink, Annelotte; Ginski, Christian; Pinilla, Paola; Kurtovic, Nicolas; Kaper, Lex; De Koter, Alex; Valegård, Per-Gunnar; Mamajek, Eric; Backs, Frank; Benisty, Myriam; Birnstiel, Til; Columba, Gabriele; Dominik, Carsten; Garufi, Antonio; Hogerheijde, Michiel; Van Holstein, Rob; Huang, Jane; Ménard, François; Rab, Christian; Ramírez-Tannus, María Claudia; Ribas, Álvaro; Williams, Jonathan P.; Zurlo, Alice "Disk Evolution Study Through Imaging of Nearby Young Stars (DESTINYS): PDS 111, an old T Tauri star with a young-looking disk," Astronomy and Astrophysics, 688, A149, 2024.

Devereaux, T.; Cassata, P.; Ibar, E.; Accard, C.; Guillaume, C.; Béthermin, M.; Dessauges-Zavadsky, M.; Faisst, A.; Jones, G. C.; Zanella, A.; Bardelli, S.; Boquien, M.; D'Onghia, E.; Giavalisco, M.; Ginolfi, M.; Gobat, R.; Hayward, C. C.; Koekemoer, A. M.; Lemaux, B.; Magdis, G.; Mendez-Hernandez, H.; Molina, J.; Pozzi, F.; Romano, M.; Tasca, L.; Vergani, D.; Zamorani, G.; Zucca, E. "ALMA-ALPINE [CII] survey: The sub-kpc morphology of three main sequence galaxy systems at z ~ 4.5 revealed by ALMA," Astronomy and Astrophysics, 686, A156, 2024.

Devogèle, Maxime; Mcgilvray, Anna; Maclennan, Eric; Monchinski, Courteney; Marshall, Sean E.; Hickson, Dylan; Virkki, Anne; Giorgini, Jon D.; Abe, Lyu; Augustin, David; Aznar-Macías, Amadeo; Baudouin, Philippe; Behrend, Raoul; Bendjoya, Philippe; Benkhaldoun, Zouhair; Bosch, Josep; Cellino, Alberto; Chatelain, Joseph; Deldem, Marc; Ferrais, Marin; Goncalves, Rui; Houdin, Gerard; Husárik, Marek; Jehin, Emmanuel; Kareta, Teddy; Kim, Myung-Jin; Licandro, Javier; Lister, Tim; Medeiros, Hissa; Pravec, Petr; Rivet, Jean-Pierre; Rousseau, Gerald; Roh, Dong-Goo; Skiff, Brian; Taylor, Patrick A.; Venditti, Flaviane; Vernet, David; Vienney, Jean-Michel; Yim, Hong-Suh; Zambrano-Marin, Luisa "Surface Heterogeneity, Physical, and Shape Model of Near-Earth Asteroid (52768) 1998 OR2," The Planetary Science Journal, 5, 44, 2024.

Dewangan, L. K.; Bhadari, N. K.; Maity, A. K.; Eswaraiah, C.; Sharma, Saurabh; Jadhav, O. R. "Galactic 'Snake' IRDC G11.11-0.12: a site of multiple hub-filament systems and colliding filamentary clouds," Monthly Notices of the Royal Astronomical Society, 527, 5895, 2024.

Dewangan, L. K.; Jadhav, O. R.; Maity, A. K.; Bhadari, N. K.; Sharma, Saurabh; Padovani, M.; Baug, T.; Mayya, Y. D.; Pandey, Rakesh "Deciphering the hidden structures of HH 216 and Pillar IV in M16: results from JWST and HST," Monthly Notices of the Royal Astronomical Society, 528, 3909, 2024.

Dey, Jyotirmoy; Pandian, Jagadheep D.; Lal, Dharam V.; Rugel, Michael R.; Brunthaler, Andreas; Menten, Karl M.; Wyrowski, Friedrich; Roy, Nirupam; Dzib, Sergio A.; Medina, Sac-Nicté X.; Khan, Sarwar; Dokara, Rohit "A multi-wavelength study of Galactic H II regions with extended emission," Astronomy and Astrophysics, 689, A254, 2024.

Dey, Lankeswar; Mclaughlin, Maura A.; Wahl, Haley M.; Demorest, Paul B.; Arzoumanian, Zaven; Blumer, Harsha; Brook, Paul R.; Burke-Spolaor, Sarah; Cromartie, H. Thankful; Decesar, Megan E.; Dolch, Timothy; Ellis, Justin A.; Ferdman, Robert D.; Ferrara, Elizabeth C.; Fiore, William; Fonseca, Emmanuel; Garver-Daniels, Nate; Gentile, Peter A.; Glaser, Joseph; Good, Deborah C.; Jennings, Ross J.; Jones, Megan L.; Lam, Michael T.; Lorimer, Duncan R.; Luo, Jing; Lynch, Ryan S.; Ng, Cherry; Nice,

David J.; Pennucci, Timothy T.; Pol, Nihan S.; Ransom, Scott M.; Spiewak, Renée; Stairs, Ingrid H.; Stovall, Kevin; Swiggum, Joseph K. "Exploring Pulsar Timing Precision: A Comparative Study of Polarization Calibration Methods for NANOGrav Data from the Green Bank Telescope," The Astrophysical Journal, 977, 114, 2024.

Dey, Subhrata; Goyal, Arti; Małek, Katarzyna; Díaz-Santos, Tanio "Radio-only and Radio-to-far-ultraviolet Spectral Energy Distribution Modeling of 14 ULIRGs: Insights into the Global Properties of Infrared Bright Galaxies," The Astrophysical Journal, 966, 61, 2024.

Dhariwal, Aditya; Speak, Thomas H.; Zeng, Linshan; Rashidi, Amirhossein; Moore, Brendan; Berné, Olivier; Remijan, Anthony J.; Schroetter, Ilane; Mcguire, Brett A.; Rivilla, Víctor M.; Belloche, Arnaud; Jørgensen, Jes K.; Djuricanin, Pavle; Momose, Takamasa; Cooke, Ilsa R. "On the Origin of Infrared Bands Attributed to Tryptophan in Spitzer Observations of IC 348," The Astrophysical Journal, 968, L9, 2024.

Di Cesare, C.; Ginolfi, M.; Graziani, L.; Schneider, R.; Romano, M.; Popping, G. "Carbon envelopes around merging galaxies at z ~ 4.5," Astronomy and Astrophysics, 690, A255, 2024.

Díaz-Berríos, Javiera K.; Guzmán, Viviana V.; Walsh, Catherine; Öberg, Karin I.; Cleeves, L. Ilsedore; Artur De La Villarmois, Elizabeth; Carpenter, John "Chemistry in Externally FUV-irradiated Disks in the Outskirts of the Orion Nebula Cluster," The Astrophysical Journal, 969, 165, 2024.

Díaz-Márquez, Elena; Grau, Roger; Busquet, Gemma; Girart, Josep Miquel; Sánchez-Monge, Álvaro; Palau, Aina; Povich, Matthew S.; Añez-López, Nacho; Liu, Hauyu Baobab; Zhang, Qizhou; Estalella, Robert "Radio survey of the stellar population in the infrared dark cloud G14.225-0.506," Astronomy and Astrophysics, 682, A180, 2024.

Dicker, Simon R.; Perez Sarmiento, Karen; Mason, Brian; Bhandarkar, Tanay; Devlin, Mark J.; Di Mascolo, Luca; Haridas, Saianeesh; Hilton, Matt; Madhavacheril, Mathew; Moravec, Emily; Mroczkowski, Tony; Orlowski-Scherer, John; Romero, Charles; Sarazin, Craig L.; Sievers, Jonathan "Sensitive 3 mm Imaging of Discrete Sources in the Fields of Thermal Sunyaev-Zel'dovich Effect-Selected Galaxy Clusters," The Astrophysical Journal, 970, 84, 2024.

Ding, Hao; Deller, Adam T.; Swiggum, Joseph K.; Lynch, Ryan S.; Chatterjee, Shami; Tauris, Thomas M. "VLBA Astrometry of the Galactic Double Neutron Stars PSR J0509+3801 and PSR J1930-1852: A Preliminary Transverse Velocity Distribution of Double Neutron Stars and its Implications," The Astrophysical Journal, 970, 90, 2024.

Ding, Hao; Lower, Marcus E.; Deller, Adam T.; Shannon, Ryan M.; Camilo, Fernando; Sarkissian, John "VLBA Astrometry of the Fastest-spinning Magnetar Swift J1818.0-1607: A Large Trigonometric Distance and a Small Transverse Velocity," The Astrophysical Journal, 971, L13, 2024.

Ding, Ran; Tian, Chi "On the anisotropies of the cosmological gravitational-wave background from pulsar timing array observations," Journal of Cosmology and Astro-Particle Physics, 2024, 016, 2024.

Diop, Amina; Cleeves, L. Ilsedore; Anderson, Dana E.; Pegues, Jamila; Plunkett, Adele "Disentangling CO Chemistry in a Protoplanetary Disk Using Explanatory Machine-learning Techniques," The Astrophysical Journal, 962, 90, 2024.

Dobie, Dougal; Sluse, Dominique; Deller, Adam; Murphy, Tara; Krone-Martins, Alberto; Stern, Daniel; Wang, Ziteng; Wang, Yuanming; Bœhm, Céline; Djorgovski, S. G.; Galluccio, Laurent; Delchambre, Ludovic; Connor, Thomas; Den Brok, Jakob Sebastiaan; Do Vale Cunha, Pedro H.; Ducourant, Christine; Graham, Matthew J.; Jalan, Priyanka; Klioner, Sergei A.; Klüter, Jonas; Mignard, François; Negi, Vibhore; Petit, Quentin; Scarano, Sergio; Slezak, Eric; Surdej, Jean; Teixeira, Ramachrisna; Walton, Dominic J.; Wambsganss, Joachim "Gaia GraL: Gaia DR2 gravitational lens systems - VIII. A radio census of lensed systems," Monthly Notices of the Royal Astronomical Society, 528, 5880, 2024.

Dodd, Jonathan M.; Oudmaijer, René D.; Radley, Isaac C.; Vioque, Miguel; Frost, Abigail J. "Gaia uncovers difference in B and Be star binarity at small scales: evidence for mass transfer causing the Be phenomenon," Monthly Notices of the Royal Astronomical Society, 527, 3076, 2024.

Doi, Kiyoaki; Kataoka, Akimasa; Liu, Hauyu Baobab; Yoshida, Tomohiro C.; Benisty, Myriam; Dong, Ruobing; Yamato, Yoshihide; Hashimoto, Jun "Asymmetric Dust Accumulation of the PDS 70 Disk Revealed by ALMA Band 3 Observations," The Astrophysical Journal, 974, L25, 2024.

Dominiak, Pandora; Bureau, Martin; Davis, Timothy A.; Ma, Chung-Pei; Greene, Jenny E.; Gu, Meng "The MASSIVE survey - XIX. Molecular gas measurements of the supermassive black hole masses in the elliptical galaxies NGC 1684 and NGC 0997," Monthly Notices of the Royal Astronomical Society, 529, 1597, 2024.

Dong, Y.; Eftekhari, T.; Fong, W.; Bhandari, S.; Berger, E.; Ould-Boukattine, O. S.; Hessels, J. W. T.; Sridhar, N.; Reines, A.; Margalit, B.; Darling, J.; Gordon, A. C.; Greene, J. E.; Kilpatrick, C. D.; Marcote, B.; Metzger, B. D.; Nimmo, K.; Nugent, A. E.; Paragi, Z.; Williams, P. K. G. "A Radio Study of Persistent Radio Sources in Nearby Dwarf Galaxies: Implications for Fast Radio Bursts," The Astrophysical Journal, 973, 133, 2024.

Dong, Yuxin; Eftekhari, Tarraneh; Fong, Wen-Fai; Deller, Adam T.; Mannings, Alexandra G.; Simha, Sunil; Sridhar, Navin; Rafelski, Marc; Gordon, Alexa C.; Bhandari, Shivani; Day, Cherie K.; Heintz, Kasper E.; Hessels, Jason W. T.; Leja, Joel; James, Clancy W.; Kilpatrick, Charles D.; Mahony, Elizabeth K.; Marcote, Benito; Margalit, Ben; Nimmo, Kenzie; Prochaska, J. Xavier; Rouco Escorial, Alicia; Ryder, Stuart D.; Schroeder, Genevieve; Shannon, Ryan M.; Tejos, Nicolas "Mapping Obscured Star Formation in the Host Galaxy of FRB 20201124A," The Astrophysical Journal, 961, 44, 2024.

Doskoch, Graham M.; Basuroski, Andrea; Halley, Kriisa; Sookram, Avinash; Rodriguez-Ramos, Iliomar; Nahata, Valmik; Rahman, Zahi; Zhang, Maureen; Uhlmann, Ashish; Lynch, Abby; Lewandowska, Natalia; Miranda, Nohely; Schmiedekamp, Ann; Schmiedekamp, Carl; Mclaughlin, Maura A.; Reichart, Daniel E.; Haislip, Joshua B.; Kouprianov, Vladimir V.; White, Steve; Ghigo, Frank; Heatherly, Sue Ann "A Statistical Analysis of Crab Pulsar Giant Pulse Rates," The Astrophysical Journal, 973, 87, 2024.

Driessen, L. N.; Barr, E. D.; Buckley, D. A. H.; Caleb, M.; Chen, H.; Chen, W.; Gromadzki, M.; Jankowski, F.; Kraan-Korteweg, R. C.; Palmerio, J.; Rajwade, K. M.; Tremou, E.; Kramer, M.; Stappers, B. W.; Vergani, S. D.; Woudt, P. A.; Bezuidenhout, M. C.; Malenta, M.; Morello, V.; Sanidas, S.; Surnis, M. P.; Fender, R. P. "FRB 20210405I: a nearby Fast Radio Burst localized to sub-arcsecond precision with MeerKAT," Monthly Notices of the Royal Astronomical Society, 527, 3659, 2024.

Du, Chen; Huang, Yong-Feng; Zhang, Zhi-Bin; Rodin, Alexander; Fedorova, Viktoriya; Kurban, Abdusattar; Li, Di "A Thorough Search for Short-timescale Periodicity in Four Active Repeating Fast Radio Bursts," The Astrophysical Journal, 977, 129, 2024.

Du, Lin; Du, Wei; Cheng, Cheng; Zhu, Ming; Yu, Haiyang; Wu, Hong "Almost Optically Dark Galaxies in DECaLS (I): Detection, Optical Properties, and Possible Origins," The Astrophysical Journal, 964, 85, 2024.

Duchêne, Gaspard; Ménard, François; Stapelfeldt, Karl R.; Villenave, Marion; Wolff, Schuyler G.; Perrin, Marshall D.; Pinte, Christophe; Tazaki, Ryo; Padgett, Deborah L. "JWST Imaging of Edge-on Protoplanetary Disks. I. Fully Vertically Mixed 10 μm Grains in the Outer Regions of a 1000 au Disk," The Astronomical Journal, 167, 77, 2024.

Duchesne, S. W.; Botteon, A.; Koribalski, B. S.; Loi, F.; Rajpurohit, K.; Riseley, C. J.; Rudnick, L.; Vernstrom, T.; Andernach, H.; Hopkins, A. M.; Kapinska, A. D.; Norris, R. P.; Zafar, T. "Evolutionary Map of the Universe (EMU): A pilot search for diffuse, non-thermal radio emission in galaxy clusters with the Australian SKA Pathfinder," Publications of the Astronomical Society of Australia, 41, e026, 2024.

Duggal, C.; O'Dea, C. P.; Baum, S. A.; Labiano, A.; Tadhunter, C.; Worrall, D. M.; Morganti, R.; Tremblay, G. R.; Dicken, D. "Optical- and UV-continuum Morphologies of Compact Radio Source Hosts," The Astrophysical Journal, 965, 17, 2024.

Duronea, N. U.; Bronfman, L.; Ortega, M.; Suad, L. A.; Baume, G.; Mendoza, E.; Carvajal, M.; Cichowolski, S.; Arnal, E. M.; Finger, R.; Merello, M.; Gamen, R. "Revisiting the massive star-forming complex RCW 122: New millimeter and submillimeter study," Astronomy and Astrophysics, 689, A76, 2024.

Dutrey, A.; Chapillon, E.; Guilloteau, S.; Tang, Y. W.; Boccaletti, A.; Bouscasse, L.; Collin-Dufresne, T.; Di Folco, E.; Fuente, A.; Piétu, V.; Rivière-Marichalar, P.; Semenov, D. "Sulfur monoxide (SO) as a shock tracer in protoplanetary disks: Case of AB Aurigae," Astronomy and Astrophysics, 689, L7, 2024.

Dutta, Somnath; Lee, Chin-Fei; Johnstone, Doug; Lee, Jeong-Eun; Hirano, Naomi; Di Francesco, James; Moraghan, Anthony; Liu, Tie; Sahu, Dipen; Liu, Sheng-Yuan; Tatematsu, Ken'Ichi; Goldsmith, Paul F.; Lee, Chang Won; Li, Shanghuo; Eden, David; Juvela, Mika; Bronfman, Leonardo; Hsu, Shih-Ying; Kim, Kee-Tae; Kwon, Woojin; Sanhueza, Patricio; Liu, Xunchuan; López-Vázquez, Jesús Alejandro; Luo, Qiuyi; Yi, Hee-Weon "ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): Molecular Jets and Episodic Accretion in Protostars," The Astronomical Journal, 167, 72, 2024.

Dykaar, Hannah; Drout, Maria R.; Gaensler, B. M.; Kaplan, David L.; Murphy, Tara; Horesh, Assaf; Anumarlapudi, Akash; Dobie, Dougal; Driessen, Laura N.; Lenc, Emil; Stewart, Adam J. "An Untargeted Search for Radio-emitting Tidal Disruption Events in the VAST Pilot Survey," The Astrophysical Journal, 973, 104, 2024.

Dzib, Sergio A.; Loinard, Laurent; Launhardt, Ralf; Ordóñez-Toro, Jazmín "Very long baseline interferometry detection of nearby (<100 pc) young stars. Pilot observations," Astronomy and Astrophysics, 686, A176, 2024.

Eales, Stephen; Gomez, Haley; Dunne, Loretta; Dye, Simon; Smith, Matthew W. L. "Metal factories in the early Universe," Monthly Notices of the Royal Astronomical Society, 532, 2905, 2024.

Echiburú-Trujillo, Constanza; Tetarenko, Alexandra J.; Haggard, Daryl; Russell, Thomas D.; Koljonen, Karri I. I.; Bahramian, Arash; Wang, Jingyi; Bremer, Michael; Bright, Joe; Casella, Piergiorgio; Russell, David M.; Altamirano, Diego; Baglio, M. Cristina; Belloni, Tomaso; Ceccobello, Chiara; Corbel, Stephane; Diaz Trigo, Maria; Maitra, Dipankar; Gabuya, Aldrin; Gallo, Elena; Heinz, Sebastian; Homan, Jeroen; Kara, Erin; Körding, Elmar; Lewis, Fraser; Lucchini, Matteo; Markoff, Sera; Migliari, Simone; Miller-Jones, James C. A.; Rodriguez, Jerome; Saikia, Payaswini; Sarazin, Craig L.; Shahbaz, Tariq; Sivakoff, Gregory; Soria, Roberto; Testa, Vincenzo; Tetarenko, Bailey E.; Tudose, Valeriu "Chasing the Break: Tracing the Full Evolution of a Black Hole X-Ray Binary Jet with Multiwavelength Spectral Modeling," The Astrophysical Journal, 962, 116, 2024.

Eibensteiner, Cosima; Sun, Jiayi; Bigiel, Frank; Leroy, Adam K.; Schinnerer, Eva; Rosolowsky, Erik; Kurapati, Sushma; Pisano, D. J.; De Blok, W. J. G.; Barnes, Ashley T.; Thorp, Mallory; Colombo, Dario; Koch, Eric W.; Chiang, I. -Da; Ostriker, Eve C.; Murphy, Eric J.; Zabel, Nikki; Laudage, Sebstian; Maccagni, Filippo M.; Healy, Julia; Sekhar, Srikrishna; Utomo, Dyas; Den Brok, Jakob; Cao, Yixian; Chevance, Mélanie; Dale, Daniel A.; Faesi,

Christopher M.; Glover, Simon C. O.; He, Hao; Jeffreson, Sarah; Jiménez-Donaire, María J.; Klessen, Ralf; Neumann, Justus; Pan, Hsi-An; Pathak, Debosmita; Querejeta, Miguel; Teng, Yu-Hsuan; Usero, Antonio; Williams, Thomas G. "PHANGS-MeerKAT and MHONGOOSE HI observations of nearby spiral galaxies: Physical drivers of the molecular gas fraction, R_{mol}," Astronomy and Astrophysics, 691, A163, 2024.
Einig, Lucas; Palud, Pierre; Roueff, Antoine; Pety, Jérôme; Bron, Emeric; Le Petit, Franck; Gerin, Maryvonne; Chanussot, Jocelyn; Chainais, Pierre; Thouvenin, Pierre-Antoine; Languignon, David; Bešlić, Ivana; Coudé, Simon; Mazurek, Helena; Orkisz, Jan H.; Santa-Maria, Miriam G.; Ségal, Léontine; Zakardjian, Antoine; Bardeau, Sébastien; Demyk, Karine; De Souza Magalhães, Victor; Goicoechea, Javier R.; Gratier, Pierre; Guzmán, Viviana V.; Hughes, Annie; Levrier, François; Le Bourlot, Jacques; Lis, Dariusz C.; Liszt, Harvey S.; Peretto, Nicolas; Roueff, Evelyne; Sievers, Albrecht "Quantifying the informativity of emission lines to infer physical conditions in giant molecular clouds: I. Application to model predictions," Astronomy and Astrophysics, 691, A109, 2024.
El-Abd, Samer J.; Brogan, Crystal L.; Hunter, Todd R.; Lee, Kin Long Kelvin; Loomis, Ryan A.; Mcguire, Brett A. "An Automated Chemical Exploration of NGC 6334I at 340 au Resolution," The Astrophysical Journal, 965, 14, 2024.
Elford, Jacob S.; Davis, Timothy A.; Ruffa, Ilaria; Bureau, Martin; Cappellari, Michele; Gensior, Jindra; Iguchi, Satoru; Liang, Fu-Heng; Liu, Lijie; Lu, Anan; Williams, Thomas G. "WISDOM Project - XVI. The link between circumnuclear molecular gas reservoirs and active galactic nucleus fuelling," Monthly Notices of the Royal Astronomical Society, 528, 319, 2024.
Ellison, Sara L.; Pan, Hsi-An; Bluck, Asa F. L.; Krumholz, Mark R.; Lin, Lihwai; Hunt, Leslie; Corbelli, Edvige; Thorp, Mallory D.; Barrera-Ballesteros, Jorge; Sánchez, Sebastian F.; Scudder, Jillian M.; Quai, Salvatore "The ALMaQUEST Survey XI: A strong but non-linear relationship between star formation and dynamical equilibrium pressure.," Monthly Notices of the Royal Astronomical Society, 527, 10201-10220, 2024.
Emonts, Bjorn H. C.; Curran, Steve J.; Miley, George K.; Lehnert, Matthew D.; Carilli, Chris L.; Yoon, Ilsang; Morganti, Raffaella; Van Weeren, Reinout J.; Villar-Martín, Montserrat; Guillard, Pierre; Cordun, Cristina M.; Oosteroo, Tom A. "Absorption of Millimeter-band CO and CN in the Early Universe: Molecular Clouds in the Radio Galaxy B2 0902+34 at Redshift 3.4," The Astrophysical Journal, 962, 187, 2024.
Encalada, Frankie J.; Looney, Leslie W.; Novak, Giles; Sadavoy, Sarah; Cox, Erin G.; Pereira-Santos, Fabio; Lee, Dennis; Harrison, Rachel; Pattle, Kate "Magnetic Fields Observed along the East-West Outflow of IRAS 16293-2422," The Astrophysical Journal, 968, 101, 2024.
Encalada, Frankie J.; Looney, Leslie W.; Takakuwa, Shigehisa; Tobin, John J.; Ohashi, Nagayoshi; Jørgensen, Jes K.; Li, Zhi-Yun; Aikawa, Yuri; Aso, Yusuke; Koch, Patrick M.; Kwon, Woojin; Lai, Shih-Ping; Lee, Chang Won; Lin, Zhe-Yu Daniel; Santamaría-Miranda, Alejandro; De Gregorio-Monsalvo, Itziar; Phuong, Nguyen Thi; Plunkett, Adele; Sai (Insa Choi), Jinshi; Sharma, Rajeeb; Yen, Hsi-Wei; Han, Ilseung "Early Planet Formation in Embedded Disks (eDisk). XIII. Aligned Disks with Nonsettled Dust around the Newly Resolved Class 0 Protobinary R CrA IRAS 32," The Astrophysical Journal, 966, 32, 2024.
Errando, Manel; Liodakis, Ioannis; Marscher, Alan P.; Marshall, Herman L.; Middei, Riccardo; Negro, Michela; Peirson, Abel Lawrence; Perri, Matteo; Puccetti, Simonetta; Rabinowitz, Pazit L.; Agudo, Iván; Jorstad, Svetlana G.; Savchenko, Sergey S.; Blinov, Dmitry; Bourbah, Ioakeim G.; Kiehlmann, Sebastian; Kontopodis, Evangelos; Mandarakas, Nikos; Romanopoulos, Stylianos; Skalidis, Raphael; Vervelaki, Anna; Aceituno, Francisco José; Bernardos, Maria I.; Bonnoli, Giacomo; Casanova, Víctor; Agís-González, Beatriz; Husillos, César; Marchini, Alessandro; Sota, Alfredo; Kouch, Pouya M.; Lindfors, Elina; Casadio, Carolina; Escudero, Juan; Myserlis, Ioannis; Imazawa, Ryo; Sasada, Mahito; Fukazawa, Yasushi; Kawabata, Koji S.; Uemura, Makoto; Mizuno, Tsunefumi; Nakaoka, Tatsuya; Akitaya, Hiroshi; Gurwell, Mark; Keating, Garrett K.; Rao, Ramprasad; Ingram, Adam; Massaro, Francesco; Antonelli, Lucio Angelo; Bonino, Raffaella; Cavazzuti, Elisabetta; Chen, Chien-Ting; Cibrario, Nicolò; Ciprini, Stefano; De Rosa, Alessandra; Di Gesu, Laura; Di Pierro, Federico; Donnarumma, Immacolata; Ehlert, Steven R.; Fenu, Francesco; Gau, Ephraim; Karas, Vladimir; Kim, Dawoon E.; Krawczynski, Henric; Laurenti, Marco; Lisalda, Lindsey; López-Coto, Rubén; Madejski, Grzegorz; Marin, Frédéric; Marinucci, Andrea; Mitsuishi, Ikuyuki; Muleri, Fabio; Pacciani, Luigi; Paggi, Alessandro; Petrucci, Pierre-Olivier; Rodriguez Cavero, Nicole; Romani, Roger W.; Tavecchio, Fabrizio; Tugliani, Stefano; Wu, Kinwah; Bachetti, Matteo; Baldini, Luca; Baumgartner, Wayne H.; Bellazzini, Ronaldo; Bianchi, Stefano; Bongiorno, Stephen D.; Brez, Alessandro; Bucciantini, Niccolò; Capitanio, Fiamma; Castellano, Simone; Costa, Enrico; Del Monte, Ettore; Di Lalla, Niccolò; Di Marco, Alessandro; Doroshenko, Victor; Dovčiak, Michal; Enoto, Teruaki; Evangelista, Yuri; Fabiani, Sergio; Ferrazzoli, Riccardo; Garcia, Javier A.; Gunji, Shuichi; Hayashida, Kiyoshi; Heyl, Jeremy; Iwakiri, Wataru; Kaaret, Philip; Kislat, Fabian; Kitaguchi, Takao; Kolodziejczak, Jeffery J.; La Monaca, Fabio; Latronico, Luca; Maldera, Simone; Manfreda, Alberto; Matt, Giorgio; Ng, C.-Y.; O'Dell, Stephen L.; Omodei, Nicola; Oppedisano, Chiara; Papitto, Alessandro; Pavlov, George G.; Pesce-Rollins, Melissa; Pilia, Maura; Possenti, Andrea; Poutanen, Juri; Ramsey, Brian D.; Rankin, John; Ratheesh, Ajay; Roberts, Oliver J.; Sgrò, Carmelo; Slane, Patrick; Soffitta, Paolo; Spandre, Gloria; Swartz, Douglas A.; Tamagawa, Toru; Taverna, Roberto; Tawara, Yuzuru; Tennant, Allyn F.; Thomas, Nicholas E.; Tombesi, Francesco; Trois, Alessio; Tsygankov, Sergey S.; Turolla, Roberto; Vink, Jacco; Weisskopf, Martin C.; Xie, Fei; Zane, Silvia "Detection of X-Ray Polarization from the Blazar 1ES 1959+650 with the Imaging X-Ray Polarimetry Explorer," The Astrophysical Journal, 963, 5, 2024.
Escudero Pedrosa, J.; Agudo, I.; Tramacere, A.; Marscher, A. P.; Jorstad, S.; Weaver, Z. R.; Casadio, C.; Thum, C.; Myserlis, I.; Fuentes, A.; Traianou, E.; Kim, J.-Y.; Kramer, J.; López-Coto, R.; D'Ammando, F.; Bernardos, M.; Bonnoli, G.; Blinov, D. A.; Borman, G. A.; Grishina, T. S.; Hagen-Thorn, V. A.; Kopatskaya, E. N.; Larionova, E. G.; Larionov, V. M.; Larionova, L. V.; Morozova, D. A.; Savchenko, S. S.; Troitskiy, I. S.; Troitskaya, Y. V.; Vasilyev, A. A. "Repeating flaring activity of the blazar AO 0235+164," Astronomy and Astrophysics, 682, A100, 2024.
Escudero Pedrosa, Juan; Agudo, Iván; Moritz, Till; Marscher, Alan P.; Jorstad, Svetlana; Tramacere, Andrea; Casadio, Carolina; Thum, Clemens; Myserlis, Ioannis; Sievers, Albrecht; Otero-Santos, Jorge; Morcuende, Daniel; López-Coto, Rubén; D'Ammando, Filippo; Bonnoli, Giacomo; Gurwell, Mark; Gómez, José Luis; Rao, Ramprasad; Keating, Garrett "The flaring activity of blazar AO 0235+164 in 2021," Astronomy and Astrophysics, 689, A56, 2024.
Esposito, Federico; Alonso-Herrero, Almudena; García-Burillo, Santiago; Casasola, Viviana; Combes, Françoise; Dallacasa, Daniele; Davies, Richard; García-Bernete, Ismael; García-Lorenzo, Begoña; Muñoz, Laura Hermosa; De Arriba, Luis Peralta; Pereira-Santaella, Miguel; Pozzi, Francesca; Almeida, Cristina Ramos; Shimizu, Thomas Taro; Vallini, Livia; Bellocchi, Enrica; González-Martín, Omaira; Hicks, Erin K. S.; Hönig, Sebastian; Labiano, Alvaro; Levenson, Nancy A.; Ricci, Claudio; Rosario, David J. "AGN feedback in the Local Universe: Multiphase outflow of the Seyfert galaxy NGC 5506," Astronomy and Astrophysics, 686, A46, 2024.
Event Horizon Telescope Collaboration; Akiyama, Kazunori; Alberdi, Antxon; Alef, Walter; Algaba, Juan Carlos; Anantua, Richard; Asada, Keiichi; Azulay, Rebecca; Bach, Uwe; Baczko, Anne-Kathrin; Ball, David; Balokovic, Mislav; Bandyopadhyay, Bidisha; Barrett, John; Bauböck, Michi; Benson, Bradford A.; Bintley, Dan; Blackburn, Lindy; Blundell, Raymond; Bouman, Katherine L.; Bower, Geoffrey C.; Boyce, Hope; Bremer, Michael; Brinkerink, Christiaan D.; Brissenden, Roger; Britzen, Silke; Broderick, Avery E.; Broguiere, Dominique; Bronzwaer, Thomas; Bustamante, Sandra; Byun, Do-Young; Carlstrom, John E.; Ceccobello, Chiara; Chael, Andrew; Chan, Chi-Kwan; Chang, Dominic O.; Chatterjee, Koushik; Chatterjee, Shami; Chen, Ming-Tang; Chen, Yongjun; Cheng, Xiaopeng; Cho, Ilje; Christian, Pierre; Conroy, Nicholas S.; Conway, John E.; Cordes, James M.; Crawford, Thomas M.; Crew, Geoffrey B.; Cruz-Osorio, Alejandro; Cui, Yuzhu; Dahale, Rohan; Davelaar, Jordy; De Laurentis, Mariafelicia; Deane, Roger; Dempsey, Jessica; Desvignes, Gregory; Dexter, Jason; Dhruv, Vedant; Dihingia, Indu K.; Doeleman, Sheperd S.; Dougal, Sean Taylor; Dzib, Sergio A.; Eatough, Ralph P.; Emami, Razieh; Falcke, Heino; Farah, Joseph; Fish, Vincent L.; Fomalont, Edward; Ford, H. Alyson; Foschi, Marianna; Fraga-Encinas, Raquel; Freeman, William T.; Friberg, Per; Fromm, Christian M.; Fuentes, Antonio; Galison, Peter; Gammie, Charles F.; García, Roberto; Gentaz, Olivier; Georgiev, Boris; Goddi, Ciriaco; Gold, Roman; Gómez-Ruiz, Arturo I.; Gómez, José L.; Gu, Minfeng; Gurwell, Mark; Hada, Kazuhiro; Haggard, Daryl; Haworth, Kari; Hecht, Michael H.; Hesper, Ronald; Heumann, Dirk; Ho, Luis C.; Ho, Paul; Honma, Mareki; Huang, Chih-Wei L.; Huang, Lei; Hughes, David H.; Ikeda, Shiro; Impellizzeri, C. M. Violette; Inoue, Makoto; Issaoun, Sara; James, David J.; Jannuzi, Buell T.; Janssen, Michael; Jeter, Britton; Jiang, Wu; Jiménez-Rosales, Alejandra; Johnson, Michael D.; Jorstad, Svetlana; Joshi, Abhishek V.; Jung, Taehyun; Karami, Mansour; Karuppusamy, Ramesh; Kawashima, Tomohisa; Keating, Garrett K.; Kettenis, Mark; Kim, Dong-Jin; Kim, Jae-Young; Kim, Jongsoo; Kim, Junhan; Kino, Motoki; Koay, Jun Yi; Kocherlakota, Prashant; Kofuji, Yutaro; Koch, Patrick M.; Koyama, Shoko; Kramer, Carsten; Kramer, Joana A.; Kramer, Michael; Krichbaum, Thomas P.; Kuo, Cheng-Yu; La Bella, Noemi; Lauer, Tod R.; Lee, Daeyoung; Lee, Sang-Sung; Leung, Po Kin; Levis, Aviad; Li, Zhiyuan; Lico, Rocco; Lindahl, Greg; Lindqvist, Michael; Lisakov, Mikhail; Liu, Jun; Liu, Kuo; Liuzzo, Elisabetta; Lo, Wen-Ping; Lobanov, Andrei P.; Loinard, Laurent; Lonsdale, Colin J.; Lowitz, Amy E.; Lu, Ru-Sen; Macdonald, Nicholas R.; Mao, Jirong; Marchili, Nicola; Markoff, Sera; Marrone, Daniel P.; Marscher, Alan P.; Martí-Vidal, Iván; Matsushita, Satoki; Matthews, Lynn D.; Medeiros, Lia; Menten, Karl M.; Michalik, Daniel; Mizuno, Izumi; Mizuno, Yosuke; Moran, James M.; Moriyama, Kotaro; Moscibrodzka, Monika; Mulaudzi, Wanga; Müller, Cornelia; Müller, Hendrik; Mus, Alejandro; Musoke, Gibwa; Myserlis, Ioannis; Nadolski, Andrew; Nagai, Hiroshi; Nagar, Neil M.; Nakamura, Masanori; Narayanan, Gopal; Natarajan, Iniyan; Nathanail, Antonios; Fuentes, Santiago Navarro; Neilsen, Joey; Neri, Roberto; Ni, Chunchong; Noutsos, Aristeidis; Nowak, Michael A.; Oh, Junghwan; Okino, Hiroki; Olivares, Héctor; Ortiz-León, Gisela N.; Oyama, Tomoaki; Özel, Feryal; Palumbo, Daniel C. M.; Paraschos, Georgios Filippos; Park, Jongho; Parsons, Harriet; Patel, Nimesh; Pen, Ue-Li; Pesce, Dominic W.; Piétu, Vincent; Plambeck, Richard; Popstefanija, Aleksandar; Porth, Oliver; Pötzl, Felix M.; Prather, Ben; Preciado-López, Jorge A.; Psaltis, Dimitrios; Pu, Hung-Yi; Ramakrishnan, Venkatessh; Rao, Ramprasad; Rawlings, Mark G.; Raymond, Alexander W.; Rezzolla, Luciano; Ricarte, Angelo; Ripperda, Bart; Roelofs, Freek; Rogers, Alan; Romero-Cañizales, Cristina; Ros, Eduardo; Roshanineshat, Arash; Rottmann, Helge; Roy, Alan L.; Ruiz, Ignacio; Ruszczyk, Chet; Rygl, Kazi L. J.; Sánchez, Salvador; Sánchez-Argüelles, David; Sánchez-Portal, Miguel; Sasada, Mahito; Satapathy, Kaushik; Savolainen, Tuomas; Schloerb, F.

Peter; Schonfeld, Jonathan; Schuster, Karl-Friedrich; Shao, Lijing; Shen, Zhiqiang; Small, Des; Sohn, Bong Won; Soohoo, Jason; Sosapanta Salas, León David; Souccar, Kamal; Stanway, Joshua S.; Sun, He; Tazaki, Fumie; Tetarenko, Alexandra J.; Tiede, Paul; Tilanus, Remo P. J.; Titus, Michael; Torne, Pablo; Toscano, Teresa; Traianou, Efthalia; Trent, Tyler; Trippe, Sascha; Turk, Matthew; Van Bemmel, Ilse; Van Langevelde, Huib Jan; Van Rossum, Daniel R.; Vos, Jesse; Wagner, Jan; Ward-Thompson, Derek; Wardle, John; Washington, Jasmin E.; Weintroub, Jonathan; Wharton, Robert; Wielgus, Maciek; Wiik, Kaj; Witzel, Gunther; Wondrak, Michael F.; Wong, George N.; Wu, Qingwen; Yadlapalli, Nitika; Yamaguchi, Paul; Yfantis, Aristomenis; Yoon, Doosoo; Young, Andrè; Young, Ken; Younsi, Ziri; Yu, Wei; Yuan, Feng; Yuan, Ye-Fei; Zensus, J. Anton; Zhang, Shuo; Zhao, Guang-Yao; Zhao, Shan-Shan "First Sagittarius A* Event Horizon Telescope Results. VII. Polarization of the Ring," The Astrophysical Journal, 964, L25, 2024.

Event Horizon Telescope Collaboration; Akiyama, Kazunori; Alberdi, Antxon; Alef, Walter; Algaba, Juan Carlos; Anantua, Richard; Asada, Keiichi; Azulay, Rebecca; Bach, Uwe; Baczko, Anne-Kathrin; Ball, David; Baloković, Mislav; Bandyopadhyay, Bidisha; Barrett, John; Bauböck, Michi; Benson, Bradford A.; Bintley, Dan; Blackburn, Lindy; Blundell, Raymond; Bouman, Katherine L.; Bower, Geoffrey C.; Boyce, Hope; Bremer, Michael; Brissenden, Roger; Britzen, Silke; Broderick, Avery E.; Broguiere, Dominique; Bronzwaer, Thomas; Bustamante, Sandra; Carlstrom, John E.; Chael, Andrew; Chan, Chi-Kwan; Chang, Dominic O.; Chatterjee, Koushik; Chatterjee, Shami; Chen, Ming-Tang; Chen, Yongjun; Cheng, Xiaopeng; Cho, Ilje; Christian, Pierre; Conroy, Nicholas S.; Conway, John E.; Crawford, Thomas M.; Crew, Geoffrey B.; Cruz-Osorio, Alejandro; Cui, Yuzhu; Dahale, Rohan; Davelaar, Jordy; De Laurentis, Mariafelicia; Deane, Roger; Dempsey, Jessica; Desvignes, Gregory; Dexter, Jason; Dhruv, Vedant; Dihingia, Indu K.; Doeleman, Sheperd S.; Dzib, Sergio A.; Eatough, Ralph P.; Emami, Razieh; Falcke, Heino; Farah, Joseph; Fish, Vincent L.; Fomalont, Edward; Ford, H. Alyson; Foschi, Marianna; Fraga-Encinas, Raquel; Freeman, William T.; Friberg, Per; Fromm, Christian M.; Fuentes, Antonio; Galison, Peter; Gammie, Charles F.; García, Roberto; Gentaz, Olivier; Georgiev, Boris; Goddi, Ciriaco; Gold, Roman; Gómez-Ruiz, Arturo I.; Gómez, José L.; Gu, Minfeng; Gurwell, Mark; Hada, Kazuhiro; Haggard, Daryl; Hesper, Ronald; Heumann, Dirk; Ho, Luis C.; Ho, Paul; Honma, Mareki; Huang, Chih-Wei L.; Huang, Lei; Hughes, David H.; Ikeda, Shiro; Violette Impellizzeri, C. M.; Inoue, Makoto; Issaoun, Sara; James, David J.; Jannuzi, Buell T.; Janssen, Michael; Jeter, Britton; Jiang, Wu; Jiménez-Rosales, Alejandra; Johnson, Michael D.; Jorstad, Svetlana; Jones, Adam C.; Joshi, Abhishek V.; Jung, Taehyun; Karuppusamy, Ramesh; Kawashima, Tomohisa; Keating, Garrett K.; Kettenis, Mark; Kim, Dong-Jin; Kim, Jae-Young; Kim, Jongsoo; Kim, Junhan; Kino, Motoki; Koay, Jun Yi; Kocherlakota, Prashant; Kofuji, Yutaro; Koch, Patrick M.; Koyama, Shoko; Kramer, Carsten; Kramer, Joana A.; Kramer, Michael; Krichbaum, Thomas P.; Kuo, Cheng-Yu; La Bella, Noemi; Lee, Sang-Sung; Levis, Aviad; Li, Zhiyuan; Lico, Rocco; Lindahl, Greg; Lindqvist, Michael; Lisakov, Mikhail; Liu, Jun; Liu, Kuo; Liuzzo, Elisabetta; Lo, Wen-Ping; Lobanov, Andrei P.; Loinard, Laurent; Lonsdale, Colin J.; Lowitz, Amy E.; Lu, Ru-Sen; Macdonald, Nicholas R.; Mao, Jirong; Marchili, Nicola; Markoff, Sera; Marrone, Daniel P.; Marscher, Alan P.; Martí-Vidal, Iván; Matsushita, Satoki; Matthews, Lynn D.; Medeiros, Lia; Menten, Karl M.; Mizuno, Izumi; Mizuno, Yosuke; Montgomery, Joshua; Moran, James M.; Moriyama, Kotaro; Moscibrodzka, Monika; Mulaudzi, Wanga; Müller, Cornelia; Müller, Hendrik; Mus, Alejandro; Musoke, Gibwa; Myserlis, Ioannis; Nagai, Hiroshi; Nagar, Neil M.; Nakamura, Masanori; Narayanan, Gopal; Natarajan, Iniyan; Nathanail, Antonios; Fuentes, Santiago Navarro; Neilsen, Joey; Ni, Chunchong; Nowak, Michael A.; Oh, Junghwan; Okino, Hiroki; Olivares, Héctor; Oyama, Tomoaki; Özel, Feryal; Palumbo, Daniel C. M.; Paraschos, Georgios Filippos; Park, Jongho; Parsons, Harriet; Patel, Nimesh; Pen, Ue-Li; Pesce, Dominic W.; Piétu, Vincent; Popstefanija, Aleksandar; Porth, Oliver; Prather, Ben; Psaltis, Dimitrios; Pu, Hung-Yi; Ramakrishnan, Venkatessh; Rao, Ramprasad; Rawlings, Mark G.; Raymond, Alexander W.; Rezzolla, Luciano; Ricarte, Angelo; Ripperda, Bart; Roelofs, Freek; Romero-Cañizales, Cristina; Ros, Eduardo; Roshanineshat, Arash; Rottmann, Helge; Roy, Alan L.; Ruiz, Ignacio; Ruszczyk, Chet; Rygl, Kazi L. J.; Sánchez, Salvador; Sánchez-Argüelles, David; Sánchez-Portal, Miguel; Sasada, Mahito; Satapathy, Kaushik; Savolainen, Tuomas; Schloerb, F. Peter; Schonfeld, Jonathan; Schuster, Karl-Friedrich; Shao, Lijing; Shen, Zhiqiang; Small, Des; Sohn, Bong Won; Soohoo, Jason; Salas, León David Sosapanta; Souccar, Kamal; Stanway, Joshua S.; Sun, He; Tazaki, Fumie; Tetarenko, Alexandra J.; Tiede, Paul; Tilanus, Remo P. J.; Titus, Michael; Toma, Kenji; Torne, Pablo; Toscano, Teresa; Traianou, Efthalia; Trent, Tyler; Trippe, Sascha; Turk, Matthew; Van Bemmel, Ilse; Van Langevelde, Huib Jan; Van Rossum, Daniel R.; Vos, Jesse; Wagner, Jan; Ward-Thompson, Derek; Wardle, John; Washington, Jasmin E.; Weintroub, Jonathan; Wharton, Robert; Wielgus, Maciek; Wiik, Kaj; Witzel, Gunther; Wondrak, Michael F.; Wong, George N.; Wu, Qingwen; Yadlapalli, Nitika; Yamaguchi, Paul; Yfantis, Aristomenis; Yoon, Doosoo; Young, André; Younsi, Ziri; Yu, Wei; Yuan, Feng; Yuan, Ye-Fei; Anton Zensus, J.; Zhang, Shuo; Zhao, Guang-Yao; Zhao, Shan-Shan; Allardi, Alexander; Chang, Shu-Hao; Chang, Chih-Cheng; Chang, Song-Chu; Chen, Chung-Chen; Chilson, Ryan; Faber, Aaron; Gale, David M.; Han, Chih-Chiang; Han, Kuo-Chang; Hasegawa, Yutaka; Hernández-Rebollar, José Luis; Huang, Yau-De; Jiang, Homin; Jinchi, Hao; Kimura, Kimihiro; Kubo, Derek; Li, Chao-Te; Lin, Lupin C.-C.; Liu, Ching-Tang; Liu, Kuan-Yu; Lu, Li-Ming; Martin-Cocher, Pierre; Meyer-Zhao, Zheng; Montaña, Alfredo; Moraghan, Anthony; Moreno-Nolasco, Marcos Emir; Nishioka, Hiroaki; Norton, Timothy J.; Nystrom, George; Ogawa, Hideo; Oshiro, Peter; Pradel, Nicolas; Principe, Giacomo; Raffin, Philippe; Rodríguez-Montoya, Iván; Shaw, Paul; Snow, William; Sridharan, Tirupati Kumara; Srinivasan, Ranjani; Wei, Ta-Shun; Yu, Chen-Yu "The persistent shadow of the supermassive black hole of M 87. I. Observations, calibration, imaging, and analysis," Astronomy and Astrophysics, 681, A79, 2024.

Event Horizon Telescope Collaboration; Akiyama, Kazunori; Alberdi, Antxon; Alef, Walter; Algaba, Juan Carlos; Anantua, Richard; Asada, Keiichi; Azulay, Rebecca; Bach, Uwe; Baczko, Anne-Kathrin; Ball, David; Baloković, Mislav; Bandyopadhyay, Bidisha; Barrett, John; Bauböck, Michi; Benson, Bradford A.; Bintley, Dan; Blackburn, Lindy; Blundell, Raymond; Bouman, Katherine L.; Bower, Geoffrey C.; Boyce, Hope; Bremer, Michael; Brinkerink, Christiaan D.; Brissenden, Roger; Britzen, Silke; Broderick, Avery E.; Broguiere, Dominique; Bronzwaer, Thomas; Bustamante, Sandra; Byun, Do-Young; Carlstrom, John E.; Ceccobello, Chiara; Chael, Andrew; Chan, Chi-Kwan; Chang, Dominic O.; Chatterjee, Koushik; Chatterjee, Shami; Chen, Ming-Tang; Chen, Yongjun; Cheng, Xiaopeng; Cho, Ilje; Christian, Pierre; Conroy, Nicholas S.; Conway, John E.; Cordes, James M.; Crawford, Thomas M.; Crew, Geoffrey B.; Cruz-Osorio, Alejandro; Cui, Yuzhu; Dahale, Rohan; Davelaar, Jordy; De Laurentis, Mariafelicia; Deane, Roger; Dempsey, Jessica; Desvignes, Gregory; Dexter, Jason; Dhruv, Vedant; Dihingia, Indu K.; Doeleman, Sheperd S.; Dougall, Sean; Dzib, Sergio A.; Eatough, Ralph P.; Emami, Razieh; Falcke, Heino; Farah, Joseph; Fish, Vincent L.; Fomalont, Edward; Ford, H. Alyson; Foschi, Marianna; Fraga-Encinas, Raquel; Freeman, William T.; Friberg, Per; Fromm, Christian M.; Fuentes, Antonio; Galison, Peter; Gammie, Charles F.; García, Roberto; Gentaz, Olivier; Georgiev, Boris; Goddi, Ciriaco; Gold, Roman; Gómez-Ruiz, Arturo I.; Gómez, José L.; Gu, Minfeng; Gurwell, Mark; Hada, Kazuhiro; Haggard, Daryl; Haworth, Kari; Hecht, Michael H.; Hesper, Ronald; Heumann, Dirk; Ho, Luis C.; Ho, Paul; Honma, Mareki; Huang, Chih-Wei L.; Huang, Lei; Hughes, David H.; Ikeda, Shiro; Impellizzeri, C. M. Violette; Inoue, Makoto; Issaoun, Sara; James, David J.; Jannuzi, Buell T.; Janssen, Michael; Jeter, Britton; Jiang, Wu; Jiménez-Rosales, Alejandra; Johnson, Michael D.; Jorstad, Svetlana; Joshi, Abhishek V.; Jung, Taehyun; Karami, Mansour; Karuppusamy, Ramesh; Kawashima, Tomohisa; Keating, Garrett K.; Kettenis, Mark; Kim, Dong-Jin; Kim, Jae-Young; Kim, Jongsoo; Kim, Junhan; Kino, Motoki; Koay, Jun Yi; Kocherlakota, Prashant; Kofuji, Yutaro; Koch, Patrick M.; Koyama, Shoko; Kramer, Carsten; Kramer, Joana A.; Kramer, Michael; Krichbaum, Thomas P.; Kuo, Cheng-Yu; La Bella, Noemi; Lauer, Tod R.; Lee, Daeyoung; Lee, Sang-Sung; Leung, Po Kin; Levis, Aviad; Li, Zhiyuan; Lico, Rocco; Lindahl, Greg; Lindqvist, Michael; Lisakov, Mikhail; Liu, Jun; Liu, Kuo; Liuzzo, Elisabetta; Lo, Wen-Ping; Lobanov, Andrei P.; Loinard, Laurent; Lonsdale, Colin J.; Lowitz, Amy E.; Lu, Ru-Sen; Macdonald, Nicholas R.; Mao, Jirong; Marchili, Nicola; Markoff, Sera; Marrone, Daniel P.; Marscher, Alan P.; Martí-Vidal, Iván; Matsushita, Satoki; Matthews, Lynn D.; Medeiros, Lia; Menten, Karl M.; Michalik, Daniel; Mizuno, Izumi; Mizuno, Yosuke; Moran, James M.; Moriyama, Kotaro; Moscibrodzka, Monika; Mulaudzi, Wanga; Müller, Cornelia; Müller, Hendrik; Mus, Alejandro; Musoke, Gibwa; Myserlis, Ioannis; Nadolski, Andrew; Nagai, Hiroshi; Nagar, Neil M.; Nakamura, Masanori; Narayanan, Gopal; Natarajan, Iniyan; Nathanail, Antonios; Fuentes, Santiago Navarro; Neilsen, Joey; Neri, Roberto; Ni, Chunchong; Noutsos, Aristeidis; Nowak, Michael A.; Oh, Junghwan; Okino, Hiroki; Olivares, Héctor; Ortiz-León, Gisela N.; Oyama, Tomoaki; Özel, Feryal; Palumbo, Daniel C. M.; Paraschos, Georgios Filippos; Park, Jongho; Parsons, Harriet; Patel, Nimesh; Pen, Ue-Li; Pesce, Dominic W.; Piétu, Vincent; Plambeck, Richard; Popstefanija, Aleksandar; Porth, Oliver; Pötzl, Felix M.; Prather, Ben; Preciado-López, Jorge A.; Psaltis, Dimitrios; Pu, Hung-Yi; Ramakrishnan, Venkatessh; Rao, Ramprasad; Rawlings, Mark G.; Raymond, Alexander W.; Rezzolla, Luciano; Ricarte, Angelo; Ripperda, Bart; Roelofs, Freek; Rogers, Alan; Romero-Cañizales, Cristina; Ros, Eduardo; Roshanineshat, Arash; Rottmann, Helge; Roy, Alan L.; Ruiz, Ignacio; Ruszczyk, Chet; Rygl, Kazi L. J.; Sánchez, Salvador; Sánchez-Argüelles, David; Sánchez-Portal, Miguel; Sasada, Mahito; Satapathy, Kaushik; Savolainen, Tuomas; Schloerb, F. Peter; Schonfeld, Jonathan; Schuster, Karl-Friedrich; Shao, Lijing; Shen, Zhiqiang; Small, Des; Sohn, Bong Won; Soohoo, Jason; Sosapanta Salas, León David; Souccar, Kamal; Stanway, Joshua S.; Sun, He; Tazaki, Fumie; Tetarenko, Alexandra J.; Tiede, Paul; Tilanus, Remo P. J.; Titus, Michael; Torne, Pablo; Toscano, Teresa; Traianou, Efthalia; Trent, Tyler; Trippe, Sascha; Turk, Matthew; Van Bemmel, Ilse; Van Langevelde, Huib Jan; Van Rossum, Daniel R.; Vos, Jesse; Wagner, Jan; Ward-Thompson, Derek; Wardle, John; Washington, Jasmin E.; Weintroub, Jonathan; Wharton, Robert; Wielgus, Maciek; Wiik, Kaj; Witzel, Gunther; Wondrak, Michael F.; Wong, George N.; Wu, Qingwen; Yadlapalli, Nitika; Yamaguchi, Paul; Yfantis, Aristomenis; Yoon, Doosoo; Young, André; Young, Ken; Younsi, Ziri; Yu, Wei; Yuan, Feng; Yuan, Ye-Fei; Zensus, J. Anton; Zhang, Shuo; Zhao, Guang-Yao; Zhao, Shan-Shan; Najafi-Ziyazi, Mahdi "First Sagittarius A* Event Horizon Telescope Results. VIII. Physical Interpretation of the Polarized Ring," The Astrophysical Journal, 964, L26, 2024.

Facchini, Stefano; Testi, Leonardo; Humphreys, Elizabeth; Vander Donckt, Mathieu; Isella, Andrea; Wrzosek, Ramon; Baudry, Alain; Gray, Malcom D.; Richards, Anita M. S.; Vlemmings, Wouter "Resolved ALMA observations

of water in the inner astronomical units of the HL Tau disk," Nature Astronomy, 8, 587, 2024.
Fassett, Caleb I.; Bramson, Ali M.; Cahill, Joshua T. S.; Harris, Cameron P.; Morgan, Gareth A.; Neish, Catherine D.; Nypaver, Cole A.; Patterson, G. Wesley; Rivera-Valentin, Edgard; Taylor, Patrick A.; Thomson, Bradley J.; Mini-Rf Team "Improved Orthorectification and Empirical Reduction of Topographic Effects in Monostatic Mini-RF S-band Observations of the Moon," The Planetary Science Journal, 5, 4, 2024.
Federman, Samuel A.; Megeath, S. Thomas; Rubinstein, Adam E.; Gutermuth, Robert; Narang, Mayank; Tyagi, Himanshu; Manoj, P.; Anglada, Guillem; Atnagulov, Prabhani; Beuther, Henrik; Bourke, Tyler L.; Brunken, Nashanty; Caratti O Garatti, Alessio; Evans, Neal J.; Fischer, William J.; Furlan, Elise; Green, Joel D.; Habel, Nolan; Hartmann, Lee; Karnath, Nicole; Klaassen, Pamela; Linz, Hendrik; Looney, Leslie W.; Osorio, Mayra; Muzerolle Page, James; Nazari, Pooneh; Pokhrel, Riwaj; Rahatgaonkar, Rohan; Rocha, Will R. M.; Sheehan, Patrick; Slavicinska, Katerina; Stanke, Thomas; Stutz, Amelia M.; Tobin, John J.; Tychoniec, Lukasz; Van Dishoeck, Ewine F.; Watson, Dan M.; Wolk, Scott; Yang, Yao-Lun "Investigating Protostellar Accretion-driven Outflows across the Mass Spectrum: JWST NIRSpec Integral Field Unit 3-5 μm Spectral Mapping of Five Young Protostars," The Astrophysical Journal, 966, 41, 2024.
Fei, Qin "Constraints on the primordial curvature power spectrum by pulsar timing array data: a polynomial parameterization approach," Communications in Theoretical Physics, 76, 015404, 2024.
Fei, Qinyue; Wang, Ran; Molina, Juan; Ho, Luis C.; Shangguan, Jinyi; Bauer, Franz E.; Treister, Ezequiel "Constraining Quasar Feedback from Analysis of the Hydrostatic Equilibrium of the Molecular Gas in Their Host Galaxies," The Astrophysical Journal, 976, 201, 2024.
Feng, Yi; Li, Di; Zhang, Yong-Kun; Tsai, Chao-Wei; Qu, Yuanhong; Wang, Wei-Yang; Yang, Yuan-Pei; Wang, Pei; Zhou, Dengke; Niu, Jiarui; Miao, Chenchen; Yuan, Mao; Xu, Jiaying; Lynch, Ryan S.; Armentrout, William Paul; Gregory, Brenne; Meng, Lingqi; Wang, Shen; Chen, Xianglei; Dai, Shi; Niu, Chen-Hui; Xue, Mengyao; Yao, Ju-Mei; Zhang, Bing; Zhang, Junshuo; Zhu, Weiwei; Xie, Jintao; Zhu, Yuhao "An Extremely Active Repeating Fast Radio Burst Source in a Likely Nonmagneto-ionic Environment," The Astrophysical Journal, 974, 296, 2024.
Fernández Aranda, Román; Díaz Santos, Tanio; Hatziminaoglou, Evanthia; Assef, Roberto J.; Aravena, Manuel; Eisenhardt, Peter R. M.; Ferkinhoff, Carl; Pensabene, Antonio; Nikola, Thomas; Andreani, Paola; Vishwas, Amit; Stacey, Gordon J.; Decarli, Roberto; Blain, Andrew W.; Brisbin, Drew; Charmandaris, Vassilis; Jun, Hyunsung D.; Li, Guodong; Liao, Mai; Martin, Lee R.; Stern, Daniel; Tsai, Chao-Wei; Wu, Jingwen; Zewdie, Dejene "A benchmark for extreme conditions of the multiphase interstellar medium in the most luminous hot dust-obscured galaxy at z = 4.6," Astronomy and Astrophysics, 682, A166, 2024.
Fielder, Catherine; Jones, Michael G.; Sand, David J.; Bennet, Paul; Crnojević, Denija; Karunakaran, Ananthan; Mutlu-Pakdil, Burçin; Spekkens, Kristine "All Puffed Up: Exploring Ultra-diffuse Galaxy Origins Through Galaxy Interactions," The Astronomical Journal, 168, 212, 2024.
Fielder, Samuel D.; Kirk, Helen; Dunham, Michael M.; Offner, Stella S. R. "An ALMA Search for Substructure and Fragmentation in Starless Cores in Orion B North," The Astrophysical Journal, 968, 10, 2024.
Finn, Molly K.; Johnson, Kelsey E.; Indebetouw, Remy; Costa, Allison H.; Adamo, Angela; Aloisi, Alessandra; Bittle, Lauren; Calzetti, Daniela; Dale, Daniel A.; Dobbs, Clare L.; Donovan Meyer, Jennifer; Elmegreen, Bruce G.; Elmegreen, Debra M.; Fumagalli, Michele; Gallagher, J. S.; Grasha, Kathryn; Grebel, Eva K.; Kennicutt, Robert C.; Krumholz, Mark R.; Lee, Janice C.; Messa, Matteo; Nair, Preethi; Sabbi, Elena; Smith, Linda J.; Thilker, David A.; Whitmore, Bradley C.; Wofford, Aida "ALMA-LEGUS. I. The Influence of Galaxy Morphology on Molecular Cloud Properties," The Astrophysical Journal, 964, 12, 2024.
Finn, Molly K.; Johnson, Kelsey E.; Indebetouw, Remy; Costa, Allison H.; Adamo, Angela; Aloisi, Alessandra; Bittle, Lauren; Calzetti, Daniela; Dale, Daniel A.; Dobbs, Clare L.; Donovan Meyer, Jennifer; Elmegreen, Bruce G.; Elmegreen, Debra M.; Fumagalli, Michele; Gallagher, J. S.; Grasha, Kathryn; Grebel, Eva K.; Kennicutt, Robert C.; Krumholz, Mark R.; Lee, Janice C.; Messa, Matteo; Nair, Preethi; Sabbi, Elena; Smith, Linda J.; Thilker, David A.; Whitmore, Bradley C.; Wofford, Aida "ALMA-LEGUS. II. The Influence of Subgalactic Environments on Molecular Cloud Properties," The Astrophysical Journal, 964, 13, 2024.
Flaherty, Kevin; Hughes, A. Meredith; Simon, Jacob B.; Reina, Alicia Smith; Qi, Chunhua; Bai, Xue-Ning; Andrews, Sean M.; Wilner, David J.; Kóspál, Ágnes "Evidence for non-zero turbulence in the protoplanetary disc around IM Lup," Monthly Notices of the Royal Astronomical Society, 532, 363, 2024.
Fonfría, José Pablo; Sánchez Contreras, Carmen; Tafoya, Daniel; Fernández-Ruiz, Patricia; Castro-Carrizo, Arancha; Alcolea, Javier; Bujarrabal, Valentín "Exploring the Ionized Core of the Proto-Planetary Nebula CRL 618 and Its Vicinity with ALMA," Galaxies, 12, 62, 2024.
Fontani, F.; Mininni, C.; Beltrán, M. T.; Rivilla, V. M.; Colzi, L.; Jiménez-Serra, I.; López-Gallifa, Á.; Sánchez-Monge, Á.; Viti, S. "The GUAPOS project: G31.41+0.31 Unbiased ALMA sPectral Observational Survey. IV. Phosphorus-bearing molecules and their relation to shock tracers," Astronomy and Astrophysics, 682, A74, 2024.
Fontani, F.; Vermariën, G.; Viti, S.; Gigli, D.; Colzi, L.; Beltrán, M. T.; Caselli, P.; Rivilla, V. M.; Sánchez-Monge, A. "CHEMOUT: CHEMical complexity in star-forming regions of the OUTer Galaxy: IV. ALMA observations of organic species at a galactocentric radius of 23 kpc," Astronomy and Astrophysics, 691, A180, 2024.
Fortenberry, Ryan C.; Mcguire, Brett A. "A Possible Additional Formation Pathway for the Interstellar Diatomic SiS," The Astrophysical Journal, 971, 101, 2024.
Fortune-Bashee, Xena; Sun, Jiayi; Tan, Jonathan C. "The Impact of Shear on Disk Galaxy Star Formation Rates," The Astrophysical Journal, 977, L6, 2024.
Foschini, Luigi; Dalla Barba, Benedetta; Tornikoski, Merja; Andernach, Heinz; Marziani, Paola; Marscher, Alan P.; Jorstad, Svetlana G.; Järvelä, Emilia; Antón, Sonia; Dalla Bontà, Elena "The Power of Relativistic Jets: A Comparative Study," Universe, 10, 156, 2024.
Fourkas, Austen; Ruíz-Rodríguez, Dary; Mundy, Lee G.; Williams, Jonathan P. "The kinematic and dynamic properties of HBC 494's wide-angle outflows," Monthly Notices of the Royal Astronomical Society, 528, 3049, 2024.
Frail, Dale A.; Polisensky, Emil; Hyman, Scott D.; Cotton, William D.; Kassim, Namir E.; Silverstein, Michele L.; Sengar, Rahul; Kaplan, David L.; Calore, Francesca; Berteaud, Joanna; Clavel, Maïca; Geyer, Marisa; Legodi, Samuel; Krishnan, Vasaant; Buchner, Sarah; Camilo, Fernando "An Image-based Search for Pulsar Candidates in the MeerKAT Bulge Survey," The Astrophysical Journal, 975, 34, 2024.
Frey, S.; Zhang, Y.; Perger, K.; An, T.; Gabányi, K. É.; Gurvits, L. I.; Hwang, C.-Y.; Koptelova, E.; Paragi, Z.; Fogasy, J. "Milliarcsecond-scale radio structure of the most distant BL Lac object candidate at redshift 6.57," Astronomy and Astrophysics, 681, L12, 2024.
Frey, Sándor; Fogasy, Judit; Perger, Krisztina; Kulish, Kateryna; Benke, Petra; Koller, Dávid; Gabányi, Krisztina Éva "Revisiting a Core-Jet Laboratory at High Redshift: Analysis of the Radio Jet in the Quasar PKS 2215+020 at z = 3.572," Universe, 10, 97, 2024.
Fried, Zachary T. P.; El-Abd, Samer J.; Hays, Brian M.; Wenzel, Gabi; Byrne, Alex N.; Margulès, Laurent; Motiyenko, Roman A.; Shipman, Steven T.; Horne, Maria P.; Jørgensen, Jes K.; Brogan, Crystal L.; Hunter, Todd R.; Remijan, Anthony J.; Lipnicky, Andrew; Loomis, Ryan A.; Mcguire, Brett A. "Rotational Spectrum and First Interstellar Detection of 2-methoxyethanol Using ALMA Observations of NGC 6334I," The Astrophysical Journal, 965, L23, 2024.
Friesen, Rachel K.; Bourke, Tyler L.; Caselli, Paola; Di Francesco, James; Li, Zhi-Yun; Pineda, Jaime E. "The Initial Conditions of Clustered Core Collapse: Multiwavelength Analysis of Oph A SM1N and N6 at 100 au Resolution," The Astrophysical Journal, 965, 165, 2024.
Friesen, Rachel K.; Jarvis, Emma "The Stability of Dense Cores near the Serpens South Protocluster," The Astrophysical Journal, 969, 70, 2024.
Fu, Shenming; Dell'Antonio, Ian; Escalante, Zacharias; Nelson, Jessica; Englert, Anthony; Helhoski, Søren; Shinde, Rahul; Brockland, Julia; Laduca, Philip; Larkin, Christelyn; Paris, Lucca; Weiner, Shane; Black, William K.; Chary, Ranga-Ram; Clowe, Douglas; Cooper, M. C.; Donahue, Megan; Evrard, August; Lacy, Mark; Lauer, Tod; Liu, Binyang; Mccleary, Jacqueline; Meneghetti, Massimo; Miyatake, Hironao; Montes, Mireia; Natarajan, Priyamvada; Ntampaka, Michelle; Pierpaoli, Elena; Postman, Marc; Sohn, Jubee; Turner, David; Umetsu, Keiichi; Utsumi, Yousuke; Wilson, Gillian "LoVoCCS. II. Weak Lensing Mass Distributions, Red-sequence Galaxy Distributions, and Their Alignment with the Brightest Cluster Galaxy in 58 Nearby X-Ray-luminous Galaxy Clusters," The Astrophysical Journal, 974, 69, 2024.
Fudamoto, Y.; Oesch, P. A.; Walter, F.; Decarli, R.; Carilli, C. L.; Ferrara, A.; Barrufet, L.; Bouwens, R.; Dessauges-Zavadsky, M.; Nelson, E. J.; Dannerbauer, H.; Illingworth, G.; Inoue, A. K.; Marques-Chaves, R.; Pérez-Fournon, I.; Riechers, D. A.; Schaerer, D.; Smit, R.; Sugahara, Y.; Van Der Werf, P. "The NOEMA observations of GN-z11: Constraining the neutral interstellar medium and dust formation in the heart of cosmic reionization at z = 10.6," Monthly Notices of the Royal Astronomical Society, 530, 340, 2024.
Fudamoto, Yoshinobu; Inoue, Akio K.; Coe, Dan; Welch, Brian; Acebron, Ana; Ricotti, Massimo; Mandelker, Nir; Windhorst, Rogier A.; Xu, Xinfeng; Sugahara, Yuma; Bauer, Franz E.; Bradač, Maruša; Bradley, Larry D.; Diego, Jose M.; Florian, Michael; Frye, Brenda; Fujimoto, Seiji; Hashimoto, Takuya; Henry, Alaina; Mahler, Guillaume; Oesch, Pascal A.; Ravindranath, Swara; Rigby, Jane; Sharon, Keren; Strait, Victoria; Tamura, Yoichi; Trenti, Michele; Vanzella, Eros; Zackrisson, Erik; Zitrin, Adi "The Extended [C II] under Construction? Observation of the Brightest High-z Lensed Star-forming Galaxy at z = 6.2," The Astrophysical Journal, 961, 71, 2024.
Fuentealba-Fuentes, M.; Lira, P.; Díaz-Santos, T.; Trakhtenbrot, B.; Netzer, H.; Videla, L. "Study of the ~50 kpc circumgalactic environment around the merger system J2057-0030 at z ~ 4.6 using ALMA," Astronomy and Astrophysics, 687, A62, 2024.
Fujimoto, Seiji; Kohno, Kotaro; Ouchi, Masami; Oguri, Masamune; Kokorev, Vasily; Brammer, Gabriel; Sun, Fengwu; González-López, Jorge; Bauer, Franz E.; Caminha, Gabriel B.; Hatsukade, Bunyo; Richard, Johan; Smail, Ian; Tsujita, Akiyoshi; Ueda, Yoshihiro; Uematsu, Ryosuke; Zitrin, Adi; Coe, Dan; Kneib, Jean-Paul; Postman, Marc; Umetsu, Keiichi; Lagos, Claudia Del P.; Popping, Gergö; Ao, Yiping; Bradley, Larry; Caputi, Karina; Dessauges-Zavadsky, Miroslava; Egami, Eiichi; Espada, Daniel; Ivison, R. J.; Jauzac, Mathilde; Knudsen, Kirsten K.; Koekemoer, Anton M.; Magdis, Georgios E.; Mahler, Guillaume; Muñoz Arancibia, A. M.; Rawle, Timothy; Shimasaku, Kazuhiro; Toft, Sune; Umehata, Hideki; Valentino, Francesco; Wang, Tao;

Wang, Wei-Hao "ALMA Lensing Cluster Survey: Deep 1.2 mm Number Counts and Infrared Luminosity Functions at z ≃ 1-8," The Astrophysical Journal Supplement Series, 275, 36, 2024.
Fujimoto, Seiji; Ouchi, Masami; Nakajima, Kimihiko; Harikane, Yuichi; Isobe, Yuki; Brammer, Gabriel; Oguri, Masamune; Giménez-Arteaga, Clara; Heintz, Kasper E.; Kokorev, Vasily; Bauer, Franz E.; Ferrara, Andrea; Kojima, Takashi; Lagos, Claudia Del P.; Laura, Sommovigo; Schaerer, Daniel; Shimasaku, Kazuhiro; Hatsukade, Bunyo; Kohno, Kotaro; Sun, Fengwu; Valentino, Francesco; Watson, Darach; Fudamoto, Yoshinobu; Inoue, Akio K.; González-López, Jorge; Koekemoer, Anton M.; Knudsen, Kirsten; Lee, Minju M.; Magdis, Georgios E.; Richard, Johan; Strait, Victoria B.; Sugahara, Yuma; Tamura, Yoichi; Toft, Sune; Umehata, Hideki; Walth, Gregory "JWST and ALMA Multiple-line Study in and around a Galaxy at z = 8.496: Optical to Far-Infrared Line Ratios and the Onset of an Outflow Promoting Ionizing Photon Escape," The Astrophysical Journal, 964, 146, 2024.
Fujita, Yutaka; Izumi, Takuma; Nagai, Hiroshi; Kawakatu, Nozomu; Kawanaka, Norita "The Relationships between Active Galactic Nucleus Power and Molecular Gas Mass within 500 pc of the Center of Elliptical Galaxies," The Astrophysical Journal, 964, 29, 2024.
Fujita, Yutaka; Kawachi, Akiko; Okazaki, Atsuo T.; Nagai, Hiroshi; Kawanaka, Norita; Akahori, Takuya "ALMA Observations of the Gamma-Ray Binary System PSR B1259-63/LS 2883 during the 2024 Periastron Passage," The Astrophysical Journal, 977, L22, 2024.
Furtak, Lukas J.; Labbé, Ivo; Zitrin, Adi; Greene, Jenny E.; Dayal, Pratika; Chemerynska, Iryna; Kokorev, Vasily; Miller, Tim B.; Goulding, Andy D.; De Graaff, Anna; Bezanson, Rachel; Brammer, Gabriel B.; Cutler, Sam E.; Leja, Joel; Pan, Richard; Price, Sedona H.; Wang, Bingjie; Weaver, John R.; Whitaker, Katherine E.; Atek, Hakim; Bogdán, Ákos; Charlot, Stéphane; Curtis-Lake, Emma; Van Dokkum, Pieter; Endsley, Ryan; Feldmann, Robert; Fudamoto, Yoshinobu; Fujimoto, Seiji; Glazebrook, Karl; Juneau, Stéphanie; Marchesini, Danilo; Maseda, Micheal V.; Nelson, Erica; Oesch, Pascal A.; Plat, Adèle; Setton, David J.; Stark, Daniel P.; Williams, Christina C. "A high black-hole-to-host mass ratio in a lensed AGN in the early Universe," Nature, 628, 57, 2024.
Furuya, Kenji; Shimonishi, Takashi "Deep Search for Phosphine in a Prestellar Core," The Astrophysical Journal, 968, L19, 2024.
Gajović, L.; Adebahr, B.; Basu, A.; Heesen, V.; Brüggen, M.; De Gasperin, F.; Lara-Lopez, M. A.; Oonk, J. B. R.; Edler, H. W.; Bomans, D. J.; Paladino, R.; Garduño, L. E.; López-Cruz, O.; Stein, M.; Fritz, J.; Piotrowska, J.; Sinha, A. "A spatially resolved radio spectral study of the galaxy M 51," Astronomy and Astrophysics, 689, A68, 2024.
Galaz, Gaspar; González-López, Jorge; Guzmán, Viviana; Messias, Hugo; Junais; Boissier, Samuel; Epinat, Benoît; Weilbacher, Peter M.; Puzia, Thomas; Johnston, Evelyn J.; Amram, Philippe; Frayer, David; Blaña, Matias; Howk, J. Christopher; Berg, Michelle; Bustos-Espinoza, Roy; Muñoz-Mateos, Juan Carlos; Cortés, Paulo; García-Appadoo, Diego; Joachimi, Katerine "First Detection of Molecular Gas in the Giant Low Surface Brightness Galaxy Malin 1," The Astrophysical Journal, 975, L26, 2024.
Gallagher, J. S.; Kotulla, R.; Laufman, L.; Geist, E.; Aalto, S.; Falstad, N.; König, S.; Krause, J.; Privon, G. C.; Wethers, C.; Evans, A.; Gorski, M. "An Imaging and Spectroscopic Exploration of the Dusty Compact Obscured Nucleus Galaxy Zw 049.057," The Astrophysical Journal Supplement Series, 274, 3, 2024.
Gallardo, D.; Finger, R.; Solis, F.; Monasterio, D.; Jorquera, S.; Pizarro, J.; Riquelme, J.; Curotto, F.; Pizarro, F.; Bronfman, L. "An Ultra-Wideband Dual Polarization Antenna Array for the Detection and Localization of Bright Fast Radio Transients in the Milky Way," Journal of Astronomical Instrumentation, 13, 2450007-62, 2024.
Gallimore, Jack F.; Impellizzeri, C. M. Violette; Aghelpasand, Samaneh; Gao, Feng; Hostetter, Virginia; Lankhaar, Boy "The Discovery of Polarized Water Vapor Megamaser Emission in a Molecular Accretion Disk," The Astrophysical Journal, 975, L9, 2024.
Galván-Madrid, Roberto; Díaz-González, Daniel J.; Motte, Frédérique; Ginsburg, Adam; Cunningham, Nichol; Menten, Karl M.; Armante, Mélanie; Bonfand, Mélisse; Braine, Jonathan; Csengeri, Timea; Dell'Ova, Pierre; Louvet, Fabien; Nony, Thomas; Rivera-Soto, Rudy; Sanhueza, Patricio; Stutz, Amelia M.; Wyrowski, Friedrich; Álvarez-Gutiérrez, Rodrigo H.; Baug, Tapas; Bontemps, Sylvain; Bronfman, Leonardo; Fernández-López, Manuel; Gusdorf, Antoine; Koley, Atanu; Liu, Hong-Li; Salinas, Javiera; Towner, Allison P. M.; Whitworth, Anthony P. "ALMA-IMF. XIV. Free-Free Templates Derived from H41α and Ionized Gas Content in 15 Massive Protoclusters," The Astrophysical Journal Supplement Series, 274, 15, 2024.
Gao, Shi-Jie; Shao, Yi-Xuan; Wang, Pei; Zhou, Ping; Li, Xiang-Dong; Zhang, Lei; Kania, Joseph W.; Lorimer, Duncan R.; Li, Di "Discovery of a Millisecond Pulsar Associated with Terzan 6," The Astrophysical Journal, 974, L2, 2024.
García-Bernete, I.; Pereira-Santaella, M.; González-Alfonso, E.; Rigopoulou, D.; Efstathiou, A.; Donnan, F. R.; Thatte, N. "Structures Of Dust and gAs (SODA): Constraining the innermost dust properties of II Zw96 with JWST observations of H_2O and CO," Astronomy and Astrophysics, 682, L5, 2024.
García-Bernete, I.; Rigopoulou, D.; Donnan, F. R.; Alonso-Herrero, A.; Pereira-Santaella, M.; Shimizu, T.; Davies, R.; Roche, P. F.; García-Burillo, S.; Labiano, A.; Hermosa Muñoz, L.; Zhang, L.; Audibert, A.; Bellocchi, E.; Bunker, A.; Combes, F.; Delaney, D.; Esparza-Arredondo, D.; Gandhi, P.; González-Martín, O.; Hönig, S. F.; Imanishi, M.; Hicks, E. K. S.; Fuller, L.; Leist, M.; Levenson, N. A.; Lopez-Rodriguez, E.; Packham, C.; Ramos Almeida, C.; Ricci, C.; Stalevski, M.; Villar Martín, M.; Ward, M. J. "The Galaxy Activity, Torus, and Outflow Survey (GATOS): V. Unveiling PAH survival and resilience in the circumnuclear regions of AGNs with JWST," Astronomy and Astrophysics, 691, A162, 2024.
García-Burillo, S.; Hicks, E. K. S.; Alonso-Herrero, A.; Pereira-Santaella, M.; Usero, A.; Querejeta, M.; González-Martín, O.; Delaney, D.; Ramos Almeida, C.; Combes, F.; Anglés-Alcázar, D.; Audibert, A.; Bellocchi, E.; Davies, R. I.; Davis, T. A.; Elford, J. S.; García-Bernete, I.; Hönig, S.; Labiano, A.; Leist, M. T.; Levenson, N. A.; López-Rodríguez, E.; Mercedes-Feliz, J.; Packham, C.; Ricci, C.; Rosario, D. J.; Shimizu, T.; Stalevski, M.; Zhang, L. "Deciphering the imprint of active galactic nucleus feedback in Seyfert galaxies: Nuclear-scale molecular gas deficits," Astronomy and Astrophysics, 689, A347, 2024.
Garsden, Hugh; Bull, Philip; Wilensky, Michael J.; Abdurashidova, Zuhra; Adams, Tyrone; Aguirre, James E.; Alexander, Paul; Ali, Zaki S.; Baartman, Rushelle; Balfour, Yanga; Beardsley, Adam P.; Berkhout, Lindsay M.; Bernardi, Gianni; Billings, Tashalee S.; Bowman, Judd D.; Bradley, Richard F.; Burba, Jacob; Carey, Steven; Carilli, Chris L.; Chen, Kai-Feng; Cheng, Carina; Choudhuri, Samir; Deboer, David R.; Acedo, Eloy De Lera; Dexter, Matt; Dillon, Joshua S.; Dynes, Scott; Eksteen, Nico; Ely, John; Ewall-Wice, Aaron; Fagnoni, Nicolas; Fritz, Randall; Furlanetto, Steven R.; Gale-Sides, Kingsley; Gehlot, Bharat Kumar; Ghosh, Abhik; Glendenning, Brian; Gorce, Adelie; Gorthi, Deepthi; Greig, Bradley; Grobbelaar, Jasper; Halday, Ziyaad; Hazelton, Bryna J.; Hewitt, Jacqueline N.; Hickish, Jack; Huang, Tian; Jacobs, Daniel C.; Josaitis, Alec; Julius, Austin; Kariseb, Maccalvin; Kern, Nicholas S.; Kerrigan, Joshua; Kim, Honggeun; Kittiwisit, Piyanat; Kohn, Saul A.; Kolopanis, Matthew; Lanman, Adam; La Plante, Paul; Liu, Adrian; Loots, Anita; Ma, Yin-Zhe; Macmahon, David H. E.; Malan, Lourence; Malgas, Cresshim; Malgas, Keith; Marero, Bradley; Martinot, Zachary E.; Mesinger, Andrei; Molewa, Mathakane; Morales, Miguel F.; Mosiane, Tshegofalang; Murray, Steven G.; Neben, Abraham R.; Nikolic, Bojan; Nunhokee, Chuneeta Devi; Nuwegeld, Hans; Parsons, Aaron R.; Pascua, Robert; Patra, Nipanjana; Pieterse, Samantha; Qin, Yuxiang; Rath, Eleanor; Razavi-Ghods, Nima; Riley, Daniel; Robnett, James; Rosie, Kathryn; Santos, Mario G.; Sims, Peter; Singh, Saurabh; Storer, Dara; Swarts, Hilton; Tan, Jianrong; Thyagarajan, Nithyanandan; Van Wyngaarden, Pieter; Williams, Peter K. G.; Xu, Zhilei; Zheng, Haoxuan "A demonstration of the effect of fringe-rate filtering in the hydrogen epoch of reionization array delay power spectrum pipeline," Monthly Notices of the Royal Astronomical Society, 535, 3218-3238, 2024.
Gasealahwe, K. V. S.; Monageng, I. M.; Fender, R. P.; Woudt, P. A.; Hughes, A. K.; Motta, S. E.; Van Den Eijnden, J.; Saikia, P.; Tremou, E. "Radio observations of the 2022 outburst of the transitional Z-Atoll source XTE J1701-462," Monthly Notices of the Royal Astronomical Society, 533, 1800-1807, 2024.
Gautam, T.; Freire, P. C. C.; Wu, J.; Venkatraman Krishnan, V.; Kramer, M.; Barr, E. D.; Bailes, M.; Cameron, A. D. "Detection of the relativistic Shapiro delay in a highly inclined millisecond pulsar binary PSR J1012-4235," Astronomy and Astrophysics, 682, A103, 2024.
Gavino, Sacha; Jørgensen, Jes K.; Sharma, Rajeeb; Yang, Yao-Lun; Li, Zhi-Yun; Tobin, John J.; Ohashi, Nagayoshi; Takakuwa, Shigehisa; Plunkett, Adele L.; Kwon, Woojin; De Gregorio-Monsalvo, Itziar; Lin, Zhe-Yu Daniel; Santamaría-Miranda, Alejandro; Aso, Yusuke; Sai, Jinshi; Aikawa, Yuri; Tomida, Kengo; Koch, Patrick M.; Lee, Jeong-Eun; Lee, Chang Won; Lai, Shih-Ping; Looney, Leslie W.; Narayanan, Suchitra; Phuong, Nguyen Thi; Thieme, Travis J.; Van'T Hoff, Merel L. R.; Williams, Jonathan P.; Yen, Hsi-Wei "Early Planet Formation in Embedded Disks. XI. A High-resolution View Toward the BHR 71 Class 0 Protostellar Wide Binary," The Astrophysical Journal, 974, 21, 2024.
Gentile, Fabrizio; Talia, Margherita; Behiri, Meriem; Zamorani, Giovanni; Barchiesi, Luigi; Vignali, Cristian; Pozzi, Francesca; Bethermin, Matthieu; Enia, Andrea; Faisst, Andreas L.; Giulietti, Marika; Gruppioni, Carlotta; Lapi, Andrea; Massardi, Marcella; Smolčić, Vernesa; Vaccari, Mattia; Cimatti, Andrea "Illuminating the Dark Side of Cosmic Star Formation. III. Building the Largest Homogeneous Sample of Radio-selected Dusty Star-forming Galaxies in COSMOS with PhoEBO," The Astrophysical Journal, 962, 26, 2024.
Gentile, Fabrizio; Talia, Margherita; Daddi, Emanuele; Giulietti, Marika; Lapi, Andrea; Massardi, Marcella; Pozzi, Francesca; Zamorani, Giovanni; Behiri, Meriem; Enia, Andrea; Bethermin, Matthieu; Dallacasa, Daniele; Delvecchio, Ivan; Faisst, Andreas L.; Gruppioni, Carlotta; Loiacono, Federica; Traina, Alberto; Vaccari, Mattia; Vallini, Livia; Vignali, Cristian; Smolčić, Vernesa; Cimatti, Andrea "Dark progenitors and massive descendants: A first ALMA perspective of radio-selected near-IR-dark galaxies in the COSMOS field," Astronomy and Astrophysics, 687, A288, 2024.
Gerasimov, Ivan S.; Egorov, Oleg V.; Moiseev, Alexei V.; Kniazev, Alexei Yu; Lozinskaya, Tatiana A.; Egorova, Evgeniya S. "Stellar feedback impact on the ionized gas kinematics in the dwarf galaxy Sextans B," Monthly Notices of the Royal Astronomical Society, 529, 1138, 2024.
Gerin, Maryvonne; Liszt, Harvey; Pety, Jérôme; Faure, Alexandre "H_2CO and CS in diffuse clouds: Excitation and abundance," Astronomy and Astrophysics, 686, A49, 2024.

Ghodsi, L.; Zhou, J.; Andreani, P.; De Breuck, C.; Man, A. W. S.; Miyamoto, Y.; Bisbas, T. G.; Lundgren, A.; Zhang, Z.-Y. "Molecular gas excitation in the circumgalactic medium of MACS1931-26," Astronomy and Astrophysics, 689, A67, 2024.
Giacintucci, S.; Venturi, T.; Markevitch, M.; Brunetti, G.; Clarke, T. E.; Kale, R. "Are Radio Minihalos Confined by Cold Fronts in Galaxy Clusters? Minihalos and Large-scale Sloshing in A3444 and MS 1455.0+2232," The Astrophysical Journal, 961, 133, 2024.
Gianfagna, Giulia; Piro, Luigi; Pannarale, Francesco; Van Eerten, Hendrik; Ricci, Fulvio; Ryan, Geoffrey "Potential biases and prospects for the Hubble constant estimation via electromagnetic and gravitational-wave joint analyses," Monthly Notices of the Royal Astronomical Society, 528, 2600, 2024.
Giarratana, S.; Salafia, O. S.; Giroletti, M.; Ghirlanda, G.; Rhodes, L.; Atri, P.; Marcote, B.; Yang, J.; An, T.; Anderson, G.; Bright, J. S.; Farah, W.; Fender, R.; Leung, J. K.; Motta, S. E.; Pérez-Torres, M.; Van Der Horst, A. J. "The expansion of the GRB 221009A afterglow," Astronomy and Astrophysics, 690, A74, 2024.
Gim, Hansung B.; Reines, Amy E. "The ALMA View of Positive Black Hole Feedback in the Dwarf Galaxy Henize 2-10," The Astrophysical Journal, 963, 103, 2024.
Gim, Hansung B.; Reines, Amy E.; Momjian, Emmanuel; Darling, Jeremy "An Outflow-Driven Water Maser Associated with Positive Black Hole Feedback in the Dwarf Galaxy Henize 2-10," The Astrophysical Journal, 969, 16, 2024.
Gingras, Marie-Joëlle; Coil, Alison L.; Mcnamara, B. R.; Perrotta, Serena; Brighenti, Fabrizio; Russell, H. R.; Li, Muzi; Oh, S. Peng; Ning, Wenmeng "Complex Kinematics of Nebular Gas in Active Galaxies Centered in Cooling X-Ray Atmospheres," The Astrophysical Journal, 977, 159, 2024.
Ginsburg, Adam; Bally, John; Barnes, Ashley T.; Battersby, Cara; Budaiev, Nazar; Butterfield, Natalie O.; Caselli, Paola; Colzi, Laura; Dutkowska, Katarzyna M.; García, Pablo; Gramze, Savannah; Henshaw, Jonathan D.; Hu, Yue; Jeff, Desmond; Jiménez-Serra, Izaskun; Kauffmann, Jens; Klessen, Ralf S.; Levesque, Emily M.; Longmore, Steven N.; Lu, Xing; Mills, Elisabeth A. C.; Morris, Mark R.; Nogueras-Lara, Francisco; Oka, Tomoharu; Pineda, Jaime E.; Pillai, Thushara G. S.; Rivilla, Víctor M.; Sánchez-Monge, Álvaro; Santa-Maria, Miriam G.; Smith, Howard A.; Sofue, Yoshiaki; Sormani, Mattia C.; Tremblay, Grant R.; Vermariën, Gijs; Vikhlinin, Alexey; Viti, Serena; Walker, Dan; Wang, Q. Daniel; Xu, Fengwei; Zhang, Qizhou "A Broad Line-width, Compact, Millimeter-bright Molecular Emission Line Source near the Galactic Center," The Astrophysical Journal, 968, L11, 2024.
Ginski, C.; Garufi, A.; Benisty, M.; Tazaki, R.; Dominik, C.; Ribas, Á.; Engler, N.; Birnstiel, T.; Chauvin, G.; Columba, G.; Facchini, S.; Goncharov, A.; Hagelberg, J.; Henning, T.; Hogerheijde, M.; Van Holstein, R. G.; Huang, J.; Muto, T.; Pinilla, P.; Kanagawa, K.; Kim, S.; Kurtovic, N.; Langlois, M.; Manara, C.; Milli, J.; Momose, M.; Orihara, R.; Pawellek, N.; Pinte, C.; Rab, C.; Schmidt, T. O. B.; Snik, F.; Wahhaj, Z.; Williams, J.; Zurlo, A. "The SPHERE view of the Chamaeleon I star-forming region. The full census of planet-forming disks with GTO and DESTINYS programs," Astronomy and Astrophysics, 685, A52, 2024.
Girdhar, A.; Harrison, C. M.; Mainieri, V.; Fernández Aranda, R.; Alexander, D. M.; Arrigoni Battaia, F.; Bianchin, M.; Calistro Rivera, G.; Circosta, C.; Costa, T.; Edge, A. C.; Farina, E. P.; Kakkad, D.; Kharb, P.; Molyneux, S. J.; Mukherjee, D.; Njeri, A.; Silpa, S.; Venturi, G.; Ward, S. R. "Quasar feedback survey: molecular gas affected by central outflows and by 10-kpc radio lobes reveal dual feedback effects in 'radio quiet' quasars," Monthly Notices of the Royal Astronomical Society, 527, 9322, 2024.
Giustini, Margherita; Miniutti, Giovanni; Arcodia, Riccardo; Goodwin, Adelle; Alexander, Kate D.; Chakraborty, Joheen; Buchner, Johannes; Kosec, Peter; Saxton, Richard; Bonetti, Matteo; Franchini, Alessia; Ryu, Taeho; Shu, Xinwen; Kara, Erin; Ponti, Gabriele; Quintin, Erwan; Vincentelli, Federico; Webb, Natalie; Kajava, Jari; Von Fellenberg, Sebastiano D. "Fragments of harmony amid apparent chaos: A closer look at the X-ray quasi-periodic eruptions of the galaxy RX J1301.9+2747," Astronomy and Astrophysics, 692, A15, 2024.
Glazer, Kelsey; Bradăc, MarušA; Sanders, Ryan L.; Fujimoto, Seiji; Bolan, Patricia; Ferrara, Andrea; Strait, Victoria; Jones, Tucker; Lemaux, Brian C.; Vallini, Livia; Ryan, Russell "Studying [C II] emission in low-mass galaxies at z 7," Monthly Notices of the Royal Astronomical Society, 531, 945, 2024.
Glikman, Eilat; Lamassa, Stephanie; Piconcelli, Enrico; Zappacosta, Luca; Lacy, Mark "Accretion and obscuration in merger-dominated luminous red quasars," Monthly Notices of the Royal Astronomical Society, 528, 711, 2024.
Gliozzi, M.; Williams, J. K.; Akylas, A.; Papadakis, I. E.; Shuvo, O. I.; Halavatkar, A.; Alt, A. "Comparing indirect methods for black hole masses in AGN: The good, the bad, and the ugly," Monthly Notices of the Royal Astronomical Society, 528, 3417-3432, 2024.
Goedhart, S.; Cotton, W. D.; Camilo, F.; Thompson, M. A.; Umana, G.; Bietenholz, M.; Woudt, P. A.; Anderson, L. D.; Bordiu, C.; Buckley, D. A. H.; Buemi, C. S.; Bufano, F.; Cavallaro, F.; Chen, H.; Chibueze, J. O.; Egbo, D.; Frank, B. S.; Hoare, M. G.; Ingallinera, A.; Irabor, T.; Kraan-Korteweg, R. C.; Kurapati, S.; Leto, P.; Loru, S.; Mutale, M.; Obonyo, W. O.; Plavin, A.; Rajohnson, S. H. A.; Rigby, A.; Riggi, S.; Seidu, M.; Serra, P.; Smart, B. M.; Stappers, B. W.; Steyn, N.; Surnis, M.; Trigilio, C.; Williams, G. M.; Abbott, T. D.; Adam, R. M.; Asad, K. M. B.; Baloyi, T.; Bauermeister, E. F.; Bennet, T. G. H.; Bester, H.; Botha, A. G.; Brederode, L. R. S.; Buchner, S.; Burger, J. P.; Cheetham, T.; Cloete, K.; De Villiers, M. S.; De Villiers, D. I. L.; Du Toit, L. J.; Esterhuyse, S. W. P.; Fanaroff, B. L.; Fourie, D. J.; Gamatham, R. R. G.; Gatsi, T. G.; Geyer, M.; Gouws, M.; Gumede, S. C.; Heywood, I.; Hokwana, A.; Hoosen, S. W.; Horn, D. M.; Horrell, L. M. G.; Hugo, B. V.; Isaacson, A. I.; Józsa, G. I. G.; Jonas, J. L.; Jordaan, J. D. B. L.; Joubert, A. F.; Julie, R. P. M.; Kapp, F. B.; Kriek, N.; Kriel, H.; Krishnan, V. K.; Kusel, T. W.; Legodi, L. S.; Lehmensiek, R.; Lord, R. T.; Macfarlane, P. S.; Magnus, L. G.; Magozore, C.; Main, J. P. L.; Malan, J. A.; Manley, J. R.; Marais, S. J.; Maree, M. D. J.; Martens, A.; Maruping, P.; Mcalpine, K.; Merry, B. C.; Mgodeli, M.; Millenaar, R. P.; Mokone, O. J.; Monama, T. E.; New, W. S.; Ngcebetsha, B.; Ngoasheng, K. J.; Nicolson, G. D.; Ockards, M. T.; Oozeer, N.; Passmoor, S. S.; Patel, A. A.; Peens-Hough, A.; Perkins, S. J.; Ramaila, A. J. T.; Ratcliffe, S. M.; Renil, R.; Richter, L. L.; Salie, S.; Sambu, N.; Schollar, C. T. G.; Schwardt, L. C.; Schwartz, R. L.; Serylak, M.; Siebrits, R.; Sirothia, S. K.; Slabber, M. J.; Smirnov, O. M.; Tiplady, A. J.; Van Balla, T. J.; Van Der Byl, A.; Van Tonder, V.; Venter, A. J.; Venter, M.; Welz, M. G.; Williams, L. P. "The SARAO MeerKAT 1.3 GHz Galactic Plane Survey," Monthly Notices of the Royal Astronomical Society, 531, 649, 2024.
Goicoechea, J. R.; Le Bourlot, J.; Black, J. H.; Alarcón, F.; Bergin, E. A.; Berné, O.; Bron, E.; Canin, A.; Chapillon, E.; Chown, R.; Dartois, E.; Gerin, M.; Habart, E.; Haworth, T. J.; Joblin, C.; Kannavou, O.; Le Petit, F.; Onaka, T.; Peeters, E.; Pety, J.; Roueff, E.; Sidhu, A.; Schroetter, I.; Tabone, B.; Tielens, A. G. G. M.; Trahin, B.; Van De Putte, D.; Vicente, S.; Zannese, M. "PDRs4All: X. ALMA and JWST detection of neutral carbon in the externally irradiated disk d203-506: Undepleted gas-phase carbon," Astronomy and Astrophysics, 689, L4, 2024.
Golay, Walter W.; Mutel, Robert L.; Abbuhl, Evan E. "Time-lapse Very Long Baseline Interferometry Imaging of the Close Active Binary HR 1099," The Astrophysical Journal, 965, 86, 2024.
Goldsmith, Paul. F.; Anderson, L. D.; Pineda, Jorge L.; Aladro, Rebeca; Ricken, Oliver "Electron Densities in H II Regions from Observation of [N II] 205 μm Fine Structure and Radio Recombination Lines," The Astrophysical Journal, 974, 34, 2024.
Golshan, Roya Hamedani; Sánchez-Monge, Álvaro; Schilke, Peter; Sewiło, Marta; Möller, Thomas; Veena, Vadamattom S.; Fuller, Gary A. "High-mass star formation across the Large Magellanic Cloud. I. Chemical properties and hot molecular cores observed with ALMA at 1.2 mm," Astronomy and Astrophysics, 688, A3, 2024.
Gómez-Garrido, M.; Bujarrabal, V.; Alcolea, J.; Castro-Carrizo, A.; Mikołajewska, J.; Santander-García, M. "Continuum and molecular emission from the inner regions of the symbiotic system R Aquarii," Astronomy and Astrophysics, 689, A317, 2024.
González-Alfonso, Eduardo; García-Bernete, Ismael; Pereira-Santaella, Miguel; Neufeld, David A.; Fischer, Jacqueline; Donnan, Fergus R. "JWST detection of extremely excited outflowing CO and H_2O in VV 114 E SW: A possible rapidly accreting IMBH," Astronomy and Astrophysics, 682, A182, 2024.
Gorai, Prasanta; Law, Chi-Yan; Tan, Jonathan C.; Zhang, Yichen; Fedriani, Rubén; Tanaka, Kei E. I.; Bonfand, Mélisse; Cosentino, Giuliana; Mardones, Diego; Beltrán, Maria T.; Garay, Guido "Astrochemical Diagnostics of the Isolated Massive Protostar G28.20-0.05," The Astrophysical Journal, 960, 127, 2024.
Gorski, M. D.; Aalto, S.; König, S.; Wethers, C. F.; Yang, C.; Muller, S.; Onishi, K.; Sato, M.; Falstad, N.; Mangum, J. G.; Linden, S. T.; Combes, F.; Martín, S.; Imanishi, M.; Wada, K.; Barcos-Muñoz, L.; Stanley, F.; García-Burillo, S.; Van Der Werf, P. P.; Evans, A. S.; Henkel, C.; Viti, S.; Harada, N.; Díaz-Santos, T.; Gallagher, J. S.; González-Alfonso, E. "A spectacular galactic scale magnetohydrodynamic powered wind in ESO 320-G030," Astronomy and Astrophysics, 684, L11, 2024.
Grant, Sierra L.; Kurtovic, Nicolas T.; Van Dishoeck, Ewine F.; Henning, Thomas; Kamp, Inga; Nowacki, Hugo; Perraut, Karine; Banzatti, Andrea; Temmink, Milou; Christiaens, Valentin; Samland, Matthias; Gasman, Danny; Tabone, Benoît; Güdel, Manuel; Lagage, Pierre-Olivier; Arabhavi, Aditya M.; Barrado, David; Caratti O Garatti, Alessio; Glauser, Adrian M.; Jang, Hyerin; Kanwar, Jayatee; Lahuis, Fred; Morales-Calderón, Maria; Olofsson, Göran; Perotti, Giulia; Schwarz, Kamber; Vlasblom, Marissa; Garcia Lopez, Rebeca; Long, Feng "MINDS: A multi-instrument investigation into the molecule-rich JWST-MIRI spectrum of the DF Tau binary system," Astronomy and Astrophysics, 689, A85, 2024.
Green, Alex; Wong, Tony; Indebetouw, Rémy; Nayak, Omnarayani; Bolatto, Alberto; Tarantino, Elizabeth; Rubio, Mónica; Madden, Suzanne C.; Hirschauer, Alec S. "The Size-Linewidth Relation and Signatures of Feedback from Quiescent to Active Star Forming Regions in the LMC," The Astrophysical Journal, 966, 51, 2024.
Guerra-Alvarado, O. M.; Van Der Marel, N.; Di Francesco, J.; Looney, L. W.; Tobin, J. J.; Cox, E. G.; Sheehan, P. D.; Wilner, D. J.; Macías, E.; Carrasco-González, C. "IRAS4A1: Multiwavelength continuum analysis of a very flared Class 0 disk," Astronomy and Astrophysics, 681, A82, 2024.
Guerra-Alvarado, Osmar M.; Carrasco-González, Carlos; Macías, Enrique; Van Der Marel, Nienke; Houge, Adrien; Maud, Luke T.; Pinilla, Paola; Villenave, Marion; Asaki, Yoshiharu; Humphreys, Elizabeth "Into the thick of it: ALMA 0.45 mm observations of HL Tau at a resolution of 2 au," Astronomy and Astrophysics, 686, A298, 2024.

Gulati, Sanna; Bhattacharya, Debbijoy; Sreekumar, P. "Constraining the Location of the γ-Ray Emission Region in Radio-loud AGN 3C 380," The Astrophysical Journal, 977, 9, 2024.
Guo, S.; An, T.; Liu, Y.; Sotnikova, Y.; Volvach, A.; Mufakharov, T.; Chen, L.; Cui, L.; Wang, A.; Xu, Z.; Zhang, Y.; Xu, W.; Kovalev, Y. A.; Kovalev, Y. Y.; Kharinov, M.; Erkenov, A.; Semenova, T.; Volvach, L. "Magnetically driven relativistic jet in the high-redshift blazar OH 471," Astronomy and Astrophysics, 685, L11, 2024.
Guo, Ziyi; Zhang, Zhi-Yu; Yan, Zhiqiang; Gjergo, Eda; Man, Allison W. S.; Ivison, R. J.; Fu, Xiaoting; Shi, Yong "First Detection of CO Isotopologues in a High-redshift Main-sequence Galaxy: Evidence of a Top-heavy Stellar Initial Mass Function," The Astrophysical Journal, 970, 136, 2024.
Guolo, Muryel; Pasham, Dheeraj R.; Zajaček, Michal; Coughlin, Eric R.; Gezari, Suvi; Suková, Petra; Wevers, Thomas; Witzany, Vojtěch; Tombesi, Francesco; Van Velzen, Sjoert; Alexander, Kate D.; Yao, Yuhan; Arcodia, Riccardo; Karas, Vladimír; Miller-Jones, James C. A.; Remillard, Ronald; Gendreau, Keith; Ferrara, Elizabeth C. "X-ray eruptions every 22 days from the nucleus of a nearby galaxy," Nature Astronomy, 8, 347, 2024.
Gupta, H.; Changala, P. B.; Cernicharo, J.; Pardo, J. R.; Agúndez, M.; Cabezas, C.; Tercero, B.; Guélin, M.; Mccarthy, M. C. "Calcium Chemistry in Carbon-rich Circumstellar Environments: The Laboratory and Astronomical Discovery of Calcium Dicarbide, CaC_2," The Astrophysical Journal, 966, L28, 2024.
Gupta, Nikhel; Norris, Ray P.; Hayder, Zeeshan; Huynh, Minh; Petersson, Lars; Rosalind Wang, X.; Hopkins, Andrew M.; Andernach, Heinz; Gordon, Yjan; Riggi, Simone; Yew, Miranda; Crawford, Evan J.; Koribalski, Bärbel; Filipović, Miroslav D.; Kapińska, Anna D.; Shabala, Stanislav; Vernstrom, Tessa; Marvil, Joshua R. "RG-CAT: Detection pipeline and catalogue of radio galaxies in the EMU pilot survey," Publications of the Astronomical Society of Australia, 41, e027, 2024.
Guzmán Ccolque, E.; Fernández López, M.; Vazzano, M. M.; De Gregorio, I.; Plunkett, A.; Santamaría-Miranda, A. "Episodicity in accretion-ejection processes associated with IRAS 15398-3359," Astronomy and Astrophysics, 686, A143, 2024.
Guzmán Ccolque, E.; Fernández López, M.; Zapata, L. A.; Bally, J.; Rivera-Ortiz, P. R. "Confirming the explosive dispersal outflow in DR21 with ALMA," Astronomy and Astrophysics, 689, A339, 2024.
Habart, Emilie; Peeters, Els; Berné, Olivier; Trahin, Boris; Canin, Amélie; Chown, Ryan; Sidhu, Ameek; Van De Putte, Dries; Alarcón, Felipe; Schroetter, Ilane; Dartois, Emmanuel; Vicente, Sílvia; Abergel, Alain; Bergin, Edwin A.; Bernard-Salas, Jeronimo; Boersma, Christiaan; Bron, Emeric; Cami, Jan; Cuadrado, Sara; Dicken, Daniel; Elyajouri, Meriem; Fuente, Asunción; Goicoechea, Javier R.; Gordon, Karl D.; Issa, Lina; Joblin, Christine; Kannavou, Olga; Khan, Baria; Lacinbala, Ozan; Languignon, David; Le Gal, Romane; Maragkoudakis, Alexandros; Meshaka, Raphael; Okada, Yoko; Onaka, Takashi; Pasquini, Sofia; Pound, Marc W.; Robberto, Massimo; Röllig, Markus; Schefter, Bethany; Schirmer, Thiébaut; Tabone, Benoit; Tielens, Alexander G. G. M.; Wolfire, Mark G.; Zannese, Marion; Ysard, Nathalie; Miville-Deschenes, Marc-Antoine; Aleman, Isabel; Allamandola, Louis; Auchettl, Rebecca; Baratta, Giuseppe Antonio; Bejaoui, Salma; Bera, Partha P.; Black, John H.; Boulanger, Francois; Bouwman, Jordy; Brandl, Bernhard; Brechignac, Philippe; Brünken, Sandra; Buragohain, Mridusmita; Burkhardt, Andrew; Candian, Alessandra; Cazaux, Stéphanie; Cernicharo, Jose; Chabot, Marin; Chakraborty, Shubhadip; Champion, Jason; Colgan, Sean W. J.; Cooke, Ilsa R.; Coutens, Audrey; Cox, Nick L. J.; Demyk, Karine; Meyer, Jennifer Donovan; Foschino, Sacha; García-Lario, Pedro; Gavilan, Lisseth; Gerin, Maryvonne; Gottlieb, Carl A.; Guillard, Pierre; Gusdorf, Antoine; Hartigan, Patrick; He, Jinhua; Herbst, Eric; Hornekaer, Liv; Jäger, Cornelia; Janot-Pacheco, Eduardo; Kaufman, Michael; Kemper, Francisca; Kendrew, Sarah; Kirsanova, Maria S.; Klaassen, Pamela; Kwok, Sun; Labiano, Álvaro; Lai, Thomas S.-Y.; Lee, Timothy J.; Lefloch, Bertrand; Le Petit, Franck; Li, Aigen; Linz, Hendrik; Mackie, Cameron J.; Madden, Suzanne C.; Mascetti, Joëlle; Mcguire, Brett A.; Merino, Pablo; Micelotta, Elisabetta R.; Misselt, Karl; Morse, Jon A.; Mulas, Giacomo; Neelamkodan, Naslim; Ohsawa, Ryou; Omont, Alain; Paladini, Roberta; Palumbo, Maria Elisabetta; Pathak, Amit; Pendleton, Yvonne J.; Petrignani, Annemieke; Pino, Thomas; Puga, Elena; Rangwala, Naseem; Rapacioli, Mathias; Ricca, Alessandra; Roman-Duval, Julia; Roser, Joseph; Roueff, Evelyne; Rouillé, Gaël; Salama, Farid; Sales, Dinalva A.; Sandstrom, Karin; Sarre, Peter; Sciamma-O'Brien, Ella; Sellgren, Kris; Shenoy, Sachindev S.; Teyssier, David; Thomas, Richard D.; Togi, Aditya; Verstraete, Laurent; Witt, Adolf N.; Wootten, Alwyn; Zettergren, Henning; Zhang, Yong; Zhang, Ziwei E.; Zhen, Junfeng "PDRs4All. II. JWST's NIR and MIR imaging view of the Orion Nebula," Astronomy and Astrophysics, 685, A73, 2024.
Hacar, A.; Socci, A.; Bonanomi, F.; Petry, D.; Tafalla, M.; Harsono, D.; Forbrich, J.; Alves, J.; Grossschedl, J.; Goicoechea, J. R.; Pety, J.; Burkert, A.; Li, G. X. "Emergence of high-mass stars in complex fiber networks (EMERGE). I. Early ALMA Survey: Observations and massive data reduction," Astronomy and Astrophysics, 687, A140, 2024.
Hagiwara, Yoshiaki; Baan, Willem A.; Imanishi, Masatoshi; Diamond, Philip "Off-nuclear H_2O maser and dense molecular gas in NGC 1068," Monthly Notices of the Royal Astronomical Society, 528, 3668, 2024.
Haidar, Houda; Rosario, David J.; Alonso-Herrero, Almudena; Pereira-Santaella, Miguel; García-Bernete, Ismael; Campbell, Stephanie; Hönig, Sebastian F.; Ramos Almeida, Cristina; Hicks, Erin; Delaney, Daniel; Davies, Richard; Ricci, Claudio; Harrison, Chris M.; Leist, Mason; Lopez-Rodriguez, Enrique; Garcia-Burillo, Santiago; Zhang, Lulu; Packham, Chris; Gandhi, Poshak; Audibert, Anelise; Bellocchi, Enrica; Boorman, Peter; Bunker, Andrew; Combes, Françoise; Diaz Santos, Tanio; Donnan, Fergus R.; Gonzalez Martin, Omaira; Hermosa Muñoz, Laura; Charidis, Matthaios; Labiano, Alvaro; Levenson, Nancy A.; May, Daniel; Rigopoulou, Dimitra; Rodriguez Ardila, Alberto; Shimizu, T. Taro; Stalevski, Marko; Ward, Martin "Dust beyond the torus: revealing the mid-infrared heart of local Seyfert ESO 428-G14 with JWST/MIRI," Monthly Notices of the Royal Astronomical Society, 532, 4645, 2024.
Hajduk, M.; Van Hoof, P. A. M.; Zijlstra, A. A.; Van De Steene, G.; Kimeswenger, S.; Barría, D.; Tafoya, D.; Toalá, J. A. "Non-thermal radio emission in Sakurai's Object," Astronomy and Astrophysics, 688, L21, 2024.
Hales, A. S.; Gupta, A.; Ruíz-Rodríguez, D.; Williams, J. P.; Pérez, S.; Cieza, L.; González-Ruilova, C.; Pineda, J. E.; Santamaría-Miranda, A.; Tobin, J.; Weber, P.; Zhu, Z.; Zurlo, A. "Discovery of an Accretion Streamer and a Slow Wide-angle Outflow around FU Orionis," The Astrophysical Journal, 966, 96, 2024.
Harada, Nanase; Meier, David S.; Martín, Sergio; Muller, Sebastien; Sakamoto, Kazushi; Saito, Toshiki; Gorski, Mark D.; Henkel, Christian; Tanaka, Kunihiko; Mangum, Jeffrey G.; Aalto, Susanne; Aladro, Rebeca; Bouvier, Mathilde; Colzi, Laura; Emig, Kimberly L.; Herrero-Illana, Rubén; Huang, Ko-Yun; Kohno, Kotaro; König, Sabine; Nakanishi, Kouichiro; Nishimura, Yuri; Takano, Shuro; Rivilla, Víctor M.; Viti, Serena; Watanabe, Yoshimasa; Van Der Werf, Paul P.; Yoshimura, Yuki "The ALCHEMI Atlas: Principal Component Analysis Reveals Starburst Evolution in NGC 253," The Astrophysical Journal Supplement Series, 271, 38, 2024.
Harada, Nanase; Saito, Toshiki; Nishimura, Yuri; Watanabe, Yoshimasa; Sakamoto, Kazushi "A Temperature or Far-ultraviolet Tracer? The HNC/HCN Ratio in M83 on the Scale of Giant Molecular Clouds," The Astrophysical Journal, 969, 82, 2024.
Harrison, Rachel E.; Lin, Zhe-Yu Daniel; Looney, Leslie W.; Li, Zhi-Yun; Yang, Haifeng; Stephens, Ian W.; Fernández-López, Manuel "Protoplanetary Disk Polarization at Multiple Wavelengths: Are Dust Populations Diverse?," The Astrophysical Journal, 967, 40, 2024.
Harshan, Anishya; Tripodi, Roberta; Martis, Nicholas S.; Rihtaršič, Gregor; Bradač, Maruša; Asada, Yoshihisa; Brammer, Gabe; Desprez, Guillaume; Estrada-Carpenter, Vince; Matharu, Jasleen; Markov, Vladan; Muzzin, Adam; Mowla, Lamiya; Noirot, Gaël; Sarrouh, Ghassan T. E.; Sawicki, Marcin; Strait, Victoria; Willott, Chris "Detailed Study of Stars and Gas in a z = 8.3 Massive Merger with Extreme Dust Conditions," The Astrophysical Journal, 977, L36, 2024.
Harsono, Daniel; Long, Feng; Pinilla, Paola; Rota, Alessia A.; Manara, Carlo F.; Herczeg, Gregory J.; Johnstone, Doug; Rosotti, Giovanni; Lodato, Giuseppe; Menard, Francois; Tazzari, Marco; Shi, Yangfan "Dual-band Observations of the Asymmetric Ring around CIDA 9A: Dead or Alive?," The Astrophysical Journal, 961, 28, 2024.
Hassani, Hamid; Rosolowsky, Erik; Koch, Eric W.; Postma, Joseph; Nofech, Joseph; Corbould, Harrisen; Thilker, David; Leroy, Adam K.; Schinnerer, Eva; Belfiore, Francesco; Bigiel, Frank; Boquien, Médéric; Chevance, Mélanie; Dale, Daniel A.; Egorov, Oleg V.; Emsellem, Eric; Glover, Simon C. O.; Grasha, Kathryn; Groves, Brent; Henny, Kiana; Kim, Jaeyeon; Klessen, Ralf S.; Kreckel, Kathryn; Kruijssen, J. M. Diederik; Lee, Janice C.; Lopez, Laura A.; Neumann, Justus; Pan, Hsi-An; Sandstrom, Karin M.; Sarbadhicary, Sumit K.; Sun, Jiayi; Williams, Thomas G. "The PHANGS-AstroSat Atlas of Nearby Star-forming Galaxies," The Astrophysical Journal Supplement Series, 271, 2, 2024.
Hatchfield, H. Perry; Battersby, Cara; Barnes, Ashley T.; Butterfield, Natalie; Ginsburg, Adam; Henshaw, Jonathan D.; Longmore, Steven N.; Lu, Xing; Svoboda, Brian; Walker, Daniel; Callanan, Daniel; Mills, Elisabeth A. C.; Ho, Luis C.; Kauffmann, Jens; Kruijssen, J. M. Diederik; Ott, Jürgen; Pillai, Thushara; Zhang, Qizhou "CMZoom. IV. Incipient High-mass Star Formation throughout the Central Molecular Zone," The Astrophysical Journal, 962, 14, 2024.
Hayashi, Takayuki J.; Doi, Akihiro; Nagai, Hiroshi "A Giant Metrewave Radio Telescope survey of radio-loud broad absorption line quasars," Monthly Notices of the Royal Astronomical Society, 530, 2590, 2024.
Hayashi, Takayuki J.; Hagiwara, Yoshiaki; Imanishi, Masatoshi "Very Long Baseline Interferometry Detection of an Active Radio Source Potentially Driving 100 kpc Scale Emission in the Ultraluminous Infrared Galaxy IRAS F01004-2237," The Astrophysical Journal, 970, 5, 2024.
He, Hao; Wilson, Christine D.; Sun, Jiayi; Teng, Yu-Hsuan; Rosolowsky, Erik; Bemis, Ashley R. "Unraveling the Mystery of the Low CO-to-H_2 Conversion Factor in Starburst Galaxies: RADEX Modeling of the Antennae," The Astrophysical Journal, 971, 176, 2024.
He, Mengfan; Zheng, Qian; Guo, Quan; Shan, Huanyuan; Zhu, Zhenghao; Xie, Yushan; Huang, Yan; Zhao, Feiyu "Influence of sources with a spectral peak in the detection of Cosmic Dawn and Epoch of Reionization," Monthly Notices of the Royal Astronomical Society, 529, 3140, 2024.
Heesen, V.; Wiegert, T.; Irwin, J.; Crocker, R.; Kiehn, A.; Li, J.-T.; Wang, Q. D.; Stein, M.; Dettmar, R.-J.; Soida, M.; Henriksen, R.; Gajović, L.; Yang, Y.; Brüggen, M. "CHANG-ES: XXXIII. A 20 kpc radio bubble in the halo of the star-forming galaxy NGC 4217," Astronomy and Astrophysics, 691, A273, 2024.
Hekatelyne, C.; Storchi-Bergmann, Thaisa; Riffel, Rogemar A.; Kharb, Preeti; Cassanta, Claudia M.; Robinson, Andrew; Sales, Dinalva A. "AGN

driven outflows in the OH absorber galaxy IRAS 19154+2704," Monthly Notices of the Royal Astronomical Society, 527, 10844-10854, 2024.
Hernández Garnica, Ricardo; Loinard, Laurent; Duran, Aurora; Ordóñez-Toro, Jazmín; Chandler, Claire J.; Dzib, Sergio A.; Cuello, Nicolás; Ménard, François; Maureira, María José; Bianchi, Eleonora; Cruz-Sáenz De Miera, Fernando; Carrasco-González, Carlos; Rodríguez, Luis F.; Torres, Rosa M.; Raga, Alejandro C.; Lim, Jeremy; Feeney-Johansson, Anton "Accurate proper motions of the protostellar binary system L 1551 IRS 5," Monthly Notices of the Royal Astronomical Society, 535, 2948, 2024.
Hernández-García, L.; Muñoz-Arancibia, A. M.; Lira, P.; Bruni, G.; Cuadra, J.; Arévalo, P.; Sánchez-Sáez, P.; Bernal, S.; Bauer, F. E.; Catelan, M.; Panessa, F.; Pávez-Herrera, M.; Ricci, C.; Reyes-Jainaga, I.; Ailawadhi, B.; Chavushyan, V.; Dastidar, R.; Deconto-Machado, A.; Förster, F.; Gangopadhyay, A.; García-Pérez, A.; Márquez, I.; Masegosa, J.; Misra, K.; Patiño-Alvarez, V. M.; Puig-Subirà, M.; Rodi, J.; Singh, M. "AT 2021hdr: A candidate tidal disruption of a gas cloud by a binary super massive black hole system," Astronomy and Astrophysics, 692, A84, 2024.
Hernández-Vera, Claudio; Guzmán, Viviana V.; Artur De La Villarmois, Elizabeth; Öberg, Karin I.; Cleeves, L. Ilsedore; Hogerheijde, Michiel R.; Qi, Chunhua; Carpenter, John; Fayolle, Edith C. "Radial and Vertical Constraints on the Icy Origin of H_2CO in the HD 163296 Protoplanetary Disk," The Astrophysical Journal, 967, 68, 2024.
Hewitt, Danté M.; Bhardwaj, Mohit; Gordon, Alexa C.; Kirichenko, Aida; Nimmo, Kenzie; Bhandari, Shivani; Cognard, Ismaël; Fong, Wen-Fai; De Paz, Armando Gil; Gopinath, Akshatha; Hessels, Jason W. T.; Kirsten, Franz; Marcote, Benito; Bezrukovs, Vladislavs; Blaauw, Richard; Bray, Justin D.; Buttaccio, Salvatore; Cassanelli, Tomas; Chawla, Pragya; Corongiu, Alessandro; Deng, William; Didehbani, Hannah N.; Dong, Yuxin; Gawroński, Marcin P.; Giroletti, Marcello; Guillemot, Lucas; Huang, Jeff; Ivanov, Dmitriy V.; Joseph, Ronniy C.; Kaspi, Victoria M.; Kharinov, Mikhail A.; Lazda, Mattias; Lindqvist, Michael; Maccaferri, Giuseppe; Mas-Ribas, Lluis; Masui, Kiyoshi W.; Mckinven, Ryan; Melnikov, Alexey; Michilli, Daniele; Mikhailov, Andrey G.; Nugent, Anya E.; Ould-Boukattine, Omar S.; Paragi, Zsolt; Pearlman, Aaron B.; Pen, Ue-Li; Pleunis, Ziggy; Sand, Ketan R.; Shah, Vishwangi; Shin, Kaitlyn; Snelders, Mark P.; Venturi, Tiziana; Wang, Na; Williams-Baldwin, David R. A.; Yang, Jun; Yuan, Jianping P. "A Repeating Fast Radio Burst Source in a Low-luminosity Dwarf Galaxy," The Astrophysical Journal, 977, L4, 2024.
Hibbard, Joshua J.; Nhan, Bang D.; Rapetti, David; Burns, Jack O. "MEDEA: A New Model for Emulating Radio Antenna Beam Patterns for 21 cm Cosmology and Antenna Design Studies," The Astrophysical Journal, 975, 36, 2024.
Hill, Ryley; Scott, Douglas; Mcleod, Derek J.; Mclure, Ross J.; Chapman, Scott C.; Dunlop, James S. "An optimal ALMA image of the Hubble Ultra Deep Field in the era of JWST: obscured star formation and the cosmic far-infrared background," Monthly Notices of the Royal Astronomical Society, 528, 5019, 2024.
Hiramatsu, Daichi; Matsumoto, Tatsuya; Berger, Edo; Ransome, Conor; Villar, V. Ashley; Gomez, Sebastian; Cendes, Yvette; De, Kishalay; Bostroem, K. Azalee; Farah, Joseph; Howell, D. Andrew; Mccully, Curtis; Newsome, Megan; Padilla Gonzalez, Estefania; Pellegrino, Craig; Suzuki, Akihiro; Terreran, Giacomo "Multiple Peaks and a Long Precursor in the Type IIn Supernova 2021qqp: An Energetic Explosion in a Complex Circumstellar Environment," The Astrophysical Journal, 964, 181, 2024.
Hirano, Naomi; Sahu, Dipen; Liu, Sheng-Yaun; Liu, Tie; Tatematsu, Ken'Ichi; Dutta, Somnath; Li, Shanghuo; Lee, Chin-Fei; Li, Pak Shing; Hsu, Shih-Ying; Lin, Sheng-Jun; Johnstone, Doug; Bronfman, Leonardo; Chen, Huei-Ru Vivien; Eden, David J.; Kuan, Yi-Jehng; Kwon, Woojin; Lee, Chang Won; Liu, Hong-Li; Rawlings, Mark G.; Ristorcelli, Isabelle; Traficante, Alessio "ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP): Discovery of an Extremely Dense and Compact Object Embedded in the Prestellar Core G208.68-19.92-N2," The Astrophysical Journal, 961, 123, 2024.
Hirota, Akihiko; Koda, Jin; Egusa, Fumi; Sawada, Tsuyoshi; Sakamoto, Kazushi; Heyer, Mark; Lee, Amanda M.; Maeda, Fumiya; Boissier, Samuel; Calzetti, Daniela; Elmegreen, Bruce G.; Harada, Nanase; Ho, Luis C.; Kobayashi, Masato I. N.; Kuno, Nario; Madore, Barry F.; Martín, Sergio; Donovan Meyer, Jennifer; Muraoka, Kazuyuki; Watanabe, Yoshimasa "Whole-disk Sampling of Molecular Clouds in M83," The Astrophysical Journal, 976, 198, 2024.
Ho, Wynn C. G.; Pol, Nihan; Deller, Adam T.; Becker, Werner; Burke-Spolaor, Sarah "First detection of X-ray pulsations and spectrum of the high Galactic latitude pulsar PSR J0837-2454 and direct Urca cooling implications," Publications of the Astronomical Society of Australia, 41, e066, 2024.
Hogarth, L. M.; Saintonge, A.; Davis, T. A.; Ellison, S. L.; Lin, L.; López-Cobá, C.; Pan, H.-A.; Thorp, M. D. "The ALMaQUEST Survey XIV: do radial molecular gas flows affect the star-forming ability of barred galaxies?," Monthly Notices of the Royal Astronomical Society, 528, 6768, 2024.
Holden, Luke R.; Tadhunter, Clive; Audibert, Anelise; Oosterloo, Tom; Ramos Almeida, Cristina; Morganti, Raffaella; Pereira-Santaella, Miguel; Lamperti, Isabella "ALMA reveals a compact and massive molecular outflow driven by the young AGN in a nearby ULIRG," Monthly Notices of the Royal Astronomical Society, 530, 446, 2024.
Hoosain, Munira; Blyth, Sarah-L.; Skelton, Rosalind E.; Kannappan, Sheila J.; Stark, David V.; Eckert, Kathleen D.; Hutchens, Zackary L.; Carr, Derrick S.; Kraljic, Katarina "The effect of cosmic web filaments on galaxy properties in the RESOLVE and ECO surveys," Monthly Notices of the Royal Astronomical Society, 528, 4139, 2024.
Houge, Adrien; Macías, Enrique; Krijt, Sebastiaan "Surviving the heat: multiwavelength analysis of V883 Ori reveals that dust aggregates survive the sublimation of their ice mantles," Monthly Notices of the Royal Astronomical Society, 527, 9668, 2024.
Hsieh, Cheng-Han; Arce, Héctor G.; Maureira, María José; Pineda, Jaime E.; Segura-Cox, Dominique; Mardones, Diego; Dunham, Michael M.; Arun, Aiswarya "The ALMA Legacy Survey of Class 0/I Disks in Corona australis, Aquila, chaMaeleon, oPhiuchus north, Ophiuchus, Serpens (CAMPOS). I. Evolution of Protostellar Disk Radii," The Astrophysical Journal, 973, 138, 2024.
Hsu, Shih-Ying; Lee, Chin-Fei; Liu, Sheng-Yuan; Johnstone, Doug; Liu, Tie; Takahashi, Satoko; Bronfman, Leonardo; Chen, Huei-Ru Vivien; Dutta, Somnath; Eden, David J.; Evans, Neal J., Ii; Hirano, Naomi; Juvela, Mika; Kuan, Yi-Jehng; Kwon, Woojin; Lee, Chang Won; Lee, Jeong-Eun; Li, Shanghuo; Liu, Chun-Fan; Liu, Xunchuan; Luo, Qiuyi; Qin, Sheng-Li; Sahu, Dipen; Sanhueza, Patricio; Shang, Hsien; Tatematsu, Kenichi; Yang, Yao-Lun "ALMASOP. The Localized and Chemically Rich Features near the Bases of the Protostellar Jet in HOPS 87," The Astrophysical Journal, 976, 29, 2024.
Hu, Dan; Zajaček, Michal; Werner, Norbert; Grossová, Romana; Jáchym, Pavel; Roberts, Ian D.; Ignesti, Alessandro; Kenney, Jeffrey D. P.; Plšek, Tomáš; Breuer, Jean-Paul; Shimwell, Timothy; Tasse, Cyril; Zhu, Zhenghao; Wu, Linhui "Ram-pressure stripped radio tail and two ULXs in the spiral galaxy HCG 97b," Monthly Notices of the Royal Astronomical Society, 527, 1062, 2024.
Hu, Xu-Zhi; Hong, Xiaoyu; Zhao, Wei; Chen, Liang; Wang, Wei-Yang; Wu, Linhui "Evolution of Magnetic Field of the Quasar 1604+159 at parsec Scale," The Astrophysical Journal, 965, 74, 2024.
Hu, Xu-Zhi; Hong, Xiaoyu; Zhao, Wei; Chen, Liang; Wang, Wei-Yang; Wu, Linhui "Magnetic Field of the Quasar 1604+159 from Parsec to Kiloparsec Scale," The Astrophysical Journal, 974, 111, 2024.
Huang, Bo; Girart, Josep M.; Stephens, Ian W.; Fernández López, Manuel; Arce, Hector G.; Carpenter, John M.; Cortes, Paulo; Cox, Erin G.; Friesen, Rachel; Le Gouellec, Valentin J. M.; Hull, Charles L. H.; Karnath, Nicole; Kwon, Woojin; Li, Zhi-Yun; Looney, Leslie W.; Megeath, S. Thomas; Myers, Philip C.; Murillo, Nadia M.; Pineda, Jaime E.; Sadavoy, Sarah; Sánchez-Monge, Álvaro; Sanhueza, Patricio; Tobin, John J.; Zhang, Qizhou; Jackson, James M.; Segura-Cox, Dominique "On the Magnetic Field Properties of Protostellar Envelopes in Orion," The Astrophysical Journal, 963, L31, 2024.
Huang, Hao-Tse; Man, Allison W. S.; Lelli, Federico; De Breuck, Carlos; Ghodsi, Laya; Zhang, Zhi-Yu; Lin, Lingrui; Zhou, Jing; Bisbas, Thomas G.; Nesvadba, Nicole P. H. "Molecular Gas Mass Measurements of an Active, Starburst Galaxy at z ≈ 2.6 Using ALMA Observations of the [C I], CO, and Dust Emission," The Astrophysical Journal, 977, 251, 2024.
Huang, Jane; Ansdell, Megan; Birnstiel, Tilman; Czekala, Ian; Long, Feng; Williams, Jonathan; Zhang, Shangjia; Zhu, Zhaohuan "High-resolution ALMA Observations of Richly Structured Protoplanetary Disks in σ Orionis," The Astrophysical Journal, 976, 132, 2024.
Huang, K.-Y.; Abbink, D.; Viti, S.; García-Burillo, S. "Multi-transition study of methanol towards NGC 1068 with ALMA," Astronomy and Astrophysics, 688, A130, 2024.
Hughes, A. K.; Sivakoff, G. R.; Van Den Eijnden, J.; Fender, R.; Miller-Jones, J. C. A.; Tremou, E. "SAX J1810.8-2609: An Outbursting Neutron Star X-ray Binary with Persistent Spatially Coincident Radio Emission," Monthly Notices of the Royal Astronomical Society, 527, 9359, 2024.
Humphreys, Roberta M.; Richards, A. M. S.; Davidson, Kris; Singh, A. P.; Decin, L.; Ziurys, L. M. "The Hidden Clumps in VY CMa Uncovered by the Atacama Large Millimeter/submillimeter Array," The Astronomical Journal, 167, 94, 2024.
Hurley-Walker, Natasha; Anderson, L. D.; Luisi, M.; Mcclure-Griffiths, N. M.; Benjamin, Robert A.; Kuhn, Michael A.; Linville, Dylan J.; Liu, B.; Zucker, Catherine "Low-frequency Absorption and Radio Recombination Line Features of the Galactic Center Lobe," The Astrophysical Journal, 969, 42, 2024.
Hyman, Sóley Ó.; Wilkes, Belinda J.; Willner, S. P.; Kuraszkiewicz, Joanna; Azadi, Mojegan; Worrall, D. M.; Foord, Adi; Vegetti, Simona; Ashby, Matthew L. N.; Birkinshaw, Mark; Fassnacht, Christopher; Haas, Martin; Stern, Daniel "A Multiwavelength Portrait of the 3C 220.3 Lensed System," The Astrophysical Journal, 974, 171, 2024.
Iani, Edoardo; Caputi, Karina I.; Rinaldi, Pierluigi; Annunziatella, Marianna; Boogaard, Leindert A.; Östlin, Göran; Costantin, Luca; Gillman, Steven; Pérez-González, Pablo G.; Colina, Luis; Greve, Thomas R.; Wright, Gillian; Alonso-Herrero, Almudena; Álvarez-Márquez, Javier; Bik, Arjan; Bosman, Sarah E. I.; Crespo Gómez, Alejandro; Eckart, Andreas; Hjorth, Jens; Jermann, Iris; Labiano, Alvaro; Langeroodi, Danial; Melinder, Jens; Moutard, Thibaud; Peißker, Florian; Pye, John P.; Tikkanen, Tuomo V.; Van Der Werf, Paul P.; Walter, Fabian; Henning, Thomas K.; Lagage, Pierre-Olivier; Van Dishoeck, Ewine F. "MIDIS: JWST NIRCam and MIRI Unveil the Stellar Population Properties of Lyα Emitters and Lyman-break Galaxies at z ≃ 3-7," The Astrophysical Journal, 963, 97, 2024.
Ibik, Adaeze L.; Drout, Maria R.; Gaensler, B. M.; Scholz, Paul; Michilli, Daniele; Bhardwaj, Mohit; Kaspi, Victoria M.; Pleunis, Ziggy; Cassanelli, Tomas; Cook, Amanda M.; Dong, Fengqiu A.; Kaczmarek, Jane F.; Leung,

Calvin; Lu, Katherine J.; Masui, Kiyoshi W.; Pearlman, Aaron B.; Rafiei-Ravandi, Masoud; Sand, Ketan R.; Shin, Kaitlyn; Smith, Kendrick M.; Stairs, Ingrid H. "Proposed Host Galaxies of Repeating Fast Radio Burst Sources Detected by CHIME/FRB," The Astrophysical Journal, 961, 99, 2024.
Ibik, Adaeze L.; Drout, Maria R.; Gaensler, B. M.; Scholz, Paul; Sridhar, Navin; Margalit, Ben; Clarke, T. E.; Law, Casey J.; Tendulkar, Shriharsh P.; Michilli, Daniele; Eftekhari, Tarraneh; Bhardwaj, Mohit; Burke-Spolaor, Sarah; Chatterjee, Shami; Cook, Amanda M.; Hessels, Jason W. T.; Kirsten, Franz; Joseph, Ronniy C.; Kaspi, Victoria M.; Lazda, Mattias; Masui, Kiyoshi W.; Nimmo, Kenzie; Pandhi, Ayush; Pearlman, Aaron B.; Pleunis, Ziggy; Rafiei-Ravandi, Masoud; Shin, Kaitlyn; Smith, Kendrick M. "A Search for Persistent Radio Sources toward Repeating Fast Radio Bursts Discovered by CHIME/FRB," The Astrophysical Journal, 976, 199, 2024.
Ighina, L.; Caccianiga, A.; Moretti, A.; Broderick, J. W.; Leung, J. K.; López-Sánchez, A. R.; Rigamonti, F.; Seymour, N.; An, T.; Belladitta, S.; Bisogni, S.; Della Ceca, R.; Drouart, G.; Gargiulo, A.; Liu, Y. "Multi-wavelength properties of three new radio-powerful z ~ 5.6 quasi-stellar objects discovered from RACS," Astronomy and Astrophysics, 692, A241, 2024.
Ilani, Gideon; Hou, Kuan-Chou; Keshet, Uri "Excess cataloged X-ray and radio sources at galaxy-cluster virial shocks," Journal of Cosmology and Astro-Particle Physics, 2024, 008, 2024.
Ilyushin, V. V.; Müller, H. S. P.; Drozdovskaya, M. N.; Jørgensen, J. K.; Bauerecker, S.; Maul, C.; Porohovoi, R.; Alekseev, E. A.; Dorovskaya, O.; Zakharenko, O.; Lewen, F.; Schlemmer, S.; Xu, L.-H.; Lees, R. M. "Rotational spectroscopy of CH_3OD with a reanalysis of CH_3OD toward IRAS 16293-2422," Astronomy and Astrophysics, 687, A220, 2024.
Indebetouw, Rémy; Wong, Tony; Madden, Suzanne; Sewiło, Marta; Roman-Duval, Julia; Chevance, Mélanie; Rubio, Monica "A Radial Decrease in Kinetic Temperature Measured with H_2CO in 30 Doradus," The Astrophysical Journal, 969, 143, 2024.
Irwin, Judith; Beck, Rainer; Cook, Tanden; Dettmar, Ralf-Jürgen; English, Jayanne; Heesen, Volker; Henriksen, Richard; Jiang, Yan; Li, Jiang-Tao; Lu, Li-Yuan; Mele, Crystal; Müller, Ancla; Murphy, Eric; Porter, Troy; Rand, Richard; Skeggs, Nathan; Stein, Michael; Stein, Yelena; Stil, Jeroen; Strong, Andrew; Walterbos, Rene; Wang, Q. Daniel; Wiegert, Theresa; Yang, Yang "CHANG-ES XXXI-A Decade of CHANG-ES: What We Have Learned from Radio Observations of Edge-on Galaxies," Galaxies, 12, 22, 2024.
Irwin, Judith; Cook, Tanden; Stein, Michael; Dettmar, Ralf-Juergen; Heesen, Volker; Wang, Q. Daniel; Wiegert, Theresa; Stein, Yelena; Vargas, Carlos "CHANG-ES. XXXII. Spatially Resolved Thermal-Nonthermal Separation from Radio Data Alone-New Probes into NGC 3044 and NGC 5775," The Astronomical Journal, 168, 138, 2024.
Isequilla, N. L.; Marinelli, A. D.; Ortega, M. E. "Study of the substructure of two high-mass molecular clumps," Boletin de la Asociacion Argentina de Astronomia La Plata Argentina, 65, 177, 2024.
Ishihara, Kousuke; Sanhueza, Patricio; Nakamura, Fumitaka; Saito, Masao; Chen, Huei-Ru Vivien; Li, Shanghuo; Olguin, Fernando; Taniguchi, Kotomi; Morii, Kaho; Lu, Xing; Luo, Qiu-Yi; Sakai, Takeshi; Zhang, Qizhou "Digging into the Interior of Hot Cores with ALMA (DIHCA). IV. Fragmentation in High-mass Star-forming Clumps," The Astrophysical Journal, 974, 95, 2024.
Izumi, Natsuko; Sanhueza, Patricio; Koch, Patrick M.; Lu, Xing; Li, Shanghuo; Sabatini, Giovanni; Olguin, Fernando A.; Zhang, Qizhou; Nakamura, Fumitaka; Tatematsu, Ken'Ichi; Morii, Kaho; Sakai, Takeshi; Tafoya, Daniel "The ALMA Survey of 70 μm Dark High-mass Clumps in Early Stages (ASHES). X. Hot Gas Reveals Deeply Embedded Star Formation," The Astrophysical Journal, 963, 163, 2024.
Izumi, Takuma; Matsuoka, Yoshiki; Onoue, Masafusa; Strauss, Michael A.; Umehata, Hideki; Silverman, John D.; Nagao, Tohru; Imanishi, Masatoshi; Kohno, Kotaro; Toba, Yoshiki; Iwasawa, Kazushi; Nakanishi, Kouichiro; Sawamura, Mahoshi; Fujimoto, Seiji; Kikuta, Satoshi; Kawaguchi, Toshihiro; Aoki, Kentaro; Goto, Tomotsugu "Merging Gas-rich Galaxies That Harbor Low-luminosity Twin Quasars at z = 6.05: A Promising Progenitor of the Most Luminous Quasars," The Astrophysical Journal, 972, 116, 2024.
Jackson, James M.; Whitaker, J. Scott; Chambers, Edward; Simon, Robert; Guevara, Cristian; Allingham, David; Patterson, Philippa; Killerby-Smith, Nicholas; Askew, Jacob; Vandenberg, Thomas; Smith, Howard A.; Sanhueza, Patricio; Stephens, Ian W.; Bonne, Lars; Polles, Fiorella L.; Schmiedeke, Anika; Honigh, Netty; Justen, Matthias "Absorption and Self-absorption of [C II] and [O I] Far Infrared Lines toward a Bright Bubble in the Nessie Infrared Dark Cloud," The Astrophysical Journal, 965, 187, 2024.
Jackson, Neal; Badole, Shruti; Dugdale, Thomas; Stacey, Hannah R.; Hartley, Philippa; Mckean, J. P. "Radio imaging of gravitationally lensed radio-quiet quasars," Monthly Notices of the Royal Astronomical Society, 530, 221, 2024.
Järvelä, E.; Savolainen, T.; Berton, M.; Lähteenmäki, A.; Kiehlmann, S.; Hovatta, T.; Varglund, I.; Readhead, A. C. S.; Tornikoski, M.; Max-Moerbeck, W.; Reeves, R. A.; Suutarinen, S. "Unprecedented extreme high-frequency radio variability in early-stage active galactic nuclei," Monthly Notices of the Royal Astronomical Society, 532, 3069, 2024.
Jarvis, Matt J.; Heywood, Ian; Jewell, Sophie M.; Deane, Roger P.; Klöckner, H.-R.; Ponomareva, Anastasia A.; Maddox, Natasha; Baker, Andrew J.; Bianchetti, Alessandro; Hess, Kelley M.; Roberts, Hayley; Rodighiero, Giulia; Ruffa, Ilaria; Sinigaglia, Francesco; Varadaraj, Rohan G.; Whittam, Imogen H.; Adams, Elizabeth A. K.; Baes, Maarten; Murphy, Eric J.; Pan, Hengxing; Vaccari, Mattia "The discovery of a z = 0.7092 OH megamaser with the MIGHTEE survey," Monthly Notices of the Royal Astronomical Society, 529, 3484, 2024.
Javaherian, Mohsen; Miraghaei, Halime; Moradpour, Hooman "On the Relation Between Symmetry of Radio Galaxies and Their Physical Parameters," Research in Astronomy and Astrophysics, 24, 095003, 2024.
Jeff, D.; Ginsburg, A.; Bulatek, A.; Budaiev, N.; Sanchez-Monge, A.; Bonfand, M.; Battersby, C.; Meng, F.; Schilke, P.; Schmiedeke, A. "Thermal Properties of the Hot Core Population in Sagittarius B2 Deep South.," The Astrophysical Journal, 962, 48, 2024.
Jennings, Ross J.; Cordes, James M.; Chatterjee, Shami; Mclaughlin, Maura A.; Demorest, Paul B.; Arzoumanian, Zaven; Baker, Paul T.; Blumer, Harsha; Brook, Paul R.; Cohen, Tyler; Crawford, Fronefield; Cromartie, H. Thankful; Decesar, Megan E.; Dolch, Timothy; Ferrara, Elizabeth C.; Fonseca, Emmanuel; Good, Deborah C.; Hazboun, Jeffrey S.; Jones, Megan L.; Kaplan, David L.; Lam, Michael T.; Lazio, T. Joseph W.; Lorimer, Duncan R.; Luo, Jing; Lynch, Ryan S.; Mckee, James W.; Madison, Dustin R.; Meyers, Bradley W.; Mingarelli, Chiara M. F.; Nice, David J.; Pennucci, Timothy T.; Perera, Benetge B. P.; Pol, Nihan S.; Ransom, Scott M.; Ray, Paul S.; Shapiro-Albert, Brent J.; Siemens, Xavier; Stairs, Ingrid H.; Stinebring, Daniel R.; Swiggum, Joseph K.; Tan, Chia Min; Taylor, Stephen R.; Vigeland, Sarah J.; Witt, Caitlin A. "An Unusual Pulse Shape Change Event in PSR J1713+0747 Observed with the Green Bank Telescope and CHIME," The Astrophysical Journal, 964, 179, 2024.
Jiang, Jun-Qian; Cai, Yong; Ye, Gen; Piao, Yun-Song "Broken blue-tilted inflationary gravitational waves: a joint analysis of NANOGrav 15-year and BICEP/Keck 2018 data," Journal of Cosmology and Astro-Particle Physics, 2024, 004, 2024.
Jiao, Wenyu; Wang, Ke; Xu, Fengwei "Absence of High-mass Prestellar Cores in the Orion Giant Molecular Cloud," The Astronomical Journal, 168, 151, 2024.
Jiménez-Andrade, Eric F.; Murphy, Eric J.; Momjian, Emmanuel; Condon, James J.; Chary, Ranga-Ram; Taylor, Russ; Dickinson, Mark "A Census of the Deep Radio Sky with the VLA. I. 10 GHz Survey of the GOODS-N Field," The Astrophysical Journal, 972, 89, 2024.
Jin, Shoko; Trager, Scott C.; Dalton, Gavin B.; Aguerri, J. Alfonso L.; Drew, J. E.; Falcón-Barroso, Jesús; Gänsicke, Boris T.; Hill, Vanessa; Iovino, Angela; Pieri, Matthew M.; Poggianti, Bianca M.; Smith, D. J. B.; Vallenari, Antonella; Abrams, Don Carlos; Aguado, David S.; Antoja, Teresa; Aragón-Salamanca, Alfonso; Ascasibar, Yago; Babusiaux, Carine; Balcells, Marc; Barrena, R.; Battaglia, Giuseppina; Belokurov, Vasily; Bensby, Thomas; Bonifacio, Piercarlo; Bragaglia, Angela; Carrasco, Esperanza; Carrera, Ricardo; Cornwell, Daniel J.; Domínguez-Palmero, Lilian; Duncan, Kenneth J.; Famaey, Benoit; Fariña, Cecilia; Gonzalez, Oscar A.; Guest, Steve; Hatch, Nina A.; Hess, Kelley M.; Hoskin, Matthew J.; Irwin, Mike; Knapen, Johan H.; Koposov, Sergey E.; Kuchner, Ulrike; Laigle, Clotilde; Lewis, Jim; Longhetti, Marcella; Lucatello, Sara; Méndez-Abreu, Jairo; Mercurio, Amata; Molaeinezhad, Alireza; Monguió, Maria; Morrison, Sean; Murphy, David N. A.; Peralta De Arriba, Luis; Pérez, Isabel; Pérez-Ràfols, Ignasi; Picó, Sergio; Raddi, Roberto; Romero-Gómez, Mercè; Royer, Frédéric; Siebert, Arnaud; Seabroke, George M.; Som, Debopam; Terrett, David; Thomas, Guillaume; Wesson, Roger; Worley, C. Clare; Alfaro, Emilio J.; Prieto, Carlos Allende; Alonso-Santiago, Javier; Amos, Nicholas J.; Ashley, Richard P.; Balaguer-Nú Nez, Lola; Balbinot, Eduardo; Bellazzini, Michele; Benn, Chris R.; Berlanas, Sara R.; Bernard, Edouard J.; Best, Philip; Bettoni, Daniela; Bianco, Andrea; Bishop, Georgia; Blomqvist, Michael; Boeche, Corrado; Bolzonella, Micol; Bonoli, Silvia; Bosma, Albert; Britavskiy, Nikolay; Busarello, Gianni; Caffau, Elisabetta; Cantat-Gaudin, Tristan; Castro-Ginard, Alfred; Couto, Guilherme; Carbajo-Hijarrubia, Juan; Carter, David; Casamiquela, Laia; Conrado, Ana M.; Corcho-Caballero, Pablo; Costantin, Luca; Deason, Alis; De Burgos, Abel; De Grandi, Sabrina; Di Matteo, Paola; Domínguez-Gómez, Jesús; Dorda, Ricardo; Drake, Alyssa; Dutta, Rajeshwari; Erkal, Denis; Feltzing, Sofia; Ferré-Mateu, Anna; Feuillet, Diane; Figueras, Francesca; Fossati, Matteo; Franciosini, Elena; Frasca, Antonio; Fumagalli, Michele; Gallazzi, Anna; García-Benito, Rubén; Fusillo, Nicola Gentile; Gebran, Marwan; Gilbert, James; Gledhill, T. M.; González Delgado, Rosa M.; Greimel, Robert; Guarcello, Mario Giuseppe; Guerra, Jose; Gullieuszik, Marco; Haines, Christopher P.; Hardcastle, Martin J.; Harris, Amy; Haywood, Misha; Helmi, Amina; Hernandez, Nauzet; Herrero, Artemio; Hughes, Sarah; Irsic, Vid; Jablonka, Pascale; Jarvis, Matt J.; Jordi, Carme; Kondapally, Rohit; Kordopatis, Georges; Krogager, Jens-Kristian; La Barbera, Francesco; Lam, Man I.; Larsen, Søren S.; Lemasle, Bertrand; Lewis, Ian J.; Lhomé, Emilie; Lind, Karin; Lodi, Marcello; Longobardi, Alessia; Lonoce, Ilaria; Magrini, Laura; Maíz Apellániz, Jesús; Marchal, Olivier; Marco, Amparo; Martin, Nicolas F.; Matsuno, Tadafumi; Maurogordato, Sophie; Merluzzi, Paola; Miralda-Escudé, Jordi; Molinari, Emilio; Monari, Giacomo; Morelli, Lorenzo; Mottram, Christopher J.; Naylor, Tim; Negueruela, Ignacio; Onorbe, Jose; Pancino, Elena; Peirani, Sébastien; Peletier, Reynier F.; Pozzetti, Lucia; Rainer, Monica; Ramos, Pau; Read, Shaun C.; Rossi, Elena Maria; Röttgering, Huub J. A.; Rubiño-Martín, Jose Alberto; Sabater Montes, Jose; San Juan, José; Sanna, Nicoletta; Schallig, Ellen; Schiavon, Ricardo P.; Schultheis, Mathias; Serra, Paolo; Shimwell, Timothy W.; Simón-Díaz, Sergio; Smith, Russell J.; Sordo, Rosanna; Sorini, Daniele; Soubiran, Caroline; Starkenburg, Else; Steele, Iain A.; Stott, John; Stuik, Remko; Tolstoy, Eline; Tortora, Crescenzo; Tsantaki, Maria; Van Der Swaelmen, Mathieu; Van Weeren, Reinout J.; Vergani, Daniela; Verheijen, Marc A. W.; Verro, Kristiina; Vink, Jorick S.;

Vioque, Miguel; Walcher, C. Jakob; Walton, Nicholas A.; Wegg, Christopher; Weijmans, Anne-Marie; Williams, Wendy L.; Wilson, Andrew J.; Wright, Nicholas J.; Xylakis-Dornbusch, Theodora; Youakim, Kris; Zibetti, Stefano; Zurita, Cristina "The wide-field, multiplexed, spectroscopic facility WEAVE: Survey design, overview, and simulated implementation," Monthly Notices of the Royal Astronomical Society, 530, 2688, 2024.

Jin, Shuowen; Sillassen, Nikolaj B.; Hodge, Jacqueline; Magdis, Georgios E.; Rizzo, Francesca; Casey, Caitlin; Koekemoer, Anton M.; Valentino, Francesco; Kokorev, Vasily; Magnelli, Benjamin; Gobat, Raphael; Gillman, Steven; Franco, Maximilien; Faisst, Andreas; Kartaltepe, Jeyhan; Schinnerer, Eva; Toft, Sune; Algera, Hiddo S. B.; Harish, Santosh; Lee, Minju; Liu, Daizhong; Shuntov, Marko; Talia, Margherita; Vijayan, Aswin "A photo-z cautionary tale: Redshift confirmation of COSBO-7 at z = 2.625," Astronomy and Astrophysics, 690, L16, 2024.

Johnson, Aaron D.; Meyers, Patrick M.; Baker, Paul T.; Cornish, Neil J.; Hazboun, Jeffrey S.; Littenberg, Tyson B.; Romano, Joseph D.; Taylor, Stephen R.; Vallisneri, Michele; Vigeland, Sarah J.; Olum, Ken D.; Siemens, Xavier; Ellis, Justin A.; Van Haasteren, Rutger; Hourihane, Sophie; Agazie, Gabriella; Anumarlapudi, Akash; Archibald, Anne M.; Arzoumanian, Zaven; Blecha, Laura; Brazier, Adam; Brook, Paul R.; Burke-Spolaor, Sarah; Bécsy, Bence; Casey-Clyde, J. Andrew; Charisi, Maria; Chatterjee, Shami; Chatziioannou, Katerina; Cohen, Tyler; Cordes, James M.; Crawford, Fronefield; Cromartie, H. Thankful; Crowter, Kathryn; Decesar, Megan E.; Demorest, Paul B.; Dolch, Timothy; Drachler, Brendan; Ferrara, Elizabeth C.; Fiore, William; Fonseca, Emmanuel; Freedman, Gabriel E.; Garver-Daniels, Nate; Gentile, Peter A.; Glaser, Joseph; Good, Deborah C.; Gültekin, Kayhan; Jennings, Ross J.; Jones, Megan L.; Kaiser, Andrew R.; Kaplan, David L.; Kelley, Luke Zoltan; Kerr, Matthew; Key, Joey S.; Laal, Nima; Lam, Michael T.; Lamb, William G.; Lazio, T. Joseph W.; Lewandowska, Natalia; Liu, Tingting; Lorimer, Duncan R.; Luo, Jing; Lynch, Ryan S.; Ma, Chung-Pei; Madison, Dustin R.; Mcewen, Alexander; Mckee, James W.; Mclaughlin, Maura A.; Mcmann, Natasha; Meyers, Bradley W.; Mingarelli, Chiara M. F.; Mitridate, Andrea; Ng, Cherry; Nice, David J.; Ocker, Stella Koch; Pennucci, Timothy T.; Perera, Benetge B. P.; Pol, Nihan S.; Radovan, Henri A.; Ransom, Scott M.; Ray, Paul S.; Sardesai, Shashwat C.; Schmiedekamp, Carl; Schmiedekamp, Ann; Schmitz, Kai; Shapiro-Albert, Brent J.; Simon, Joseph; Siwek, Magdalena S.; Stairs, Ingrid H.; Stinebring, Daniel R.; Stovall, Kevin; Susobhanan, Abhimanyu; Swiggum, Joseph K.; Turner, Jacob E.; Unal, Caner; Wahl, Haley M.; Witt, Caitlin A.; Young, Olivia; Nanograv Collaboration "NANOGrav 15-year gravitational-wave background methods," Physical Review D, 109, 103012, 2024.

Jones, Gareth C.; Witstok, Joris; Concas, Alice; Laporte, Nicolas "New constraints on the molecular gas content of a z 8 galaxy from JVLA CO(J = 2-1) observations," Monthly Notices of the Royal Astronomical Society, 529, L1, 2024.

Jones, Michael G.; Janowiecki, Steven; Dey, Swapnaneel; Sand, David J.; Bennet, Paul; Crnojević, Denija; Fielder, Catherine E.; Karunakaran, Ananthan; Kent, Brian R.; Mazziotti, Nicolas; Mutlu-Pakdil, Burçin; Spekkens, Kristine "Dark No More: The Low-luminosity Stellar Counterpart of a Dark Cloud in the Virgo Cluster," The Astrophysical Journal, 966, L15, 2024.

Jones, Michael G.; Sand, David J.; Karunakaran, Ananthan; Spekkens, Kristine; Oman, Kyle A.; Bennet, Paul; Besla, Gurtina; Crnojević, Denija; Cuillandre, Jean-Charles; Fielder, Catherine E.; Gwyn, Stephen; Mutlu-Pakdil, Burçin "Gas and Star Formation in Satellites of Milky Way Analogs," The Astrophysical Journal, 966, 93, 2024.

Jones, Michael G.; Sand, David J.; Mutlu-Pakdil, Burçin; Fielder, Catherine E.; Crnojević, Denija; Bennet, Paul; Spekkens, Kristine; Donnerstein, Richard; Doliva-Dolinsky, Amandine; Karunakaran, Ananthan; Strader, Jay; Zaritsky, Dennis "Corvus A: A Low-mass, Isolated Galaxy at 3.5 Mpc," The Astrophysical Journal, 971, L37, 2024.

Jurlin, N.; Morganti, R.; Sweijen, F.; Morabito, L. K.; Brienza, M.; Barthel, P.; Miley, G. K. "Nuclear regions as seen with LOFAR international baselines. A high-resolution study of the recurrent activity," Astronomy and Astrophysics, 682, A118, 2024.

Kaasinen, Melanie; Venemans, Bram; Harrington, Kevin C.; Boogaard, Leindert A.; Meyer, Romain A.; Bañados, Eduardo; Decarli, Roberto; Walter, Fabian; Neeleman, Marcel; Rivera, Gabriela Calistro; Da Cunha, Elisabete "The cold molecular gas in z ≳ 6 quasar host galaxies," Astronomy and Astrophysics, 684, A33, 2024.

Kabasares, Kyle M.; Cohn, Jonathan H.; Barth, Aaron J.; Boizelle, Benjamin D.; Davidson, Jared R.; Sy, Janelle M.; Flores-Velázquez, Jeysen; Delgado Andrade, Silvana C.; Buote, David A.; Walsh, Jonelle L.; Baker, Andrew J.; Darling, Jeremy; Ho, Luis C. "Gas-dynamical Mass Measurements of the Supermassive Black Holes in the Early-type Galaxies NGC 4786 and NGC 5193 from ALMA and HST Observations," The Astrophysical Journal, 966, 132, 2024.

Kade, K.; Knudsen, K. K.; Bewketu Belete, A.; Yang, C.; König, S.; Stanley, F.; Scholtz, J. "Probing the interstellar medium of the quasar BRI 0952-0115. An analysis of [C II], [C II], CO, OH, and H_2O," Astronomy and Astrophysics, 684, A56, 2024.

Kado-Fong, Erin; Robinson, Azia; Nyland, Kristina; Greene, Jenny E.; Suess, Katherine A.; Stierwalt, Sabrina; Beaton, Rachael "Dwarf-Dwarf Interactions Can Both Trigger and Quench Star Formation," The Astrophysical Journal, 963, 37, 2024.

Kam, Minchul; Hodgson, Jeffrey A.; Park, Jongho; Kino, Motoki; Nagai, Hiroshi; Trippe, Sascha; Wagner, Alexander Y. "Evolution of the Termination Region of the Parsec-scale Jet of 3C 84 Over the Past 20 yr," The Astrophysical Journal, 970, 176, 2024.

Kameno, Seiji; Harikane, Yuichi; Sawada-Satoh, Satoko; Sawada, Tsuyoshi; Saito, Toshiki; Nakanishi, Kouichiro; Humphreys, Elizabeth; Impellizzeri, C. M. Violette "Sub-parsec-scale jet-driven water maser with possible gravitational acceleration in the radio galaxy NGC 1052," Publications of the Astronomical Society of Japan, 76, 340, 2024.

Kamieneski, Patrick S.; Frye, Brenda L.; Windhorst, Rogier A.; Harrington, Kevin C.; Yun, Min S.; Noble, Allison; Pascale, Massimo; Foo, Nicholas; Cohen, Seth H.; Jansen, Rolf A.; Carleton, Timothy; Koekemoer, Anton M.; Willmer, Christopher N. A.; Summers, Jake S.; Garuda, Nikhil; Leimbach, Reagen; Holwerda, Benne W.; Pierel, Justin D. R.; Jiménez-Andrade, Eric F.; Willner, S. P.; Alcalde Pampliega, Belén; Vishwas, Amit; Keel, William C.; Wang, Q. Daniel; Cheng, Cheng; Coe, Dan; Conselice, Christopher J.; D'Silva, Jordan C. J.; Driver, Simon P.; Grogin, Norman A.; Hinrichs, Tyler; Lowenthal, James D.; Marshall, Madeline A.; Nonino, Mario; Ortiz, Rafael; Pigarelli, Alex; Pirzkal, Nor; Polletta, Maria Del Carmen; Robotham, Aaron S. G.; Ryan, Russell E.; Yan, Haojing "Birds of a Feather: Resolving Stellar Mass Assembly with JWST/NIRCam in a Pair of Kindred z ~ 2 Dusty Star-forming Galaxies Lensed by the PLCK G165.7+67.0 Cluster," The Astrophysical Journal, 973, 25, 2024.

Kamieneski, Patrick S.; Yun, Min S.; Harrington, Kevin C.; Lowenthal, James D.; Wang, Q. Daniel; Frye, Brenda L.; Jiménez-Andrade, Eric F.; Vishwas, Amit; Cooper, Olivia; Pascale, Massimo; Foo, Nicholas; Berman, Derek; Englert, Anthony; Garcia Diaz, Carlos "PASSAGES: The Wide-ranging, Extreme Intrinsic Properties of Planck-selected, Lensed Dusty Star-forming Galaxies," The Astrophysical Journal, 961, 2, 2024.

Kang, Wen-Yong; Wang, Jun-Xian; Cai, Zhen-Yi; Wang, Hao-Chen; Ren, Wen-Ke; Liao, Mai; Yuan, Feng; Zdziarski, Andrzej; Cao, Xinwu "A Surprising Excess of Radio Emission in Extremely Stable Quasars: A Unique Clue to Jet Launching?," The Astrophysical Journal, 971, 60, 2024.

Kapanadze, B.; Gurchumelia, A.; Aller, M. "Swift Observations of Mrk 421 in Selected Epochs. IV. Physical Implications of X-Ray Flaring Activity and Features of Relativistic Magnetic Reconnection in 2018 April-2023 December," The Astrophysical Journal Supplement Series, 275, 23, 2024.

Kar, Subhajit; Bhattacharya, Rajorshi; Das, Ramkrishna; Pihlström, Ylva; Lewis, Megan O. "Classification of Wolf-Rayet Stars Using Ensemble-based Machine Learning Algorithms," The Astrophysical Journal, 977, 170, 2024.

Karnath, Nicole; Rubinstein, Adam E.; Federman, Samuel; Quillen, Alice C.; Green, Joel D.; Chambers, Edward T.; Watson, Dan M.; Megeath, S. Thomas; Coudé, Simon; Justen, Matthias; Narang, Mayank; Goldman, Steve; Tobin, John J. "An Analysis of the Complex and Compact Outflow Cavity Carved by HOPS 361-A in NGC 2071 IR," The Astrophysical Journal, 974, 65, 2024.

Karunakaran, Ananthan; Motiwala, Khadeejah; Spekkens, Kristine; Zaritsky, Dennis; Donnerstein, Richard L.; Dey, Arjun "Systematically Measuring Ultradiffuse Galaxies. VII. The H I Survey Overview," The Astrophysical Journal, 975, 91, 2024.

Kashyap, Parashmoni; Majumdar, Liton; Dutrey, Anne; Guilloteau, Stéphane; Willacy, Karen; Chapillon, Edwige; Teague, Richard; Semenov, Dmitry; Henning, Thomas; Turner, Neal; Sahai, Raghvendra; Kóspál, Ágnes; Coutens, Audrey; Piétu, V.; Gratier, Pierre; Ruaud, Maxime; Phuong, N. T.; Di Folco, E.; Lee, Chin-Fei; Tang, Y.-W. "Chemistry in the GG Tau A Disk: Constraints from H_2D^+, N_2H^+, and DCO^+ High Angular Resolution ALMA Observations," The Astrophysical Journal, 976, 258, 2024.

Kastner, Joel H.; Wilner, David J.; Moraga Baez, Paula; Bublitz, Jesse; De Marco, Orsola; Sahai, Raghvendra; Wootten, Al "The Molecular Exoskeleton of the Ring-like Planetary Nebula NGC 3132," The Astrophysical Journal, 965, 21, 2024.

Kaur, B.; Kanekar, N.; Neeleman, M.; Rafelski, M.; Prochaska, J. X.; Dutta, R. "An HI-absorption-selected Cold Rotating Disk Galaxy at z ≈ 2.193," The Astrophysical Journal, 971, L33, 2024.

Kaur, Simranpreet; Girart, Josep M.; Viganò, Daniele; Monge, Álvaro Sánchez; Cleeves, L. Ilsedore; Zurlo, Alice; Del Sordo, Fabio; Morata, Òscar; Bhowmik, Trisha; Alves, Felipe O. "Variable circularly polarized radio emission from the young stellar object [BHB2007]-1: Another ingredient of a unique system," Astronomy and Astrophysics, 690, A303, 2024.

Kaur, Simranpreet; Viganò, Daniele; Béjar, Víctor J. S.; Sánchez Monge, Álvaro; Morata, Òscar; Kansabanik, Devojyoti; Miquel Girart, Josep; Carlos Morales, Juan; Anglada-Escudé, Guillem; Murgas, Felipe; Shan, Yutong; Ilin, Ekaterina; Pérez-Torres, Miguel; Zapatero Osorio, María Rosa; Amado, Pedro J.; Caballero, José A.; Del Sordo, Fabio; Palle, Enric; Quirrenbach, Andreas; Reiners, Ansgar; Ribas, Ignasi "Hints of auroral and magnetospheric polarized radio emission from the scallop-shell star 2MASS J05082729-2101444," Astronomy and Astrophysics, 691, L17, 2024.

Kawamuro, Taiki; Ricci, Claudio; Yamada, Satoshi; Noda, Hirofumi; Li, Ruancun; Temple, Matthew J.; Tortosa, Alessia "Coevolution and Nuclear Structure in the Dwarf Galaxy POX 52 Studied by Multiwavelength Data from Radio to X-Ray," The Astrophysical Journal, 960, 15, 2024.

Keller, Pascal M.; Thyagarajan, Nithyanandan; Kumar, Ajay; Kanekar, Nissim; Bernardi, Gianni "The radio-loud fraction of quasars at z > 6," Monthly Notices of the Royal Astronomical Society, 528, 5692, 2024.

Kerrison, Emily F.; Allison, James R.; Moss, Vanessa A.; Sadler, Elaine M.; Rees, Glen A. "RADIOSED - I. Bayesian inference of radio SEDs from

inhomogeneous surveys," Monthly Notices of the Royal Astronomical Society, 533, 4248, 2024.
Keyte, Luke; Kama, Mihkel; Booth, Alice S.; Law, Charles J.; Leemker, Margot "Volatile composition of the HD 169142 disc and its embedded planet," Monthly Notices of the Royal Astronomical Society, 534, 3576, 2024.
Keyte, Luke; Kama, Mihkel; Chuang, Ko-Ju; Cleeves, L. Ilsedore; Drozdovskaya, Maria N.; Furuya, Kenji; Rawlings, Jonathan; Shorttle, Oliver "Spatially resolving the volatile sulfur abundance in the HD 100546 protoplanetary disc," Monthly Notices of the Royal Astronomical Society, 528, 388, 2024.
Khan, S.; Rugel, M. R.; Brunthaler, A.; Menten, K. M.; Wyrowski, F.; Urquhart, J. S.; Gong, Y.; Yang, A. Y.; Nguyen, H.; Dokara, R.; Dzib, S. A.; Medina, S. -N. X.; Ortiz-León, G. N.; Pandian, J. D.; Beuther, H.; Veena, V. S.; Neupane, S.; Cheema, A.; Reich, W.; Roy, N. "A global view on star formation: The GLOSTAR Galactic plane survey: X. Galactic H II region catalog using radio recombination lines," Astronomy and Astrophysics, 689, A81, 2024.
Kharb, Preeti; Blackman, Eric G.; Clausen-Brown, Eric; Das, Mousumi; Schwartz, Daniel A.; Siemiginowska, Aneta; Subramanian, Smitha; Vaddi, Sravani "Relativistic Jet Motion in the Radio-quiet LINER Galaxy KISSR 872," The Astrophysical Journal, 962, 180, 2024.
Khouri, T.; Olofsson, H.; Vlemmings, W. H. T.; Schirmer, T.; Tafoya, D.; Maercker, M.; De Beck, E.; Nyman, L. -Å.; Saberi, M. "An empirical view of the extended atmosphere and inner envelope of the asymptotic giant branch star R Doradus. I. Physical model based on CO lines," Astronomy and Astrophysics, 685, A11, 2024.
Kianfar, K.; Andreani, P.; Fernández-Ontiveros, J. A.; Combes, F.; Spinoglio, L.; Hatziminaoglou, E.; Ricci, C.; Bewketu-Belete, A.; Imanishi, M.; Pereira-Santaella, M.; Slater, R.; Malheiro, M. "AGN feeding along a one-armed spiral in NGC 4593: A study using ALMA CO(2-1) observations," Astronomy and Astrophysics, 691, A118, 2024.
Kiehlmann, S.; Lister, M. L.; Readhead, A. C. S.; Liodakis, I.; O'Neill, Sandra; Pearson, T. J.; Sheldahl, Evan; Siemiginowska, Aneta; Tassis, K.; Taylor, G. B.; Wilkinson, P. N. "Compact Symmetric Objects. I. Toward a Comprehensive Bona Fide Catalog," The Astrophysical Journal, 961, 240, 2024.
Kiehlmann, S.; Readhead, A. C. S.; O'Neill, S.; Wilkinson, P. N.; Lister, M. L.; Liodakis, I.; Bruzewski, S.; Pavlidou, V.; Pearson, T. J.; Sheldahl, E.; Siemiginowska, A.; Tassis, K.; Taylor, G. B. "Compact Symmetric Objects. II. Confirmation of a Distinct Population of High-luminosity Jetted Active Galaxies," The Astrophysical Journal, 961, 241, 2024.
Killi, Meghana; Ginolfi, Michele; Popping, Gergö; Watson, Darach; Zamorani, Giovanni; Lemaux, Brian C.; Fujimoto, Seiji; Faisst, Andreas; Bethermin, Matthieu; Romano, Michael; Fudamoto, Yoshinobu; Bardelli, Sandro; Boquien, Médéric; Carniani, Stefano; Dessauges-Zavadsky, Miroslava; Gruppioni, Carlotta; Hathi, Nimish; Ibar, Eduardo; Jones, Gareth C.; Koekemoer, Anton M.; Langan, Ivanna; Méndez-Hernández, Hugo; Sugahara, Yuma; Vallini, Livia; Vergani, Daniela "The ALPINE-ALMA [C II] survey: characterization of spatial offsets in main-sequence galaxies at z 4-6," Monthly Notices of the Royal Astronomical Society, 531, 3222, 2024.
Kim, Chul-Hwan; Lee, Jeong-Eun; Peña, Carlos Contreras; Johnstone, Doug; Herczeg, Gregory J.; Tobin, John J.; Evans, Neal J., Ii "The CO Outflow Components Ejected by a Recent Accretion Event in B335," The Astrophysical Journal, 961, 108, 2024.
Kim, Dae-Won; Ros, Eduardo; Kadler, Matthias; Krichbaum, Thomas P.; Zhao, Guang-Yao; Rösch, Florian; Lobanov, Andrei P.; Anton Zensus, J. "PKS 1424-418: A persistent candidate source of the mm-γ-ray connection?," Astronomy and Astrophysics, 692, A203, 2024.
Kim, Dawoon E.; Di Gesu, Laura; Liodakis, Ioannis; Marscher, Alan P.; Jorstad, Svetlana G.; Middei, Riccardo; Marshall, Herman L.; Pacciani, Luigi; Agudo, Iván; Tavecchio, Fabrizio; Cibrario, Nicolò; Tugliani, Stefano; Bonino, Raffaella; Negro, Michela; Puccetti, Simonetta; Tombesi, Francesco; Costa, Enrico; Donnarumma, Immacolata; Soffitta, Paolo; Mizuno, Tsunefumi; Fukazawa, Yasushi; Kawabata, Koji S.; Nakaoka, Tatsuya; Uemura, Makoto; Imazawa, Ryo; Sasada, Mahito; Akitaya, Hiroshi; Josè Aceituno, Francisco; Bonnoli, Giacomo; Casanova, Victor; Myserlis, Ioannis; Sievers, Albrecht; Angelakis, Emmanouil; Kraus, Alexander; Yeon Cheong, Whee; Jeong, Hyeon-Woo; Kang, Sincheol; Kim, Sang-Hyun; Lee, Sang-Sung; Agìs-Gonzàlez, Beatriz; Sota, Alfredo; Escudero, Juan; Gurwell, Mark; Keating, Garrett K.; Rao, Ramprasad; Kouch, Pouya M.; Lindfors, Elina; Bourbah, Ioakeim G.; Kiehlmann, Sebastian; Kontopodis, Evangelos; Mandarakas, Nikos; Romanopoulos, Stylianos; Skalidis, Raphael; Vervelaki, Anna; Savchenko, Sergey S.; Antonelli, Lucio A.; Bachetti, Matteo; Baldini, Luca; Baumgartner, Wayne H.; Bellazzini, Ronaldo; Bianchi, Stefano; Bongiorno, Stephen D.; Brez, Alessandro; Bucciantini, Niccoló; Capitanio, Fiamma; Castellano, Simone; Cavazzuti, Elisabetta; Chen, Chien-Ting; Ciprini, Stefano; De Rosa, Alessandra; Del Monte, Ettore; Di Lalla, Niccoló; Di Marco, Alessandro; Doroshenko, Victor; Dovčiak, Michal; Ehlert, Steven R.; Enoto, Teruaki; Evangelista, Yuri; Fabiani, Sergio; Ferrazzoli, Riccardo; Garcia, Javier A.; Gunji, Shuichi; Hayashida, Kiyoshi; Heyl, Jeremy; Iwakiri, Wataru; Kaaret, Philip; Karas, Vladimir; Kislat, Fabian; Kitaguchi, Takao; Kolodziejczak, Jeffery J.; Krawczynski, Henric; La Monaca, Fabio; Latronico, Luca; Maldera, Simone; Manfreda, Alberto; Marin, Frédéric; Marinucci, Andrea; Massaro, Francesco; Matt, Giorgio; Mitsuishi, Ikuyuki; Muleri, Fabio; Ng, C.-Y.; O'Dell, Stephen L.; Omodei, Nicola; Oppedisano, Chiara; Papitto, Alessandro; Pavlov, George G.; Peirson, Abel L.; Perri, Matteo; Pesce-Rollins, Melissa; Petrucci, Pierre-Olivier; Pilia, Maura; Possenti, Andrea; Poutanen, Juri; Ramsey, Brian D.; Rankin, John; Ratheesh, Ajay; Roberts, Oliver; Romani, Roger W.; Sgró, Carmelo; Slane, Patrick; Spandre, Gloria; Swartz, Doug; Tamagawa, Toru; Taverna, Roberto; Tawara, Yuzuru; Tennant, Allyn F.; Thomas, Nicholas E.; Trois, Alessio; Tsygankov, Sergey S.; Turolla, Roberto; Vink, Jacco; Weisskopf, Martin C.; Wu, Kinwah; Xie, Fei; Zane, Silvia "Magnetic field properties inside the jet of Mrk 421. Multiwavelength polarimetry, including the Imaging X-ray Polarimetry Explorer," Astronomy and Astrophysics, 681, A12, 2024.
Kim, Helen Kyung; Malkan, Matthew A.; Takagi, Toshinobu; Oi, Nagisa; Burgarella, Denis; Miyaji, Takamitsu; Shim, Hyunjin; Matsuhara, Hideo; Goto, Tomotsugu; Ohyama, Yoichi; Buat, Veronique; Kim, Seong Jin "The Calibration of Polycyclic Aromatic Hydrocarbon Dust Emission as a Star Formation Rate Indicator in the AKARI NEP Survey," The Astrophysical Journal, 974, 253, 2024.
Kim, Jong-Seo; Nikonov, Aleksei S.; Roth, Jakob; Enßlin, Torsten A.; Janssen, Michael; Arras, Philipp; Müller, Hendrik; Lobanov, Andrei P. "Bayesian self-calibration and imaging in very long baseline interferometry," Astronomy and Astrophysics, 690, A129, 2024.
Kim, Taehyun; Gadotti, Dimitri A.; Querejeta, Miguel; Pérez, Isabel; Zurita, Almudena; Neumann, Justus; Van De Ven, Glenn; Méndez-Abreu, Jairo; De Lorenzo-Cáceres, Adriana; Sánchez-Blázquez, Patricia; Fragkoudi, Francesca; Martins, Lucimara P.; Silva-Lima, Luiz A.; Kim, Woong-Tae; Park, Myeong-Gu "Impacts of Bar-driven Shear and Shocks on Star Formation," The Astrophysical Journal, 968, 87, 2024.
Klein, Maxwell; Sharon, Keren; Napier, Kate; Gladders, Michael D.; Khullar, Gourav; Bayliss, Matthew; Dahle, Håkon; Owens, M. Riley; Stark, Antony; Brownsberger, Sasha; Kim, Keunho J.; Kuchta, Nicole; Mahler, Guillaume; Smith, Grace; Walker, Ryan; Gozman, Katya; Martinez, Michael N.; Matthews Acuña, Owen S.; Merz, Kaiya; Sanchez, Jorge A.; Stein, Daniel J. Kavin; Sukay, Ezra O.; Tavangar, Kiyan "COOL-LAMPS. VI. Lens Model and New Constraints on the Properties of COOL J1241+2219, a Bright z = 5 Lyman Break Galaxy and its z = 1 Cluster Lens," The Astrophysical Journal, 963, 44, 2024.
Klutse, D. Y.; Hilton, M.; Heywood, I.; Smail, I.; Swinbank, A. M.; Knowles, K.; Sikhosana, S. P. "MeerKAT observations of starburst galaxies and AGNs within the core of XMMXCS J2215.9-1738 at z = 1.46," Monthly Notices of the Royal Astronomical Society, 532, 2842, 2024.
Ko, Takatoshi; Tsuna, Daichi; Hatsukade, Bunyo; Shigeyama, Toshikazu "Radio emission from SN 1181 hosting a white dwarf merger product," Publications of the Astronomical Society of Japan, 76, 475, 2024.
Koda, Jin; Combes, Françoise; Rubio, Monica; Andersen, Morten; Bigiel, Frank; Gil De Paz, Armando; Junais; Lee, Amanda M.; Meyer, Jennifer Donovan; Morokuma-Matsui, Kana; Yagi, Masafumi; Zavagno, Annie "Compact and high excitation molecular clumps in the extended ultraviolet disk of M83," Astronomy and Astrophysics, 691, A197, 2024.
Komesh, Toktarkhan; Garay, Guido; Henkel, Christian; Omar, Aruzhan; Estalella, Robert; Assembay, Zhandos; Li, Dalei; Guzmán, Andrés; Esimbek, Jarken; Huang, Jiasheng; He, Yuxin; Alimgazinova, Nazgul; Kyzgarina, Meiramgul; Bekdaulet, Shukirgaliyev; Zhumabay, Nurman; Manapbayeva, Arailym "Infall Motions in the Hot Core Associated with the Hypercompact H II Region G345.0061+01.794 B," The Astrophysical Journal, 967, 15, 2024.
Kőmíves, Janka; Gabányi, Krisztina Éva; Frey, Sándor; Kun, Emma "VLBI Analysis of a Potential High-Energy Neutrino Emitter Blazar," Universe, 10, 78, 2024.
Konishi, Ayu; Muraoka, Kazuyuki; Tokuda, Kazuki; Fujita, Shinji; Fukui, Yasuo; Yamada, Rin I.; Demachi, Fumika; Tachihara, Kengo; Kobayashi, Masato I. N.; Kuno, Nario; Tsuge, Kisetsu; Sano, Hidetoshi; Miura, Rie E.; Kawamura, Akiko; Onishi, Toshikazu "ACA CO(J = 2-1) mapping of the nearest spiral galaxy M 33. II. Exploring the evolution of giant molecular clouds," Publications of the Astronomical Society of Japan, 76, 1098, 2024.
Kosogorov, N. A.; Kovalev, Y. Y.; Perucho, M.; Kovalev, Yu A. "Parsec-scale evolution of the gigahertz-peaked spectrum quasar PKS 0858 - 279," Monthly Notices of the Royal Astronomical Society, 528, 1697, 2024.
Kozák, Bettina; Frey, Sándor; Gabányi, Krisztina Éva "Superluminal Motion and Jet Parameters in the Gamma-ray-Emitting Narrow-Line Seyfert 1 Galaxy TXS 1206+549," Galaxies, 12, 8, 2024.
Krahm, Grace; Finn, Molly K.; Indebetouw, Remy; Johnson, Kelsey E.; Kamenetzky, Julia; Bemis, Ashley "Physical Properties of Molecular Clouds in the Overlap Region of the Merging Antennae Galaxies," The Astrophysical Journal, 964, 166, 2024.
Kremer, Kyle; Ye, Claire S.; Heinke, Craig O.; Piro, Anthony L.; Ransom, Scott M.; Rasio, Frederic A. "Can Slow Pulsars in Milky Way Globular Clusters Form via Partial Recycling?," The Astrophysical Journal, 977, L42, 2024.
Krezinger, M.; Baldini, G.; Giroletti, M.; Sbarrato, T.; Ghisellini, G.; Giovannini, G.; An, T.; Gabányi, K. É.; Frey, S. "Revealing faint compact radio jets at redshifts above 5 with very long baseline interferometry," Astronomy and Astrophysics, 690, A321, 2024.
Krezinger, Máté; Frey, Sándor; Perger, Krisztina; Gabányi, Krisztina É.; An, Tao; Zhang, Yingkang; Gurvits, Leonid I.; Titov, Oleg; Melnikov, Alexey; Paragi, Zsolt "Proper motion of the radio jets in two blazars at redshift above 3," Monthly Notices of the Royal Astronomical Society, 530, 4614, 2024.

Kukreti, Pranav; Morganti, Raffaella "Connecting the radio AGN life cycle to feedback: Ionised gas is more disturbed in young radio AGN," Astronomy and Astrophysics, 690, A140, 2024.
Kumari, Shobha; Pal, Sabyasachi "Discovery of a circular symmetry extended diffuse radio emission around an elliptical galaxy with the VLA FIRST survey," Monthly Notices of the Royal Astronomical Society, 527, 11233, 2024.
Kumari, Shobha; Pal, Sabyasachi "A horseshoe-shaped ring of diffuse emission detected at 1.4 GHz," Astronomy and Astrophysics, 683, A175, 2024.
Kun, Emma; Jaroschewski, Ilja; Tjus, Julia Becker; Britzen, Silke; Frey, Sándor; Gabányi, Krisztina Éva; Cui, Lang; Wang, Xin; Shen, Yuling "Follow-up on the Supermassive Black Hole Binary Candidate J1048+7143: Successful Prediction of the Next Gamma-Ray Flare and Refined Binary Parameters in the Framework of the Jet Precession Model," The Astrophysical Journal, 963, L16, 2024.
Kuo, C. Y.; Gao, F.; Braatz, J. A.; Pesce, D. W.; Humphreys, E. M. L.; Reid, M. J.; Impellizzeri, C. M. V.; Henkel, C.; Wagner, J.; Wu, C. E. "What determines the boundaries of H_2O maser emission in an X-ray illuminated gas disc?," Monthly Notices of the Royal Astronomical Society, 532, 3020, 2024.
Kuo, I. -Hsuan Genevieve; Yen, Hsi-Wei; Gu, Pin-Gao "ALMA Observations of Proper Motions of the Dust Clumps in the Protoplanetary Disk MWC 758," The Astrophysical Journal, 975, L33, 2024.
Kurahara, Kohei; Akahori, Takuya; Oki, Aika; Omiya, Yuki; Nakazawa, Kazuhiro "Discovery of diffuse radio source in Abell 1060," Publications of the Astronomical Society of Japan, 76, L8, 2024.
Kurtovic, N. T.; Facchini, S.; Benisty, M.; Pinilla, P.; Cabrit, S.; Jensen, E. L. N.; Dougados, C.; Booth, R.; Kimmig, C. N.; Manara, C. F.; Rodriguez, J. E. "Binary orbit and disks properties of the RW Aur system using ALMA observations," Astronomy and Astrophysics, 692, A155, 2024.
Kurtovic, N. T.; Pinilla, P. "Recovering the gas properties of protoplanetary disks through parametric visibility modeling: MHO 6," Astronomy and Astrophysics, 687, A188, 2024.
Lacy, Mark; Engholm, Athena; Farrah, Duncan; Ejercito, Kiana "Constraints on Cosmological Coupling from the Accretion History of Supermassive Black Holes," The Astrophysical Journal, 961, L33, 2024.
Ladu, E.; Tarchi, A.; Castangia, P.; Surcis, G.; Braatz, J. A.; Panessa, F.; Pesce, D. W. "IC 485: A new candidate disc-maser galaxy at ~100 Mpc. Milliarcsecond resolution study of the galaxy nucleus and the H_2O megamaser," Astronomy and Astrophysics, 682, A25, 2024.
Lambert, S.; Sol, H.; Pierron, A. "Identification of the optical emission detected by Gaia with radio structures in parsec-scale active galactic nucleus jets," Astronomy and Astrophysics, 684, A202, 2024.
Lambrides, Erini; Chiaberge, Marco; Long, Arianna S.; Liu, Daizhong; Akins, Hollis B.; Ptak, Andrew F.; Andika, Irham Taufik; Capetti, Alessandro; Casey, Caitlin M.; Champagne, Jaclyn B.; Chworowsky, Katherine; Clarke, Tracy E.; Cooper, Olivia R.; Ding, Xuheng; Dong, Dillon Z.; Faisst, Andreas L.; Forman, Jordan Y.; Franco, Maximilien; Gillman, Steven; Gozaliasl, Ghassem; Hall, Kirsten R.; Harish, Santosh; Hayward, Christopher C.; Hirschmann, Michaela; Hutchison, Taylor A.; Jahnke, Knud; Jin, Shuowen; Kartaltepe, Jeyhan S.; Kleiner, Emma T.; Koekemoer, Anton M.; Kokorev, Vasily; Manning, Sinclaire M.; Martin, Crystal L.; Mckinney, Jed; Norman, Colin; Nyland, Kristina; Onoue, Masafusa; Robertson, Brant E.; Shuntov, Marko; Silverman, John D.; Stiavelli, Massimo; Trakhtenbrot, Benny; Vardoulaki, Eleni; Zavala, Jorge A.; Allen, Natalie; Ilbert, Olivier; Mccracken, Henry Joy; Paquereau, Louise; Rhodes, Jason; Toft, Sune "Uncovering a Massive z 7.7 Galaxy Hosting a Heavily Obscured Radio-loud Active Galactic Nucleus Candidate in COSMOS-Web," The Astrophysical Journal, 961, L25, 2024.
Lamperti, Isabella; Arribas, Santiago; Perna, Michele; Rodríguez Del Pino, Bruno; Circosta, Chiara; Pérez-González, Pablo G.; Bunker, Andrew J.; Carniani, Stefano; Charlot, Stéphane; D'Eugenio, Francesco; Maiolino, Roberto; Übler, Hannah; Willott, Chris J.; Bertola, Elena; Böker, Torsten; Cresci, Giovanni; Curti, Mirko; Jones, Gareth C.; Kumari, Nimisha; Parlanti, Eleonora; Scholtz, Jan; Venturi, Giacomo "GA-NIFS: JWST/NIRSpec IFS view of the z ~ 3.5 galaxy GS5001 and its close environment at the core of a large-scale overdensity," Astronomy and Astrophysics, 691, A153, 2024.
Langan, I.; Popping, G.; Ginolfi, M.; Gentile, F.; Valentino, F.; Kaasinen, M. "ALMA reveals a dust-obscured galaxy merger at cosmic noon," Astronomy and Astrophysics, 689, A283, 2024.
Langlen Chanu, Athokpam; Chingangbam, Pravabati; Rahman, Fazlu; Brojen Singh, R. K.; Kharb, Preeti "Analysis of the structural complexity of Crab Nebula observed at radio frequency using a multifractal approach," Journal of Physics: Complexity, 5, 015005, 2024.
Lankhaar, Boy; Aalto, Susanne; Wethers, Clare; Moldon, Javier; Beswick, Rob; Gorski, Mark; König, Sabine; Yang, Chentao; Mangum, Jeff; Gallagher, John; Combes, Françoise; Rigopoulou, Dimitra; González-Alfonso, Eduardo; Muller, Sébastien; Garcia-Bernete, Ismael; Henkel, Christian; Nishimura, Yuri; Ricci, Claudio "The fountain of the luminous infrared galaxy Zw049.057 as traced by its OH megamaser," Astronomy and Astrophysics, 689, A163, 2024.
Lankhaar, Boy; Surcis, Gabriele; Vlemmings, Wouter; Impellizzeri, Violette "Maser polarization through anisotropic pumping," Astronomy and Astrophysics, 683, A117, 2024.
Lao, Bao-Qiang; Yang, Xiao-Long; Jaiswal, Sumit; Mohan, Prashanth; Sun, Xiao-Hui; Qin, Sheng-Li; Zhao, Ru-Shuang "A Machine Learning Made Catalog of FR-II Radio Galaxies from the FIRST Survey," Research in Astronomy and Astrophysics, 24, 035021, 2024.
Larsen, Bjorn; Mingarelli, Chiara M. F.; Hazboun, Jeffrey S.; Chalumeau, Aurélien; Good, Deborah C.; Simon, Joseph; Agazie, Gabriella; Anumarlapudi, Akash; Archibald, Anne M.; Arzoumanian, Zaven; Baker, Paul T.; Brook, Paul R.; Cromartie, H. Thankful; Crowter, Kathryn; Decesar, Megan E.; Demorest, Paul B.; Dolch, Timothy; Ferrara, Elizabeth C.; Fiore, William; Fonseca, Emmanuel; Freedman, Gabriel E.; Garver-Daniels, Nate; Gentile, Peter A.; Glaser, Joseph; Jennings, Ross J.; Jones, Megan L.; Kaplan, David L.; Kerr, Matthew; Lam, Michael T.; Lorimer, Duncan R.; Luo, Jing; Lynch, Ryan S.; Mcewen, Alexander; Mclaughlin, Maura A.; Mcmann, Natasha; Meyers, Bradley W.; Ng, Cherry; Nice, David J.; Pennucci, Timothy T.; Perera, Benetge B. P.; Pol, Nihan S.; Radovan, Henri A.; Ransom, Scott M.; Ray, Paul S.; Schmiedekamp, Ann; Schmiedekamp, Carl; Shapiro-Albert, Brent J.; Stairs, Ingrid H.; Stovall, Kevin; Susobhanan, Abhimanyu; Swiggum, Joseph K.; Wahl, Haley M.; Champion, David J.; Cognard, Ismaël; Guillemot, Lucas; Hu, Huanchen; Keith, Michael J.; Liu, Kuo; Mckee, James W.; Parthasarathy, Aditya; Perrodin, Delphine; Possenti, Andrea; Shaifullah, Golam M.; Theureau, Gilles "The NANOGrav 15 yr Data Set: Chromatic Gaussian Process Noise Models for Six Pulsars," The Astrophysical Journal, 972, 49, 2024.
Laudage, Sebastian; Eibensteiner, Cosima; Bigiel, Frank; Leroy, Adam K.; Meidt, Sharon; Schinnerer, Eva; De Blok, W. J. G.; Querejeta, Miguele; Stuber, Sophia; Colombo, Dario; Rosolowsky, Erik; Pisano, D. J.; Utomo, Dyas; Levy, Rebecca C.; Klessen, Ralf; Cao, Yixian; Koch, Eric W.; Kurapati, Sushma; Sanchez-Blazquez, Patricia; Neumann, Justus; Neumann, Lukas; Pan, Hsi-An; Williams, Thomas G. "Neutral atomic and molecular gas dynamics in the nearby spiral galaxies NGC 1512, NGC 4535, and NGC 7496," Astronomy and Astrophysics, 690, A169, 2024.
Law, Casey J.; Sharma, Kritti; Ravi, Vikram; Chen, Ge; Catha, Morgan; Connor, Liam; Faber, Jakob T.; Hallinan, Gregg; Harnach, Charlie; Hellbourg, Greg; Hobbs, Rick; Hodge, David; Hodges, Mark; Lamb, James W.; Rasmussen, Paul; Sherman, Myles B.; Shi, Jun; Simard, Dana; Squillace, Reynier; Weinreb, Sander; Woody, David P.; Yurk, Nitika Yadlapalli "Deep Synoptic Array Science: First FRB and Host Galaxy Catalog," The Astrophysical Journal, 967, 29, 2024.
Law, Charles J.; Benisty, Myriam; Facchini, Stefano; Teague, Richard; Bae, Jaehan; Isella, Andrea; Kamp, Inga; Öberg, Karin I.; Portilla-Revelo, Bayron; Rampinelli, Luna "Mapping the Vertical Gas Structure of the Planet-hosting PDS 70 Disk," The Astrophysical Journal, 964, 190, 2024.
Law, Chi-Yan; Tan, Jonathan C.; Skalidis, Raphael; Morgan, Larry; Xu, Duo; De Oliveira Alves, Felipe; Barnes, Ashley T.; Butterfield, Natalie; Caselli, Paola; Cosentino, Giuliana; Fontani, Francesco; Henshaw, Jonathan D.; Jimenez-Serra, Izaskun; Lim, Wanggi "Polarized Light from Massive Protoclusters (POLIMAP). I. Dissecting the Role of Magnetic Fields in the Massive Infrared Dark Cloud G28.37+0.07," The Astrophysical Journal, 967, 157, 2024.
Lazarević, Sanja; Filipović, Miroslav D.; Dai, Shi; Kothes, Roland; Ahmad, Adeel; Alsaberi, Rami Z. E.; Balzan, Joel C. F.; Barnes, Luke A.; Cotton, William D.; Edwards, Philip G.; Gordon, Yjan A.; Haberl, Frank; Hopkins, Andrew M.; Koribalski, Bärbel S.; Leahy, Denis; Maitra, Chandreyee; Mićić, Marko; Rowell, Gavin; Sasaki, Manami; Tothill, Nicholas F. H.; Umana, Grazia; Velović, Velibor "Fast as Potoroo: Radio continuum detection of a bow-shock pulsar wind nebula powered by pulsar J1638-4713," Publications of the Astronomical Society of Australia, 41, e032, 2024.
Le Reste, Alexandra; Cannon, John M.; Hayes, Matthew J.; Inoue, John L.; Kepley, Amanda A.; Melinder, Jens; Menacho, Veronica; Adamo, Angela; Bik, Arjan; Ejdetjärn, Timmy; Józsa, Gyula I. G.; Östlin, Göran; Taft, Sarah H. "Tidally offset neutral gas in Lyman continuum emitting galaxy Haro 11," Monthly Notices of the Royal Astronomical Society, 528, 757, 2024.
Ledger, B.; Saito, T.; Iono, D.; Wilson, C. D. "Stored in the archives: Uncovering the CN/CO intensity ratio with ALMA in nearby U/LIRGs," Monthly Notices of the Royal Astronomical Society, 527, 2963, 2024.
Lee, Amanda M.; Koda, Jin; Hirota, Akihiko; Egusa, Fumi; Heyer, Mark "The CO-to-H_2 Conversion Factor in the Barred Spiral Galaxy M83," The Astrophysical Journal, 968, 97, 2024.
Lee, Chin-Fei; Li, Zhi-Yun; Ching, Tao-Chung; Yang, Haifeng; Lai, Shih-Ping; Lin, Zhe-Yu Daniel; Hu, Ying-Chi "Polarization Substructure in the Spiral-dominated HH 111 Disk: Evidence for Grain Growth," The Astrophysical Journal, 971, L23, 2024.
Lee, Jeong-Eun; Kim, Chul-Hwan; Lee, Seokho; Lee, Seonjae; Baek, Giseon; Yun, Hyeong-Sik; Aikawa, Yuri; Johnstone, Doug; Herczeg, Gregory J.; Cieza, Lucas "ALMA Spectral Survey of an Eruptive Young Star, V883 Ori (ASSAY). I. What Triggered the Current Episode of Eruption?," The Astrophysical Journal, 966, 119, 2024.
Lee, Kianhong; Akiyama, Masayuki; Kohno, Kotaro; Iono, Daisuke; Imanishi, Masatoshi; Hatsukade, Bunyo; Umehata, Hideki; Nagao, Tohru; Toba, Yoshiki; Chen, Xiaoyang; Egusa, Fumi; Ichikawa, Kohei; Izumi, Takuma; Matsumoto, Naoki; Schramm, Malte; Matsuoka, Kenta "Ongoing and Fossil Large-scale Outflows Detected in a High-redshift Radio Galaxy: [C II] Observations of TN J0924-2201 at z = 5.174," The Astrophysical Journal, 972, 111, 2024.
Lee, Minju M.; Steidel, Charles C.; Brammer, Gabriel; Förster-Schreiber, Natascha; Renzini, Alvio; Liu, Daizhong; Herrera-Camus, Rodrigo; Naab,

Thorsten; Price, Sedona H.; Übler, Hannah; Arriagada-Neira, Sebastián; Magdis, Georgios "High dust content of a quiescent galaxy at z 2 revealed by deep ALMA observation," Monthly Notices of the Royal Astronomical Society, 527, 9529, 2024.
Lee, Seokho; Lee, Jeong-Eun; Johnstone, Doug; Herczeg, Gregory J.; Aikawa, Yuri "Multiple Jets in the Bursting Protostar HOPS 373SW," The Astrophysical Journal, 964, 34, 2024.
Lee, Seonjae; Lee, Jeong-Eun; Lee, Seokho "HCN and HNC in the Disk of an Outbursting Young Star, V883 Ori," Journal of Korean Astronomical Society, 57, 163, 2024.
Leemker, M.; Booth, A. S.; Van Dishoeck, E. F.; Wölfer, L.; Dent, B. "Chemistry across dust and gas gaps in protoplanetary disks. Modelling the co-spatial molecular rings in the HD 100546 disk," Astronomy and Astrophysics, 687, A299, 2024.
Leftley, J. H.; Nesvadba, N. P. H.; Bicknell, G. V.; Janssen, R. M. J.; Mukherjee, D.; Petrov, R.; Shende, M. B.; Zovaro, H. R. M. "JWST/NIRSpec and MIRI observations of an expanding, jet-driven bubble of warm H_2 in the radio galaxy 3C 326 N," Astronomy and Astrophysics, 689, A314, 2024.
Lei, Xianhuan; Zhu, Hui; Yin, Zongyao; Zhang, Haiyan; Tian, Wenwu; Yu, Xianchuan "Spectral Index Distribution of Various Scale Components in Supernova Remnant Cassiopeia A," Research in Astronomy and Astrophysics, 24, 055017, 2024.
Lenkić, Laura; Fisher, Deanne B.; Bolatto, Alberto D.; Teuben, Peter J.; Levy, Rebecca C.; Sun, Jiayi; Herrera-Camus, Rodrigo; Glazebrook, Karl; Obreschkow, Danail; Abraham, Roberto "Disk Turbulence and Star Formation Regulation in High-z Main-sequence Analog Galaxies," The Astrophysical Journal, 976, 88, 2024.
Lepore, M.; Di Mascolo, L.; Tozzi, P.; Churazov, E.; Mroczkowski, T.; Borgani, S.; Carilli, C.; Gaspari, M.; Ginolfi, M.; Liu, A.; Pentericci, L.; Rasia, E.; Rosati, P.; Röttgering, H. J. A.; Anderson, C. S.; Dannerbauer, H.; Miley, G.; Norman, C. "Feeding and feedback processes in the Spiderweb proto-intracluster medium," Astronomy and Astrophysics, 682, A186, 2024.
Leroy, L.; Elbaz, D.; Magnelli, B.; Gómez-Guijarro, C.; Daddi, E.; Xiao, M.; Dickinson, M. "The role of stellar mass in the cosmic history of star formation as seen by Herschel and ALMA," Astronomy and Astrophysics, 691, A248, 2024.
Levis, Aviad; Chael, Andrew A.; Bouman, Katherine L.; Wielgus, Maciek; Srinivasan, Pratul P. "Orbital polarimetric tomography of a flare near the Sagittarius A˙ supermassive black hole," Nature Astronomy, 8, 765, 2024.
Levy, Rebecca C.; Bolatto, Alberto D.; Mayya, Divakara; Cuevas-Otahola, Bolivia; Tarantino, Elizabeth; Boyer, Martha L.; Boogaard, Leindert A.; Böker, Torsten; Cronin, Serena A.; Dale, Daniel A.; Donaghue, Keaton; Emig, Kimberly L.; Fisher, Deanne B.; Glover, Simon C. O.; Herrera-Camus, Rodrigo; Jiménez-Donaire, María J.; Klessen, Ralf S.; Lenkić, Laura; Leroy, Adam K.; De Looze, Ilse; Meier, David S.; Mills, Elisabeth A. C.; Ott, Juergen; Relaño, Mónica; Veilleux, Sylvain; Villanueva, Vicente; Walter, Fabian; Van Der Werf, Paul P. "JWST Observations of Starbursts: Massive Star Clusters in the Central Starburst of M82," The Astrophysical Journal, 973, L55, 2024.
Li, Chuanshou; Qin, Sheng-Li; Liu, Tie; Liu, Sheng-Yuan; Tang, Mengyao; Liu, Hong-Li; Chen, Li; Li, Xiaohu; Xu, Fengwei; Zhang, Tianwei; Liu, Meizhu; Shi, Hongqiong; Wu, Yuefang "Correlations of methyl formate (CH_3OCHO), dimethyl ether (CH_3OCH_3), and ketene (H_2CCO) in high-mass star-forming regions," Monthly Notices of the Royal Astronomical Society, 533, 1583, 2024.
Li, Fei; Zhang, Zhi-Yu; Wang, Junzhi; Luo, Gan; Lin, Lingrui; Zhou, Jing "Dense gas properties around the centre of the Circinus galaxy," Monthly Notices of the Royal Astronomical Society, 527, 531, 2024.
Li, Jialu; Harris, Andrew I.; Rosolowsky, Erik; Kepley, Amanda A.; Frayer, David; Bolatto, Alberto D.; Leroy, Adam K.; Donovan Meyer, Jennifer; Church, Sarah; Gundersen, Joshua Ott; Cleary, Kieran; Degas Team Members "GBT/Argus Observations of Molecular Gas in the Inner Regions of IC 342," The Astrophysical Journal, 963, 117, 2024.
Li, Jianan; Emonts, Bjorn H. C.; Cai, Zheng; Li, Jianrui; Wang, Ran; Villar-Martín, Montserrat; Arrigoni Battaia, Fabrizio; Li, Mingyu; Wu, Yunjing; Yoon, Ilsang; Lehnert, Matthew D.; Massingill, Kyle; Sarazin, Craig; Prochaska, Jason X.; Lacy, Mark; Mason, Brian "The SUPERCOLD-CGM Survey. II. [C I](1-0) Emission and the Physical Conditions of Cold Gas in Enormous Lyα Nebulae at z ~ 2," The Astrophysical Journal, 977, 198, 2024.
Li, Jianan; Wang, Ran; Pensabene, Antonio; Walter, Fabian; Venemans, Bram P.; Decarli, Roberto; Bañados, Eduardo; Cox, Pierre; Neri, Roberto; Omont, Alain; Cai, Zheng; Khusanova, Yana; Xu, Fuxiang; Riechers, Dominik; Wagg, Jeff; Shao, Yali; Liu, Yuanqi; Menten, Karl M.; Li, Qiong; Fan, Xiaohui "Diverse Molecular Gas Excitations in Quasar Host Galaxies at z ~ 6," The Astrophysical Journal, 962, 119, 2024.
Li, Jiang-Tao; Sun, Wei; Ji, Li; Yang, Yang "Pressure Balance and Energy Budget of the Nuclear Superbubble of NGC 3079," The Astrophysical Journal, 966, 239, 2024.
Li, Juan; Quan, Donghui; Wang, Junzhi; Zhang, Xia; Lu, Xing; Gou, Qian; Gao, Feng; Wu, Yajun; Bergin, Edwin; Li, Shanghuo; Shen, Zhiqiang; Du, Fujun; Li, Meng; Zheng, Siqi; Zheng, Xingwu "Tentative detection of cyanoformamide $NCCONH_2$ in space," Publications of the Astronomical Society of Japan, 76, 54, 2024.
Li, Juno; Da Cunha, Elisabete; González-López, Jorge; Aravena, Manuel; De Looze, Ilse; Förster Schreiber, N. M.; Herrera-Camus, Rodrigo; Spilker, Justin; Tadaki, Ken-Ichi; Barcos-Munoz, Loreto; Battisti, Andrew J.; Birkin, Jack E.; Bowler, Rebecca A. A.; Davies, Rebecca; Díaz-Santos, Tanio; Ferrara, Andrea; Fisher, Deanne B.; Hodge, Jacqueline; Ikeda, Ryota; Killi, Meghana; Lee, Lilian; Liu, Daizhong; Lutz, Dieter; Mitsuhashi, Ikki; Naab, Thorsten; Posses, Ana; Relaño, Monica; Solimano, Manuel; Übler, Hannah; Van Der Giessen, Stefan Anthony; Villanueva, Vicente "The ALMA-CRISTAL Survey: Spatially Resolved Star Formation Activity and Dust Content in 4 < z < 6 Star-forming Galaxies," The Astrophysical Journal, 976, 70, 2024.
Li, Mingyu; Zhang, Haibin; Cai, Zheng; Liang, Yongming; Kashikawa, Nobunari; Ma, Ke; Fan, Xiaohui; Prochaska, J. Xavier; Emonts, Bjorn H. C.; Wang, Xin; Wu, Yunjing; Zhang, Shiwu; Li, Qiong; Johnson, Sean D.; Yue, Minghao; Arrigoni Battaia, Fabrizio; Cantalupo, Sebastiano; Hennawi, Joseph F.; Kikuta, Satoshi; Ning, Yuanhang; Ouchi, Masami; Shimakawa, Rhythm; Wang, Ben; Wang, Weichen; Zheng, Zheng; Zheng, Zhen-Ya "MAMMOTH-Subaru. II. Diverse Populations of Circumgalactic Lyα Nebulae at Cosmic Noon," The Astrophysical Journal Supplement Series, 275, 27, 2024.
Li, Qiang; Li, Mingyue; Zhang, Li; Pei, Songpeng "Variation in X_{CO} Factor in N55 Region," Universe, 10, 200, 2024.
Li, Shanghuo; Sanhueza, Patricio; Beuther, Henrik; Chen, Huei-Ru Vivien; Kuiper, Rolf; Olguin, Fernando A.; Pudritz, Ralph E.; Stephens, Ian W.; Zhang, Qizhou; Nakamura, Fumitaka; Lu, Xing; Kuruwita, Rajika L.; Sakai, Takeshi; Henning, Thomas; Taniguchi, Kotomi; Li, Fei "Observations of high-order multiplicity in a high-mass stellar protocluster," Nature Astronomy, 8, 472, 2024.
Li, Xiao; Li, Cheng; Mo, H. J.; Hu, Jianhong; Wang, Jing; Xiao, Ting "On the Existence, Rareness, and Uniqueness of Quenched H I-rich Galaxies in the Local Universe," The Astrophysical Journal, 963, 86, 2024.
Li, Xiaofeng; Yang, Jun; Cheng, Xiaopeng; Liao, Mai; Hong, Xiaoyu; Dou, Liming; Zhao, Tianle; Fan, Zhongying; Zhang, Fupeng; Huang, Weirong "A Centiparsec-scale Compact Radio Core in the Nearby Galaxy M60," The Astrophysical Journal, 960, 1, 2024.
Liang, Fu-Heng; Smith, Mark D.; Bureau, Martin; Gao, Feng; Davis, Timothy A.; Cappellari, Michele; Elford, Jacob S.; Greene, Jenny E.; Iguchi, Satoru; Lelli, Federico; Lu, Anan; Ruffa, Ilaria; Williams, Thomas G.; Zhang, Hengyue "WISDOM project - XVIII. Molecular gas distributions and kinematics of three megamaser galaxies," Monthly Notices of the Royal Astronomical Society, 527, 9343, 2024.
Liao, Cheng-Lin; Chen, Chian-Chou; Wang, Wei-Hao; Smail, Ian; Ao, Y.; Chapman, S. C.; Dudzevičiūtė, U.; Frias Castillo, M.; Lee, Minju M.; Serjeant, Stephen; Swinbank, A. M.; Taylor, Dominic J.; Umehata, Hideki; Zhao, Y. "An ALMA Spectroscopic Survey of the Brightest Submillimeter Galaxies in the SCUBA-2-COSMOS Field (AS2COSPEC): Physical Properties of z = 2-5 Ultra- and Hyperluminous Infrared Galaxies," The Astrophysical Journal, 961, 226, 2024.
Liao, Mai; Wang, Junxian; Ren, Wenke; Zhou, Minhua "Outflow-related radio emission in radio-quiet quasars," Monthly Notices of the Royal Astronomical Society, 528, 3696, 2024.
Lin, Hsiu-Hsien; Scholz, Paul; Ng, Cherry; Pen, Ue-Li; Bhardwaj, Mohit; Chawla, Pragya; Curtin, Alice P.; Li, Dongzi; Newburgh, Laura; Reda, Alex; Sand, Ketan R.; Tendulkar, Shriharsh P.; Andersen, Bridget; Bandura, Kevin; Brar, Charanjot; Cassanelli, Tomas; Cook, Amanda M.; Dobbs, Matt; Dong, Fengqiu Adam; Eadie, Gwendolyn; Fonseca, Emmanuel; Gaensler, B. M.; Giri, Utkarsh; Herrera-Martin, Antonio; Hill, Alex S.; Kaczmarek, Jane; Kania, Joseph; Kaspi, Victoria; Khairy, Kholoud; Lanman, Adam E.; Leung, Calvin; Masui, Kiyoshi W.; Mena-Parra, Juan; Meyers, Bradley Ward; Michilli, Daniele; Milutinovic, Nikola; Ordog, Anna; Pearlman, Aaron B.; Pleunis, Ziggy; Rafiei-Ravandi, Masoud; Rahman, Mubdi; Ransom, Scott; Sanghavi, Pranav; Shin, Kaitlyn; Smith, Kendrick; Stairs, Ingrid; Stenning, David C.; Vanderlinde, Keith; Wulf, Dallas "Do All Fast Radio Bursts Repeat? Constraints from CHIME/FRB Far Sidelobe FRBs," The Astrophysical Journal, 975, 75, 2024.
Lin, Lihwai; Pan, Hsi-An; Ellison, Sara L.; Harada, Nanase; Jiménez-Donaire, María J.; French, K. Decker; Baker, William M.; Hsieh, Bau-Ching; Koyama, Yusei; López-Cobá, Carlos; Michiyama, Tomonari; Rowlands, Kate; Sánchez, Sebastián F.; Thorp, Mallory D. "The ALMaQUEST Survey. XII. Dense Molecular Gas as Traced by HCN and HCO^+ in Green Valley Galaxies," The Astrophysical Journal, 963, 115, 2024.
Lin, Shang-Jing; Yen, Hsi-Wei; Lai, Shih-Ping "Multiple Misaligned Outflows and Warped Accretion Flows in the Proto-multiple System Per-emb-8 and 55," The Astronomical Journal, 168, 107, 2024.
Lin, Sheng-Jun; Lai, Shih-Ping; Pagani, Laurent; Lefèvre, Charlène; Thieme, Travis J. "Deuterium fractionation of the starless core L 1498," Astronomy and Astrophysics, 688, A118, 2024.
Lin, Sheng-Jun; Lai, Shih-Ping; Pattle, Kate; Berry, David; Clemens, Dan P.; Pagani, Laurent; Ward-Thompson, Derek; Thieme, Travis J.; Ching, Tao-Chung "Magnetic Fields of the Starless Core L 1512," The Astrophysical Journal, 961, 117, 2024.
Lin, Zhe-Yu Daniel; Li, Zhi-Yun; Stephens, Ian W.; Fernández-López, Manuel; Carrasco-González, Carlos; Chandler, Claire J.; Pasetto, Alice; Looney, Leslie W.; Yang, Haifeng; Harrison, Rachel E.; Sadavoy, Sarah I.; Henning, Thomas; Hughes, A. Meredith; Kataoka, Akimasa; Kwon, Woojin; Muto, Takayuki; Segura-Cox, Dominique "Panchromatic (Sub)millimeter polarization observations of HL Tau unveil aligned scattering grains," Monthly Notices of the Royal Astronomical Society, 528, 843, 2024.

Lin, Zhe-Yu Daniel; Li, Zhi-Yun; Yang, Haifeng; Looney, Leslie W.; Stephens, Ian W.; Fernández-López, Manuel; Harrison, Rachel E. "Badminton birdie-like aerodynamic alignment of drifting dust grains by subsonic gaseous flows in protoplanetary discs," Monthly Notices of the Royal Astronomical Society, 534, 3713, 2024.

Linden, Sean T.; Lai, Thomas; Evans, Aaron S.; Armus, Lee; Larson, Kirsten L.; Rich, Jeffrey A.; U, Vivian; Privon, George C.; Inami, Hanae; Song, Yiqing; Bianchin, Marina; Bohn, Thomas; Buiten, Victorine A.; Sanchez-García, Maria; Kader, Justin; Lenkić, Laura; Medling, Anne M.; Böker, Torsten; Díaz-Santos, Tanio; Charmandaris, Vassilis; Barcos-Muñoz, Loreto; Van Der Werf, Paul; Stierwalt, Sabrina; Aalto, Susanne; Appleton, Philip; Hayward, Christopher C.; Howell, Justin H.; Malkan, Matthew A.; Mazzarella, Joseph M.; Murphy, Eric J.; Surace, Jason "GOALS-JWST: Constraining the Emergence Timescale for Massive Star Clusters in NGC 3256," The Astrophysical Journal, 974, L27, 2024.

Ling, Chenxiaoji; Sun, Bangzheng; Cheng, Cheng; Li, Nan; Ma, Zhiyuan; Yan, Haojing "A Strongly Lensed Dusty Starburst of an Intrinsic Disk Morphology at a Photometric Redshift of $z_{ph} > 7$," The Astrophysical Journal, 969, L28, 2024.

Liszt, Harvey "H I Kinematics and the E(B - V)/N(H I) Ratio," The Astrophysical Journal, 973, 43, 2024.

Liu, Daizhong; Förster Schreiber, Natascha M.; Harrington, Kevin C.; Lee, Lilian L.; Kamieneski, Patrick S.; Davies, Richard I.; Lutz, Dieter; Renzini, Alvio; Wuyts, Stijn; Tacconi, Linda J.; Genzel, Reinhard; Burkert, Andreas; Herrera-Camus, Rodrigo; Alcalde Pampliega, Belén; Vishwas, Amit; Kaasinen, Melanie; Wang, Q. Daniel; Jiménez-Andrade, Eric F.; Lowenthal, James; Foo, Nicholas; Frye, Brenda L.; Shangguan, Jinyi; Cao, Yixian; Agapito, Guido; Agudo Berbel, Alex; Barfety, Capucine; Baruffolo, Andrea; Berman, Derek; Black, Martin; Bonaglia, Marco; Briguglio, Runa; Carbonaro, Luca; Chapman, Lee; Chen, Jianhang; Cikota, Aleksandar; Concas, Alice; Cooper, Olivia; Cresci, Giovanni; Dallilar, Yigit; Deysenroth, Matthias; Di Antonio, Ivan; Di Cianno, Amico; Di Rico, Gianluca; Doelman, David; Dolci, Mauro; Eisenhauer, Frank; Espejo, Juan; Esposito, Simone; Fantinel, Daniela; Ferruzzi, Debora; Feuchtgruber, Helmut; Gao, Xiaofeng; Garcia Diaz, Carlos; Gillessen, Stefan; Grani, Paolo; Hartl, Michael; Henry, David; Huber, Heinrich; Jolly, Jean-Baptiste; Keller, Christoph U.; Kenworthy, Matthew; Kravchenko, Kateryna; Lee, Minju M.; Lightfoot, John; Lunney, David; Macintosh, Mike; Mannucci, Filippo; Ott, Thomas; Pascale, Massimo; Pastras, Stavros; Pearson, David; Puglisi, Alfio; Pulsoni, Claudia; Rabien, Sebastian; Rau, Christian; Riccardi, Armando; Salasnich, Bernardo; Shimizu, Taro; Snik, Frans; Sturm, Eckhard; Taylor, William; Valentini, Angelo; Waring, Christopher; Wiezorrek, Erich; Xompero, Marco; Yun, Min S. "Detailed study of a rare hyperluminous rotating disk in an Einstein ring 10 billion years ago," Nature Astronomy, 8, 1181, 2024.

Liu, Hauyu Baobab; Casassus, Simon; Dong, Ruobing; Doi, Kiyoaki; Hashimoto, Jun; Muto, Takayuki "First JVLA Radio Observation on PDS 70," The Astrophysical Journal, 972, 163, 2024.

Liu, Hauyu Baobab; Muto, Takayuki; Konishi, Mihoko; Chung, Chia-Ying; Hashimoto, Jun; Doi, Kiyoaki; Dong, Ruobing; Kudo, Tomoyuki; Hasegawa, Yasuhiro; Terada, Yuka; Kataoka, Akimasa "Forming localized dust concentrations in a dust ring: DM Tau case study. The asymmetric 7 mm dust continuum of the DM Tau disk," Astronomy and Astrophysics, 685, A18, 2024.

Liu, Junhao; Zhang, Qizhou; Lin, Yuxin; Qiu, Keping; Koch, Patrick M.; Liu, Hauyu Baobab; Li, Zhi-Yun; Girart, Josep Miquel; Pillai, Thushara G. S.; Li, Shanghuo; Chen, Huei-Ru Vivien; Ching, Tao-Chung; Ho, Paul T. P.; Lai, Shih-Ping; Rao, Ramprasad; Tang, Ya-Wen; Wang, Ke "Dark Dragon Breaks Magnetic Chain: Dynamical Substructures of IRDC G28.34 Form in Supported Environments," The Astrophysical Journal, 966, 120, 2024.

Liu, Lang; Chen, Zu-Cheng; Huang, Qing-Guo "Implications for the non-Gaussianity of curvature perturbation from pulsar timing arrays," Physical Review D, 109, L061301, 2024.

Liu, Lang; Wu, You; Chen, Zu-Cheng "Simultaneously probing the sound speed and equation of state of the early Universe with pulsar timing arrays," Journal of Cosmology and Astro-Particle Physics, 2024, 011, 2024.

Liu, Wenhao; Sun, Ming; Voit, G. Mark; Lal, Dharam Vir; Nulsen, Paul; Gaspari, Massimo; Sarazin, Craig; Ehlert, Steven; Zheng, Xianzhong "X-ray cool core remnants heated by strong radio AGN feedback," Monthly Notices of the Royal Astronomical Society, 531, 2063, 2024.

Liu, Xunchuan; Liu, Tie; Zhu, Lei; Garay, Guido; Liu, Hong-Li; Goldsmith, Paul; Evans, Neal; Kim, Kee-Tae; Liu, Sheng-Yuan; Xu, Fengwei; Lu, Xing; Tej, Anandmayee; Mai, Xiaofeng; Bronfman, Leonardo; Li, Shanghuo; Mardones, Diego; Stutz, Amelia; Tatematsu, Ken'Ichi; Wang, Ke; Zhang, Qizhou; Qin, Sheng-Li; Zhou, Jianwen; Luo, Qiuyi; Zhang, Siju; Cheng, Yu; He, Jinhua; Gu, Qilao; Li, Ziyang; Zhang, Zhenying; Zhang, Suinan; Saha, Anindya; Dewangan, Lokesh; Sanhueza, Patricio; Shen, Zhiqiang "The ALMA-QUARKS Survey. I. Survey Description and Data Reduction," Research in Astronomy and Astrophysics, 24, 025009, 2024.

Liu, Yuanqi; An, Tao; Guo, Shaoguang; Zhang, Yingkang; Wang, Ailing; Xu, Zhijun; Khorunzhev, Georgii; Sotnikova, Yulia; Mufakharov, Timur; Mikhailov, Alexander; Mingaliev, Marat "Very long baseline interferometry observations of the high-redshift X-ray-bright blazar SRGE J170245.3+130104," Astronomy and Astrophysics, 685, A111, 2024.

Liu, Yuhua; Takahashi, Satoko; Machida, Masahiro; Tomisaka, Kohji; Girart, Josep Miquel; Ho, Paul T. P.; Nakanishi, Kouichiro; Sato, Asako "Dust Polarization of Prestellar and Protostellar Sources in OMC-3," The Astrophysical Journal, 963, 104, 2024.

Liu, Zhaoxuan; Silverman, John D.; Daddi, Emanuele; Puglisi, Annagrazia; Renzini, Alvio; Kalita, Boris S.; Kartaltepe, Jeyhan S.; Kashino, Daichi; Rodighiero, Giulia; Rujopakarn, Wiphu; Suzuki, Tomoko L.; Tanaka, Takumi S.; Valentino, Francesco; Andika, Irham Taufik; Casey, Caitlin M.; Faisst, Andreas; Franco, Maximilien; Gozaliasl, Ghassem; Gillman, Steven; Hayward, Christopher C.; Koekemoer, Anton M.; Kokorev, Vasily; Lambrides, Erini; Lee, Minju M.; Magdis, Georgios E.; Harish, Santosh; Mccracken, Henry Joy; Rhodes, Jason; Shuntov, Marko; Ding, Xuheng "JWST and ALMA Discern the Assembly of Structural and Obscured Components in a High-redshift Starburst Galaxy," The Astrophysical Journal, 968, 15, 2024.

Loiacono, Federica; Decarli, Roberto; Mignoli, Marco; Farina, Emanuele Paolo; Bañados, Eduardo; Bosman, Sarah; Eilers, Anna-Christina; Schindler, Jan-Torge; Strauss, Michael A.; Vestergaard, Marianne; Wang, Feige; Blecha, Laura; Carilli, Chris L.; Comastri, Andrea; Connor, Thomas; Costa, Tiago; Dotti, Massimo; Fan, Xiaohui; Gilli, Roberto; Jun, Hyunsung D.; Liu, Weizhe; Lupi, Alessandro; Marshall, Madeline A.; Mazzucchelli, Chiara; Meyer, Romain A.; Neeleman, Marcel; Overzier, Roderik; Pensabene, Antonio; Riechers, Dominik A.; Trakhtenbrot, Benny; Trebitsch, Maxime; Venemans, Bram; Walter, Fabian; Yang, Jinyi "A quasar-galaxy merger at $z \sim 6.2$: Black hole mass and quasar properties from the NIRSpec spectrum," Astronomy and Astrophysics, 685, A121, 2024.

Lomaeva, Maria; Saintonge, Amélie; De Looze, Ilse "The recent star formation histories of nearby galaxies on resolved scales," Monthly Notices of the Royal Astronomical Society, 531, 815, 2024.

Long, Deryl E.; Cleeves, L. Ilsedore; Adams, Fred C.; Andrews, Sean; Bergin, Edwin A.; Guzmán, Viviana V.; Huang, Jane; Hughes, A. Meredith; Qi, Chunhua; Schwarz, Kamber; Simon, Jacob B.; Wilner, David "Exploring the Complex Ionization Environment of the Turbulent DM Tau Disk," The Astrophysical Journal, 972, 88, 2024.

López-Cobá, Carlos; Lin, Lihwai; Sánchez, Sebastián F. "Unveiling a Hidden Bar-like Structure in NGC 1087: Kinematic and Photometric Evidence Using MUSE/VLT, ALMA, and JWST," The Astrophysical Journal, 962, 65, 2024.

López-Gallifa, Á.; Rivilla, V. M.; Beltrán, M. T.; Colzi, L.; Mininni, C.; Sánchez-Monge, Á.; Fontani, F.; Viti, S.; Jiménez-Serra, I.; Testi, L.; Cesaroni, R.; Lorenzani, A. "The GUAPOS project - V: The chemical ingredients of a massive stellar protocluster in the making," Monthly Notices of the Royal Astronomical Society, 529, 3244, 2024.

López-Vázquez, J. A.; Lee, Chin-Fei; Fernández-López, M.; Louvet, Fabien; Guerra-Alvarado, O.; Zapata, Luis A. "Multiple Shells Driven by Disk Winds: ALMA Observations in the HH 30 Outflow," The Astrophysical Journal, 962, 28, 2024.

López-Vázquez, J. A.; Lee, Chin-Fei; Shang, Hsien; Cabrit, Sylvie; Krasnopolsky, Ruben; Codella, Claudio; Liu, Chun-Fan; Podio, Linda; Dutta, Somnath; Murphy, A.; Wiseman, Jennifer "Multiple Components of the Outflow in the Protostellar System HH 212: Outer Outflow Shell, Rotating Wind, Shocked Wind, and Jet," The Astrophysical Journal, 977, 126, 2024.

Loru, S.; Ingallinera, A.; Umana, G.; Bordiu, C.; Buemi, C.; Bufano, F.; Cavallaro, F.; Leto, P.; Riggi, S.; Trigilio, C.; Thompson, M. A.; Cotton, W. D.; Goedhart, S.; Anderson, L. D.; Chibueze, J. O. "The MeerKAT view on Galactic supernova remnants," Astronomy and Astrophysics, 692, A193, 2024.

Louvet, F.; Sanhueza, P.; Stutz, A.; Men'Shchikov, A.; Motte, F.; Galván-Madrid, R.; Bontemps, S.; Pouteau, Y.; Ginsburg, A.; Csengeri, T.; Di Francesco, J.; Dell'Ova, P.; González, M.; Didelon, P.; Braine, J.; Cunningham, N.; Thomasson, B.; Lesaffre, P.; Hennebelle, P.; Bonfand, M.; Gusdorf, A.; Álverez-Gutiérrez, R. H.; Nony, T.; Busquet, G.; Olguin, F.; Bronfman, L.; Salinas, J.; Fernandez-Lopez, M.; Moraux, E.; Liu, H. L.; Lu, X.; Huei-Ru, V.; Towner, A.; Valeille-Manet, M.; Brouillet, N.; Herpin, F.; Lefloch, B.; Baug, T.; Maud, L.; López-Sepulcre, A.; Svoboda, B. "ALMA-IMF: XV. Core mass function in the high-mass star formation regime," Astronomy and Astrophysics, 690, A33, 2024.

Lovell, Joshua Bennett; Keating, Garrett K.; Wilner, David J.; Andrews, Sean M.; Macgregor, Meredith; Rahman, Ramisa Akther; Rao, Ramprasad; Williams, Jonathan P. "SMA Detection of an Extreme Millimeter Flare from the Young Class III Star HD 283572," The Astrophysical Journal, 962, L12, 2024.

Lower, Sidney; Narayanan, Desika; Hu, Chia-Yu; Privon, George C. "Cosmic Sands. II. Challenges in Predicting and Measuring High-z Dust Temperatures," The Astrophysical Journal, 965, 123, 2024.

Lu, Anan; Haggard, Daryl; Bureau, Martin; Gensior, Jindra; Jeffreson, Sarah; Robert, Carmelle; Williams, Thomas G.; Liang, Fu-Heng; Choi, Woorak; Davis, Timothy A.; Babic, Sara; Boyce, Hope; Cheung, Benjamin; Drissen, Laurent; Elford, Jacob S.; Liu, Lijie; Martin, Thomas; Rhea, Carter; Rousseau-Nepton, Laurie; Ruffa, Ilaria "WISDOM project XX. - Strong shear tearing molecular clouds apart in NGC 524," Monthly Notices of the Royal Astronomical Society, 531, 3888, 2024.

Lucatelli, Geferson; Beswick, Robert J.; Moldón, Javier; Pérez-Torres, Miguel A.; Conway, John E.; Alberdi, Antxon; Romero-Cañizales, Cristina; Varenius, Eskil; Klöckner, Hans-Rainer; Barcos-Muñoz, Loreto; Bondi, Marco; Garrington, Simon T.; Aalto, Susanne; Baan, Willem A.; Pihlström, Ylva M. "The PARADIGM project I: a multiscale radio morphological analysis of local U/LIRGS," Monthly Notices of the Royal Astronomical Society, 529, 4468, 2024.

Luna-Cervantes, J.; Tramacere, A.; Benítez, E. "Exploring the nature of the jetted hybrid AGNs: PKS 2004-447, 3C 286, and PKS 0440-00 through the SED modeling," Monthly Notices of the Royal Astronomical Society, 532, 3729, 2024.

Lunz, Susanne; Anderson, James M.; Xu, Ming H.; Heinkelmann, Robert; Titov, Oleg; Lestrade, Jean-François; Johnson, Megan C.; Shu, Fengchun; Chen, Wen; Melnikov, Alexey; Mikhailov, Andrei; Mccallum, Jamie; Lopez, Yulia; De Vicente Abad, Pablo; Schuh, Harald "The impact of improved estimates of radio star astrometric models on the alignment of the Gaia bright reference frame to ICRF3," Astronomy and Astrophysics, 689, A134, 2024.

Luo, Gan; Colzi, Laura; Liu, Tie; Bisbas, Thomas G.; Li, Di; Sun, Yichen; Tang, Ningyu "A new measurement of the Galactic $^{12}C/^{13}C$ gradient from sensitive HCO^+ absorption observations," Astronomy and Astrophysics, 690, A372, 2024.

Luo, Gan; Li, Di; Zhang, Zhi-Yu; Bisbas, Thomas G.; Tang, Ningyu; Lin, Lingrui; Sun, Yichen; Zuo, Pei; Zhou, Jing "The CO-dark molecular gas in the cold H I arc," Astronomy and Astrophysics, 685, L12, 2024.

Luo, Tian-Xian; Zhou, Ping; He, Hao-Ning "Investigation of Galactic Supernova Remnants and their Environment in 26.°6 < l < 30.°6, |b| ≤1.°25 Using Radio Surveys," The Astronomical Journal, 168, 42, 2024.

Luque-Escamilla, Pedro L.; Martí, Josep "A Radio-loud Semiregular Variable," The Astrophysical Journal, 973, 127, 2024.

Ma, Rong; Quan, Donghui; Zhou, Yan; Esimbek, Jarken; Li, Dalei; Li, Xiaohu; Zhang, Xia; Tuo, Juan; Feng, Yanan "Investigating Sulfur Chemistry in the HD163296 Disk," Research in Astronomy and Astrophysics, 24, 075017, 2024.

Maeda, Fumiya; Egusa, Fumi; Tsujita, Akiyoshi; Inoue, Shuhei; Kohno, Kotaro; Komugi, Shinya; Ohta, Kouji; Asada, Yoshihisa; Fujimoto, Yusuke; Habe, Asao; Hatsukade, Bunyo; Inoue, Shin; Kaneko, Hiroyuki; Kobayashi, Masato I. N.; Tosaki, Tomoka "Detection of CO(1-0) Emission at the Tips of the Tidal Tail in the Antennae Galaxies," The Astrophysical Journal, 962, 4, 2024.

Maercker, M.; De Beck, E.; Khouri, T.; Vlemmings, W. H. T.; Gustafsson, J.; Olofsson, H.; Tafoya, D.; Kerschbaum, F.; Lindqvist, M. "Probing the dynamical and kinematical structures of detached shells around AGB stars," Astronomy and Astrophysics, 687, A112, 2024.

Magaudda, E.; Stelzer, B.; Osten, R. A.; Pineda, J. S.; Raetz, St.; Mckay, M. "Transitions in magnetic behavior at the substellar boundary," Astronomy and Astrophysics, 687, A95, 2024.

Magnelli, Benjamin; Adscheid, Sylvia; Wang, Tsan-Ming; Ciesla, Laure; Daddi, Emanuele; Delvecchio, Ivan; Elbaz, David; Fudamoto, Yoshinobu; Fukushima, Shuma; Franco, Maximilien; Gómez-Guijarro, Carlos; Gruppioni, Carlotta; Jiménez-Andrade, Eric F.; Liu, Daizhong; Oesch, Pascal; Schinnerer, Eva; Traina, Alberto "A^{3}COSMOS: Measuring the cosmic dust-attenuated star formation rate density at 4 < z < 5," Astronomy and Astrophysics, 688, A55, 2024.

Mai, Xiaofeng; Liu, Tie; Liu, Xunchuan; Zhu, Lei; Garay, Guido; Goldsmith, Paul F.; Juvela, Mika; Liu, Hongli; Mannfors, Emma; Tej, Anandmayee; Sanhueza, Patricio; Li, Shanghuo; Xu, Fengwei; Semadeni, Enrique Vazquez; Jiao, Wenyu; Peng, Yaping; Baug, T.; Yang, Aiyuan; Dewangan, Lokesh; Bronfman, Leonardo; Gómez, Gilberto C.; Palau, Aina; Lee, Chang Won; Qin, Sheng-Li; Tatematsu, Ken'Ichi; Chibueze, James O.; Yang, Dongting; Lu, Xing; Luo, Qiuyi; Gu, Qilao; Issac, Namitha; Zhang, Suinan; Li, Pak-Shing; Zhang, Bo; Tóth, L. Viktor "The ALMA-QUARKS Survey: Detection of Two Extremely Dense Substructures in a Massive Prestellar Core," The Astrophysical Journal, 961, L35, 2024.

Makarov, Valeri V.; Cigan, Phil; Gordon, David; Johnson, Megan C.; Dilullo, Christopher; Lambert, Sébastien "Partial Alignment of Astrometric Position Excursions of International Celestial Reference Frame Quasars with Radio Jet Structures," The Astrophysical Journal, 977, L14, 2024.

Mancera Piña, Pavel E.; Golini, Giulia; Trujillo, Ignacio; Montes, Mireia "Exploring the nature of dark matter with the extreme galaxy AGC 114905," Astronomy and Astrophysics, 689, A344, 2024.

Mandal, Manoj; Saha, Debasish; Pal, Sabyasachi; Manna, Arijit "Multi-wavelength observation of MAXI J1348-630 during the outburst in 2019," Astrophysics and Space Science, 369, 18, 2024.

Manna, Arijit; Pal, Sabyasachi "Detection of possible glycine precursor molecule methylamine towards the hot molecular core G358.93-0.03 MM1," New Astronomy, 109, 102199, 2024.

Manna, Arijit; Pal, Sabyasachi "Detection and prebiotic chemistry of possible glycine precursor molecule methylenimine towards the hot molecular core G10.47+0.03," International Journal of Astrobiology, 23, 14, 2024.

Manna, Arijit; Pal, Sabyasachi "Observation of Complex Organic Molecules Containing Peptide-like Bonds Toward Hot Core G358.93-0.03 MM1," Research in Astronomy and Astrophysics, 24, 075014, 2024.

Manna, Arijit; Pal, Sabyasachi "ALMA detection of hydrogen cyanide in the atmosphere of Saturn," Journal of Astrophysics and Astronomy, 45, 31, 2024.

Manna, Arijit; Pal, Sabyasachi " Confirmation of interstellar phosphine towards asymptotic giant branch star IRC+10216," Journal of Astrophysics and Astronomy, 45, 36, 2024.

Manna, Arijit; Pal, Sabyasachi "Detection and Chemical Modeling of Complex Prebiotic Molecule Cyanamide in the Hot Molecular Core G31.41 + 0.31," ACS Earth and Space Chemistry, 8, 665, 2024.

Manna, Arijit; Pal, Sabyasachi; Baug, Tapas; Mondal, Sougata "Study of Complex Nitrogen and Oxygen-bearing Molecules toward the High-mass Protostar IRAS 18089-1732," Research in Astronomy and Astrophysics, 24, 065008, 2024.

Manna, Arijit; Pal, Sabyasachi; Sinha, Sekhar; Mondal, Sushanta Kumar "ALMA and GMRT Studies of Dust Continuum Emission and Spectral Lines Toward Oort Cloud Comet C/2022 E3 (ZTF)," Research in Astronomy and Astrophysics, 24, 125009, 2024.

Manna, Arijit; Pal, Sabyasachi; Viti, Serena "Detection of antifreeze molecule ethylene glycol in the hot molecular core G358.93-0.03 MM1," Monthly Notices of the Royal Astronomical Society, 533, 1143, 2024.

Manna, Souvik; Roy, Subhashis; Baug, Tapas "Radio Continuum Halos of Seven Nearby Large Galaxies Using uGMRT," The Astrophysical Journal, 976, 216, 2024.

Marchal, Antoine; Martin, Peter G.; Miville-Deschênes, Marc-Antoine; Mcclure-Griffiths, Naomi M.; Lynn, Callum; Bracco, Andrea; Vujeva, Luka "Mapping a Lower Limit on the Mass Fraction of the Cold Neutral Medium Using Fourier-transformed H I 21 cm Emission Line Spectra: Application to the DRAO Deep Field from DHIGLS and the HI4PI Survey," The Astrophysical Journal, 961, 161, 2024.

Marongiu, M.; Pellizzoni, A.; Mulas, S.; Righini, S.; Nesti, R.; Murtas, G.; Egron, E.; Iacolina, M. N.; Melis, A.; Valente, G.; Serra, G.; Guglielmino, S. L.; Zanichelli, A.; Romano, P.; Loru, S.; Bachetti, M.; Bemporad, A.; Buffa, F.; Concu, R.; Deiana, G. L.; Karakotia, C.; Ladu, A.; Maccaferri, A.; Marongiu, P.; Messerotti, M.; Navarrini, A.; Orfei, A.; Ortu, P.; Pili, M.; Pisanu, T.; Pupillo, G.; Saba, A.; Schirru, L.; Tiburzi, C.; Zucca, P. "Study of solar brightness profiles in the 18-26 GHz frequency range with INAF radio telescopes. I. Solar radius," Astronomy and Astrophysics, 684, A122, 2024.

Marongiu, M.; Pellizzoni, A.; Righini, S.; Mulas, S.; Nesti, R.; Burtovoi, A.; Romoli, M.; Serra, G.; Valente, G.; Egron, E.; Murtas, G.; Iacolina, M. N.; Melis, A.; Guglielmino, S. L.; Loru, S.; Zucca, P.; Zanichelli, A.; Bachetti, M.; Bemporad, A.; Buffa, F.; Concu, R.; Deiana, G. L.; Karakotia, C.; Ladu, A.; Maccaferri, A.; Marongiu, P.; Messerotti, M.; Navarrini, A.; Orfei, A.; Ortu, P.; Pili, M.; Pisanu, T.; Pupillo, G.; Romano, P.; Saba, A.; Schirru, L.; Tiburzi, C.; Abbo, L.; Frassati, F.; Giarrusso, M.; Jerse, G.; Landini, F.; Pancrazzi, M.; Russano, G.; Sasso, C.; Susino, R. "Study of solar brightness profiles in the 18-26 GHz frequency range with INAF radio telescopes. II. Evidence of coronal emission," Astronomy and Astrophysics, 684, A123, 2024.

Marshall, Herman L.; Liodakis, Ioannis; Marscher, Alan P.; Di Lalla, Niccolò; Jorstad, Svetlana G.; Kim, Dawoon E.; Middei, Riccardo; Negro, Michela; Omodei, Nicola; Peirson, Abel L.; Perri, Matteo; Puccetti, Simonetta; Laurenti, Marco; Agudo, Iván; Bonnoli, Giacomo; Berdyugin, Andrei V.; Cavazzuti, Elisabetta; Rodriguez Cavero, Nicole; Donnarumma, Immacolata; Di Gesu, Laura; Jormanainen, Jenni; Krawczynski, Henric; Lindfors, Elina; Madjeski, Greg; Marin, Frédéric; Massaro, Francesco; Pacciani, Luigi; Poutanen, Juri; Tavecchio, Fabrizio; Kouch, Pouya M.; Aceituno, Francisco José; Bernardos, Maria I.; Casanova, Víctor; García-Comas, Maya; Agís-González, Beatriz; Husillos, César; Marchini, Alessandro; Sota, Alfredo; Blinov, Dmitry; Bourbah, Ioakeim G.; Kielhmann, Sebastian; Kontopodis, Evangelos; Mandarakas, Nikos; Romanopoulos, Stylianos; Skalidis, Raphael; Vervelaki, Anna; Borman, George A.; Kopatskaya, Evgenia N.; Larionova, Elena G.; Morozova, Daria A.; Savchenko, Sergey S.; Vasilyev, Andrey A.; Zhovtan, Alexey V.; Casadio, Carolina; Escudero, Juan; Kramer, Joana; Myserlis, Ioannis; Trainou, Efthalia; Imazawa, Ryo; Sasada, Mahito; Fukazawa, Yasushi; Kawabata, Koji S.; Uemura, Makoto; Mizuno, Tsunefumi; Nakaoka, Tatsuya; Akitaya, Hiroshi; Masiero, Joseph R.; Mawet, Dimitri; Panopoulou, Georgia V.; Tinyanont, Samaporn; Kagitani, Masato; Kravtsov, Vadim; Sakanoi, Takeshi; Dattolo, Matthew; Gurwell, Mark; Keating, Garrett; Rao, Ramprasad; Cheong, Whee Yeon; Jeong, Hyeon-Woo; Kang, Sincheol; Kim, Sang-Hyun; Lee, Sang-Sung; Angelakis, Emmanouil; Kraus, Alexander; Hales, Antonio; Kameno, Seiji; Kneissl, Ruediger; Messias, Hugo; Nagai, Hiroshi; Antonelli, Lucio A.; Bachetti, Matteo; Baldini, Luca; Baumgartner, Wayne H.; Bellazzini, Ronaldo; Bianchi, Stefano; Bongiorno, Stephen D.; Bonino, Raffaella; Brez, Alessandro; Bucciantini, Niccolò; Capitanio, Fiamma; Castellano, Simone; Chen, Chen-Ting; Ciprini, Stefano; Costa, Enrico; De Rosa, Alessandra; Del Monte, Ettore; Di Marco, Alessandro; Doroshenko, Victor; Dovčiak, Michal; Ehlert, Steven R.; Enoto, Teruaki; Evangelista, Yuri; Fabiani, Sergio; Ferrazzoli, Riccardo; Garcia, Javier A.; Gunji, Shuichi; Hayashida, Kiyoshi; Heyl, Jeremy; Iwakiri, Wataru; Kaaret, Philip; Karas, Vladimir; Kislat, Fabian; Kitaguchi, Takao; Kolodziejczak, Jeffery J.; La Monaca, Fabio; Latronico, Luca; Maldera, Simone; Manfreda, Alberto; Marinucci, Andrea; Matt, Giorgio; Mitsuishi, Ikuyuki; Muleri, Fabio; Ng, C.-Y.; O'Dell, Stephen L.; Oppedisano, Chiara; Papitto, Alessandro; Pavlov, George G.; Pesce-Rollins, Melissa; Petrucci, Pierre-Olivier; Pilia, Maura; Possenti, Andrea; Ramsey, Brian D.; Rankin, John; Ratheesh, Ajay; Roberts, Oliver J.; Romani, Roger W.; Sgrò, Carmelo; Slane, Patrick; Soffitta, Paolo; Spandre, Gloria; Swartz, Douglas A.; Tamagawa, Toru; Taverna, Roberto; Tawara, Yuzuru; Tennant, Allyn F.; Thomas, Nicholas E.; Tombesi, Francesco; Trois, Alessio; Tsygankov, Sergey S.; Turolla, Roberto; Vink, Jacco; Weisskopf, Martin C.; Wu, Kinwah; Xie, Fei; Zane, Silvia "Observations of Low and Intermediate Spectral Peak Blazars with the Imaging X-Ray Polarimetry Explorer," The Astrophysical Journal, 972, 74, 2024.

Martin, Lee R.; Blain, Andrew W.; Díaz-Santos, Tanio; Assef, Roberto J.; Tsai, Chao-Wei; Jun, Hyunsung D.; Eisenhardt, Peter R. M.; Wu, Jingwen;

Vayner, Andrey; Aranda, Román Fernández "CO spectra of the ISM in the Host Galaxies of the most luminous WISE-selected AGNs," Monthly Notices of the Royal Astronomical Society, 534, 978, 2024.
Martinez, N. C.; Paron, S.; Mast, D.; Ortega, M. E.; Petriella, A.; Fariña, C. "Understanding the chemistry of the young stellar object G29.862-0.0044," Boletin de la Asociacion Argentina de Astronomia La Plata Argentina, 65, 173, 2024.
Martinez, N. C.; Paron, S.; Ortega, M. E.; Petriella, A.; Álamo, A.; Brook, M.; Carballo, C.; Heberling, T. "Sulfur-bearing molecules in a sample of early star-forming cores," Astronomy and Astrophysics, 692, A97, 2024.
Martínez-Henares, Antonio; Zhang, Qizhou; Jiménez-Serra, Izaskun; Martín-Pintado, Jesús; Huélamo, Nuria; Prasad, Sirina; Moran, James; Báez-Rubio, Alejandro "Imaging the Jet of MWC 349A with Resolved Radio Recombination Line Emission from ALMA," The Astrophysical Journal, 971, L7, 2024.
Maschmann, Daniel; Lee, Janice C.; Thilker, David A.; Whitmore, Bradley C.; Deger, Sinan; Boquien, Médéric; Chandar, Rupali; Dale, Daniel A.; Wofford, Aida; Hannon, Stephen; Larson, Kirsten L.; Leroy, Adam K.; Schinnerer, Eva; Rosolowsky, Erik; Úbeda, Leonardo; Barnes, Ashley T.; Emsellem, Eric; Grasha, Kathryn; Groves, Brent; Indebetouw, Rémy; Kim, Hwihyun; Klessen, Ralf S.; Kreckel, Kathryn; Levy, Rebecca C.; Pinna, Francesca; Rodríguez, M. Jimena; Tian, Qiushi; Williams, Thomas G. "PHANGS-HST Catalogs for ~100,000 Star Clusters and Compact Associations in 38 Galaxies. I. Observed Properties," The Astrophysical Journal Supplement Series, 273, 14, 2024.
Massingill, Kyle; Mason, Brian; Lacy, Mark; Emonts, Bjorn H. C.; Yoon, Ilsang; Li, Jianrui; Sarazin, Craig "Observational Constraints on Sunyaev-Zeldovich Effect Halos around High-z Quasars," The Astrophysical Journal, 969, 56, 2024.
Matković, Filip; Brajša, Roman; Kuhar, Matej; Benz, Arnold O.; Ludwig, Hans-G.; Selhorst, Caius L.; Skokić, Ivica; Sudar, Davor; Hanslmeier, Arnold "Calculated brightness temperatures of solar structures compared with ALMA and Metsähovi measurements," Astronomische Nachrichten, 345, e20230149, 2024.
Matsuura, Mikako; Boyer, M.; Arendt, Richard G.; Larsson, J.; Fransson, C.; Rest, A.; Ravi, A. P.; Park, S.; Cigan, P.; Temim, T.; Dwek, E.; Barlow, M. J.; Bouchet, P.; Clayton, G.; Chevalier, R.; Danziger, J.; De Buizer, J.; De Looze, I.; De Marchi, G.; Fox, O.; Gall, C.; Gehrz, R. D.; Gomez, H. L.; Indebetouw, R.; Kangas, T.; Kirchschlager, F.; Kirshner, R.; Lundqvist, P.; Marcaide, J. M.; Martí-Vidal, I.; Meixner, M.; Milisavljevic, D.; Orlando, S.; Otsuka, M.; Priestley, F.; Richards, A. M. S.; Schmidt, F.; Staveley-Smith, L.; Smith, Nathan; Spyromilio, J.; Vink, J.; Wang, Lifan; Watson, D.; Wesson, R.; Wheeler, J. C.; Woodward, C. E.; Zanardo, G.; Alp, D.; Burrows, D. "Deep JWST/NIRCam imaging of Supernova 1987A," Monthly Notices of the Royal Astronomical Society, 532, 3625, 2024.
Matthews, A. M.; Kelson, D. D.; Newman, A. B.; Camilo, F.; Condon, J. J.; Cotton, W. D.; Dickinson, M.; Jarrett, T. H.; Lacy, M. "Confirmation of a Substantial Discrepancy between Radio and UV-IR Measures of the Star Formation Rate Density at 0.2 < z < 1.3," The Astrophysical Journal, 966, 194, 2024.
Maureira, M. J.; Pineda, J. E.; Liu, H. B.; Testi, L.; Segura-Cox, D.; Chandler, C.; Johnstone, D.; Caselli, P.; Sabatini, G.; Aikawa, Y.; Bianchi, E.; Codella, C.; Cuello, N.; Fedele, D.; Friesen, R.; Loinard, L.; Podio, L.; Ceccarelli, C.; Sakai, N.; Yamamoto, S. "FAUST: XVIII. Evidence of annular substructure in a very young Class 0 disk," Astronomy and Astrophysics, 689, L5, 2024.
Mayker Chen, Ness; Leroy, Adam K.; Sarbadhicary, Sumit K.; Lopez, Laura A.; Thompson, Todd A.; Barnes, Ashley T.; Emsellem, Eric; Groves, Brent; Chandar, Rupali; Chevance, Mélanie; Chown, Ryan; Dale, Daniel A.; Egorov, Oleg V.; Glover, Simon C. O.; Grasha, Kathryn; Klessen, Ralf S.; Kreckel, Kathryn; Li, Jing; Méndez-Delgado, J. Eduardo; Murphy, Eric J.; Pathak, Debosmita; Schinnerer, Eva; Thilker, David A.; Úbeda, Leonardo; Williams, Thomas G. "Hα Emission and H II Regions at the Locations of Recent Supernovae in Nearby Galaxies," The Astronomical Journal, 168, 5, 2024.
Mccarver, Amaris V.; Maccarone, Thomas J.; Ransom, Scott M.; Clarke, Tracy E.; Giacintucci, Simona; Peters, Wendy M.; Polisensky, Emil; Nyland, Kristina; Gautam, Tasha; Freire, Paulo C. C.; Rangelov, Blagoy "A VLITE Search for Millisecond Pulsars in Globular Clusters: Discovery of a Pulsar in GLIMPSE-C01," The Astrophysical Journal, 969, 30, 2024.
Mcewen, A. E.; Lynch, R. S.; Kaplan, D. L.; Bolda, C.; Sengar, R.; Fonseca, E.; Agoudemos, T.; Boyles, J.; Chatterjee, S.; Cohen, T.; Crawford, F.; Decesar, M. E.; Ehlke, A.; Fernandez, T.; Ferrara, E. C.; Fiore, W.; Gilhaus, N.; Gleiter, M.; Hessels, J. W. T.; Holman, T.; Joy, A.; Kaspi, V.; Kondratiev, V.; Leon, H. D.; Levin, L.; Lorenz, B.; Lorimer, D. R.; Madison, D. R.; Mclaughlin, M. A.; Meyers, B. W.; Parent, E.; Patron, L.; Ransom, S. M.; Ray, P. S.; Roberts, M. S.; Roch, S.; Siemens, X.; Stearns, G.; Swiggum, J. K.; Stairs, I. H.; Stovall, K.; Tan, C. M.; Valentine, N.; Van Leeuwen, J. "The Green Bank 820 MHz Pulsar Survey. I. Survey Overview and Initial Results," The Astrophysical Journal, 969, 118, 2024.
Mcewen, A. E.; Swiggum, J. K.; Kaplan, D. L.; Tan, C. M.; Meyers, B. W.; Fonseca, E.; Agazie, G. Y.; Chawla, P.; Crowter, K.; Decesar, M. E.; Dolch, T.; Dong, F. A.; Fiore, W.; Fonseca, E.; Good, D. C.; Istrate, A. G.; Kaspi, V. M.; Kondratiev, V. I.; Van Leeuwen, J.; Levin, L.; Lewis, E. F.; Lynch, R. S.; Masui, K. W.; Mckee, J. W.; Mclaughlin, M. A.; Al Noori, H.; Parent, E.; Ransom, S. M.; Siemens, X.; Spiewak, R.; Stairs, I. H. "The Green Bank North Celestial Cap Survey. IX. Timing Follow-up for 128 Pulsars," The Astrophysical Journal, 962, 167, 2024.
Mckay, S. J.; Barger, A. J.; Cowie, L. L. "Comparing SCUBA-2 and ALMA Selections of Faint Dusty Star-forming Galaxies in A2744," The Astrophysical Journal, 962, 128, 2024.
Mckinnon, M. M. "An Examination of Polarization Mode Transitions in Pulsar Radio Emission," The Astrophysical Journal, 961, 151, 2024.
Mckinnon, M. M. "Behavior of the Position and Ellipticity Angles at Polarization Mode Transitions in Pulsar Radio Emission," The Astrophysical Journal, 973, 35, 2024.
Mcleod, Anna F.; Klaassen, Pamela D.; Reiter, Megan; Henshaw, Jonathan; Kuiper, Rolf; Ginsburg, Adam "A probable Keplerian disk feeding an optically revealed massive young star," Nature, 625, 55, 2024.
Medeiros, H.; Licandro, J.; Popescu, M.; De León, J.; Simion, N. G.; Alarcon, M. R.; Pinilla-Alonso, N.; Serra-Ricart, M.; Marshall, S. E.; Naidu, S. P.; Virkki, A.; Venditti, F. C. F.; Hickson, D. C.; Zambrano-Marín, L. F.; Taylor, P. A.; Bonsall, A.; Ghigo, F. "Physical properties of five near-Earth asteroids within the NEOROCKS project," Monthly Notices of the Royal Astronomical Society, 535, 3479-3488, 2024.
Medina, S. -N. X.; Dzib, S. A.; Urquhart, J. S.; Yang, A. Y.; Brunthaler, A.; Menten, K. M.; Wyrowski, F.; Cotton, W. D.; Cheema, A.; Dokara, R.; Gong, Y.; Khan, S.; Nguyen, H.; Ortiz-León, G. N.; Rugel, M. R.; Veena, V. S.; Beuther, H.; Csengeri, T.; Pandian, J. D.; Roy, N. "A global view on star formation: The GLOSTAR Galactic plane survey: XI. Radio source catalog IV: 2° < ℓ < 28°, 36° < ℓ < 60° and |b| < 1°," Astronomy and Astrophysics, 689, A196, 2024.
Mengistue, Shimeles Terefe; Marziani, Paola; Del Olmo, Ascensión; Pović, Mirjana; Perea, Jaime; Deconto Machado, Alice "Quasar 3C 47: Extreme Population B jetted source with double-peaked profiles," Astronomy and Astrophysics, 685, A116, 2024.
Mérida, Rosa M.; Gómez-Guijarro, Carlos; Pérez-González, Pablo G.; Sánchez-Blázquez, Patricia; Elbaz, David; Franco, Maximilien; Leroy, Lucas; Magdis, Georgios E.; Magnelli, Benjamin; Xiao, Mengyuan "Measuring the gas reservoirs in $10^8 < M_* < 10^{11}$ $M_\odot$ galaxies at $1 \leq z \leq 3$," Astronomy and Astrophysics, 686, A64, 2024.
Messias, Hugo; Guerrero, Andrea; Nagar, Neil; Regueiro, Jack; Impellizzeri, Violette; Orellana, Gustavo; Vioque, Miguel "H I content at cosmic noon - a millimetre-wavelength perspective," Monthly Notices of the Royal Astronomical Society, 533, 3937, 2024.
Meusinger, Helmut; Mhaskey, Mukul "A comparison of compact, presumably young with extended, evolved radio active galactic nuclei," Astronomy and Astrophysics, 682, A18, 2024.
Miao, Dan; Chen, Xi; Bayandina, Olga S.; Sobolev, Andrej M.; Li, Wan-Jun; Sugiyama, Koichiro "Large-scale Effect of an Accretion Burst in the High-Mass Young Stellar Object G358.93-0.03-MM1," The Astronomical Journal, 167, 63, 2024.
Michail, Joseph M.; Yusef-Zadeh, Farhad; Wardle, Mark; Kunneriath, Devaky; Hora, Joseph L.; Bushouse, Howard; Fazio, Giovanni G.; Markoff, Sera; Smith, Howard A. "Multiwavelength Observations of Sgr A*. II. 2019 July 21 and 26," The Astrophysical Journal, 971, 52, 2024.
Michałowski, Michał J.; Gall, C.; Hjorth, J.; Frayer, D. T.; Tsai, A.-L.; Rowlands, K.; Takeuchi, T. T.; Leśniewska, A.; Behrendt, D.; Bourne, N.; Hughes, D. H.; Koprowski, M. P.; Nadolny, J.; Ryzhov, O.; Solar, M.; Spring, E.; Zavala, J.; Bartczak, P. "The Fate of the Interstellar Medium in Early-type Galaxies. III. The Mechanism of Interstellar Medium Removal and the Quenching of Star Formation," The Astrophysical Journal, 964, 129, 2024.
Michiyama, Tomonari; Inoue, Yoshiyuki; Doi, Akihiro; Yamada, Tomoya; Fukazawa, Yasushi; Kubo, Hidetoshi; Barnier, Samuel "ALMA Confirmation of Millimeter Time Variability in the Gamma-Ray Detected Seyfert Galaxy GRS 1734-292," The Astrophysical Journal, 965, 68, 2024.
Miley, J. M.; Carpenter, J.; Booth, R.; Jennings, J.; Haworth, T. J.; Vioque, M.; Andrews, S.; Wilner, D.; Benisty, M.; Huang, J.; Perez, L.; Guzman, V.; Ricci, L.; Isella, A. "High-resolution ALMA observations of compact discs in the wide-binary system Sz 65 and Sz 66," Astronomy and Astrophysics, 682, A55, 2024.
Minter, Anthony H.; Lockman, Felix J.; Balashev, S. A.; Ford, H. Alyson "Limits on the OH Molecule in the Smith High-velocity Cloud," The Astrophysical Journal, 966, 76, 2024.
Mitsuhashi, Ikki; Harikane, Yuichi; Bauer, Franz E.; Bakx, Tom J. L. C.; Ferrara, Andrea; Fujimoto, Seiji; Hashimoto, Takuya; Inoue, Akio K.; Iwasawa, Kazushi; Nishimura, Yuri; Imanishi, Masatoshi; Ono, Yoshiaki; Saito, Toshiki; Sugahara, Yuma; Umehata, Hideki; Vallini, Livia; Wang, Tao; Zavala, Jorge A. "SERENADE. II. An ALMA Multiband Dust Continuum Analysis of 28 Galaxies at 5 < z < 8 and the Physical Origin of the Dust Temperature Evolution," The Astrophysical Journal, 971, 161, 2024.
Mitsuhashi, Ikki; Tadaki, Ken-Ichi; Ikeda, Ryota; Herrera-Camus, Rodrigo; Aravena, Manuel; De Looze, Ilse; Förster Schreiber, Natascha M.; González-López, Jorge; Spilker, Justin; Assef, Roberto J.; Bouwens, Rychard; Barcos-Munoz, Loreto; Birkin, Jack; Bowler, Rebecca A. A.; Rivera, Gabriela Calistro; Davies, Rebecca; Da Cunha, Elisabete; Díaz-Santos, Tanio; Ferrara, Andrea; Fisher, Deanne B.; Lee, Lilian L.; Li, Juno; Lutz, Dieter; Relaño, Monica; Naab, Thorsten; Palla, Marco; Posses, Ana; Solimano, Manuel; Tacconi, Linda; Übler, Hannah; Van Der Giessen, Stefan; Veilleux, Sylvain "The ALMA-CRISTAL survey: Widespread dust-obscured star formation in typical star-forming galaxies at z = 4-6," Astronomy and Astrophysics, 690, A197, 2024.

Miyoshi, Makoto; Kato, Yoshiaki; Makino, Junichiro "An independent hybrid imaging of Sgr A* from the data in EHT 2017 observations," Monthly Notices of the Royal Astronomical Society, 534, 3237, 2024.
Mizener, Andrew; Pope, Alexandra; Mckinney, Jed; Kamieneski, Patrick; Whitaker, Katherine E.; Battisti, Andrew; Murphy, Eric "First Constraints on the Interstellar Medium Conditions of a Low-mass, Highly Obscured z = 4.27 Main-sequence Galaxy," The Astrophysical Journal, 970, 30, 2024.
Mohana A, Krishna; Gupta, Alok C.; Marscher, Alan P.; Sotnikova, Yulia V.; Jorstad, S. G.; Wiita, Paul J.; Cui, Lang; Aller, Margo F.; Aller, Hugh D.; Kovalev, Yu A.; Kovalev, Y. Y.; Liu, Xiang; Mufakharov, T. V.; Popkov, A. V.; Mingaliev, M. G.; Erkenov, A. K.; Nizhelsky, N. A.; Tsybulev, P. G.; Zhao, Wei; Weaver, Z. R.; Morozova, D. A. "Multi-band cross-correlated radio variability of the Blazar 3C 279," Monthly Notices of the Royal Astronomical Society, 527, 6970, 2024.
Molina, Isabella; Chomiuk, Laura; Linford, Justin D.; Aydi, Elias; Mioduszewski, Amy J.; Mukai, Koji; Sokolovsky, Kirill V.; Strader, Jay; Craig, Peter; Dong, Dillon; Harris, Chelsea E.; Nyamai, Miriam M.; Rupen, Michael P.; Sokoloski, Jennifer L.; Walter, Frederick M.; Weston, Jennifer H. S.; Williams, Montana N. "The symbiotic recurrent nova V745 Sco at radio wavelengths," Monthly Notices of the Royal Astronomical Society, 534, 1227-1246, 2024.
Molyneux, S. J.; Calistro Rivera, G.; De Breuck, C.; Harrison, C. M.; Mainieri, V.; Lundgren, A.; Kakkad, D.; Circosta, C.; Girdhar, A.; Costa, T.; Mullaney, J. R.; Kharb, P.; Arrigoni Battaia, F.; Farina, E. P.; Alexander, D. M.; Ward, S. R.; Silpa, S.; Smit, R. "The Quasar Feedback Survey: characterizing CO excitation in quasar host galaxies," Monthly Notices of the Royal Astronomical Society, 527, 4420, 2024.
Moncada-Cuadri, Blanca M.; Lisenfeld, Ute; Querejeta, Miguel; Mundell, Carole "Radio continuum emission from a tidal dwarf galaxy," Monthly Notices of the Royal Astronomical Society, 532, 496, 2024.
Mondal, Santanu; Das, Mousumi; Rubinur, Khatun; Bansal, Karishma; Nath, Aniket; Taylor, Greg B. "Detection of the Fe K lines from the binary AGN in 4C+37.11," Astronomy and Astrophysics, 691, A279, 2024.
Monsalve, R. A.; Altamirano, C.; Bidula, V.; Bustos, R.; Bye, C. H.; Chiang, H. C.; Díaz, M.; Fernández, B.; Guo, X.; Hendricksen, I.; Hornecker, E.; Lucero, F.; Mani, H.; Mcgee, F.; Mena, F. P.; Pessôa, M.; Prabhakar, G.; Restrepo, O.; Sievers, J. L.; Thyagarajan, N. "Mapper of the IGM spin temperature: instrument overview," Monthly Notices of the Royal Astronomical Society, 530, 4125, 2024.
Monsalve, Raul A.; Bye, Christian H.; Sievers, Jonathan L.; Bidula, Vadym; Bustos, Ricardo; Chiang, H. Cynthia; Guo, Xinze; Hendricksen, Ian; Mcgee, Francis; Mena, F. Patricio; Prabhakar, Garima; Restrepo, Oscar; Thyagarajan, Nithyanandan "Simulating the Detection of the Global 21 cm Signal with MIST for Different Models of the Soil and Beam Directivity," The Astrophysical Journal, 961, 56, 2024.
Montes, Mireia; Trujillo, Ignacio; Karunakaran, Ananthan; Infante-Sainz, Raúl; Spekkens, Kristine; Golini, Giulia; Beasley, Michael; Cebrián, Maria; Chamba, Nushkia; D'Onofrio, Mauro; Kelvin, Lee; Román, Javier "An almost dark galaxy with the mass of the Small Magellanic Cloud," Astronomy and Astrophysics, 681, A15, 2024.
Montoro-Molina, B.; Tafoya, D.; Guerrero, M. A.; Toalá, J. A.; Santamaría, E. "Optical tomography of the born-again ejecta of A 58," Astronomy and Astrophysics, 684, A107, 2024.
Montoya Arroyave, I.; Cicone, C.; Andreani, P.; Weiss, A.; De Breuck, C.; Lundgren, A.; Severgnini, P.; Hagedorn, B.; Rubinur, K.; Baumschlager, B.; Makroleivaditi, E. "A possible relation between global CO excitation and massive molecular outflows in local ULIRGs," Astronomy and Astrophysics, 686, A47, 2024.
Morii, Kaho; Sanhueza, Patricio; Zhang, Qizhou; Nakamura, Fumitaka; Li, Shanghuo; Sabatini, Giovanni; Olguin, Fernando A.; Beuther, Henrik; Tafoya, Daniel; Izumi, Natsuko; Tatematsu, Ken'Ichi; Sakai, Takeshi "The ALMA Survey of 70 μm Dark High-mass Clumps in Early Stages (ASHES). XI. Statistical Study of Early Fragmentation," The Astrophysical Journal, 966, 171, 2024.
Moscadelli, L.; Oliva, A.; Sanna, A.; Surcis, G.; Bayandina, O. "Protostellar Outflows at the EarliesT Stages (POETS): V. The launching mechanism of protostellar winds via water masers," Astronomy and Astrophysics, 690, A81, 2024.
Müller, H. S. P.; Coutens, A.; Jørgensen, J. K.; Margulès, L.; Motiyenko, R. A.; Guillemin, J.-C. "The rotation-tunneling spectrum of 3-hydroxypropenal and confirmation of its detection toward IRAS 16293-2422 B," Astronomy and Astrophysics, 687, A8, 2024.
Müller, Hendrik "Prospects of directly using closure traces for imaging in very long baseline interferometry," Astronomy and Astrophysics, 689, A299, 2024.
Müller, Hendrik; Massa, Paolo; Mus, Alejandro; Kim, Jong-Seo; Perracchione, Emma "Identifying synergies between VLBI and STIX imaging," Astronomy and Astrophysics, 684, A47, 2024.
Müller, Holger S. P.; Ilyushin, Vadim V.; Belloche, Arnaud; Lewen, Frank; Schlemmer, Stephan "Investigation of the rotational spectrum of CH_3 ^{17}OH and its tentative detection toward Sagittarius B2(N)," Astronomy and Astrophysics, 688, A201, 2024.
Muller, S.; Le Gal, R.; Roueff, E.; Black, J. H.; Faure, A.; Guélin, M.; Omont, A.; Gérin, M.; Combes, F.; Aalto, S. "Protonated acetylene in the z = 0.89 molecular absorber toward PKS 1830-211," Astronomy and Astrophysics, 683, A62, 2024.
Muñoz-Romero, Carlos E.; Öberg, Karin I.; Banzatti, Andrea; Pontoppidan, Klaus M.; Andrews, Sean M.; Wilner, David J.; Bergin, Edwin A.; Czekala, Ian; Law, Charles J.; Salyk, Colette; Teague, Richard; Qi, Chunhua; Bergner, Jennifer B.; Huang, Jane; Walsh, Catherine; Guzmán, Viviana V.; Cleeves, L. Ilsedore; Aikawa, Yuri; Bae, Jaehan; Booth, Alice S.; Cataldi, Gianni; Ilee, John D.; Le Gal, Romane; Long, Feng; Loomis, Ryan A.; Menard, François; Liu, Yao "JWST-MIRI Spectroscopy of Warm Molecular Emission and Variability in the AS 209 Disk," The Astrophysical Journal, 964, 36, 2024.
Murgia, M.; Govoni, F.; Vacca, V.; Loi, F.; Feretti, L.; Giovannini, G.; Melis, A.; Concu, R.; Carretti, E.; Poppi, S.; Valente, G.; Bernardi, G.; Bonafede, A.; Boschin, W.; Brienza, M.; Clarke, T. E.; De Gasperin, F.; Enßlin, T. A.; Ferrari, C.; Gastaldello, F.; Girardi, M.; Gregorini, L.; Johnston-Hollitt, M.; Orrù, E.; Parma, P.; Perley, R. A.; Taylor, G. B.; Marchegiani, P. "Sardinia Radio Telescope observations of the Coma cluster," Monthly Notices of the Royal Astronomical Society, 528, 6470, 2024.
Murillo, N. M.; Fuchs, C. M.; Harsono, D.; Sakai, N.; Hacar, A.; Johnstone, D.; Mignon-Risse, R.; Zeng, S.; Hsieh, T. H.; Yang, Y. L.; Tobin, J. J.; Persson, M. V. "The factors that influence protostellar multiplicity: I. Gas temperature, density, and mass in Perseus with Nobeyama," Astronomy and Astrophysics, 689, A267, 2024.
Murphy, Geoff G.; Bull, Philip; Santos, Mario G.; Abdurashidova, Zara; Adams, Tyrone; Aguirre, James E.; Alexander, Paul; Ali, Zaki S.; Baartman, Rushelle; Balfour, Yanga; Beardsley, Adam P.; Bernardi, Gianni; Billings, Tashalee S.; Bowman, Judd D.; Bradley, Richard F.; Burba, Jacob; Cain, Christopher; Carey, Steven; Carilli, Chris L.; Cheng, Carina; Deboer, David R.; Acedo, Eloy De Lera; Dexter, Matt; Dillon, Joshua S.; Eksteen, Nico; Ely, John; Ewall-Wice, Aaron; Fagnoni, Nicolas; Fritz, Randall; Furlanetto, Steven R.; Gale-Sides, Kingsley; Glendenning, Brian; Gorthi, Deepthi; Greig, Bradley; Grobbelaar, Jasper; Halday, Ziyaad; Hazelton, Bryna J.; Hewitt, Jacqueline N.; Hickish, Jack; Jacobs, Daniel C.; Julius, Austin; Kariseb, Maccalvin; Kern, Nicholas S.; Kerrigan, Joshua; Kittiwisit, Piyanat; Kohn, Saul A.; Kolopanis, Matthew; Lanman, Adam; Plante, Paul La; Liu, Adrian; Loots, Anita; Macmahon, David Harold Edward; Malan, Lourence; Malgas, Cresshim; Malgas, Keith; Marero, Bradley; Martinot, Zachary E.; Mesinger, Andrei; Molewa, Mathakane; Morales, Miguel F.; Mosiane, Tshegofalang; Murray, Steven G.; Neben, Abraham R.; Nikolic, Bojan; Nuwegeld, Hans; Parsons, Aaron R.; Patra, Nipanjana; Pieterse, Samantha; Razavi-Ghods, Nima; Robnett, James; Rosie, Kathryn; Sims, Peter; Sipple, Jackson; Smith, Craig; Swarts, Hilton; Thyagarajan, Nithyanandan; Van Wyngaarden, Pieter; Williams, Peter K. G.; Zheng, Haoxuan "Bayesian estimation of cross-coupling and reflection systematics in 21cm array visibility data," Monthly Notices of the Royal Astronomical Society, 534, 2653, 2024.
Murthy, Suma; Morganti, Raffaella; Oosterloo, Tom; Schulz, Robert; Paragi, Zsolt "Turbulent circumnuclear disc and cold gas outflow in the newborn radio source 4C 31.04," Astronomy and Astrophysics, 688, A84, 2024.
Mus, Alejandro; Müller, Hendrik; Lobanov, Andrei "Swarm intelligence for full Stokes dynamic imaging reconstruction of interferometric data," Astronomy and Astrophysics, 688, A100, 2024.
Mus, Alejandro; Müller, Hendrik; Martí-Vidal, Ivan; Lobanov, Andrei "Using multiobjective optimization to reconstruct interferometric data. II. Polarimetry and time dynamics," Astronomy and Astrophysics, 684, A55, 2024.
Mutie, Isaac M.; Williams-Baldwin, David; Beswick, Robert J.; Bempong-Manful, Emmanuel K.; Baki, Paul O.; Muxlow, Tom W. B.; Gallimore, Jack F.; Aalto, Susanne E.; Dullo, Bililign T.; Baldi, Ranieri D. "Radio jets in NGC 1068 with e-MERLIN and VLA: structure and morphology," Monthly Notices of the Royal Astronomical Society, 527, 11756, 2024.
Nagashima, Yuzuki; Saito, Toshiki; Ikarashi, Soh; Takano, Shuro; Nakanishi, Kouichiro; Harada, Nanase; Nakajima, Taku; Taniguchi, Akio; Tosaki, Tomoka; Bamba, Kazuharu "Measuring 60 pc-scale Star Formation Rate of the Nearby Seyfert Galaxy NGC 1068 with ALMA, HST, VLT/MUSE, and VLA," The Astrophysical Journal, 974, 243, 2024.
Nandi, Sumana; Kharb, Preeti; Caproni, Anderson; Roy, Rupak; Sebastian, Biny "A Relook at the Black Hole Binary Candidate J1328+2752 with VLBI," The Astrophysical Journal, 965, 9, 2024.
Narang, Mayank; Manoj, P.; Tyagi, Himanshu; Watson, Dan M.; Megeath, S. Thomas; Federman, Samuel; Rubinstein, Adam E.; Gutermuth, Robert; Caratti O Garatti, Alessio; Beuther, Henrik; Bourke, Tyler L.; Van Dishoeck, Ewine F.; Evans, Neal J.; Anglada, Guillem; Osorio, Mayra; Stanke, Thomas; Muzerolle, James; Looney, Leslie W.; Yang, Yao-Lun; Klaassen, Pamela; Karnath, Nicole; Atnagulov, Prabhani; Brunken, Nashanty; Fischer, William J.; Furlan, Elise; Green, Joel; Habel, Nolan; Hartmann, Lee; Linz, Hendrik; Nazari, Pooneh; Pokhrel, Riwaj; Rahatgaonkar, Rohan; Rocha, Will R. M.; Sheehan, Patrick; Slavicinska, Katerina; Stutz, Amelia M.; Tobin, John J.; Tychoniec, Lukasz; Wolk, Scott "Discovery of a Collimated Jet from the Low-luminosity Protostar IRAS 16253-2429 in a Quiescent Accretion Phase with the JWST," The Astrophysical Journal, 962, L16, 2024.
Narita, Kanako; Sakamoto, Seiichi; Koda, Jin; Yoshimura, Yuki; Kohno, Kotaro "Physical and Chemical Properties of Galactic Molecular Gas toward QSO J1851+0035," The Astrophysical Journal, 969, 102, 2024.
Nasirzadeh, M. R.; Tabatabaei, F. S.; Beck, R.; Heesen, V.; Howaida, P.; Reina-Campos, M.; Paladino, R.; Dettmar, R.-J.; Chyży, K. T. "Radio-FIR correlation: A probe into cosmic ray propagation in the nearby galaxy IC 342," Astronomy and Astrophysics, 691, A199, 2024.

Nazari, P.; Cheung, J. S. Y.; Asensio, J. Ferrer; Murillo, N. M.; Van Dishoeck, E. F.; Jørgensen, J. K.; Bourke, T. L.; Chuang, K.-J.; Drozdovskaya, M. N.; Fedoseev, G.; Garrod, R. T.; Ioppolo, S.; Linnartz, H.; Mcguire, B. A.; Müller, H. S. P.; Qasim, D.; Wampfler, S. F. "A deep search for large complex organic species toward IRAS16293-2422 B at 3 mm with ALMA," Astronomy and Astrophysics, 686, A59, 2024.

Nazari, P.; Tabone, B.; Ahmadi, A.; Cabrit, S.; Van Dishoeck, E. F.; Codella, C.; Ferreira, J.; Podio, L.; Tychoniec, Ł.; Van Gelder, M. L. "ALMA view of the L1448-mm protostellar system on disk scales: CH_3OH and $H^{13}CN$ as new disk wind tracers," Astronomy and Astrophysics, 686, A201, 2024.

Nederlander, Ava; Plunkett, Adele; Hales, Antonio; Kóspál, Ágnes; White, Jacob A.; Johnstone, Makoto A.; Kun, Mária; Ábrahám, Péter; Hughes, Anna G. "An Outbursting Protostar: The Environment of L1251 VLA 6," The Astrophysical Journal, 964, 49, 2024.

Neufeld, David A.; Manoj, P.; Tyagi, Himanshu; Narang, Mayank; Watson, Dan M.; Megeath, S. Thomas; Van Dishoeck, Ewine F.; Gutermuth, Robert A.; Stanke, Thomas; Yang, Yao-Lun; Rubinstein, Adam E.; Anglada, Guillem; Beuther, Henrik; Caratti O Garatti, Alessio; Evans, Neal J.; Federman, Samuel; Fischer, William J.; Green, Joel; Klaassen, Pamela; Looney, Leslie W.; Osorio, Mayra; Nazari, Pooneh; Tobin, John J.; Tychoniec, Łukasz; Wolk, Scott "JWST/MIRI Detection of Suprathermal OH Rotational Emissions: Probing the Dissociation of the Water by Lyα Photons near the Protostar HOPS 370," The Astrophysical Journal, 966, L22, 2024.

Neumann, Lukas; Bigiel, Frank; Barnes, Ashley T.; Gallagher, Molly J.; Leroy, Adam; Usero, Antonio; Rosolowsky, Erik; Bešlić, Ivana; Boquien, Médéric; Cao, Yixian; Chevance, Mélanie; Colombo, Dario; Dale, Daniel A.; Eibensteiner, Cosima; Grasha, Kathryn; Henshaw, Jonathan D.; Jiménez-Donaire, María J.; Meidt, Sharon; Menon, Shyam H.; Murphy, Eric J.; Pan, Hsi-An; Querejeta, Miguel; Saito, Toshiki; Schinnerer, Eva; Stuber, Sophia K.; Teng, Yu-Hsuan; Williams, Thomas G. "A 260 pc resolution ALMA map of HCN(1-0) in the galaxy NGC 4321," Astronomy and Astrophysics, 691, A121, 2024.

Nguyen, Quynh Lan; Hu, Yue; Lazarian, Alex "Exploring Magnetic Fields in a Merging Galaxy: Comparing Polarization and Velocity Gradient in the Centaurus Galaxy," The Astrophysical Journal, 977, 121, 2024.

Nhan, Bang D.; De Pree, Christopher G.; Iverson, Matt; Gregory, Brenne; Dueri, Daniel; Beasley, Anthony; Schepis, Brian "Toward Spectrum Coexistence: First Demonstration of the Effectiveness of Boresight Avoidance between the NRAO Green Bank Telescope and Starlink Satellites," The Astrophysical Journal, 971, L49, 2024.

Nhung, Pham T.; Hoai, Do T.; Darriulat, Pierre; Tuan-Anh, Pham; Diep, Pham N.; Ngoc, Nguyen B.; Thai, Tran T. "EP Aquarii: A New Picture of the Circumstellar Envelope," Research in Astronomy and Astrophysics, 24, 035009, 2024.

Nianias, James; Lim, Jeremy; Yeung, Michael "On the Evidence for Molecular Outflows in High-redshift Dusty Star-forming Galaxies," The Astrophysical Journal, 963, 19, 2024.

Nikolic, Bojan; Carilli, Christopher L.; Thyagarajan, Nithyanandan; Torino, Laura; Iriso, Ubaldo "Two-dimensional synchrotron beam characterization from a single interferogram," Physical Review Special Topics Accelerators and Beams, 27, 112802, 2024.

Nilipour, Andy; Ott, Juergen; Meier, David S.; Svoboda, Brian; Sormani, Mattia C.; Ginsburg, Adam; Gramze, Savannah R.; Butterfield, Natalie O.; Klessen, Ralf S. "Turbulent Pressure Heats Gas and Suppresses Star Formation in Galactic Bar Molecular Clouds," The Astrophysical Journal, 977, 37, 2024.

Nishimura, Y.; Aalto, S.; Gorski, M. D.; König, S.; Onishi, K.; Wethers, C.; Yang, C.; Barcos-Muñoz, L.; Combes, F.; Díaz-Santos, T.; Gallagher, J. S.; García-Burillo, S.; González-Alfonso, E.; Greve, T. R.; Harada, N.; Henkel, C.; Imanishi, M.; Kohno, K.; Linden, S. T.; Mangum, J. G.; Martín, S.; Muller, S.; Privon, G. C.; Ricci, C.; Stanley, F.; Van Der Werf, P. P.; Viti, S. "CONquest. II. Spatially and spectrally resolved HCN/HCO^+ line ratios in local luminous and ultraluminous infrared galaxies," Astronomy and Astrophysics, 686, A48, 2024.

Njeri, Ann; Deane, Roger P.; Radcliffe, J. F.; Beswick, R. J.; Thomson, A. P.; Muxlow, T. W. B.; Garrett, M. A.; Harrison, C. M. "The VLBA CANDELS GOODS-North Survey. II - Wide-field source catalogue comparison between the VLBA, EVN, e-MERLIN, and VLA," Monthly Notices of the Royal Astronomical Society, 528, 6141, 2024.

Noble, J. A.; Fraser, H. J.; Smith, Z. L.; Dartois, E.; Boogert, A. C. A.; Cuppen, H. M.; Dickinson, H. J.; Dulieu, F.; Egami, E.; Erkal, J.; Giuliano, B. M.; Husquinet, B.; Lamberts, T.; Maté, B.; Mcclure, M. K.; Palumbo, M. E.; Shimonishi, T.; Sun, F.; Bergner, J. B.; Brown, W. A.; Caselli, P.; Congiu, E.; Drozdovskaya, M. N.; Herrero, V. J.; Ioppolo, S.; Jimenez-Serra, I.; Linnartz, H.; Melnick, G. J.; Mcguire, B. A.; Oberg, K. I.; Perotti, G.; Qasim, D.; Rocha, W. R. M.; Urso, R. G. "Detection of the elusive dangling OH ice features at 2.7 μm in Chamaeleon I with JWST NIRCam," Nature Astronomy, 8, 1169-1180, 2024.

Nonhebel, M.; Barnes, A. T.; Immer, K.; Armijos-Abendaño, J.; Bally, J.; Battersby, C.; Burton, M. G.; Butterfield, N.; Colzi, L.; García, P.; Ginsburg, A.; Henshaw, J. D.; Hu, Y.; Jiménez-Serra, I.; Klessen, R. S.; Kruijssen, J. M. D.; Liang, F.-H.; Longmore, S. N.; Lu, X.; Martín, S.; Mills, E. A. C.; Nogueras-Lara, F.; Petkova, M. A.; Pineda, J. E.; Rivilla, V. M.; Sánchez-Monge, Á.; Santa-Maria, M. G.; Smith, H. A.; Sofue, Y.; Sormani, M. C.; Tolls, V.; Walker, D. L.; Wallace, J.; Wang, Q. D.; Williams, G. M.; Xu, F.-W. "Disruption of a massive molecular cloud by a supernova in the Galactic Centre: Initial results from the ACES project," Astronomy and Astrophysics, 691, A70, 2024.

Nony, T.; Galván-Madrid, R.; Brouillet, N.; Suárez, G.; Louvet, F.; De Pree, C. G.; Juárez-Gama, M.; Ginsburg, A.; Immer, K.; Lin, Y.; Liu, H. B.; Román-Zúñiga, C. G.; Zhang, Q. "Core to ultracompact HII region evolution in the W49A massive protocluster," Astronomy and Astrophysics, 687, A84, 2024.

Oayda, Oliver T.; Mittal, Vasudev; Lewis, Geraint F.; Murphy, Tara "A Bayesian approach to the cosmic dipole in radio galaxy surveys: joint analysis of NVSS & RACS," Monthly Notices of the Royal Astronomical Society, 531, 4545, 2024.

Obonyo, W. O.; Hoare, M. G.; Lumsden, S. L.; Thompson, M. A.; Chibueze, J. O.; Cotton, W. D.; Rigby, A.; Leto, P.; Trigilio, C.; Williams, G. M. "Non-thermal radio emission from massive protostars in the SARAO MeerKAT Galactic Plane Survey," Monthly Notices of the Royal Astronomical Society, 533, 3862, 2024.

O'Brien, Rosalia; Jansen, Rolf A.; Grogin, Norman A.; Cohen, Seth H.; Smith, Brent M.; Silver, Ross M.; Maksym, W. P.; Windhorst, Rogier A.; Carleton, Timothy; Koekemoer, Anton M.; Hathi, Nimish P.; Willmer, Christopher N. A.; Frye, Brenda L.; Alpaslan, M.; Ashby, M. L. N.; Ashcraft, T. A.; Bonoli, S.; Brisken, W.; Cappelluti, N.; Civano, F.; Conselice, C. J.; Dhillon, V. S.; Driver, S. P.; Duncan, K. J.; Dupke, R.; Elvis, M.; Fazio, G. G.; Finkelstein, S. L.; Gim, H. B.; Griffiths, A.; Hammel, H. B.; Hyun, M.; Im, M.; Jones, V. R.; Kim, D.; Ladjelate, B.; Larson, R. L.; Malhotra, S.; Marshall, M. A.; Milam, S. N.; Pierel, J. D. R.; Rhoads, J. E.; Rodney, S. A.; Röttgering, H. J. A.; Rutkowski, M. J.; Ryan, R. E.; Ward, M. J.; White, C. W.; Van Weeren, R. J.; Zhao, X.; Summers, J.; D'Silva, J. C. J.; Ortiz, R.; Robotham, A. S. G.; Coe, D.; Nonino, M.; Pirzkal, N.; Yan, H.; Acharya, T. "TREASUREHUNT: Transients and Variability Discovered with HST in the JWST North Ecliptic Pole Time-domain Field," The Astrophysical Journal Supplement Series, 272, 19, 2024.

Oei, Martijn S. S. L.; Hardcastle, Martin J.; Timmerman, Roland; Gast, Aivin R. D. J. G. I. B.; Botteon, Andrea; Rodriguez, Antonio C.; Stern, Daniel; Calistro Rivera, Gabriela; Van Weeren, Reinout J.; Röttgering, Huub J. A.; Intema, Huib T.; De Gasperin, Francesco; Djorgovski, S. G. "Black hole jets on the scale of the cosmic web," Nature, 633, 537, 2024.

Ogle, Patrick M.; López, Iván E.; Reynaldi, Victoria; Togi, Aditya; Rich, R. Michael; Román, Javier; Caceres, Osmin; Li, Zhuofu (Chester); Donnelly, Grant; Smith, J. D. T.; Appleton, Philip N.; Lanz, Lauranne "Radio Jet Feedback on the Inner Disk of Virgo Spiral Galaxy Messier 58," The Astrophysical Journal, 962, 196, 2024.

Ohnaka, K.; Wong, K. T.; Weigelt, G.; Hofmann, K.-H. "Contemporaneous high-angular-resolution imaging of the AGB star W Hya in vibrationally excited H_2O lines and visible polarized light with ALMA and VLT/SPHERE-ZIMPOL," Astronomy and Astrophysics, 691, L14, 2024.

Okoda, Yuki; Oya, Yoko; Sakai, Nami; Watanabe, Yoshimasa; López-Sepulcre, Ana; Oyama, Takahiro; Zeng, Shaoshan; Yamamoto, Satoshi "CH_3OH and Its Deuterated Species in the Disk/Envelope System of the Low-mass Protostellar Source B335," The Astrophysical Journal, 970, 28, 2024.

Olvera, Alejandro J.; Borthakur, Sanchayeeta; Padave, Mansi; Heckman, Timothy; Gim, Hansung B.; Koplitz, Brad; Dupuis, Christopher; Momjian, Emmanuel; Jansen, Rolf A. "DIISC-IV. DIISCovery of Anomalously Low Metallicity H II Regions in NGC 99: Indirect Evidence of Gas Inflows," The Astrophysical Journal, 976, 205, 2024.

Omoruyi, Osase; Tremblay, Grant R.; Combes, Francoise; Davis, Timothy A.; Gladders, Michael D.; Vikhlinin, Alexey; Nulsen, Paul; Kharb, Preeti; Baum, Stefi A.; O'Dea, Christopher P.; Sharon, Keren; Terrazas, Bryan A.; Nevin, Rebecca; Schechter, Aimee L.; Zuhone, John A.; Mcdonald, Michael; Dahle, Hakon; Bayliss, Matthew B.; Connor, Thomas; Florian, Michael; Rigby, Jane R.; Vaddi, Sravani "'Beads-on-a-string' Star Formation Tied to One of the Most Powerful Active Galactic Nucleus Outbursts Observed in a Cool-core Galaxy Cluster," The Astrophysical Journal, 963, 1, 2024.

Omura, Mitsuki; Tokuda, Kazuki; Machida, Masahiro N. "Revealing Multiple Nested Molecular Outflows with Rotating Signatures in HH270mms1-A with ALMA," The Astrophysical Journal, 963, 72, 2024.

Oosterloo, Tom; Morganti, Raffaella; Murthy, Suma "Closing the feedback-feeding loop of the radio galaxy 3C 84," Nature Astronomy, 8, 256, 2024.

Ordóñez-Toro, Jazmín; Dzib, Sergio A.; Loinard, Laurent; Ortiz-León, Gisela; Kounkel, Marina A.; Masqué, Josep M.; Medina, S. -N. X.; Galli, Phillip A. B.; Dupuy, Trent J.; Rodríguez, Luis F.; Quiroga-Nuñez, Luis H. "Dynamical Mass of the Ophiuchus Intermediate-mass Stellar System S1 with DYNAMO-VLBA," The Astronomical Journal, 167, 108, 2024.

Orienti, M.; Siemiginowska, A.; D'Ammando, F.; Migliori, G. "A high-resolution radio morphology and polarization of the kiloparsec-scale X-ray jet of PKS 1127-145," Astronomy and Astrophysics, 687, A287, 2024.

Ortega, M. E.; Petriella, A.; Paron, S. "A comprehensive analysis towards the Fermi-LAT source 4FGL J1846.9-0227: jets of a proto-planetary nebula producing γ-rays?," Monthly Notices of the Royal Astronomical Society, 532, 4446, 2024.

Ortiz Ceballos, Kevin N.; Cendes, Yvette; Berger, Edo; Williams, Peter K. G. "A Volume-limited Radio Search for Magnetic Activity in 140 Exoplanets with the Very Large Array," The Astronomical Journal, 168, 127, 2024.

Oyarzún, Grecco A.; Rafelski, Marc; Kanekar, Nissim; Prochaska, J. Xavier; Neeleman, Marcel; Jorgenson, Regina A. "A Survey of Lyα Emission around Damped Lyα Absorbers at $z \approx 2$ with the Keck Cosmic Web Imager," The Astrophysical Journal, 962, 72, 2024.

Pabst, C. H. M.; Goicoechea, J. R.; Cuadrado, S.; Salas, P.; Tielens, A. G. G. M.; Marcelino, N. "Multiline observations of hydrogen, helium, and carbon radio-recombination lines toward Orion A: A detailed dynamical study and direct determination of physical conditions," Astronomy and Astrophysics, 688, A7, 2024.
Padave, Mansi; Borthakur, Sanchayeeta; Gim, Hansung B.; Thilker, David; Jansen, Rolf A.; Monkiewicz, Jacqueline; Kennicutt, Robert C.; Kauffmann, Guinevere; Fox, Andrew J.; Momjian, Emmanuel; Heckman, Timothy "DIISC-III. Signatures of Stellar Disk Growth in Nearby Galaxies," The Astrophysical Journal, 960, 24, 2024.
Padmanabh, P. V.; Ransom, S. M.; Freire, P. C. C.; Ridolfi, A.; Taylor, J. D.; Choza, C.; Clark, C. J.; Abbate, F.; Bailes, M.; Barr, E. D.; Buchner, S.; Burgay, M.; Decesar, M. E.; Chen, W.; Corongiu, A.; Champion, D. J.; Dutta, A.; Geyer, M.; Hessels, J. W. T.; Kramer, M.; Possenti, A.; Stairs, I. H.; Stappers, B. W.; Venkatraman Krishnan, V.; Vleeschower, L.; Zhang, L. "Discovery and timing of ten new millisecond pulsars in the globular cluster Terzan 5," Astronomy and Astrophysics, 686, A166, 2024.
Padmanabhan, Hamsa; Loeb, Abraham "Constraints on supermassive black hole binaries from JWST and NANOGrav," Astronomy and Astrophysics, 684, L15, 2024.
Paine, S.; Hawkins, T.; Lorimer, D. R.; Stanley, J.; Kania, J.; Crawford, F.; Fairfield, N. "A search for millisecond radio bursts from Messier 82," Monthly Notices of the Royal Astronomical Society, 528, 6340, 2024.
Pak, Mina; Baek, Junhyun; Lee, Joon Hyeop; Chung, Aeree; Owers, Matt; Jeong, Hyunjin; Sung, Eon-Chang; Sheen, Yun-Kyeong "Discovery of a Large-scale H I Plume in the NGC 7194 Group," The Astrophysical Journal, 961, L11, 2024.
Paliya, Vaidehi S.; Saikia, D. J.; Domínguez, Alberto; Stalin, C. S. "Radio Morphology of Gamma-Ray Sources: Double-lobed Radio Sources," The Astrophysical Journal, 976, 120, 2024.
Pan, Hsi-An; Lin, Lihwai; Ellison, Sara L.; Thorp, Mallory D.; Sánchez, Sebastián F.; Bluck, Asa F. L.; Belfiore, Francesco; Piotrowska, Joanna M.; Scudder, Jillian M.; Baker, William M. "The ALMaQUEST Survey. XIII. Understanding Radial Trends in Star Formation Quenching via the Relative Roles of Gas Availability and Star Formation Efficiency," The Astrophysical Journal, 964, 120, 2024.
Paneque-Carreño, T.; Izquierdo, A. F.; Teague, R.; Miotello, A.; Bergin, E. A.; Loomis, R.; Van Dishoeck, E. F. "High turbulence in the IM Lup protoplanetary disk. Direct observational constraints from CN and C_2H emission," Astronomy and Astrophysics, 684, A174, 2024.
Panurach, Teresa; Dage, Kristen C.; Urquhart, Ryan; Plotkin, Richard M.; Paul, Jeremiah D.; Bahramian, Arash; Brumback, Mckinley C.; Galvin, Timothy J.; Molina, Isabella; Miller-Jones, James C. A.; Saikia, Payaswini "Do Neutron Star Ultraluminous X-Ray Sources Masquerade as Intermediate-mass Black Holes in Radio and X-Ray?," The Astrophysical Journal, 977, 211, 2024.
Paraschos, G. F.; Debbrecht, L. C.; Kramer, J. A.; Traianou, E.; Liodakis, I.; Krichbaum, T. P.; Kim, J.-Y.; Janssen, M.; Nair, D. G.; Savolainen, T.; Ros, E.; Bach, U.; Hodgson, J. A.; Lisakov, M.; Macdonald, N. R.; Zensus, J. A. "Evidence of a toroidal magnetic field in the core of 3C 84," Astronomy and Astrophysics, 686, L5, 2024.
Paraschos, G. F.; Kim, J.-Y.; Wielgus, M.; Röder, J.; Krichbaum, T. P.; Ros, E.; Agudo, I.; Myserlis, I.; Moscibrodzka, M.; Traianou, E.; Zensus, J. A.; Blackburn, L.; Chan, C.-K.; Issaoun, S.; Janssen, M.; Johnson, M. D.; Fish, V. L.; Akiyama, K.; Alberdi, A.; Alef, W.; Algaba, J. C.; Anantua, R.; Asada, K.; Azulay, R.; Bach, U.; Baczko, A.-K.; Ball, D.; Baloković, M.; Barrett, J.; Bauböck, M.; Benson, B. A.; Bintley, D.; Blundell, R.; Bouman, K. L.; Bower, G. C.; Boyce, H.; Bremer, M.; Brinkerink, C. D.; Brissenden, R.; Britzen, S.; Broderick, A. E.; Broguiere, D.; Bronzwaer, T.; Bustamante, S.; Byun, D.-Y.; Carlstrom, J. E.; Ceccobello, C.; Chael, A.; Chang, D. O.; Chatterjee, K.; Chatterjee, S.; Chen, M. T.; Chen, Y.; Cheng, X.; Cho, I.; Christian, P.; Conroy, N. S.; Conway, J. E.; Cordes, J. M.; Crawford, T. M.; Crew, G. B.; Cruz-Osorio, A.; Cui, Y.; Dahale, R.; Davelaar, J.; De Laurentis, M.; Deane, R.; Dempsey, J.; Desvignes, G.; Dexter, J.; Dhruv, V.; Doeleman, S. S.; Dougal, S.; Dzib, S. A.; Eatough, R. P.; Emami, R.; Falcke, H.; Farah, J.; Fomalont, E.; Ford, H. A.; Foschi, M.; Fraga-Encinas, R.; Freeman, W. T.; Friberg, P.; Fromm, C. M.; Fuentes, A.; Galison, P.; Gammie, C. F.; García, R.; Gentaz, O.; Georgiev, B.; Goddi, C.; Gold, R.; Gómez-Ruiz, A. I.; Gómez, J. L.; Gu, M.; Gurwell, M.; Hada, K.; Haggard, D.; Haworth, K.; Hecht, M. H.; Hesper, R.; Heumann, D.; Ho, L. C.; Ho, P.; Honma, M.; Huang, C. L.; Huang, L.; Hughes, D. H.; Ikeda, S.; Impellizzeri, C. M. V.; Inoue, M.; James, D. J.; Jannuzi, B. T.; Jeter, B.; Jaing, W.; Jiménez-Rosales, A.; Jorstad, S.; Joshi, A. V.; Jung, T.; Karami, M.; Karuppusamy, R.; Kawashima, T.; Keating, G. K.; Kettenis, M.; Kim, D.-J.; Kim, J.; Kim, J.; Kino, M.; Koay, J. Y.; Kocherlakota, P.; Kofuji, Y.; Koch, P. M.; Koyama, S.; Kramer, C.; Kramer, J. A.; Kramer, M.; Kuo, C.-Y.; La Bella, N.; Lauer, T. R.; Lee, D.; Lee, S.-S.; Leung, P. K.; Levis, A.; Li, Z.; Lico, R.; Lindahl, G.; Lindqvist, M.; Lisakov, M.; Liu, J.; Liu, K.; Liuzzo, E.; Lo, W.-P.; Lobanov, A. P.; Loinard, L.; Lonsdale, C. J.; Lowitz, A. E.; Lu, R.-S.; Macdonald, N. R.; Mao, J.; Marchili, N.; Markoff, S.; Marrone, D. P.; Marscher, A. P.; Martí-Vidal, I.; Matsushita, S.; Matthews, L. D.; Medeiros, L.; Menten, K. M.; Michalik, D.; Mizuno, I.; Mizuno, Y.; Moran, J. M.; Moriyama, K.; Mulaudzi, W.; Müller, C.; Müller, H.; Mus, A.; Musoke, G.; Nadolski, A.; Nagai, H.; Nagar, N. M.; Nakamura, M.; Narayanan, G.; Natarajan, I.; Nathanail, A.; Navarro Fuentes, S.; Neilsen, J.; Neri, R.; Ni, C.; Noutsos, A.; Nowak, M. A.; Oh, J.; Okino, H.; Olivares, H.; Ortiz-León, G. N.; Oyama, T.; Özel, F.; Palumbo, D. C. M.; Park, J.; Parsons, H.; Patel, N.; Pen, U.-L.; Piétu, V.; Plambeck, R.; Popstefanija, A.; Porth, O.; Pötzl, F. M.; Prather, B.; Preciado-López, J. A.; Psaltis, D.; Pu, H.-Y.; Ramakrishnan, V.; Rao, R.; Rawlings, M. G.; Raymond, A. W.; Rezzolla, L.; Ricarte, A.; Ripperda, B.; Roelofs, F.; Rogers, A.; Romero-Cañizales, C.; Roshanineshat, A.; Rottmann, H.; Roy, A. L.; Ruiz, I.; Ruszczyk, C.; Rygl, K. L. J.; Sánchez, S.; Sánchez-Argüelles, D.; Sánchez-Portal, M.; Sasada, M.; Satapathy, K.; Savolainen, T.; Schloerb, F. P.; Schonfeld, J.; Schuster, K.; Shao, L.; Shen, Z.; Small, D.; Sohn, B. W.; Soohoo, J.; Sosapanta Salas, L. D.; Souccar, K.; Sun, H.; Tazaki, F.; Tetarenko, A. J.; Tiede, P.; Tilanus, R. P. J.; Titus, M.; Torne, P.; Toscano, T.; Trent, T.; Trippe, S.; Turk, M.; Van Bemmel, I.; Van Langevelde, H. J.; Van Rossum, D. R.; Vos, J.; Wagner, J.; Ward-Thompson, D.; Wardle, J.; Washington, J. E.; Weintroub, J.; Wharton, R.; Wiik, K.; Witzel, G.; Wondrak, M. F.; Wong, G. N.; Wu, Q.; Yadlapalli, N.; Yamaguchi, P.; Yfantis, A.; Yoon, D.; Young, A.; Young, K.; Younsi, Z.; Yu, W.; Yuan, F.; Yuan, Y.-F.; Zhang, S.; Zhao, G. Y.; Zhao, S.-S. "Ordered magnetic fields around the 3C 84 central black hole," Astronomy and Astrophysics, 682, L3, 2024.
Paré, Dylan M.; Lang, Cornelia C.; Morris, Mark R. "A VLA Study of Newly Discovered Southern Latitude Nonthermal Filaments in the Galactic Center: Polarimetric and Magnetic Field Properties," The Astrophysical Journal, 974, 200, 2024.
Paré, Dylan; Butterfield, Natalie O.; Chuss, David T.; Guerra, Jordan A.; Iuliano, Jeffrey Inara; Karpovich, Kaitlyn; Morris, Mark R.; Wollack, Edward J. "SOFIA/HAWC+ Far-infrared Polarimetric Large-area CMZ Exploration Survey. III. Full Survey Data Set," The Astrophysical Journal, 969, 150, 2024.
Park, Hye-Jin; Battisti, Andrew J.; Wisnioski, Emily; Cortese, Luca; Seibert, Mark; Grasha, Kathryn; Madore, Barry F.; Groves, Brent; Rich, Jeff A.; Beaton, Rachael L.; Chen, Qian-Hui; Mun, Marcie; Mcclure-Griffiths, Naomi M.; De Blok, W. J. G.; Kewley, Lisa J. "The spatially resolved relation between dust, gas, and metal abundance with the TYPHOON survey," Monthly Notices of the Royal Astronomical Society, 535, 729, 2024.
Park, Jongho; Kino, Motoki; Nagai, Hiroshi; Nakamura, Masanori; Asada, Keiichi; Kam, Minchul; Hodgson, Jeffrey A. "Observational evidence to support a dense ambient medium shaping the jet in 3C 84," Astronomy and Astrophysics, 685, A115, 2024.
Park, Jongho; Zhao, Guang-Yao; Nakamura, Masanori; Mizuno, Yosuke; Pu, Hung-Yi; Asada, Keiichi; Takahashi, Kazuya; Toma, Kenji; Kino, Motoki; Cho, Ilje; Hada, Kazuhiro; Edwards, Phil G.; Ro, Hyunwook; Kam, Minchul; Yi, Kunwoo; Lee, Yunjeong; Koyama, Shoko; Byun, Do-Young; Phillips, Chris; Reynolds, Cormac; Hodgson, Jeffrey A.; Lee, Sang-Sung "Discovery of Limb Brightening in the Parsec-scale Jet of NGC 315 through Global Very Long Baseline Interferometry Observations and Its Implications for Jet Models," The Astrophysical Journal, 973, L45, 2024.
Parker, Kaelee S.; Berg, Danielle A.; Gazagnes, Simon; Chisholm, John; James, Bethan L.; Hayes, Matthew; Heckman, Timothy; Henry, Alaina; Berg, Michelle A.; Arellano-Córdova, Karla Z.; Xu, Xinfeng; Erb, Dawn K.; Martin, Crystal L.; Hu, Weida; Skillman, Evan D.; Mcquinn, Kristen B. W.; Chen, Zuyi; Stark, Dan P. "CLASSY. XI. Tracing Neutral Gas Properties Using UV Absorption Lines and 21 cm Observations," The Astrophysical Journal, 977, 104, 2024.
Parlanti, Eleonora; Carniani, Stefano; Übler, Hannah; Venturi, Giacomo; Circosta, Chiara; D'Eugenio, Francesco; Arribas, Santiago; Bunker, Andrew J.; Charlot, Stéphane; Lützgendorf, Nora; Maiolino, Roberto; Perna, Michele; Rodríguez Del Pino, Bruno; Willott, Chris J.; Böker, Torsten; Cameron, Alex J.; Chevallard, Jacopo; Cresci, Giovanni; Jones, Gareth C.; Kumari, Nimisha; Lamperti, Isabella; Scholtz, Jan "GA-NIFS: Early-stage feedback in a heavily obscured active galactic nucleus at z = 4.76," Astronomy and Astrophysics, 684, A24, 2024.
Paswan, Abhishek; Das, Mousumi; Rubinur, K "An Accreting Supermassive Black Hole Buried in a Faint Dwarf Galaxy," The Astrophysical Journal, 972, L24, 2024.
Patel, A. L.; Urquhart, J. S.; Yang, A. Y.; Moore, T.; Thompson, M. A.; Menten, K. M.; Csengeri, T. "SCOTCH - search for clandestine optically thick compact H II regions: II," Monthly Notices of the Royal Astronomical Society, 533, 2005, 2024.
Patra, Dusmanta; Pal, Sabyasachi "Multi-frequency study of large size radio galaxies 3C 35 and 3C 284," Advances in Space Research, 73, 1113, 2024.
Pattie, Eli C.; Maccarone, Thomas J.; Tetarenko, Alexandra J.; Miller-Jones, James C. A.; Pichardo Marcano, Manuel; Rivera Sandoval, Liliana E. "Variable Radio Emission of Neutron Star X-Ray Binary Ser X-1 during Its Persistent Soft State," The Astrophysical Journal, 970, 126, 2024.
Paul, Jeremiah D.; Plotkin, Richard M.; Brandt, W. N.; Ellis, Christopher H.; Gallo, Elena; Greene, Jenny E.; Ho, Luis C.; Kimball, Amy E.; Haggard, Daryl "Radio Scrutiny of the X-Ray-weak Tail of Low-mass Active Galactic Nuclei: A Novel Signature of High-Eddington Accretion?," The Astrophysical Journal, 974, 66, 2024.
Paulson, Sonu Tabitha; Mallick, K. K.; Ojha, D. K. "Unveiling the Cosmic Cradle: clustering and massive star formation in the enigmatic Galactic bubble N59," Monthly Notices of the Royal Astronomical Society, 530, 1516, 2024.
Peeters, Els; Habart, Emilie; Berné, Olivier; Sidhu, Ameek; Chown, Ryan; Van De Putte, Dries; Trahin, Boris; Schroetter, Ilane; Canin, Amélie; Alarcón, Felipe; Schefter, Bethany; Khan, Baria; Pasquini, Sofia; Tielens, Alexander G. G. M.; Wolfire, Mark G.; Dartois, Emmanuel; Goicoechea, Javier R.; Maragkoudakis, Alexandros; Onaka, Takashi; Pound, Marc W.;

Vicente, Sílvia; Abergel, Alain; Bergin, Edwin A.; Bernard-Salas, Jeronimo; Boersma, Christiaan; Bron, Emeric; Cami, Jan; Cuadrado, Sara; Dicken, Daniel; Elyajouri, Meriem; Fuente, Asunción; Gordon, Karl D.; Issa, Lina; Joblin, Christine; Kannavou, Olga; Lacinbala, Ozan; Languignon, David; Le Gal, Romane; Meshaka, Raphael; Okada, Yoko; Robberto, Massimo; Röllig, Markus; Schirmer, Thiébaut; Tabone, Benoit; Zannese, Marion; Aleman, Isabel; Allamandola, Louis; Auchettl, Rebecca; Baratta, Giuseppe Antonio; Bejaoui, Salma; Bera, Partha P.; Black, John H.; Boulanger, Francois; Bouwman, Jordy; Brandl, Bernhard; Brechignac, Philippe; Brünken, Sandra; Buragohain, Mridusmita; Burkhardt, Andrew; Candian, Alessandra; Cazaux, Stéphanie; Cernicharo, Jose; Chabot, Marin; Chakraborty, Shubhadip; Champion, Jason; Colgan, Sean W. J.; Cooke, Ilsa R.; Coutens, Audrey; Cox, Nick L. J.; Demyk, Karine; Meyer, Jennifer Donovan; Foschino, Sacha; García-Lario, Pedro; Gerin, Maryvonne; Gottlieb, Carl A.; Guillard, Pierre; Gusdorf, Antoine; Hartigan, Patrick; He, Jinhua; Herbst, Eric; Hornekaer, Liv; Jäger, Cornelia; Janot-Pacheco, Eduardo; Kaufman, Michael; Kendrew, Sarah; Kirsanova, Maria S.; Klaassen, Pamela; Kwok, Sun; Labiano, Álvaro; Lai, Thomas S.-Y.; Lee, Timothy J.; Lefloch, Bertrand; Le Petit, Franck; Li, Aigen; Linz, Hendrik; Mackie, Cameron J.; Madden, Suzanne C.; Mascetti, Joëlle; Mcguire, Brett A.; Merino, Pablo; Micelotta, Elisabetta R.; Misselt, Karl; Morse, Jon A.; Mulas, Giacomo; Neelamkodan, Naslim; Ohsawa, Ryou; Paladini, Roberta; Palumbo, Maria Elisabetta; Pathak, Amit; Pendleton, Yvonne J.; Petrignani, Annemieke; Pino, Thomas; Puga, Elena; Rangwala, Naseem; Rapacioli, Mathias; Ricca, Alessandra; Roman-Duval, Julia; Roser, Joseph; Roueff, Evelyne; Rouillé, Gaël; Salama, Farid; Sales, Dinalva A.; Sandstrom, Karin; Sarre, Peter; Sciamma-O'Brien, Ella; Sellgren, Kris; Shenoy, Sachindev S.; Teyssier, David; Thomas, Richard D.; Togi, Aditya; Verstraete, Laurent; Witt, Adolf N.; Wootten, Alwyn; Ysard, Nathalie; Zettergren, Henning; Zhang, Yong; Zhang, Ziwei E.; Zhen, Junfeng "PDRs4All: III. JWST's NIR spectroscopic view of the Orion Bar," Astronomy and Astrophysics, 685, A74, 2024.

Pelisoli, Ingrid; Chomiuk, Laura; Strader, Jay; Marsh, T. R.; Aydi, Elias; Dage, Kristen C.; Kyer, Rebecca; Molina, Isabella; Panurach, Teresa; Urquhart, Ryan; Maccarone, Thomas J.; Rich, R. Michael; Rodriguez, Antonio C.; Breedt, E.; Brown, A. J.; Dhillon, V. S.; Dyer, M. J.; Gaensicke, Boris T.; Garbutt, J. A.; Green, M. J.; Kennedy, M. R.; Kerry, P.; Littlefair, S. P.; Munday, James; Parsons, S. G. "A survey for radio emission from white dwarfs in the VLA Sky Survey," Monthly Notices of the Royal Astronomical Society, 531, 1805, 2024.

Pellegrino, C.; Modjaz, M.; Takei, Y.; Tsuna, D.; Newsome, M.; Pritchard, T.; Baer-Way, R.; Bostroem, K. A.; Chandra, P.; Charalampopoulos, P.; Dong, Y.; Farah, J.; Howell, D. A.; Mccully, C.; Mohamed, S.; Padilla Gonzalez, E.; Terreran, G. "The X-Ray Luminous Type Ibn SN 2022ablq: Estimates of Preexplosion Mass Loss and Constraints on Precursor Emission," The Astrophysical Journal, 977, 2, 2024.

Peltonen, Joshua; Rosolowsky, Erik; Williams, Thomas G.; Koch, Eric W.; Dolphin, Andrew; Chastenet, Jérémy; Dalcanton, Julianne J.; Ginsburg, Adam; Johnson, L. Clifton; Leroy, Adam K.; Richardson, Theo; Sandstrom, Karin M.; Sarbadhicary, Sumit K.; Smercina, Adam; Wainer, Tobin; Williams, Benjamin F. "JWST reveals star formation across a spiral arm in M33," Monthly Notices of the Royal Astronomical Society, 527, 10668-10679, 2024.

Peng, Sijia; Lu, Ru-Sen; Goddi, Ciriaco; Krichbaum, Thomas P.; Li, Zhiyuan; Liu, Ruo-Yu; Kim, Jae-Young; Nakamura, Masanori; Yuan, Feng; Chen, Liang; Martí-Vidal, Iván; Shen, Zhiqiang "The Faraday Rotation Measure of the M87 Jet at 3.5 mm with ALMA," The Astrophysical Journal, 975, 103, 2024.

Pensabene, A.; Cantalupo, S.; Cicone, C.; Decarli, R.; Galbiati, M.; Ginolfi, M.; De Beer, S.; Fossati, M.; Fumagalli, M.; Lazeyras, T.; Pezzulli, G.; Travascio, A.; Wang, W.; Matthee, J.; Maseda, M. V. "ALMA survey of a massive node of the Cosmic Web at z ~ 3. I. Discovery of a large overdensity of CO emitters," Astronomy and Astrophysics, 684, A119, 2024.

Pereira-Santaella, M.; González-Alfonso, E.; García-Bernete, I.; García-Burillo, S.; Rigopoulou, D. "The CO-to-H_2 conversion factor of molecular outflows. Rovibrational CO emission in NGC 3256-S resolved by JWST/NIRSpec," Astronomy and Astrophysics, 681, A117, 2024.

Pérez-González, Pablo G.; Rinaldi, Pierluigi; Caputi, Karina I.; Álvarez-Márquez, Javier; Annunziatella, Marianna; Langeroodi, Danial; Moutard, Thibaud; Boogaard, Leindert; Iani, Edoardo; Melinder, Jens; Costantin, Luca; Östlin, Göran; Colina, Luis; Greve, Thomas R.; Wright, Gillian; Alonso-Herrero, Almudena; Bik, Arjan; Bosman, Sarah E. I.; Crespo Gómez, Alejandro; Dicken, Daniel; Eckart, Andreas; García-Marín, Macarena; Gillman, Steven; Güdel, Manuel; Henning, Thomas; Hjorth, Jens; Jermann, Iris; Labiano, Álvaro; Meyer, Romain A.; Peißker, Florian; Pye, John P.; Ray, Thomas P.; Tikkanen, Tuomo; Walter, Fabian; Van Der Werf, Paul P. "A NIRCam-dark Galaxy Detected with the MIRI/F1000W Filter in the MIDIS/JADES Hubble Ultra Deep Field," The Astrophysical Journal, 969, L10, 2024.

Pérez-Martínez, J. M.; Kodama, T.; Koyama, Y.; Shimakawa, R.; Suzuki, T. L.; Daikuhara, K.; Adachi, K.; Onodera, M.; Tanaka, I. "Enhanced star formation and metallicity deficit in the USS 1558-003 forming protocluster at z = 2.53," Monthly Notices of the Royal Astronomical Society, 527, 10221, 2024.

Perger, Krisztina; Frey, Sándor; Gabányi, Krisztina É. "Sub-mJy radio emission from high-redshift active galactic nuclei in the footprint of the VLA Sky Survey," Monthly Notices of the Royal Astronomical Society, 527, 3436, 2024.

Petrashkevich, I. V.; Punanova, A. F.; Caselli, P.; Sipilä, O.; Pineda, J. E.; Friesen, R. K.; Korotaeva, M. G.; Vasyunin, A. I. "Deuterium fractionation in cold dense cores in the low-mass star-forming region L1688," Monthly Notices of the Royal Astronomical Society, 528, 1327, 2024.

Petrov, Leonid "Radio Astrometry at Different Frequencies," The Astronomical Journal, 168, 76, 2024.

Petruk, Oleh; Kuzyo, Taras; Patrii, Mariana; Chomiuk, Laura; Arias, Maria; Miceli, Marco; Orlando, Salvatore; Bocchino, Fabrizio "Evidence of Gradients of Density and Magnetic Field in the Remnant of Tycho's Supernova," The Astrophysical Journal, 972, 63, 2024.

Pineda, Jaime E.; Soler, Juan D.; Offner, Stella; Koch, Eric W.; Segura-Cox, Dominique M.; Neri, Roberto; Kuffmeier, Michael; Ivlev, Alexei V.; Teresa Valdivia-Mena, Maria; Sipilä, Olli; Jose Maureira, Maria; Caselli, Paola; Cunningham, Nichol; Schmiedeke, Anika; Gieser, Caroline; Chen, Michael; Spezzano, Silvia "Probing the physics of star formation (ProPStar): III. No evidence of dissipation of turbulence down to 20 mpc (4000 au) scale," Astronomy and Astrophysics, 690, L5, 2024.

Pineda, Jorge L.; Horiuchi, Shinji; Anderson, L. D.; Luisi, Matteo; Langer, William D.; Goldsmith, Paul F.; Kuiper, Thomas B. H.; Fischer, Christian; Gong, Yan; Brunthaler, Andreas; Rugel, Michael; Menten, Karl M. "Nitrogen Abundance Distribution in the Inner Milky Way," The Astrophysical Journal, 973, 89, 2024.

Pingel, Nickolas M.; Chen, Hongxing; Stanimirović, Snežana; Koch, Eric W.; Leroy, Adam K.; Rosolowsky, Erik; Kim, Chang-Goo; Dalcanton, Julianne J.; Walter, Fabian; Busch, Michael P.; Chown, Ryan; Donovan Meyer, Jennifer; Eibensteiner, Cosima; Hunter, Deidre A.; Sarbadhicary, Sumit K.; Tarantino, Elizabeth; Villanueva, Vicente; Williams, Thomas G. "The Local Group L-band Survey: The First Measurements of Localized Cold Neutral Medium Properties in the Low-metallicity Dwarf Galaxy NGC 6822," The Astrophysical Journal, 974, 93, 2024.

Plant, Kathryn; Hallinan, Gregg; Bastian, Tim "Radio Emission from the Magnetically Active M Dwarf UV Ceti from 1 to 105 GHz," The Astrophysical Journal, 970, 56, 2024.

Podio, L.; Ceccarelli, C.; Codella, C.; Sabatini, G.; Segura-Cox, D.; Balucani, N.; Rimola, A.; Ugliengo, P.; Chandler, C. J.; Sakai, N.; Svoboda, B.; Pineda, J.; De Simone, M.; Bianchi, E.; Caselli, P.; Isella, A.; Aikawa, Y.; Bouvier, M.; Caux, E.; Chahine, L.; Charnley, S. B.; Cuello, N.; Dulieu, F.; Evans, L.; Fedele, D.; Feng, S.; Fontani, F.; Hama, T.; Hanawa, T.; Herbst, E.; Hirota, T.; Jiménez-Serra, I.; Johnstone, D.; Lefloch, B.; Le Gal, R.; Loinard, L.; Liu, H. Baobab; López-Sepulcre, A.; Maud, L. T.; Maureira, M. J.; Menard, F.; Miotello, A.; Moellenbrock, G.; Nomura, H.; Oba, Y.; Ohashi, S.; Okoda, Y.; Oya, Y.; Sakai, T.; Shirley, Y.; Testi, L.; Vastel, C.; Viti, S.; Watanabe, N.; Watanabe, Y.; Zhang, Y.; Zhang, Z. E.; Yamamoto, S. "FAUST. XVII. Super deuteration in the planet-forming system IRS 63 where the streamer strikes the disk," Astronomy and Astrophysics, 688, L22, 2024.

Polles, Fiorella L.; Fadda, Dario; Vacca, William D.; Abel, Nicholas P.; Chevance, Mélanie; Fischer, Christian; Jackson, James M.; Lebouteiller, Vianney; Madden, Suzanne; Ramambason, Lise "Electron Density Distribution in H II Regions in IC 10," The Astronomical Journal, 168, 117, 2024.

Poojon, Panomporn; Chung, Aeree; Hoang, Thiem; Baek, Junhyun; Nakanishi, Hiroyuki; Hirota, Tomoya; Tsai, Chao-Wei "Detection of Extragalactic Anomalous Microwave Emission in NGC 2903 Using KVN Single-dish Observations," The Astrophysical Journal, 963, 88, 2024.

Pozzi, F.; Calura, F.; D'Amato, Q.; Gavarente, M.; Bethermin, M.; Boquien, M.; Casasola, V.; Cimatti, A.; Cochrane, R.; Dessauges-Zavadsky, M.; Enia, A.; Esposito, F.; Faisst, A. L.; Gilli, R.; Ginolfi, M.; Gobat, R.; Gruppioni, C.; Hayward, C. C.; Ibar, E.; Koekemoer, A. M.; Lemaux, B. C.; Magdis, G. E.; Molina, J.; Romano, M.; Talia, M.; Vallini, L.; Vergani, D.; Zamorani, G. "The ALPINE-ALMA [CII] survey: Dust emission effective radius up to 3 kpc in the early Universe," Astronomy and Astrophysics, 686, A187, 2024.

Prathap, Jahang; Hopkins, Andrew M.; Robotham, Aaron S. G.; Bellstedt, Sabine; Afonso, José; Ahmed, Ummee T.; Bilicki, Maciej; Bremer, Malcolm N.; Brough, Sarah; Brown, Michael J. I.; Gordon, Yjan; Holwerda, Benne W.; Leahy, Denis; López-Sánchez, Ángel R.; Marvil, Joshua R.; Mukherjee, Tamal; Prandoni, Isabella; Shabala, Stanislav S.; Vernstrom, Tessa; Zafar, Tayyaba "EMU/GAMA: A technique for detecting active galactic nuclei in low mass systems," Publications of the Astronomical Society of Australia, 41, e016, 2024.

Prieto, Almudena; Gladis Magris, C.; Bruzual, Gustavo; Fernández-Ontiveros, Juan A.; Burkert, Andreas "The PARSEC view of star formation in galaxy centres: from protoclusters to star clusters in an early-type spiral," Monthly Notices of the Royal Astronomical Society, 533, 433, 2024.

Purkayastha, S.; Kanekar, N.; Kumari, S.; Rhoads, J.; Malhotra, S.; Pharo, J.; Ghosh, T. "The Second Case of a Major Merger Triggering a Starburst in a Green Pea Galaxy," The Astrophysical Journal, 977, 68, 2024.

Qi, Chunhua; Wilner, David J. "Evidence for a Sharp CO Snow Line Transition in a Protoplanetary Disk and Implications for Millimeter-wave Observations of CO Isotopologues," The Astrophysical Journal, 977, 60, 2024.

Querejeta, Miguel; Leroy, Adam K.; Meidt, Sharon E.; Schinnerer, Eva; Belfiore, Francesco; Emsellem, Eric; Klessen, Ralf S.; Sun, Jiayi; Sormani, Mattia; Bešlić, Ivana; Cao, Yixian; Chevance, Mélanie; Colombo, Dario; Dale, Daniel A.; García-Burillo, Santiago; Glover, Simon C. O.; Grasha,

Kathryn; Groves, Brent; Koch, Eric. W.; Neumann, Lukas; Pan, Hsi-An; Pessa, Ismael; Pety, Jérôme; Pinna, Francesca; Ramambason, Lise; Razza, Alessandro; Romanelli, Andrea; Rosolowsky, Erik; Ruiz-García, Marina; Sánchez-Blázquez, Patricia; Smith, Rowan; Stuber, Sophia; Ubeda, Leonardo; Usero, Antonio; Williams, Thomas G. "Do spiral arms enhance star formation efficiency?," Astronomy and Astrophysics, 687, A293, 2024.
Quinatoa, Daysi; Yang, Chentao; Ibar, Edo; Humphreys, Elizabeth; Aalto, Susanne; Barcos-Muñoz, Loreto; González-Alfonso, Eduardo; Impellizzeri, Violette; Jaffé, Yara; Liu, Lijie; Martín, Sergio; Weiss, Axel; Zhang, Zhi-Yu "The first ground-based detection of the 752 GHz water line in local ultraluminous infrared galaxies using APEX-SEPIA," Monthly Notices of the Royal Astronomical Society, 527, 6321, 2024.
Quirós-Rojas, Marianela; Montaña, Alfredo; Zavala, Jorge A.; Aretxaga, Itziar; Hughes, David H. "ALMA follow-up of 3000 red-Herschel galaxies: The nature of extreme submillimeter galaxies," Monthly Notices of the Royal Astronomical Society, 533, 2966, 2024.
Rajpurohit, K.; Lovisari, L.; Botteon, A.; Jones, C.; Forman, W.; O'Sullivan, E.; Van Weeren, R. J.; Hyeonghan, K.; Bonafede, A.; Jee, M. J.; Vazza, F.; Brunetti, G.; Cho, H.; Domínguez-Fernández, P.; Stroe, A.; Finner, K.; Brüggen, M.; Vrtilek, J. M.; David, L. P.; Schellenberger, G.; Wittman, D.; Lusetti, G.; Kraft, R.; De Gasperin, F. "Abell 746: A Highly Disturbed Cluster Undergoing Multiple Mergers," The Astrophysical Journal, 966, 38, 2024.
Rajpurohit, K.; O'Sullivan, E.; Schellenberger, G.; Brienza, M.; Vrtilek, J. M.; Forman, W.; David, L. P.; Clarke, T.; Botteon, A.; Vazza, F.; Giacintucci, S.; Jones, C.; Brüggen, M.; Shimwell, T. W.; Drabent, A.; Loi, F.; Loubser, S. I.; Kolokythas, K.; Babyk, I.; Röttgering, H. J. A. "A Deep Dive into the NGC 741 Galaxy Group: Insights into a Spectacular Head-tail Radio Galaxy from VLA, MeerKAT, uGMRT, and LOFAR," The Astrophysical Journal, 976, 64, 2024.
Rampinelli, L.; Facchini, S.; Leemker, M.; Bae, J.; Benisty, M.; Teague, R.; Law, C. J.; Öberg, K. I.; Portilla-Revelo, B.; Cridland, A. J. "ALMA high-resolution observations unveil planet formation shaping molecular emission in the PDS 70 disk," Astronomy and Astrophysics, 689, A65, 2024.
Ravi, Nitya; Douglass, Kelly A.; Demina, Regina "A Full Accounting of the Visible Mass in SDSS MaNGA Disk Galaxies," The Astrophysical Journal, 967, 135, 2024.
Ravi, R.; Singh, A. P.; Richards, A. M. S.; Humphreys, R. M.; Decin, L.; Ziurys, L. M. "PO and PN in the Envelope of VY Canis Majoris: Elucidating the Chemistry and Origin of Phosphorus," The Astrophysical Journal, 971, L43, 2024.
Ray, Mahitosh; Hwang, Chorng-Yuan "Molecular Distribution in the Central Region of M87," The Astrophysical Journal, 974, 5, 2024.
Raymond, Alexander W.; Doeleman, Sheperd S.; Asada, Keiichi; Blackburn, Lindy; Bower, Geoffrey C.; Bremer, Michael; Broguiere, Dominique; Chen, Ming-Tang; Crew, Geoffrey B.; Dornbusch, Sven; Fish, Vincent L.; García, Roberto; Gentaz, Olivier; Goddi, Ciriaco; Han, Chih-Chiang; Hecht, Michael H.; Huang, Yau-De; Janssen, Michael; Keating, Garrett K.; Koay, Jun Yi; Krichbaum, Thomas P.; Lo, Wen-Ping; Matsushita, Satoki; Matthews, Lynn D.; Moran, James M.; Norton, Timothy J.; Patel, Nimesh; Pesce, Dominic W.; Ramakrishnan, Venkatessh; Rottmann, Helge; Roy, Alan L.; Sánchez, Salvador; Tilanus, Remo P. J.; Titus, Michael; Torne, Pablo; Wagner, Jan; Weintroub, Jonathan; Wielgus, Maciek; Young, André; Akiyama, Kazunori; Albentosa-Ruíz, Ezequiel; Alberdi, Antxon; Alef, Walter; Algaba, Juan Carlos; Anantua, Richard; Azulay, Rebecca; Bach, Uwe; Baczko, Anne-Kathrin; Ball, David; Balokovic, Mislav; Bandyopadhyay, Bidisha; Barrett, John; Bauböck, Michi; Benson, Bradford A.; Bintley, Dan; Blundell, Raymond; Bouman, Katherine L.; Boyce, Hope; Brissenden, Roger; Britzen, Silke; Broderick, Avery E.; Bronzwaer, Thomas; Bustamante, Sandra; Carlstrom, John E.; Chael, Andrew; Chan, Chi-Kwan; Chang, Dominic O.; Chatterjee, Koushik; Chatterjee, Shami; Chen, Yongjun; Cheng, Xiaopeng; Cho, Ilje; Christian, Pierre; Conroy, Nicholas S.; Conway, John E.; Crawford, Thomas M.; Cruz-Osorio, Alejandro; Cui, Yuzhu; Dahale, Rohan; Davelaar, Jordy; De Laurentis, Mariafelicia; Deane, Roger; Dempsey, Jessica; Desvignes, Gregory; Dexter, Jason; Dhruv, Vedant; Dihingia, Indu K.; Dzib, Sergio A.; Eatough, Ralph P.; Emami, Razieh; Falcke, Heino; Farah, Joseph; Fomalont, Edward; Fontana, Anne-Laure; Ford, H. Alyson; Foschi, Marianna; Fraga-Encinas, Raquel; Freeman, William T.; Friberg, Per; Fromm, Christian M.; Fuentes, Antonio; Galison, Peter; Gammie, Charles F.; Georgiev, Boris; Gold, Roman; Gómez-Ruiz, Arturo I.; Gómez, José L.; Gu, Minfeng; Gurwell, Mark; Hada, Kazuhiro; Haggard, Daryl; Hesper, Ronald; Heumann, Dirk; Ho, Luis C.; Ho, Paul; Honma, Mareki; Huang, Chih-Wei L.; Huang, Lei; Hughes, David H.; Ikeda, Shiro; Impellizzeri, C. M. Violette; Inoue, Makoto; Issaoun, Sara; James, David J.; Jannuzi, Buell T.; Jeter, Britton; Jiang, Wu; Jiménez-Rosales, Alejandra; Johnson, Michael D.; Jorstad, Svetlana; Jones, Adam C.; Joshi, Abhishek V.; Jung, Taehyun; Karuppusamy, Ramesh; Kawashima, Tomohisa; Kettenis, Mark; Kim, Dong-Jin; Kim, Jae-Young; Kim, Jongsoo; Kim, Junhan; Kino, Motoki; Kocherlakota, Prashant; Kofuji, Yutaro; Koch, Patrick M.; Koyama, Shoko; Kramer, Carsten; Kramer, Joana A.; Kramer, Michael; Kubo, Derek; Kuo, Cheng-Yu; La Bella, Noemi; Lee, Sang-Sung; Levis, Aviad; Li, Zhiyuan; Lico, Rocco; Lindahl, Greg; Lindqvist, Michael; Lisakov, Mikhail; Liu, Jun; Liu, Kuo; Liuzzo, Elisabetta; Lobanov, Andrei P.; Loinard, Laurent; Lonsdale, Colin J.; Lowitz, Amy E.; Lu, Ru-Sen; Macdonald, Nicholas R.; Mahieu, Sylvain; Maier, Doris; Mao, Jirong; Marchili, Nicola; Markoff, Sera; Marrone, Daniel P.; Marscher, Alan P.; Martí-Vidal, Iván; Medeiros, Lia; Menten, Karl M.; Mizuno, Izumi; Mizuno, Yosuke; Montgomery, Joshua; Moriyama, Kotaro; Moscibrodzka, Monika; Mulaudzi, Wanga; Müller, Cornelia; Müller, Hendrik; Mus, Alejandro; Musoke, Gibwa; Myserlis, Ioannis; Nagai, Hiroshi; Nagar, Neil M.; Nakamura, Masanori; Narayanan, Gopal; Natarajan, Iniyan; Nathanail, Antonios; Fuentes, Santiago Navarro; Neilsen, Joey; Ni, Chunchong; Nowak, Michael A.; Oh, Junghwan; Okino, Hiroki; Olivares Sánchez, Héctor Raúl; Oyama, Tomoaki; Özel, Feryal; Palumbo, Daniel C. M.; Paraschos, Georgios Filippos; Park, Jongho; Parsons, Harriet; Pen, Ue-Li; Piétu, Vincent; Popstefanija, Aleksandar; Porth, Oliver; Prather, Ben; Principe, Giacomo; Psaltis, Dimitrios; Pu, Hung-Yi; Raffin, Philippe A.; Rao, Ramprasad; Rawlings, Mark G.; Ricarte, Angelo; Ripperda, Bart; Roelofs, Freek; Romero-Cañizales, Cristina; Ros, Eduardo; Roshanineshat, Arash; Ruiz, Ignacio; Ruszczyk, Chet; Rygl, Kazi L. J.; Sánchez-Argüelles, David; Sánchez-Portal, Miguel; Sasada, Mahito; Satapathy, Kaushik; Savolainen, Tuomas; Schloerb, F. Peter; Schonfeld, Jonathan; Schuster, Karl-Friedrich; Shao, Lijing; Shen, Zhiqiang; Small, Des; Sohn, Bong Won; Soohoo, Jason; Sosapanta Salas, León David; Souccar, Kamal; Stanway, Joshua S.; Sun, He; Tazaki, Fumie; Tetarenko, Alexandra J.; Tiede, Paul; Toma, Kenji; Toscano, Teresa; Traianou, Efthalia; Trent, Tyler; Trippe, Sascha; Turk, Matthew; Van Bemmel, Ilse; Van Langevelde, Huib Jan; Van Rossum, Daniel R.; Vos, Jesse; Ward-Thompson, Derek; Wardle, John; Washington, Jasmin E.; Wharton, Robert; Wiik, Kaj; Witzel, Gunther; Wondrak, Michael F.; Wong, George N.; Wu, Qingwen; Yadlapalli, Nitika; Yamaguchi, Paul; Yfantis, Aristomenis; Yoon, Doosoo; Younsi, Ziri; Yu, Wei; Yuan, Feng; Yuan, Ye-Fei; Zensus, J. Anton; Zhang, Shuo; Zhao, Guang-Yao; Zhao, Shan-Shan "First Very Long Baseline Interferometry Detections at 870 μm," The Astronomical Journal, 168, 130, 2024.
Readhead, A. C. S.; Ravi, V.; Blandford, R. D.; Sullivan, A. G.; Somalwar, J.; Begelman, M. C.; Birkinshaw, M.; Liodakis, I.; Lister, M. L.; Pearson, T. J.; Taylor, G. B.; Wilkinson, P. N.; Globus, N.; Kiehlmann, S.; Lawrence, C. R.; Murphy, D.; O'Neill, S.; Pavlidou, V.; Sheldahl, E.; Siemiginowska, A.; Tassis, K. "Compact Symmetric Objects. III. Evolution of the High-luminosity Branch and a Possible Connection with Tidal Disruption Events," The Astrophysical Journal, 961, 242, 2024.
Remijan, Anthony J.; Fried, Zachary T. P.; Cooke, Ilsa R.; Wenzel, Gabi; Loomis, Ryan; Shingledecker, Christopher N.; Lipnicky, Andrew; Xue, Ci; Mccarthy, Michael C.; Mcguire, Brett A. "High Spectral Resolution Observations of Propynal (HCCCHO) toward TMC-1 from the GOTHAM Large Program on the GBT," The Astrophysical Journal, 976, 105, 2024.
Reynolds, Nickalas K.; Tobin, John J.; Sheehan, Patrick D.; Sadavoy, Sarah I.; Looney, Leslie W.; Kratter, Kaitlin M.; Li, Zhi-Yun; Segura-Cox, Dominique M.; Kaib, Nathan A. "The Disk Orientations of Perseus Protostellar Multiples at ~8 au Resolution," The Astrophysical Journal, 963, 164, 2024.
Rhodes, L.; Van Der Horst, A. J.; Bright, J. S.; Leung, J. K.; Anderson, G. E.; Fender, R.; Fernandez, J. F. Agüí; Bremer, M.; Chandra, P.; Dobie, D.; Farah, W.; Giarratana, S.; Gourdji, K.; Green, D. A.; Lenc, E.; Michałowski, M. J.; Murphy, T.; Nayana, A. J.; Pollak, A. W.; Rowlinson, A.; Schussler, F.; Siemion, A.; Starling, R. L. C.; Scott, P.; Thöne, C. C.; Titterington, D.; De Ugarte Postigo, A. "Rocking the BOAT: the ups and downs of the long-term radio light curve for GRB 221009A," Monthly Notices of the Royal Astronomical Society, 533, 4435, 2024.
Riaz, B.; Stamatellos, D.; Machida, M. N. "Observations of spiral and streamer on a candidate proto-brown dwarf," Monthly Notices of the Royal Astronomical Society, 529, 3601, 2024.
Riaz, B.; Thi, W.-F.; Machida, M. N. "HCN as a probe of the inner disc in a candidate proto-brown dwarf," Monthly Notices of the Royal Astronomical Society, 532, L36, 2024.
Ribas, Á.; Clarke, Cathie J.; Zagaria, Francesco "Inner walls or vortices? Crescent-shaped asymmetries in ALMA observations of protoplanetary discs," Monthly Notices of the Royal Astronomical Society, 532, 1752, 2024.
Richardson, Theo; Ginsburg, Adam; Indebetouw, Rémy; Robitaille, Thomas P. "An Updated Modular Set of Synthetic Spectral Energy Distributions for Young Stellar Objects," The Astrophysical Journal, 961, 188, 2024.
Rickards Vaught, Ryan J.; Sandstrom, Karin M.; Belfiore, Francesco; Kreckel, Kathryn; Méndez-Delgado, J. Eduardo; Emsellem, Eric; Groves, Brent; Blanc, Guillermo A.; Dale, Daniel A.; Egorov, Oleg V.; Glover, Simon C. O.; Grasha, Kathryn; Klessen, Ralf S.; Neumann, Justus; Williams, Thomas G. "Investigating the Drivers of Electron Temperature Variations in H II Regions with Keck-KCWI and VLT-MUSE," The Astrophysical Journal, 966, 130, 2024.
Ridley, E. J.; Nicholl, M.; Ward, C. A.; Blanchard, P. K.; Chornock, R.; Fraser, M.; Gomez, S.; Mattila, S.; Oates, S. R.; Pratten, G.; Runnoe, J. C.; Schmidt, P.; Alexander, K. D.; Gromadzki, M.; Lawrence, A.; Reynolds, T. M.; Smith, K. W.; Wyrzykowski, Ł.; Aamer, A.; Anderson, J. P.; Benetti, S.; Berger, E.; De Boer, T.; Chambers, K. C.; Chen, T.-W.; Gao, H.; Gutiérrez, C. P.; Inserra, C.; Kangas, T.; Leloudas, G.; Magnier, E. A.; Makrygianni, L.; Moore, T.; Müller-Bravo, T. E.; Smartt, S. J.; Sokolovsky, K. V.; Wainscoat, R.; Young, D. R. "Time-varying double-peaked emission lines following the sudden ignition of the dormant galactic nucleus AT2017bcc," Monthly Notices of the Royal Astronomical Society, 531, 1905, 2024.
Rigby, Andrew J.; Peretto, Nicolas; Anderson, Michael; Ragan, Sarah E.; Priestley, Felix D.; Fuller, Gary A.; Thompson, Mark A.; Traficante, Alessio; Watkins, Elizabeth J.; Williams, Gwenllian M. "The dynamic centres of infrared-dark clouds and the formation of cores," Monthly Notices of the Royal Astronomical Society, 528, 1172, 2024.

Rivera-Valentín, Edgard G.; Aponte-Hernández, Betzaida; Taylor, Patrick A.; Nolan, Michael C.; Howell, Ellen S.; Waller, Dany; Zambrano-Marín, Luisa F.; Virkki, Anne K.; Ballouz, Ronald-Louis; Stickle, Angela M. "Radar Circular Polarization Ratio of Near-Earth Asteroids: Links to Spectral Taxonomy and Surface Processes," The Planetary Science Journal, 5, 232, 2024.

Rivière-Marichalar, P.; Macías, E.; Baruteau, C.; Fuente, A.; Neri, R.; Ribas, Á.; Esplugues, G.; Navarro-Almaida, D.; Osorio, M.; Anglada, G. "AB Aur, a Rosetta stone for studies of planet formation. III. Continuum observations at 2 and 7 mm," Astronomy and Astrophysics, 683, A141, 2024.

Rizzo, F.; Bacchini, C.; Kohandel, M.; Di Mascolo, L.; Fraternali, F.; Roman-Oliveira, F.; Zanella, A.; Popping, G.; Valentino, F.; Magdis, G.; Whitaker, K. "The ALMA-ALPAKA survey: II. Evolution of turbulence in galaxy disks across cosmic time: Difference between cold and warm gas," Astronomy and Astrophysics, 689, A273, 2024.

Roberts, I. D.; Van Weeren, R. J.; Lal, D. V.; Sun, M.; Chen, H.; Ignesti, A.; Brüggen, M.; Lyskova, N.; Venturi, T.; Yagi, M. "Radio-continuum spectra of ram-pressure-stripped galaxies in the Coma Cluster," Astronomy and Astrophysics, 683, A11, 2024.

Robin, Thomas; Kartha, Sreeja S.; Ujjwal, Krishnan; Saha, Kanak; Parekh, Viral; George, Koshy; Mathew, Blesson "What drives the wheels of evolution in NGC 1512? A UVIT study," Astronomy and Astrophysics, 681, A7, 2024.

Röder, Jan; Ros, Eduardo; Schinzel, Frank K.; Lobanov, Andrei P. "Up around the bend: A multiwavelength view of the quasar 3C 345," Astronomy and Astrophysics, 684, A211, 2024.

Rodriguez, Antonio C.; Cendes, Yvette; El-Badry, Kareem; Berger, Edo "No X-Rays or Radio from the Nearest Black Holes and Implications for Future Searches," Publications of the Astronomical Society of the Pacific, 136, 024203, 2024.

Rodríguez, L. F.; Dzib, S. A.; Zapata, L. A.; Loinard, L. "Radio Proper Motions of the Nearby Ultra-Cool Dwarf Binary VHS 1256-1257AB," Revista Mexicana de Astronomia y Astrofisica, 60, 13, 2024.

Rodríguez, L. F.; Dzib, S. A.; Zapata, L. A.; Loinard, L. "Radio Proper Motions and a Search for the Origin of PSR B1849+00," Revista Mexicana de Astronomia y Astrofisica, 60, 397, 2024.

Rodríguez, L. F.; Yanza, V.; Dzib, S. A. "Compact Radio Sources in the Field of Tycho's Supernova Remnant," Revista Mexicana de Astronomia y Astrofisica, 60, 113, 2024.

Rodríguez, L. F.; Zapata, L. A. "The Radio Continuum Source Projected Near HR 8799," Revista Mexicana de Astronomia y Astrofisica, 60, 355, 2024.

Rodríguez, Luis F.; Loinard, Laurent; Zapata, Luis A. "A Radio Counterpart to a Jupiter-mass Binary Object in Orion," The Astrophysical Journal, 960, L14, 2024.

Rodríguez, Tatiana M.; Momjian, Emmanuel; Hofner, Peter; Sarma, Anuj P.; Araya, Esteban D. "Radio Continuum and Water Maser Observations of the High-mass Protostar IRAS 19035+0641 A," The Astrophysical Journal, 962, 133, 2024.

Roman-Oliveira, F.; Rizzo, F.; Fraternali, F. "Dynamical modelling and the origin of gas turbulence in z ~ 4.5 galaxies," Astronomy and Astrophysics, 687, A35, 2024.

Rose, Tom; Mcnamara, B. R.; Combes, F.; Edge, A. C.; Mcdonald, M.; O'Sullivan, Ewan; Russell, H.; Fabian, A. C.; Ferland, G.; Salomé, P.; Tremblay, G. "Two distinct molecular cloud populations detected in massive galaxies," Monthly Notices of the Royal Astronomical Society, 533, 771, 2024.

Rose, Tom; Mcnamara, B. R.; Combes, F.; Edge, A. C.; Russell, H.; Salomé, P.; Tamhane, P.; Fabian, A. C.; Tremblay, G. "A massive multiphase plume of gas in Abell 2390's brightest cluster galaxy," Monthly Notices of the Royal Astronomical Society, 528, 3441, 2024.

Rota, A. A.; Meijerhof, J. D.; Van Der Marel, N.; Francis, L.; Van Der Tak, F. F. S.; Sellek, A. D. "Correlation between accretion rate and free-free emission in protoplanetary disks. A multiwavelength analysis of central mm/cm emission in transition disks," Astronomy and Astrophysics, 684, A134, 2024.

Roueff, Antoine; Pety, Jérôme; Gerin, Maryvonne; Ségal, Léontine E.; Goicoechea, Javier R.; Liszt, Harvey S.; Gratier, Pierre; Beslic, Ivana; Einig, Lucas; Gaudel, Mathilde; Orkisz, Jan H.; Palud, Pierre; Santa-Maria, Miriam G.; De Souza Magalhaes, Victor; Zakardjian, Antoine; Bardeau, Sébastien; Bron, Emeric; Chainais, Pierre; Coudé, Simon; Demyk, Karine; Guzman, Viviana V.; Hughes, Annie; Languignon, David; Levrier, François; Lis, Dariusz C.; Le Bourlot, Jacques; Le Petit, Franck; Peretto, Nicolas; Roueff, Evelyne; Sievers, Albrecht; Thouvenin, Pierre-Antoine "Bias versus variance when fitting multi-species molecular lines with a non-LTE radiative transfer model. Application to the estimation of the gas temperature and volume density," Astronomy and Astrophysics, 686, A255, 2024.

Rowland, Lucie E.; Hodge, Jacqueline; Bouwens, Rychard; Piña, Pavel E. Mancera; Hygate, Alexander; Algera, Hiddo; Aravena, Manuel; Bowler, Rebecca; Da Cunha, Elisabete; Dayal, Pratika; Ferrara, Andrea; Herard-Demanche, Thomas; Inami, Hanae; Van Leeuwen, Ivana; De Looze, Ilse; Oesch, Pascal; Pallottini, Andrea; Phillips, Siân; Rybak, Matus; Schouws, Sander; Smit, Renske; Sommovigo, Laura; Stefanon, Mauro; Van Der Werf, Paul "REBELS-25: discovery of a dynamically cold disc galaxy at z = 7.31," Monthly Notices of the Royal Astronomical Society, 535, 2068, 2024.

Roy, Rupak; Mandal, Samir; Sahu, D. K.; Anupama, G. C.; Nandi, Sumana; Kumar, Brijesh "AT2020ohl: its nature and probable implications," Monthly Notices of the Royal Astronomical Society, 528, 6176, 2024.

Roychowdhury, Agniva; Meyer, Eileen T.; Georganopoulos, Markos; Kollmann, Kassidy "Proper Motions in the sub-kiloparsec Jet of 3C 78: Novel Constraints on the Physical Nature of Relativistic Jets," Monthly Notices of the Royal Astronomical Society, 527, 10262-10278, 2024.

Rubinstein, Adam E.; Evans, Neal J.; Tyagi, Himanshu; Narang, Mayank; Nazari, Pooneh; Gutermuth, Robert; Federman, Samuel; Manoj, P.; Green, Joel D.; Watson, Dan M.; Megeath, S. Thomas; Rocha, Will R. M.; Brunken, Nashanty G. C.; Slavicinska, Katerina; Van Dishoeck, Ewine F.; Beuther, Henrik; Bourke, Tyler L.; Caratti O Garatti, Alessio; Hartmann, Lee; Klaassen, Pamela; Linz, Hendrik; Looney, Leslie W.; Muzerolle, James; Stanke, Thomas; Tobin, John J.; Wolk, Scott J.; Yang, Yao-Lun "IPA: Class 0 Protostars Viewed in CO Emission Using JWST," The Astrophysical Journal, 974, 112, 2024.

Ruby, Mason; Müller-Sánchez, Francisco; Comerford, Julia M.; Stern, Daniel; Cales, Sabrina L.; Harrison, Fiona; Malkan, Matthew A.; Privon, George C.; Treister, Ezequiel "Evolution of the Dual AGN in Mrk 266: A Young AGN and a Rotation Dominated Disk in the SW Nucleus," Monthly Notices of the Royal Astronomical Society, 535, 763-780, 2024.

Rudnick, Lawrence; Anderson, C.; Cotton, W. D.; Pasetto, A.; Alexander, E.; Tahani, M. "Pseudo-3D visualization of Faraday structure in polarized radio sources: Methods, science use cases, and development priorities," Monthly Notices of the Royal Astronomical Society, 535, 2115, 2024.

Ruffa, Ilaria; Davis, Timothy A.; Elford, Jacob S.; Bureau, Martin; Cappellari, Michele; Gensior, Jindra; Haggard, Daryl; Iguchi, Satoru; Lelli, Federico; Liang, Fu-Heng; Liu, Lijie; Sarzi, Marc; Williams, Thomas G.; Zhang, Hengyue "A fundamental plane of black hole accretion at millimetre wavelengths," Monthly Notices of the Royal Astronomical Society, 528, L76, 2024.

Ruiz-García, Marina; Querejeta, Miguel; García-Burillo, Santiago; Emsellem, Eric; Meidt, Sharon E.; Sormani, Mattia C.; Schinnerer, Eva; Williams, Thomas G.; Bazzi, Zein; Colombo, Dario; Gleis, Damian R.; Gnedin, Oleg Y.; Klessen, Ralf S.; Leroy, Adam K.; Sánchez-Blázquez, Patricia; Stuber, Sophia K. "Dynamical resonances in PHANGS galaxies," Astronomy and Astrophysics, 691, A351, 2024.

Sabatini, G.; Podio, L.; Codella, C.; Watanabe, Y.; De Simone, M.; Bianchi, E.; Ceccarelli, C.; Chandler, C. J.; Sakai, N.; Svoboda, B.; Testi, L.; Aikawa, Y.; Balucani, N.; Bouvier, M.; Caselli, P.; Caux, E.; Chahine, L.; Charnley, S.; Cuello, N.; Dulieu, F.; Evans, L.; Fedele, D.; Feng, S.; Fontani, F.; Hama, T.; Hanawa, T.; Herbst, E.; Hirota, T.; Isella, A.; Jímenez-Serra, I.; Johnstone, D.; Lefloch, B.; Le Gal, R.; Loinard, L.; Liu, H. B.; López-Sepulcre, A.; Maud, L. T.; Maureira, M. J.; Menard, F.; Miotello, A.; Moellenbrock, G.; Nomura, H.; Oba, Y.; Ohashi, S.; Okoda, Y.; Oya, Y.; Pineda, J.; Rimola, A.; Sakai, T.; Segura-Cox, D.; Shirley, Y.; Vastel, C.; Viti, S.; Watanabe, N.; Zhang, Y.; Zhang, Z. E.; Yamamoto, S. "FAUST. XIII. Dusty cavity and molecular shock driven by IRS7B in the Corona Australis cluster," Astronomy and Astrophysics, 684, L12, 2024.

Sacchi, Andrea; Karovska, Margarita; Raymond, John; Kashyap, Vinay; Gaetz, Terrance J.; Hack, Warren; Kennea, Jamie; Lee, Nicholas; Mioduszewski, Amy J.; Claussen, Mark J. "Front-row Seat of the Recent R Aqr Periastron Passage: X-Ray Multiepoch Spectral and Spatial Analysis," The Astrophysical Journal, 961, 12, 2024.

Sadavoy, Sarah I.; Sheehan, Patrick; Tobin, John J.; Murillo, Nadia M.; Teague, Richard; Stephens, Ian W.; Henning, Thomas; Myers, Philip C.; Bergin, Edwin A. "Constraining the stellar masses and origin of the protostellar VLA 1623 system," Astronomy and Astrophysics, 687, A308, 2024.

Saha, Anindya; Tej, Anandmayee; Liu, Hong-Li; Liu, Tie; Garay, Guido; Goldsmith, Paul F.; Lee, Chang Won; He, Jinhua; Juvela, Mika; Bronfman, Leonardo; Baug, Tapas; Vázquez-Semadeni, Enrique; Sanhueza, Patricio; Li, Shanghuo; Chibueze, James O.; Bhadari, N. K.; Dewangan, Lokesh K.; Das, Swagat Ranjan; Xu, Feng-Wei; Issac, Namitha; Hwang, Jihye; Tóth, L. Viktor "Direct Observational Evidence of Multi-epoch Massive Star Formation in G24.47+0.49," The Astrophysical Journal, 970, L40, 2024.

Saha, Piyali; Sanhueza, Patricio; Padovani, Marco; Girart, Josep M.; Cortés, Paulo C.; Morii, Kaho; Liu, Junhao; Sánchez-Monge, Á.; Galli, Daniele; Basu, Shantanu; Koch, Patrick M.; Beltrán, Maria T.; Li, Shanghuo; Beuther, Henrik; Stephens, Ian W.; Nakamura, Fumitaka; Zhang, Qizhou; Jiao, Wenyu; Fernández-López, M.; Hwang, Jihye; Chung, Eun Jung; Pattle, Kate; Zapata, Luis A.; Xu, Fengwei; Olguin, Fernando A.; Kang, Ji-Hyun; Karoly, Janik; Law, Chi-Yan; Wang, Jia-Wei; Csengeri, Timea; Lu, Xing; Cheng, Yu; Kim, Jongsoo; Choudhury, Spandan; Chen, Huei-Ru Vivien; Hull, Charles L. H. "Magnetic Fields in Massive Star-forming Regions (MagMaR): Unveiling an Hourglass Magnetic Field in G333.46-0.16 Using ALMA," The Astrophysical Journal, 972, L6, 2024.

Sai, Jinshi; Yen, Hsi-Wei; Machida, Masahiro N.; Ohashi, Nagayoshi; Aso, Yusuke; Maury, Anaëlle J.; Maret, Sébastien "Multiple Outflows around a Single Protostar IRAS 15398-3359," The Astrophysical Journal, 966, 192, 2024.

Salak, Dragan; Hashimoto, Takuya; Inoue, Akio K.; Bakx, Tom J. L. C.; Donevski, Darko; Tamura, Yoichi; Sugahara, Yuma; Kuno, Nario; Miyamoto, Yusuke; Fujimoto, Seiji; Suphapolthaworn, Suphakorn "Molecular Outflow in the Reionization-epoch Quasar J2054-0005 Revealed by OH 119 μm Observations," The Astrophysical Journal, 962, 1, 2024.

Salomé, Q.; Salomé, P.; Godard, B.; Guillard, P.; Gusdorf, A. "Physical conditions in Centaurus A's northern filaments: II. Does the HCO^+ emission highlight the presence of shocks?," Astronomy and Astrophysics, 690, L18, 2024.
Salter, C. J.; Ghosh, T.; Minchin, R. F.; Momjian, E.; Catinella, B.; Lebron, M.; Lerner, M. S. "The Discovery and Evolution of a Radio Continuum and Excited-OH Spectral-line Outburst in the Nearby Galaxy NGC 660," The Astronomical Journal, 168, 257, 2024.
Sánchez Contreras, C.; Tafoya, D.; Fonfría, J. P.; Alcolea, J.; Castro-Carrizo, A.; Bujarrabal, V. "Uncovering the structure and kinematics of the ionized core of M 2-9 with ALMA," Astronomy and Astrophysics, 692, A151, 2024.
Sanderson, Kelly N.; Kapińska, Anna D.; Prescott, Moire K. M.; Dijeau, Audrey F.; Gramze, Savannah R.; Hernandez, Jacqueline; Kauma, Katherine T. "Signatures of Active Galactic Nucleus Feedback Modes: A Green Bean Galaxy with 150 kpc Jet-induced Radio Emission," The Astrophysical Journal, 971, 20, 2024.
Santamaría-Miranda, Alejandro; De Gregorio-Monsalvo, Itziar; Ohashi, Nagayoshi; Tobin, John J.; Sai, Jinshi; Jørgensen, Jes K.; Aso, Yusuke; Daniel Lin, Zhe-Yu; Flores, Christian; Kido, Miyu; Koch, Patrick M.; Kwon, Woojin; Lee, Chang Won; Li, Zhi-Yun; Looney, Leslie W.; Plunkett, Adele L.; Takakuwa, Shigehisa; R Van'T Hoff, Merel L.; Williams, Jonathan P.; Yen, Hsi-Wei "Early Planet Formation in Embedded Disks (eDisk): XVI. Asymmetric dust disk driving a multicomponent molecular outflow in the young Class 0 protostar GSS30 IRS3," Astronomy and Astrophysics, 690, A46, 2024.
Santos, Julia C.; Van Gelder, Martijn L.; Nazari, Pooneh; Ahmadi, Aida; Van Dishoeck, Ewine F. "SO_2 and OCS toward high-mass protostars: A comparative study of ice and gas," Astronomy and Astrophysics, 689, A248, 2024.
Santra, R.; Kale, R.; Giacintucci, S.; Wik, D. R.; Venturi, T.; Dallacasa, D.; Cassano, R.; Brunetti, G.; Joshi, D. C. "The Radio Halo in PLCKESZ G171.94-40.65: Beacon of Merging Activity," The Astrophysical Journal, 976, 66, 2024.
Sargent, Andrew J.; Fischer, Travis C.; Johnson, Megan C.; Van Der Horst, Alexander J.; Secrest, Nathan J.; Shuvo, Onic I.; Cigan, Phil J.; Smith, Krista L. "VLA FRAMEx. I. Wideband Radio Properties of the AGN in NGC 4388," The Astrophysical Journal, 961, 230, 2024.
Sato, Kazuki; Shinnaga, Hiroko; Furuya, Ray S.; Suzuki, Takeru K.; Kakiuchi, Kensuke; Ott, Jürgen "Spiral magnetic fields and their role on accretion dynamics in the circumnuclear disk of Sagittarius A*: Insight from λ = 850 μm polarization imaging," Publications of the Astronomical Society of Japan, 76, 960, 2024.
Schellenberger, Gerrit; O'Sullivan, Ewan; David, Laurence P.; Vrtilek, Jan; Romero, Charles; Petitpas, Glen; Forman, William; Giacintucci, Simona; Gurwell, Mark; Jones, Christine; Rajpurohit, Kamlesh; Ubertosi, Francesco; Venturi, Tiziana "Probing the High-frequency Variability of NGC 5044: The Key to Active Galactic Nucleus Feedback," The Astrophysical Journal, 976, 246, 2024.
Schmaltz, Tyler; Hu, Yue; Lazarian, Alex "Velocity gradient and stellar polarization: magnetic field tomography towards the L1688 cloud," Monthly Notices of the Royal Astronomical Society, 528, 3897, 2024.
Schneider, Nicola; Ossenkopf-Okada, Volker; Keilmann, Eduard; Röllig, Markus; Kabanovic, Slawa; Bonne, Lars; Csengeri, Timea; Klein, Bernd; Simon, Robert; Comerón, Fernando "First detection of the [CII] 158 μm line in the intermediate-velocity cloud Draco," Astronomy and Astrophysics, 686, A109, 2024.
Scholz, Aleks; Muzic, Koraljka; Almendros-Abad, Victor; Natta, Antonella; Ruiz-Rodriguez, Dary; Cieza, Lucas; Rodriguez-Lopez, Cristina "Variability in SSTc2d J163134.1-240100, a brown dwarf with quasi-spherical mass loss," The Open Journal of Astrophysics, 7, 30, 2024.
Schroeder, Genevieve; Rhodes, Lauren; Laskar, Tanmoy; Nugent, Anya; Escorial, Alicia Rouco; Rastinejad, Jillian C.; Fong, Wen-Fai; Van Der Horst, Alexander J.; Veres, Péter; Alexander, Kate D.; Andersson, Alex; Berger, Edo; Blanchard, Peter K.; Chastain, Sarah; Christensen, Lise; Fender, Rob; Green, David A.; Groot, Paul; Heywood, Ian; Horesh, Assaf; Izzo, Luca; Kilpatrick, Charles D.; Körding, Elmar; Lien, Amy; Malesani, Daniele B.; Mcbride, Vanessa; Mooley, Kunal; Rowlinson, Antonia; Sears, Huei; Stappers, Ben; Tanvir, Nial; Vergani, Susanna D.; Wijers, Ralph A. M. J.; Williams-Baldwin, David; Woudt, Patrick "A Radio Flare in the Long-lived Afterglow of the Distant Short GRB 210726A: Energy Injection or a Reverse Shock from Shell Collisions?," The Astrophysical Journal, 970, 139, 2024.
Schwartzman, Emma; Clarke, Tracy E.; Nyland, Kristina; Secrest, Nathan J.; Pfeifle, Ryan W.; Schmitt, Henrique; Satyapal, Shobita; Rothberg, Barry "VaDAR: Varstrometry for Dual AGN Using Radio Interferometry," The Astrophysical Journal, 961, 233, 2024.
Scibelli, Samantha; Shirley, Yancy; Megías, Andrés; Jiménez-Serra, Izaskun "Survey of Complex Organic Molecules in starless and prestellar cores in the Perseus Molecular Cloud," Monthly Notices of the Royal Astronomical Society, 533, 4104, 2024.
Scott, Tom C.; Brinks, Elias; Sengupta, Chandreyee; Lagos, Patricio "High-resolution HI mapping of nearby extremely metal-poor blue compact dwarf galaxies," Astronomy and Astrophysics, 692, A51, 2024.
Sebastian, Biny; Caproni, Anderson; Kharb, Preeti; Nayana, A. J.; Ali, Arshi; Rubinur, K.; O'Dea, Christopher P.; Baum, Stefi; Nandi, Sumana "A VLBA-uGMRT search for candidate binary black holes: Study of six X-shaped radio galaxies with double-peaked emission lines," Monthly Notices of the Royal Astronomical Society, 530, 4902, 2024.
Ségal, Léontine; Roueff, Antoine; Pety, Jérôme; Gerin, Maryvonne; Roueff, Evelyne; Goicoechea, Javier R.; Bešlic, Ivana; Coudé, Simon; Einig, Lucas; Mazurek, Helena; Orkisz, Jan H.; Palud, Pierre; Santa-Maria, Miriam G.; Zakardjian, Antoine; Bardeau, Sébastien; Bron, Emeric; Chainais, Pierre; Demyk, Karine; De Souza Magalhaes, Victor; Gratier, Pierre; Guzman, Viviana V.; Hughes, Annie; Languignon, David; Levrier, François; Le Bourlot, Jacques; Le Petit, Franck; Lis, Dariusz C.; Liszt, Harvey S.; Peretto, Nicolas; Sievers, Albrecht; Thouvenin, Pierre-Antoine "Toward a robust physical and chemical characterization of heterogeneous lines of sight: The case of the Horsehead nebula," Astronomy and Astrophysics, 692, A160, 2024.
Seidu, Mavis; Chibueze, J. O.; Fuller, Gary A.; Avison, A.; Frimpong, N. Asabre "MeerKAT and ALMA view of the AGAL045.804-0.356 clump," Monthly Notices of the Royal Astronomical Society, 530, 1956, 2024.
Semenko, E.; Kochukhov, O.; Mikulášek, Z.; Wade, G. A.; Alecian, E.; Bohlender, D.; Das, B.; Feliz, D. L.; Janík, J.; Kolář, J.; Krtička, J.; Kudryavtsev, D. O.; Labadie-Bartz, J. M.; Mkrtichian, D.; Monin, D.; Petit, V.; Romanyuk, I. I.; Shultz, M. E.; Shulyak, D.; Siverd, R. J.; Tkachenko, A.; Yakunin, I. A.; Zejda, M.; The Binamics Collaboration "HD 34736: an intensely magnetised double-lined spectroscopic binary with rapidly rotating chemically peculiar B-type components," Monthly Notices of the Royal Astronomical Society, 535, 2812, 2024.
Seraille, Emeric; Noller, Johannes; Sherwin, Blake D. "Constraining dark energy with the integrated Sachs-Wolfe effect," Physical Review D, 110, 123525, 2024.
Seriacopi, D. B.; Carciofi, A. C.; De Amorim, T. H.; Magalhães, A. M.; Vieira, R. G.; Domiciano De Souza, A.; Rubio, A.; Rubinho, M. S.; Bednarski, D.; Mota, B. C.; Faes, D. M.; Silva, A. C. F. "Multitechnique study of the B[e] supergiant RMC 82," Monthly Notices of the Royal Astronomical Society, 528, 122-140, 2024.
Sethi, Sagar; Kuźmicz, Agnieszka; Jamrozy, Marek; Slavcheva-Mihova, Lyuba "Discovery of a 100 kpc Narrow Curved Twin Jet in the S-shaped Giant Radio Galaxy J0644+1043," The Astrophysical Journal, 969, 156, 2024.
Seymour, Nicholas; Broderick, Jess W.; Noirot, Gaël; Turner, Ross; Hedge, Alexander John; Gupta, Anshu; Reynolds, Cormac; An, Tao; Emonts, Bjorn; Ross, Kathryn; Stern, Daniel K.; Afonso, José M. "A jet-induced shock in a young, powerful radio galaxy at z = 3.00," Publications of the Astronomical Society of Australia, 41, e114, 2024.
Sfaradi, I.; Horesh, A.; Sollerman, J.; Fender, R.; Rhodes, L.; Williams, D. R. A.; Bright, J.; Green, D. A.; Schulze, S.; Gal-Yam, A. "The dense and non-homogeneous circumstellar medium revealed in radio wavelengths around the Type Ib SN 2019oys," Astronomy and Astrophysics, 686, A129, 2024.
Shablovinskaya, E.; Ricci, C.; Chang, C.-S.; Tortosa, A.; Del Palacio, S.; Kawamuro, T.; Aalto, S.; Arzoumanian, Z.; Balokovic, M.; Bauer, F. E.; Gendreau, K. C.; Ho, L. C.; Kakkad, D.; Kara, E.; Koss, M. J.; Liu, T.; Loewenstein, M.; Mushotzky, R.; Paltani, S.; Privon, G. C.; Smith, K.; Tombesi, F.; Trakhtenbrot, B. "Joint ALMA/X-ray monitoring of the radio-quiet type 1 active galactic nucleus IC 4329A," Astronomy and Astrophysics, 690, A232, 2024.
Sharma, Kritti; Ravi, Vikram; Connor, Liam; Law, Casey; Ocker, Stella Koch; Sherman, Myles; Kosogorov, Nikita; Faber, Jakob; Hallinan, Gregg; Harnach, Charlie; Hellbourg, Greg; Hobbs, Rick; Hodge, David; Hodges, Mark; Lamb, James; Rasmussen, Paul; Somalwar, Jean; Weinreb, Sander; Woody, David; Leja, Joel; Anand, Shreya; Das, Kaustav Kashyap; Qin, Yu-Jing; Rose, Sam; Dong, Dillon Z.; Miller, Jessie; Yao, Yuhan "Preferential occurrence of fast radio bursts in massive star-forming galaxies," Nature, 635, 61, 2024.
Sharma, Rohit; Battaglia, Marina; Yu, Sijie; Chen, Bin; Luo, Yingjie; Krucker, Säm "Study of Particle Acceleration Using Fine Structures and Oscillations in Microwaves from the Electron Cyclotron Maser," The Astrophysical Journal, 970, 17, 2024.
Sheikh, Sofia; Brown, Grayce C.; Mactaggart, Jackson; Nguyen, Thomas; Fletcher, William D.; Jones, Brenda L.; Koller, Emma; Petrus, Veronica; Pighini, Katie F.; Rosario, Gray; Smedile, Vincent A.; Stone, Adam T.; You, Shawn; Mclaughlin, Maura A.; Turner, Jacob E.; Deneva, Julia S.; Lam, Michael T.; Shapiro-Albert, Brent J. "Scintillation Bandwidth Measurements from 23 Pulsars from the AO327 Survey," The Astrophysical Journal, 976, 225, 2024.
Sherman, Myles B.; Ravi, Vikram; El-Badry, Kareem; Sharma, Kritti; Ocker, Stella Koch; Kosogorov, Nikita; Connor, Liam; Faber, Jakob T. "Searching for magnetar binaries disrupted by core-collapse supernovae," Monthly Notices of the Royal Astronomical Society, 531, 2379, 2024.
Shi, Yangfan; Long, Feng; Herczeg, Gregory J.; Harsono, Daniel; Liu, Yao; Pinilla, Paola; Ragusa, Enrico; Johnstone, Doug; Bai, Xue-Ning; Pascucci, Ilaria; Manara, Carlo F.; Mulders, Gijs D.; Cieza, Lucas A. "Small and Large Dust Cavities in Disks around Mid-M Stars in Taurus," The Astrophysical Journal, 966, 59, 2024.
Shimojo, Masumi; Bastian, Timothy S.; Kameno, Seiji; Hales, Antonio S. "Observing the Sun with the Atacama Large Millimeter/Submillimeter Array (ALMA): Polarization Observations at 3 mm," Solar Physics, 299, 20, 2024.

Shivaei, Irene; Boogaard, Leindert A. "The tight correlation between PAH and CO emission from z ~ 0 to 4," Astronomy and Astrophysics, 691, L2, 2024.
Shope, Brielle M.; El-Abd, Samer J.; Brogan, Crystal L.; Hunter, Todd R.; Willis, Eric R.; Mcguire, Brett A.; Garrod, Robin T. "Interstellar Glycolaldehyde, Methyl Formate, and Acetic Acid. II. Chemical Modeling of the Bimodal Abundance Pattern in NGC 6334I," The Astrophysical Journal, 972, 146, 2024.
Shoshi, Ayumu; Harada, Naoto; Tokuda, Kazuki; Kawasaki, Yoshihiro; Yamasaki, Hayao; Sato, Asako; Omura, Mitsuki; Yamaguchi, Masayuki; Tachihara, Kengo; Machida, Masahiro N. "Ring Gap Structure around Class I Protostar WL 17," The Astrophysical Journal, 961, 228, 2024.
Shull, J. Michael; Panopoulou, Georgia V. "Variations of Interstellar Gas-to-dust Ratios at High Galactic Latitudes," The Astrophysical Journal, 961, 204, 2024.
Shuvo, Onic I.; Johnson, Megan C.; Secrest, Nathan J.; Gliozzi, Mario; Cigan, Phillip J.; Fischer, Travis C.; Van Der Horst, Alexander J. "FRAMEx. V. Radio Spectral Shape at Central Subparsec Region of Active Galactic Nuclei," The Astrophysical Journal, 961, 109, 2024.
Sierra, Anibal; Pérez, Laura M.; Agurto-Gangas, Carolina; Miley, James; Zhang, Ke; Pinilla, Paola; Pascucci, Ilaria; Trapman, Leon; Kurtovic, Nicolas; Vioque, Miguel; Deng, Dingshan; Anania, Rossella; Carpenter, John; Cieza, Lucas A.; González-Ruilova, Camilo; Hogerheijde, Michiel; Kuznetsova, Aleksandra; Rosotti, Giovanni P.; Ruiz-Rodriguez, Dary A.; Schwarz, Kamber; Tabone, Benoît; Torresvillanueva, Estephani E. "Hints of Planet Formation Signatures in a Large-cavity Disk Studied in the AGE-PRO ALMA Large Program," The Astrophysical Journal, 974, 102, 2024.
Sierra, Anibal; Pérez, Laura M.; Sotomayor, Benjamín; Benisty, Myriam; Chandler, Claire J.; Andrews, Sean; Carpenter, John; Henning, Thomas; Testi, Leonardo; Ricci, Luca; Wilner, David "Constraints on the Physical Origin of Large Cavities in Transition Disks from Multiwavelength Dust Continuum Emission," The Astrophysical Journal, 974, 306, 2024.
Sillassen, Nikolaj B.; Jin, Shuowen; Magdis, Georgios E.; Daddi, Emanuele; Wang, Tao; Lu, Shiying; Sun, Hanwen; Arumugam, Vinod; Liu, Daizhong; Brinch, Malte; D'Eugenio, Chiara; Gobat, Raphael; Gómez-Guijarro, Carlos; Rich, Michael; Schinnerer, Eva; Strazzullo, Veronica; Tan, Qinghua; Valentino, Francesco; Wang, Yijun; Xiao, Mengyuan; Zhou, Luwenjia; Blánquez-Sesé, David; Cai, Zheng; Chen, Yanmei; Ciesla, Laure; Dai, Yu; Delvecchio, Ivan; Elbaz, David; Finoguenov, Alexis; Gao, Fangyou; Gu, Qiusheng; Hale, Catherine; Hao, Qiaoyang; Huang, Jiasheng; Jarvis, Matt; Kalita, Boris; Ke, Xu; Le Bail, Aurelien; Magnelli, Benjamin; Shi, Yong; Vaccari, Mattia; Whittam, Imogen; Yang, Tiancheng; Zhang, Zhiyu "NOEMA formIng Cluster survEy (NICE): Characterizing eight massive galaxy groups at 1.5 < z < 4 in the COSMOS field," Astronomy and Astrophysics, 690, A55, 2024.
Simonte, M.; Andernach, H.; Brüggen, M.; Miley, G. K.; Barthel, P. "Giant radio galaxies in the LOFAR deep fields," Astronomy and Astrophysics, 686, A21, 2024.
Singal, Ashok K. "Resolution of the incongruency of dipole asymmetries within various large radio surveys - implications for the Cosmological Principle," Monthly Notices of the Royal Astronomical Society, 528, 5679, 2024.
Sinigaglia, Francesco; Rodighiero, Giulia; Elson, Ed; Bianchetti, Alessandro; Vaccari, Mattia; Maddox, Natasha; Ponomareva, Anastasia A.; Frank, Bradley S.; Jarvis, Matt J.; Catinella, Barbara; Cortese, Luca; Roychowdhury, Sambit; Baes, Maarten; Collier, Jordan D.; Ilbert, Olivier; Khostovan, Ali A.; Kurapati, Sushma; Pan, Hengxing; Prandoni, Isabella; Rajohnson, Sambatriniaina H. A.; Salvato, Mara; Sekhar, Srikrishna; Sharma, Gauri "MIGHTEE-H I: H I galaxy properties in the large-scale structure environment at z 0.37 from a stacking experiment," Monthly Notices of the Royal Astronomical Society, 529, 4192, 2024.
Šlaus, B.; Smolčić, V.; Ivezić, Ž.; Fotopoulou, S.; Willott, C. J.; Pendo, P.; Vignali, C.; Chiappetti, L.; Pierre, M. "The XXL survey. LII. The evolution of radio AGN LF determined via parametric methods from GMRT, ATCA, VLA, and Cambridge interferometer observations," Astronomy and Astrophysics, 684, A19, 2024.
Slavicinska, Katerina; Van Dishoeck, Ewine F.; Tychoniec, Łukasz; Nazari, Pooneh; Rubinstein, Adam E.; Gutermuth, Robert; Tyagi, Himanshu; Chen, Yuan; Brunken, Nashanty G. C.; Rocha, Will R. M.; Manoj, P.; Narang, Mayank; Thomas Megeath, S.; Yang, Yao-Lun; Looney, Leslie W.; Tobin, John J.; Beuther, Henrik; Bourke, Tyler L.; Linnartz, Harold; Federman, Samuel; Watson, Dan M.; Linz, Hendrik "JWST detections of amorphous and crystalline HDO ice toward massive protostars," Astronomy and Astrophysics, 688, A29, 2024.
Smail, Ian "Obscured star formation in clusters at z = 1.6-2.0: massive galaxy formation and the reversal of the star formation-density relation," Monthly Notices of the Royal Astronomical Society, 529, 2290, 2024.
Socci, A.; Hacar, A.; Bonanomi, F.; Tafalla, M.; Suri, S. "Emergence of high-mass stars in complex fiber networks (EMERGE): III. Fiber networks in Orion," Astronomy and Astrophysics, 690, A375, 2024.
Solar, Martín; Michałowski, Michał J.; Nadolny, Jakub; Galbany, Lluís; Hjorth, Jens; Zapartas, Emmanouil; Sollerman, Jesper; Hunt, Leslie; Klose, Sylvio; Koprowski, Maciej; Leśniewska, Aleksandra; Małkowski, Michał; Nicuesa Guelbenzu, Ana M.; Ryzhov, Oleh; Savaglio, Sandra; Schady, Patricia; Schulze, Steve; De Ugarte Postigo, Antonio; Vergani, Susanna D.; Watson, Darach; Wróblewski, Radosław "Binary progenitor systems for Type Ic supernovae," Nature Communications, 15, 7667, 2024.
Solimano, M.; González-López, J.; Aravena, M.; Herrera-Camus, R.; De Looze, I.; Förster Schreiber, N. M.; Spilker, J.; Tadaki, K.; Assef, R. J.; Barcos-Muñoz, L.; Davies, R. L.; Díaz-Santos, T.; Ferrara, A.; Fisher, D. B.; Guaita, L.; Ikeda, R.; Johnston, E. J.; Lutz, D.; Mitsuhashi, I.; Moya-Sierralta, C.; Relaño, M.; Naab, T.; Posses, A. C.; Telikova, K.; Übler, H.; Van Der Giessen, S.; Veilleux, S.; Villanueva, V. "The ALMA-CRISTAL survey: Discovery of a 15 kpc-long gas plume in a z = 4.54 Lyman-α blob," Astronomy and Astrophysics, 689, A145, 2024.
Sorgho, A.; Verdes-Montenegro, L.; Hess, K. M.; Jones, M. G.; Jarrett, T. H.; Sanchez-Expósito, S.; Garrido, J. "The AMIGA sample of isolated galaxies - effects of environment on angular momentum," Monthly Notices of the Royal Astronomical Society, 528, 1630, 2024.
Sosa Fiscella, Sophia Valentina; Lam, Michael T.; Arzoumanian, Zaven; Blumer, Harsha; Brook, Paul R.; Cromartie, H. Thankful; Decesar, Megan E.; Demorest, Paul B.; Dolch, Timothy; Ellis, Justin A.; Ferdman, Robert D.; Ferrara, Elizabeth C.; Fonseca, Emmanuel; Garver-Daniels, Nate; Gentile, Peter A.; Good, Deborah C.; Jones, Megan L.; Lorimer, Duncan R.; Luo, Jing; Lynch, Ryan S.; Mclaughlin, Maura A.; Ng, Cherry; Nice, David J.; Pennucci, Timothy T.; Pol, Nihan S.; Ransom, Scott M.; Spiewak, Renée; Stairs, Ingrid H.; Stovall, Kevin; Swiggum, Joseph K.; Vigeland, Sarah J. "The NANOGrav 12.5-Year Data Set: Dispersion Measure Misestimations with Varying Bandwidths," The Astrophysical Journal, 966, 95, 2024.
Souchay, J.; Secrest, N.; Sexton, R.; Barache, C. "LQAC-6: Sixth Release of the Large Quasar Astrometric Catalogue. A compilation of 2 073 099 objects with 1 739 187 Gaia DR3 counterparts," Astronomy and Astrophysics, 683, A112, 2024.
Speedie, Jessica; Dong, Ruobing; Hall, Cassandra; Longarini, Cristiano; Veronesi, Benedetta; Paneque-Carreño, Teresa; Lodato, Giuseppe; Tang, Ya-Wen; Teague, Richard; Hashimoto, Jun "Gravitational instability in a planet-forming disk," Nature, 633, 58, 2024.
Srinivasaragavan, Gokul P.; Yang, Sheng; Anand, Shreya; Sollerman, Jesper; Ho, Anna Y. Q.; Corsi, Alessandra; Cenko, S. Bradley; Perley, Daniel; Schulze, Steve; Sanchez-Fleming, Marquice; Pope, Jack; Sarin, Nikhil; Omand, Conor; Das, Kaustav K.; Fremling, Christoffer; Andreoni, Igor; Bruch, Rachel; Burdge, Kevin B.; De, Kishalay; Gal-Yam, Avishay; Gangopadhyay, Anjasha; Graham, Matthew J.; Jencson, Jacob E.; Karambelkar, Viraj; Kasliwal, Mansi M.; Kulkarni, S. R.; Martikainen, Julia; Sharma, Yashvi S.; Tzanidakis, Anastasios; Yan, Lin; Yao, Yuhan; Bellm, Eric C.; Groom, Steven L.; Masci, Frank J.; Nir, Guy; Purdum, Josiah; Smith, Roger; Sravan, Niharika "Optical and Radio Analysis of Systematically Classified Broad-lined Type Ic Supernovae from the Zwicky Transient Facility," The Astrophysical Journal, 976, 71, 2024.
Stacey, H. R.; Powell, D. M.; Vegetti, S.; Mckean, J. P.; Fassnacht, C. D.; Wen, D.; O'Riordan, C. M. "Complex angular structure of three elliptical galaxies from high-resolution ALMA observations of strong gravitational lenses," Astronomy and Astrophysics, 688, A110, 2024.
Stapper, L. M.; Hogerheijde, M. R.; Van Dishoeck, E. F.; Lin, L.; Ahmadi, A.; Booth, A. S.; Grant, S. L.; Immer, K.; Leemker, M.; Pérez-Sánchez, A. F. "Constraining the gas mass of Herbig disks using CO isotopologues," Astronomy and Astrophysics, 682, A149, 2024.
Stark, David V.; Tuttle, Sarah; Tonnesen, Stephanie; Tu, Zachary; Fillingham, Sean P. "BreakBRD Galaxies: Evolutionary Clues through an Analysis of Gas Content," The Astrophysical Journal, 971, 116, 2024.
Steffes, Lucille; Rybarczyk, Daniel R.; Stanimirović, Snežana; Dawson, J. R.; Putman, Mary; Richter, Philipp; Gallagher, John; Liszt, Harvey; Murray, Claire; Dickey, John Miller; Heiles, Carl; Hernandez, Audra; Lindner, Robert; Liu, Yangyang; Mcclure-Griffiths, Naomi M.; Wong, Tony; Savage, Blair "A search for 3-mm molecular absorption line transitions in the magellanic stream," Publications of the Astronomical Society of Australia, 41, e094, 2024.
Steinmetz, T.; Kamiński, T.; Schmidt, M.; Kiljan, A. "A bipolar structure and shocks surrounding the stellar-merger remnant V1309 Scorpii," Astronomy and Astrophysics, 682, A127, 2024.
Sturm, J. A.; Mcclure, M. K.; Harsono, D.; Bergner, J. B.; Dartois, E.; Boogert, A. C. A.; Cordiner, M. A.; Drozdovskaya, M. N.; Ioppolo, S.; Law, C. J.; Lis, D. C.; Mcguire, B. A.; Melnick, G. J.; Noble, J. A.; Öberg, K. I.; Palumbo, M. E.; Pendleton, Y. J.; Perotti, G.; Rocha, W. R. M.; Urso, R. G.; Van Dishoeck, E. F. "A JWST/MIRI analysis of the ice distribution and polycyclic aromatic hydrocarbon emission in the protoplanetary disk HH 48 NE," Astronomy and Astrophysics, 689, A92, 2024.
Sun, Jiayi; He, Hao; Batschkun, Kyle; Levy, Rebecca C.; Emig, Kimberly; Rodríguez, M. Jimena; Hassani, Hamid; Leroy, Adam K.; Schinnerer, Eva; Ostriker, Eve C.; Wilson, Christine D.; Bolatto, Alberto D.; Mills, Elisabeth A. C.; Rosolowsky, Erik; Lee, Janice C.; Dale, Daniel A.; Larson, Kirsten L.; Thilker, David A.; Ubeda, Leonardo; Whitmore, Bradley C.; Williams, Thomas G.; Barnes, Ashley T.; Bigiel, Frank; Chevance, Mélanie; Glover, Simon C. O.; Grasha, Kathryn; Groves, Brent; Henshaw, Jonathan D.; Indebetouw, Rémy; Jiménez-Donaire, María J.; Klessen, Ralf S.; Koch, Eric W.; Liu, Daizhong; Mathur, Smita; Meidt, Sharon; Menon, Shyam H.; Neumann, Justus; Pinna, Francesca; Querejeta, Miguel; Sormani, Mattia C.; Tress, Robin G. "Hidden Gems on a Ring: Infant Massive Clusters and Their Formation Timeline Unveiled by ALMA, HST, and JWST in NGC 3351," The Astrophysical Journal, 967, 133, 2024.

Sun, Weibin; Fan, Lulu; Han, Yunkun; Knudsen, Kirsten K.; Chen, Guangwen; Zhang, Hong-Xin "Physical Properties of Hyperluminous, Dust-obscured Quasars at z ~ 3: Multiwavelength Spectral Energy Distribution Analysis and Cold Gas Content Revealed by ALMA," The Astrophysical Journal, 964, 95, 2024.
Suresh, Arjun; Blanton, Michael R. "Radio Active Galactic Nuclei Activity in Low Redshift Galaxies Is Not Directly Related to Star Formation Rates," The Astrophysical Journal, 977, 194, 2024.
Susobhanan, Abhimanyu; Kaplan, David L.; Archibald, Anne M.; Luo, Jing; Ray, Paul S.; Pennucci, Timothy T.; Ransom, Scott M.; Agazie, Gabriella; Fiore, William; Larsen, Bjorn; O'Neill, Patrick; Van Haasteren, Rutger; Anumarlapudi, Akash; Bachetti, Matteo; Bhakta, Deven; Champagne, Chloe A.; Cromartie, H. Thankful; Demorest, Paul B.; Jennings, Ross J.; Kerr, Matthew; Levina, Sasha; Mcewen, Alexander; Shapiro-Albert, Brent J.; Swiggum, Joseph K. "PINT: Maximum-likelihood Estimation of Pulsar Timing Noise Parameters," The Astrophysical Journal, 971, 150, 2024.
Sutter, Jessica; Sandstrom, Karin; Chastenet, Jérémy; Leroy, Adam K.; Koch, Eric W.; Williams, Thomas G.; Chown, Ryan; Belfiore, Francesco; Bigiel, Frank; Boquien, Médéric; Cao, Yixian; Chevance, Mélanie; Dale, Daniel A.; Egorov, Oleg V.; Glover, Simon C. O.; Groves, Brent; Klessen, Ralf S.; Kreckel, Kathryn; Larson, Kirsten L.; Oakes, Elias K.; Pathak, Debosmita; Ramambason, Lise; Rosolowsky, Erik; Watkins, Elizabeth J. "The Fraction of Dust Mass in the Form of Polycyclic Aromatic Hydrocarbons on 10-50 pc Scales in Nearby Galaxies," The Astrophysical Journal, 971, 178, 2024.
Sylos Labini, Francesco; De Marzo, Giordano; Straccamore, Matteo; Comerón, Sébastien "The Tully-Fisher relation and the Bosma effect," Monthly Notices of the Royal Astronomical Society, 527, 2697, 2024.
Tachihara, Kengo; Fukaya, Naofumi; Tokuda, Kazuki; Yamasaki, Yasumasa; Nishioka, Takeru; Abe, Daisei; Inoue, Tsuyoshi; Harada, Naoto; Shoshi, Ayumu; Nozaki, Shingo; Sato, Asako; Omura, Mitsuki; Fujishiro, Kakeru; Fukagawa, Misato; Machida, Masahiro N.; Kanai, Takahiro; Oasa, Yumiko; Onishi, Toshikazu; Saigo, Kazuya; Fukui, Yasuo "Internal 1000 au Scale Structures of the R CrA Cluster-forming Cloud. I. Filamentary Structures," The Astrophysical Journal, 968, 131, 2024.
Tadhunter, C.; Oosterloo, T.; Morganti, R.; Almeida, C. Ramos; Martín, M. Villar; Emonts, B.; Dicken, D. "An ALMA CO(1-0) survey of the 2Jy sample: large and massive molecular discs in radio AGN host galaxies," Monthly Notices of the Royal Astronomical Society, 532, 4463, 2024.
Takahashi, Satoko; Machida, Masahiro N.; Omura, Mitsuki; Johnstone, Doug; Saigo, Kazuya; Harada, Naoto; Tomisaka, Kohji; Ho, Paul T. P.; Zapata, Luis A.; Mairs, Steve; Herczeg, Gregory J.; Taniguchi, Kotomi; Liu, Yuhua; Sato, Asako "An Extremely Young Protostellar Core, MMS 1/OMC-3: Episodic Mass Ejection History Traced by the Micro SiO Jet," The Astrophysical Journal, 964, 48, 2024.
Takakuwa, Shigehisa; Saigo, Kazuya; Kido, Miyu; Ohashi, Nagayoshi; Tobin, John J.; Jørgensen, Jes K.; Aikawa, Yuri; Aso, Yusuke; Gavino, Sacha; Han, Ilseung; Koch, Patrick M.; Kwon, Woojin; Lee, Chang Won; Lee, Jeong-Eun; Li, Zhi-Yun; Lin, Zhe-Yu Daniel; Looney, Leslie W.; Mori, Shoji; Sai, Jinshi (Insa Choi), Jinshi; Sharma, Rajeeb; Sheehan, Patrick D.; Tomida, Kengo; Williams, Jonathan P.; Yamato, Yoshihide; Yen, Hsi-Wei "Early Planet Formation in Embedded Disks (eDisk). XIV. Flared Dust Distribution and Viscous Accretion Heating of the Disk around R CrA IRS 7B-a," The Astrophysical Journal, 964, 24, 2024.
Takeuchi, Tsutomu T.; Yata, Kazuyoshi; Egashira, Kento; Aoshima, Makoto; Ishii, Aki; Cooray, Suchetha; Nakanishi, Kouichiro; Kohno, Kotaro; Kono, Kai T. "High-dimensional Statistical Analysis and Its Application to an ALMA Map of NGC 253," The Astrophysical Journal Supplement Series, 271, 44, 2024.
Tan, Chia Min; Fonseca, Emmanuel; Crowter, Kathryn; Dong, Fengqiu Adam; Kaspi, Victoria M.; Masui, Kiyoshi W.; Mckee, James W.; Meyers, Bradley W.; Ransom, Scott M.; Stairs, Ingrid H. "High-cadence Timing of Binary Pulsars with CHIME," The Astrophysical Journal, 966, 26, 2024.
Tan, Qing-Hua; Daddi, Emanuele; Magnelli, Benjamin; Correa, Camila A.; Bournaud, Frédéric; Adscheid, Sylvia; Zhang, Shao-Bo; Elbaz, David; Gómez-Guijarro, Carlos; Kalita, Boris S.; Liu, Daizhong; Liu, Zhaoxuan; Pety, Jérôme; Puglisi, Annagrazia; Schinnerer, Eva; Silverman, John D.; Valentino, Francesco "In situ spheroid formation in distant submillimetre-bright galaxies," Nature, 636, 69, 2024.
Tanaka, Kunihiko; Mangum, Jeffrey G.; Viti, Serena; Martín, Sergio; Harada, Nanase; Sakamoto, Kazushi; Muller, Sebastien; Yoshimura, Yuki; Nakanishi, Kouichiro; Herrero-Illana, Rubén; Emig, Kimberly L.; Mühle, S.; Kaneko, Hiroyuki; Tosaki, Tomoka; Behrens, Erica; Rivilla, Víctor M.; Colzi, Laura; Nishimura, Yuri; Humire, P. K.; Bouvier, Mathilde; Huang, Ko-Yun; Butterworth, Joshua; Meier, David S.; Van Der Werf, Paul P. "Volume Density Structure of the Central Molecular Zone NGC 253 through ALCHEMI Excitation Analysis," The Astrophysical Journal, 961, 18, 2024.
Tang, Mengyao; Qin, Sheng-Li; Liu, Tie; Zapata, Luis A.; Liu, Xunchuan; Peng, Yaping; Xu, Fengwei; Zhang, Chao; Tatematsu, Ken'Ichi "A Survey of Sulfur-bearing Molecular Lines toward the Dense Cores in 11 Massive Protoclusters," The Astrophysical Journal Supplement Series, 275, 25, 2024.
Taniguchi, Kotomi; Gorai, Prasanta; Tan, Jonathan C.; Gómez-Garrido, Miguel; Fedriani, Rubén; Yang, Yao-Lun; Tirupati Kumara, Sridharan; Tanaka, Kei E. I.; Saito, Masao; Zhang, Yichen; Morgan, Lawrence; Cosentino, Giuliana; Law, Chi-Yan "The SOFIA Massive (SOMA) Star Formation Q-band follow-up: I. Carbon-chain chemistry of intermediate-mass protostars," Astronomy and Astrophysics, 692, A65, 2024.
Taniguchi, Kotomi; Pineda, Jaime E.; Caselli, Paola; Shimoikura, Tomomi; Friesen, Rachel K.; Segura-Cox, Dominique M.; Schmiedeke, Anika "The Reservoir of the Per-emb-2 Streamer," The Astrophysical Journal, 965, 162, 2024.
Tarantino, Elizabeth; Bolatto, Alberto D.; Indebetouw, Rémy; Rubio, Mónica; Sandstrom, Karin M.; Smith, J. -D. T.; Stapleton, Daniel; Wolfire, Mark "Modeling Ionized Gas in the Small Magellanic Cloud: The Wolf-Rayet Nebula N76," The Astrophysical Journal, 969, 101, 2024.
Tarchi, A.; Castangia, P.; Surcis, G.; Impellizzeri, V.; Ladu, E.; Bannikova, E. Yu. "Detection of maser emission at 183 and 380 GHz with ALMA in the gigamaser galaxy TXS 2226-184," Astronomy and Astrophysics, 688, L18, 2024.
Taylor, A. R.; Sekhar, S.; Heino, L.; Scaife, A. M. M.; Stil, J.; Bowles, M.; Jarvis, M.; Heywood, I.; Collier, J. D. "MIGHTEE polarization early science fields: the deep polarized sky," Monthly Notices of the Royal Astronomical Society, 528, 2511, 2024.
Taylor, Jackson; Ransom, Scott; Padmanabh, Prajwal V. "Algorithmic Pulsar Timer for Binaries," The Astrophysical Journal, 964, 128, 2024.
Teng, Yu-Hsuan; Chiang, I. -Da; Sandstrom, Karin M.; Sun, Jiayi; Leroy, Adam K.; Bolatto, Alberto D.; Usero, Antonio; Ostriker, Eve C.; Querejeta, Miguel; Chastenet, Jérémy; Bigiel, Frank; Boquien, Médéric; Den Brok, Jakob; Cao, Yixian; Chevance, Mélanie; Chown, Ryan; Colombo, Dario; Eibensteiner, Cosima; Glover, Simon C. O.; Grasha, Kathryn; Henshaw, Jonathan D.; Jiménez-Donaire, María J.; Liu, Daizhong; Murphy, Eric J.; Pan, Hsi-An; Stuber, Sophia K.; Williams, Thomas G. "Star Formation Efficiency in Nearby Galaxies Revealed with a New CO-to-H_2 Conversion Factor Prescription," The Astrophysical Journal, 961, 42, 2024.
Thang, Nguyen Tat; Diep, Pham Ngoc; Hoang, Thiem; Tram, Le Ngoc; Ngoc, Nguyen Bich; Phuong, Nguyen Thi; Truong, Bao "Evidence of Grain Alignment by Magnetically Enhanced Radiative Torques from Multiwavelength Dust Polarization Modeling of HL Tau," The Astrophysical Journal, 970, 114, 2024.
Thelen, Alexander E.; Nixon, Conor A.; Cordiner, Martin A.; Lellouch, Emmanuel; Vinatier, Sandrine; Teanby, Nicholas A.; Butler, Bryan; Charnley, Steven B.; Cosentino, Richard G.; De Kleer, Katherine; Irwin, Patrick G. J.; Gurwell, Mark A.; Kisiel, Zbigniew; Moreno, Raphael "Observations of Titan's Stratosphere during Northern Summer: Temperatures, CH_3CN and CH_3D Abundances," The Planetary Science Journal, 5, 125, 2024.
Thongkham, Khunanon; Gonzalez, Anthony H.; Brodwin, Mark; Trudeau, Ariane; Eisenhardt, Peter; Stanford, S. A.; Moravec, Emily; Connor, Thomas; Stern, Daniel; Spivey, Ryan; Garcia, Karolina "The Massive and Distant Clusters of WISE Survey 2: Second Data Release," The Astrophysical Journal, 976, 186, 2024.
Thongkham, Khunanon; Gonzalez, Anthony H.; Brodwin, Mark; Trudeau, Ariane; Saha, Ripon; Eisenhardt, Peter; Stanford, S. A.; Moravec, Emily; Connor, Thomas; Stern, Daniel "The Massive and Distant Clusters of WISE Survey 2: Equatorial First Data Release," The Astrophysical Journal, 967, 123, 2024.
Thongmeearkom, T.; Clark, C. J.; Breton, R. P.; Burgay, M.; Nieder, L.; Freire, P. C. C.; Barr, E. D.; Stappers, B. W.; Ransom, S. M.; Buchner, S.; Calore, F.; Champion, D. J.; Cognard, I.; Grießmeier, J.-M.; Kramer, M.; Levin, L.; Padmanabh, P. V.; Possenti, A.; Ridolfi, A.; Krishnan, V. Venkatraman; Vleeschower, L. "A targeted radio pulsar survey of redback candidates with MeerKAT," Monthly Notices of the Royal Astronomical Society, 530, 4676, 2024.
Tobin, John J.; Sheehan, Patrick D. "An Observational View of Structure in Protostellar Systems," Annual Review of Astronomy and Astrophysics, 62, 203, 2024.
Tofflemire, Benjamin M.; Prato, Lisa; Kraus, Adam L.; Segura-Cox, Dominique; Schaefer, G. H.; Akeson, Rachel; Andrews, Sean; Jensen, Eric L. N.; Johns-Krull, Christopher M.; Zanazzi, J. J.; Simon, M. "Sites of Planet Formation in Binary Systems. I. Evidence for Disk-Orbit Alignment in the Close Binary FO Tau," The Astronomical Journal, 167, 232, 2024.
Tokuda, Kazuki; Harada, Naoto; Omura, Mitsuki; Matsumoto, Tomoaki; Onishi, Toshikazu; Saigo, Kazuya; Shoshi, Ayumu; Nozaki, Shingo; Tachihara, Kengo; Fukaya, Naofumi; Fukui, Yasuo; Inutsuka, Shu-Ichiro; Machida, Masahiro N. "Discovery of Asymmetric Spike-like Structures of the 10 au Disk around the Very Low-luminosity Protostar Embedded in the Taurus Dense Core MC 27/L1521F with ALMA," The Astrophysical Journal, 965, 99, 2024.
Tortosa, A.; Ricci, C.; Shablovinskaia, E.; Tombesi, F.; Kawamuro, T.; Kara, E.; Mantovani, G.; Balokovic, M.; Chang, C.-S.; Gendreau, K.; Koss, M. J.; Liu, T.; Loewenstein, M.; Paltani, S.; Privon, G. C.; Trakhtenbrot, B. "XMM-Newton - NuSTAR monitoring campaign of the Seyfert 1 galaxy IC 4329A," Astronomy and Astrophysics, 687, A51, 2024.
Towner, A. P. M.; Ginsburg, A.; Dell'Ova, P.; Gusdorf, A.; Bontemps, S.; Csengeri, T.; Galván-Madrid, R.; Louvet, F. K.; Motte, F.; Sanhueza, P.; Stutz, A. M.; Bally, J.; Baug, T.; Chen, H. -R. V.; Cunningham, N.; Fernández-López, M.; Liu, H.-L.; Lu, X.; Nony, T.; Valeille-Manet, M.; Wu, B.; Álvarez-Gutiérrez, R. H.; Bonfand, M.; Di Francesco, J.; Nguyen-Luong, Q.; Olguin, F.; Whitworth, A. P. "ALMA-IMF. IX. Catalog and Physical Properties of 315 SiO Outflow Candidates in 15 Massive Protoclusters," The Astrophysical Journal, 960, 48, 2024.

Traianou, Efthalia; Krichbaum, Thomas P.; Gómez, José L.; Lico, Rocco; Paraschos, Georgios Filippos; Cho, Ilje; Ros, Eduardo; Zhao, Guang-Yao; Liodakis, Ioannis; Dahale, Rohan; Toscano, Teresa; Fuentes, Antonio; Foschi, Marianna; Casadio, Carolina; Macdonald, Nicholas; Kim, Jae-Young; Hervet, Olivier; Jorstad, Svetlana; Lobanov, Andrei P.; Hodgson, Jeffrey; Myserlis, Ioannis; Agudo, Ivan; Zensus, Anton J.; Marscher, Alan P. "Lost in the curve: Investigating the disappearing knots in blazar 3C 454.3," Astronomy and Astrophysics, 682, A154, 2024.

Traina, A.; Gruppioni, C.; Delvecchio, I.; Calura, F.; Bisigello, L.; Feltre, A.; Magnelli, B.; Schinnerer, E.; Liu, D.; Adscheid, S.; Behiri, M.; Gentile, F.; Pozzi, F.; Talia, M.; Zamorani, G.; Algera, H.; Gillman, S.; Lambrides, E.; Symeonidis, M. "A^{3}COSMOS: The infrared luminosity function and dust-obscured star formation rate density at 0.5 < z < 6," Astronomy and Astrophysics, 681, A118, 2024.

Traina, A.; Magnelli, B.; Gruppioni, C.; Delvecchio, I.; Parente, M.; Calura, F.; Bisigello, L.; Feltre, A.; Pozzi, F.; Vallini, L. "A^{3}COSMOS: Dust mass function and dust mass density at 0.5 < z < 6," Astronomy and Astrophysics, 690, A84, 2024.

Tremblay, C. D.; Varghese, S. S.; Hickish, J.; Demorest, P. B.; Ng, C.; Siemion, A. P. V.; Czech, D.; Donnachie, R. A.; Farah, W.; Gajjar, V.; Lebofsky, M.; Macmahon, D. H. E.; Myburgh, T.; Ruzindana, M.; Bright, J. S.; Erickson, A.; Lacker, K. "COSMIC: An Ethernet-based Commensal, Multimode Digital Backend on the Karl G. Jansky Very Large Array for the Search for Extraterrestrial Intelligence," The Astronomical Journal, 167, 35, 2024.

Trindade Falcão, Anna; Fabbiano, G.; Elvis, M.; Paggi, A.; Maksym, W. P. "Deep Chandra Observations of NGC 5728. III. Probing the High-resolution X-Ray Morphology and Multiphase Interstellar Medium Interactions in the Circumnuclear Region," The Astrophysical Journal, 977, 275, 2024.

Trindade Falcão, Anna; Turner, T. J.; Kraemer, S. B.; Reeves, J.; Braito, V.; Schmitt, H. R.; Feuillet, L. "Resolving a Candidate Dual Active Galactic Nucleus with ~100 pc Separation in MCG-03-34-64," The Astrophysical Journal, 972, 185, 2024.

Tripodi, R.; Feruglio, C.; Fiore, F.; Zappacosta, L.; Piconcelli, E.; Bischetti, M.; Bongiorno, A.; Carniani, S.; Civano, F.; Chen, C.-C.; Cristiani, S.; Cupani, G.; Di Mascia, F.; D'Odorico, V.; Fan, X.; Ferrara, A.; Gallerani, S.; Ginolfi, M.; Maiolino, R.; Mainieri, V.; Marconi, A.; Saccheo, I.; Salvestrini, F.; Tortosa, A.; Valiante, R. "HYPERION: Coevolution of supermassive black holes and galaxies at z > 6 and the build-up of massive galaxies," Astronomy and Astrophysics, 689, A220, 2024.

Tripodi, R.; Scholtz, J.; Maiolino, R.; Fujimoto, S.; Carniani, S.; Silverman, J. D.; Feruglio, C.; Ginolfi, M.; Zappacosta, L.; Costa, T.; Jones, G. C.; Piconcelli, E.; Bischetti, M.; Fiore, F. "HYPERION. Interacting companion and outflow in the most luminous z > 6 quasar," Astronomy and Astrophysics, 682, A54, 2024.

Trudeau, A.; Gonzalez, Anthony H.; Thongkham, K.; Lee, Kyoung-Soo; Alberts, Stacey; Brodwin, M.; Connor, Thomas; Eisenhardt, Peter R. M.; Moravec, Emily; Puvvada, Eshwar; Stanford, S. A. "The Massive and Distant Clusters of WISE Survey 2: A Stacking Analysis Investigating the Evolution of Star Formation Rates and Stellar Masses in Groups and Clusters," The Astrophysical Journal, 972, 27, 2024.

Tsuge, K.; Sasaki, M.; Knies, J. R.; Haberl, F.; Points, S.; Maitra, C.; Filipović, M. D.; Staveley-Smith, L.; Koribalski, B. S.; Kerp, J. "Multiwavelength study of the HII region LHA 120-N11 in the Large Magellanic Cloud with eROSITA," Astronomy and Astrophysics, 686, A307, 2024.

Tsukui, Takafumi; Wisnioski, Emily; Bland-Hawthorn, Joss; Mai, Yifan; Iguchi, Satoru; Baba, Junichi; Freeman, Ken "Detecting a disc bending wave in a barred-spiral galaxy at redshift 4.4," Monthly Notices of the Royal Astronomical Society, 527, 8941, 2024.

Tu, Tian-Yu; Chen, Yang; Zhou, Ping; Safi-Harb, Samar; Liu, Qian-Cheng "Shock and Cosmic-Ray Chemistry Associated with the Supernova Remnant W28," The Astrophysical Journal, 966, 178, 2024.

Turner, Jacob E.; Dolch, Timothy; Cordes, James M.; Ocker, Stella K.; Stinebring, Daniel R.; Chatterjee, Shami; Mclaughlin, Maura A.; Catlett, Victoria E.; Jessup, Cody; Jones, Nathaniel; Scheithauer, Christopher "A Cyclic Spectroscopy Scintillation Study of PSR B1937+21. I. Demonstration of Improved Scintillometry," The Astrophysical Journal, 972, 16, 2024.

Turner, Jacob E.; Joshi, Bhal Chandra; Mclaughlin, Maura A.; Stinebring, Daniel R. "A Simultaneous Dual-frequency Scintillation Arc Survey of Six Bright Canonical Pulsars Using the Upgraded Giant Metrewave Radio Telescope," The Astrophysical Journal, 961, 101, 2024.

Turner, Jacob E.; Lebron Medina, Juan G.; Zelensky, Zachary; Gustavson, Kathleen A.; Marx, Jeffrey; Kothapalli, Manvith; Cruz Vega, Luis D.; Lee, Alexander; Figueroa, Caryelis B.; Reichart, Daniel E.; Haislip, Joshua B.; Kouprianov, Vladimir V.; White, Steve; Ghigo, Frank; Heatherly, Sue Ann; Mclaughlin, Maura A. "The Pulsar Science Collaboratory: Multiepoch Scintillation Studies of Pulsars," The Astrophysical Journal, 977, 205, 2024.

Tychoniec, Łukasz; Van Gelder, Martijn L.; Van Dishoeck, Ewine F.; Francis, Logan; Rocha, Will R. M.; Caratti O Garatti, Alessio; Beuther, Henrik; Gieser, Caroline; Justtanont, Kay; Linnartz, Harold; Le Gouellec, Valentin J. M.; Perotti, Giulia; Devaraj, Rangaswamy; Tabone, Benoît; Ray, Thomas P.; Brunken, Nashanty G. C.; Chen, Yuan; Kavanagh, Patrick J.; Klaassen, Pamela; Slavicinska, Katerina; Güdel, Manuel; Östlin, Goran "JWST Observations of Young protoStars (JOYS). Linked accretion and ejection in a Class I protobinary system," Astronomy and Astrophysics, 687, A36, 2024.

Ubertosi, F.; Giacintucci, S.; Clarke, T.; Markevitch, M.; Venturi, T.; O'Sullivan, E.; Gitti, M. "Multi-epoch jet outbursts in Abell 496: Synchrotron ageing and buoyant X-ray cavities draped by warm gas filaments," Astronomy and Astrophysics, 691, A294, 2024.

Ubertosi, F.; Giroletti, M.; Gitti, M.; Biava, N.; De Rubeis, E.; Bonafede, A.; Feretti, L.; Bondi, M.; Bruno, L.; Liuzzo, E.; Ignesti, A.; Brunetti, G. "A JVLA, LOFAR, e-Merlin, VLBA, and EVN study of RBS 797: can binary supermassive black holes explain the outburst history of the central radio galaxy?," Astronomy and Astrophysics, 688, A86, 2024.

Ubertosi, Francesco; Schellenberger, Gerrit; O'Sullivan, Ewan; Vrtilek, Jan; Giacintucci, Simona; David, Laurence P.; Forman, William; Gitti, Myriam; Venturi, Tiziana; Jones, Christine; Brighenti, Fabrizio "Jet Reorientation in Central Galaxies of Clusters and Groups: Insights from VLBA and Chandra Data," The Astrophysical Journal, 961, 134, 2024.

Uematsu, Ryosuke; Ueda, Yoshihiro; Kohno, Kotaro; Toba, Yoshiki; Yamada, Satoshi; Smail, Ian; Umehata, Hideki; Fujimoto, Seiji; Hatsukade, Bunyo; Ao, Yiping; Bauer, Franz Erik; Brammer, Gabriel; Dessauges-Zavadsky, Miroslava; Espada, Daniel; Jolly, Jean-Baptiste; Koekemoer, Anton M.; Kokorev, Vasily; Magdis, Georgios E.; Oguri, Masamune; Sun, Fengwu "ALMA Lensing Cluster Survey: Full Spectral Energy Distribution Analysis of z ~ 0.5-6 Lensed Galaxies Detected with millimeter Observations," The Astrophysical Journal, 965, 108, 2024.

Unnikrishnan, R.; De Beck, E.; Nyman, L. -Å.; Olofsson, H.; Vlemmings, W. H. T.; Tafoya, D.; Maercker, M.; Charnley, S. B.; Cordiner, M. A.; De Gregorio, I.; Humphreys, E.; Millar, T. J.; Rawlings, M. G. "Charting circumstellar chemistry of carbon-rich asymptotic giant branch stars. I. ALMA 3 mm spectral surveys," Astronomy and Astrophysics, 684, A4, 2024.

Urbina, F.; Miley, J.; Kama, M.; Keyte, L. "Vertical and radial distribution of atomic carbon in HD 163296," Astronomy and Astrophysics, 686, A120, 2024.

Valdivia-Mena, María Teresa; Pineda, Jaime E.; Caselli, Paola; Segura-Cox, Dominique M.; Schmiedeke, Anika; Spezzano, Silvia; Offner, Stella; Ivlev, Alexei V.; Kuffmeier, Michael; Cunningham, Nichol; Neri, Roberto; Maureira, María José "Probing the physics of star formation (ProPStar). II. The first systematic search for streamers toward protostars," Astronomy and Astrophysics, 687, A71, 2024.

Valegård, P.-G.; Ginski, C.; Derkink, A.; Garufi, A.; Dominik, C.; Ribas, Á.; Williams, J. P.; Benisty, M.; Birnstiel, T.; Facchini, S.; Columba, G.; Hogerheijde, M.; Van Holstein, R. G.; Huang, J.; Kenworthy, M.; Manara, C. F.; Pinilla, P.; Rab, Ch.; Sulaiman, R.; Zurlo, A. "Disk Evolution Study Through Imaging of Nearby Young Stars (DESTINYS): The SPHERE view of the Orion star-forming region," Astronomy and Astrophysics, 685, A54, 2024.

Valentino, F.; Fujimoto, S.; Giménez-Arteaga, C.; Brammer, G.; Kohno, K.; Sun, F.; Kokorev, V.; Bauer, F. E.; Di Cesare, C.; Espada, D.; Lee, M.; Dessauges-Zavadsky, M.; Ao, Y.; Koekemoer, A. M.; Ouchi, M.; Wu, J. F.; Egami, E.; Jolly, J.-B.; Lagos, C. Del P.; Magdis, G. E.; Schaerer, D.; Shimasaku, K.; Umehata, H.; Wang, W.-H. "The cold interstellar medium of a normal sub-L* galaxy at the end of reionization," Astronomy and Astrophysics, 685, A138, 2024.

Vallini, Livia; Witstok, Joris; Sommovigo, Laura; Pallottini, Andrea; Ferrara, Andrea; Carniani, Stefano; Kohandel, Mahsa; Smit, Renske; Gallerani, Simona; Gruppioni, Carlotta "Spatially resolved Kennicutt-Schmidt relation at z ≈ 7 and its connection with the interstellar medium properties," Monthly Notices of the Royal Astronomical Society, 527, 10, 2024.

Van De Putte, Dries; Meshaka, Raphael; Trahin, Boris; Habart, Emilie; Peeters, Els; Berné, Olivier; Alarcón, Felipe; Canin, Amélie; Chown, Ryan; Schroetter, Ilane; Sidhu, Ameek; Boersma, Christiaan; Bron, Emeric; Dartois, Emmanuel; Goicoechea, Javier R.; Gordon, Karl D.; Onaka, Takashi; Tielens, Alexander G. G. M.; Verstraete, Laurent; Wolfire, Mark G.; Abergel, Alain; Bergin, Edwin A.; Bernard-Salas, Jeronimo; Cami, Jan; Cuadrado, Sara; Dicken, Daniel; Elyajouri, Meriem; Fuente, Asunción; Joblin, Christine; Khan, Baria; Lacinbala, Ozan; Languignon, David; Le Gal, Romane; Maragkoudakis, Alexandros; Okada, Yoko; Pasquini, Sofia; Pound, Marc W.; Robberto, Massimo; Röllig, Markus; Schefter, Bethany; Schirmer, Thiébaut; Tabone, Benoit; Vicente, Sílvia; Zannese, Marion; Colgan, Sean W. J.; He, Jinhua; Rouillé, Gaël; Togi, Aditya; Aleman, Isabel; Auchettl, Rebecca; Baratta, Giuseppe Antonio; Bejaoui, Salma; Bera, Partha P.; Black, John H.; Boulanger, Francois; Bouwman, Jordy; Brandl, Bernhard; Brechignac, Philippe; Brünken, Sandra; Buragohain, Mridusmita; Burkhardt, Andrew; Candian, Alessandra; Cazaux, Stéphanie; Cernicharo, Jose; Chabot, Marin; Chakraborty, Shubhadip; Champion, Jason; Cooke, Ilsa R.; Coutens, Audrey; Cox, Nick L. J.; Demyk, Karine; Meyer, Jennifer Donovan; Foschino, Sacha; García-Lario, Pedro; Gerin, Maryvonne; Gottlieb, Carl A.; Guillard, Pierre; Gusdorf, Antoine; Hartigan, Patrick; Herbst, Eric; Hornekaer, Liv; Issa, Lina; Jäger, Cornelia; Janot-Pacheco, Eduardo; Kannavou, Olga; Kaufman, Michael; Kemper, Francisca; Kendrew, Sarah; Kirsanova, Maria S.; Klaassen, Pamela; Kwok, Sun; Labiano, Álvaro; Lai, Thomas S.-Y.; Le Floch, Bertrand; Le Petit, Franck; Li, Aigen; Linz, Hendrik; Mackie, Cameron J.; Madden, Suzanne C.; Mascetti, Joëlle; Mcguire, Brett A.; Merino, Pablo; Micelotta, Elisabetta R.; Morse, Jon A.; Mulas, Giacomo; Neelamkodan, Naslim; Ohsawa, Ryou; Omont, Alain; Paladini, Roberta; Palumbo, Maria Elisabetta; Pathak, Amit; Pendleton, Yvonne J.; Petrignani, Annemieke; Pino, Thomas; Puga, Elena; Rangwala, Naseem; Rapacioli, Mathias; Rho, Jeonghee; Ricca, Alessandra; Roman-Duval, Julia; Roser, Joseph; Roueff, Evelyne; Salama, Farid; Sales, Dinalva

A.; Sandstrom, Karin; Sarre, Peter; Sciamma-O'Brien, Ella; Sellgren, Kris; Shenoy, Sachindev S.; Teyssier, David; Thomas, Richard D.; Witt, Adolf N.; Wootten, Alwyn; Ysard, Nathalie; Zettergren, Henning; Zhang, Yong; Zhang, Ziwei E.; Zhen, Junfeng "PDRs4All. VIII. Mid-infrared emission line inventory of the Orion Bar," Astronomy and Astrophysics, 687, A86, 2024.
Van De Sande, M.; Walsh, C.; Danilovich, T.; De Ceuster, F.; Ceulemans, T. "Modelling predicts a molecule-rich disc around the AGB star L_2 Puppis," Monthly Notices of the Royal Astronomical Society, 532, 734, 2024.
Van Den Eijnden, J.; Robins, D.; Sharma, R.; Sánchez-Fernández, C.; Russell, T. D.; Degenaar, N.; Miller-Jones, J. C. A.; Maccarone, T. "The variable radio jet of the accreting neutron star the Rapid Burster," Monthly Notices of the Royal Astronomical Society, 533, 756, 2024.
Van Den Eijnden, J.; Rouco Escorial, A.; Alfonso-Garzón, J.; Miller-Jones, J. C. A.; Kretschmar, P.; Fürst, F.; Degenaar, N.; Hernández Santisteban, J. V.; Sivakoff, G. R.; Russell, T. D.; Wijnands, R. "VLA monitoring of LS V +44 17 reveals scatter in the X-ray - radio correlation of Be/X-ray binaries," Monthly Notices of the Royal Astronomical Society, 527, 4260, 2024.
Van Gelder, M. L.; Ressler, M. E.; Van Dishoeck, E. F.; Nazari, P.; Tabone, B.; Black, J. H.; Tychoniec, Ł.; Francis, L.; Barsony, M.; Beuther, H.; Caratti O Garatti, A.; Chen, Y.; Gieser, C.; Le Gouellec, V. J. M.; Kavanagh, P. J.; Klaassen, P. D.; Lew, B. W. P.; Linnartz, H.; Majumdar, L.; Perotti, G.; Rocha, W. R. M. "JOYS+: Mid-infrared detection of gas-phase SO_2 emission in a low-mass protostar. The case of NGC 1333 IRAS 2A: Hot core or accretion shock?," Astronomy and Astrophysics, 682, A78, 2024.
Van Leeuwen, I. F.; Bouwens, R. J.; Van Der Werf, P. P.; Hodge, J. A.; Schouws, S.; Stefanon, M.; Algera, H. S. B.; Aravena, M.; Boogaard, L. A.; Bowler, R. A. A.; Da Cunha, E.; Dayal, P.; Decarli, R.; Gonzalez, V.; Inami, H.; De Looze, I.; Sommovigo, L.; Venemans, B. P.; Walter, F.; Barrufet, L.; Ferrara, A.; Graziani, L.; Hygate, A. P. S.; Oesch, P.; Palla, M.; Rowland, L.; Schneider, R. "Characterizing the contribution of dust-obscured star formation at $z \gtrsim 5$ using 18 serendipitously identified [C II] emitters," Monthly Notices of the Royal Astronomical Society, 534, 2062, 2024.
Van Marrewijk, J.; Di Mascolo, L.; Gill, A. S.; Battaglia, N.; Battistelli, E. S.; Bond, J. R.; Devlin, M. J.; Doze, P.; Dunkley, J.; Knowles, K.; Hincks, A.; Hughes, J. P.; Hilton, M.; Moodley, K.; Mroczkowski, T.; Naess, S.; Partridge, B.; Popping, G.; Sifón, C.; Staggs, S. T.; Wollack, E. J. "XLSSC 122 caught in the act of growing up: Spatially resolved SZ observations of a z = 1.98 galaxy cluster," Astronomy and Astrophysics, 689, A41, 2024.
Van Velzen, Sjoert; Stein, Robert; Gilfanov, Marat; Kowalski, Marek; Hayasaki, Kimitake; Reusch, Simeon; Yao, Yuhan; Garrappa, Simone; Franckowiak, Anna; Gezari, Suvi; Nordin, Jakob; Fremling, Christoffer; Sharma, Yashvi; Yan, Lin; Kool, Erik C.; Stern, Daniel; Veres, Patrik M.; Sollerman, Jesper; Medvedev, Pavel; Sunyaev, Rashid; Bellm, Eric C.; Dekany, Richard G.; Duev, Dimitri A.; Graham, Matthew J.; Kasliwal, Mansi M.; Kulkarni, Shrinivas R.; Laher, Russ R.; Riddle, Reed L.; Rusholme, Ben "Establishing accretion flares from supermassive black holes as a source of high-energy neutrinos," Monthly Notices of the Royal Astronomical Society, 529, 2559, 2024.
Van Weeren, R. J.; Timmerman, R.; Vaidya, V.; Gendron-Marsolais, M.-L.; Botteon, A.; Roberts, I. D.; Hlavacek-Larrondo, J.; Bonafede, A.; Brüggen, M.; Brunetti, G.; Cassano, R.; Cuciti, V.; Edge, A. C.; Gastaldello, F.; Groeneveld, C.; Shimwell, T. W. "LOFAR high-band antenna observations of the Perseus cluster: The discovery of a giant radio halo," Astronomy and Astrophysics, 692, A12, 2024.
Van'T Hoff, Merel L. R.; Bergin, Edwin A.; Riley, Penelope; Mittal, Sanil; Jørgensen, Jes K.; Tobin, John J. "Identification of Hot Gas around Low-mass Protostars," The Astrophysical Journal, 970, 138, 2024.
Vantyghem, A. N.; Galvin, T. J.; Sebastian, B.; O'Dea, C. P.; Gordon, Y. A.; Boyce, M.; Rudnick, L.; Polsterer, K.; Andernach, H.; Dionyssiou, M.; Venkataraman, P.; Norris, R.; Baum, S. A.; Wang, X. R.; Huynh, M. "Rotation and flipping invariant self-organizing maps with astronomical images: A cookbook and application to the VLA Sky Survey QuickLook images," Astronomy and Computing, 47, 100824, 2024.
Vastel, C.; Sakai, T.; Ceccarelli, C.; Jiménez-Serra, I.; Alves, F.; Balucani, N.; Bianchi, E.; Bouvier, M.; Caselli, P.; Chandler, C. J.; Charnley, S.; Codella, C.; De Simone, M.; Dulieu, F.; Evans, L.; Fontani, F.; Lefloch, B.; Loinard, L.; Menard, F.; Podio, L.; Sabatini, G.; Sakai, N.; Yamamoto, S. "FAUST. XI. Enhancement of the complex organic material in the shocked matter surrounding the [BHB2007] 11 protobinary system," Astronomy and Astrophysics, 684, A189, 2024.
Venkateshwaran, Aparna; Weiss, Axel; Sulzenauer, Nikolaus; Menten, Karl; Aravena, Manuel; Chapman, Scott C.; Gonzalez, Anthony; Gururajan, Gayathri; Hayward, Christopher C.; Hill, Ryley; Reuter, Cassie; Spilker, Justin S.; Vieira, Joaquin D. "Kinematic Analysis of z = 4.3 Galaxies in the SPT2349-56 Protocluster Core," The Astrophysical Journal, 977, 161, 2024.
Venkattu, Deepika; Lundqvist, Peter; Pérez Torres, Miguel; Bonnassieux, Etienne; Tasse, Cyril; Melchior, Anne-Laure; Combes, Francoise "SN 1885A and Supernova Remnants in the Centre of M31 with LOFAR," The Astrophysical Journal, 976, 213, 2024.
Villanueva, V.; Herrera-Camus, R.; González-López, J.; Aravena, M.; Assef, R. J.; Baeza-Garay, M.; Barcos-Muñoz, L.; Bovino, S.; Bowler, R. A. A.; Da Cunha, E.; De Looze, I.; Diaz-Santos, T.; Ferrara, A.; Förster Schreiber, N. M.; Algera, H.; Ikeda, R.; Killi, M.; Mitsuhashi, I.; Naab, T.; Relano, M.; Spilker, J.; Solimano, M.; Palla, M.; Price, S. H.; Posses, A.; Tadaki, K.; Telikova, K.; Übler, H. "The ALMA-CRISTAL survey: Dust temperature and physical conditions of the interstellar medium in a typical galaxy at z = 5.66," Astronomy and Astrophysics, 691, A133, 2024.
Villanueva, Vicente; Bolatto, Alberto D.; Vogel, Stuart N.; Wong, Tony; Leroy, Adam K.; Sánchez, Sebastian F.; Levy, Rebecca C.; Rosolowsky, Erik; Colombo, Dario; Kalinova, Veselina; Cronin, Serena; Teuben, Peter; Rubio, Mónica; Bazzi, Zein "The EDGE-CALIFA Survey: Molecular Gas and Star Formation Activity across the Green Valley," The Astrophysical Journal, 962, 88, 2024.
Vleeschower, L.; Corongiu, A.; Stappers, B. W.; Freire, P. C. C.; Ridolfi, A.; Abbate, F.; Ransom, S. M.; Possenti, A.; Padmanabh, P. V.; Balakrishnan, V.; Kramer, M.; Krishnan, V. Venkatraman; Zhang, L.; Bailes, M.; Barr, E. D.; Buchner, S.; Chen, W. "Discoveries and timing of pulsars in M62," Monthly Notices of the Royal Astronomical Society, 530, 1436, 2024.
Vlemmings, W. H. T.; Lankhaar, B.; Velilla-Prieto, L. "Molecular line polarisation from the circumstellar envelopes of asymptotic giant branch stars," Astronomy and Astrophysics, 686, A274, 2024.
Vlemmings, Wouter; Khouri, Theo; Bojnordi Arbab, Behzad; De Beck, Elvire; Maercker, Matthias "One month convection timescale on the surface of a giant evolved star," Nature, 633, 323, 2024.
Vorster, J. M.; Chibueze, J. O.; Hirota, T.; Macleod, G. C.; Van Der Walt, D. J.; Vorobyov, E. I.; Sobolev, A. M.; Juvela, M. "Identifying the mechanisms of water maser variability during the accretion burst in NGC6334I," Astronomy and Astrophysics, 691, A157, 2024.
Wagenveld, J. D.; Klöckner, H.-R.; Gupta, N.; Sekhar, S.; Jagannathan, P.; Deka, P. P.; Jose, J.; Balashev, S. A.; Borgaonkar, D.; Chatterjee, A.; Combes, F.; Emig, K. L.; Gaunekar, A. N.; Hilton, M.; Józsa, G. I. G.; Klutse, D. Y.; Knowles, K.; Krogager, J.-K.; Momjian, E.; Muller, S.; Sikhosana, S. P. "The MeerKAT Absorption Line Survey Data Release 2: Wideband continuum catalogues and a measurement of the cosmic radio dipole," Astronomy and Astrophysics, 690, A163, 2024.
Wallström, S. H. J.; Danilovich, T.; Müller, H. S. P.; Gottlieb, C. A.; Maes, S.; Van De Sande, M.; Decin, L.; Richards, A. M. S.; Baudry, A.; Bolte, J.; Ceulemans, T.; De Ceuster, F.; De Koter, A.; El Mellah, I.; Esseldeurs, M.; Etoka, S.; Gobrecht, D.; Gottlieb, E.; Gray, M.; Herpin, F.; Jeste, M.; Kee, D.; Kervella, P.; Khouri, T.; Lagadec, E.; Malfait, J.; Marinho, L.; Mcdonald, I.; Menten, K. M.; Millar, T. J.; Montargès, M.; Nuth, J. A.; Plane, J. M. C.; Sahai, R.; Waters, L. B. F. M.; Wong, K. T.; Yates, J.; Zijlstra, A. "ATOMIUM: Molecular inventory of 17 oxygen-rich evolved stars observed with ALMA," Astronomy and Astrophysics, 681, A50, 2024.
Walsh, Gregory; Burke-Spolaor, Sarah "Prevalence of Compact Nuclear Radio Emission in Post-merger Galaxies and Its Origin," The Astrophysical Journal, 971, 46, 2024.
Walters, Liam; Shroyer, Jordan E.; Edenton, Madeleine; Agrawal, Prakamya; Johnson, Bradley; Kavanagh, Bradley J.; Marsh, David J. E.; Visinelli, Luca "Axions in Andromeda: Searching for minicluster-neutron star encounters with the Green Bank Telescope," Physical Review D, 110, 123002, 2024.
Wang, Chao; Wang, Ke; Xu, Feng-Wei; Sanhueza, Patricio; Liu, Hauyu Baobab; Zhang, Qizhou; Lu, Xing; Fontani, F.; Caselli, Paola; Busquet, Gemma; Tan, Jonathan C.; Li, Di; Jackson, J. M.; Pillai, Thushara; Ho, Paul T. P.; Guzmán, Andrés E.; Yue, Nannan "The role of turbulence in high-mass star formation: Subsonic and transonic turbulence are ubiquitously found at early stages," Astronomy and Astrophysics, 681, A51, 2024.
Wang, Feige; Yang, Jinyi; Fan, Xiaohui; Venemans, Bram; Decarli, Roberto; Bañados, Eduardo; Walter, Fabian; Barth, Aaron J.; Bian, Fuyan; Davies, Frederick B.; Eilers, Anna-Christina; Farina, Emanuele Paolo; Hennawi, Joseph F.; Li, Jiang-Tao; Mazzucchelli, Chiara; Wang, Ran; Wu, Xue-Bing; Yue, Minghao "A Spatially Resolved [C II] Survey of 31 z ~ 7 Massive Galaxies Hosting Luminous Quasars," The Astrophysical Journal, 968, 9, 2024.
Wang, Feige; Yang, Jinyi; Hennawi, Joseph F.; Fan, Xiaohui; Yue, Minghao; Bañados, Eduardo; Bechtel, Shane; Bian, Fuyan; Bosman, Sarah; Champagne, Jaclyn B.; Davies, Frederick B.; Decarli, Roberto; Farina, Emanuele Paolo; Mazzucchelli, Chiara; Venemans, Bram; Walter, Fabian "A Massive Protocluster Anchored by a Luminous Quasar at z = 6.63," The Astrophysical Journal, 962, L11, 2024.
Wang, Jia-Wei; Koch, Patrick M.; Clarke, Seamus D.; Fuller, Gary; Peretto, Nicolas; Tang, Ya-Wen; Yen, Hsi-Wei; Lai, Shih-Ping; Ohashi, Nagayoshi; Arzoumanian, Doris; Johnstone, Doug; Furuya, Ray; Inutsuka, Shu-Ichiro; Lee, Chang Won; Ward-Thompson, Derek; Le Gouellec, Valentin J. M.; Liu, Hong-Li; Fanciullo, Lapo; Hwang, Jihye; Pattle, Kate; Poidevin, Frédérick; Tahani, Mehrnoosh; Onaka, Takashi; Rawlings, Mark G.; Chung, Eun Jung; Liu, Junhao; Lyo, A. -Ran; Priestley, Felix; Hoang, Thiem; Tamura, Motohide; Berry, David; Bastien, Pierre; Ching, Tao-Chung; Coudé, Simon; Kwon, Woojin; Chen, Mike; Eswaraiah, Chakali; Soam, Archana; Hasegawa, Tetsuo; Qiu, Keping; Bourke, Tyler L.; Byun, Do-Young; Chen, Zhiwei; Chen, Huei-Ru Vivien; Chen, Wen Ping; Cho, Jungyeon; Choi, Minho; Choi, Yunhee; Choi, Youngwoo; Chrysostomou, Antonio; Dai, Sophia; Di Francesco, James; Diep, Pham Ngoc; Doi, Yasuo; Duan, Yan; Duan, Hao-Yuan; Eden, David; Fiege, Jason; Fissel, Laura M.; Franzmann, Erica; Friberg, Per; Friesen, Rachel; Gledhill, Tim; Graves, Sarah; Greaves, Jane; Griffin, Matt; Gu, Qilao; Han, Ilseung; Hayashi, Saeko; Houde, Martin; Inoue, Tsuyoshi; Iwasaki, Kazunari; Jeong, Il-Gyo; Könyves, Vera; Kang, Ji-Hyun; Kang, Miju; Karoly, Janik; Kataoka, Akimasa; Kawabata, Koji; Khan, Zacariyya; Kim, Mi-Ryang; Kim, Kee-Tae; Kim, Kyoung Hee; Kim, Shinyoung; Kim, Jongsoo; Kim, Hyosung; Kim, Gwanjeong; Kirchschlager,

Florian; Kirk, Jason; Kobayashi, Masato I. N.; Kusune, Takayoshi; Kwon, Jungmi; Lacaille, Kevin; Law, Chi-Yan; Lee, Sang-Sung; Lee, Hyeseung; Lee, Jeong-Eun; Lee, Chin-Fei; Li, Dalei; Li, Hua-Bai; Li, Guangxing; Li, Di; Lin, Sheng-Jun; Liu, Tie; Liu, Sheng-Yuan; Lu, Xing; Mairs, Steve; Matsumura, Masafumi; Matthews, Brenda; Moriarty-Schieven, Gerald; Nagata, Tetsuya; Nakamura, Fumitaka; Nakanishi, Hiroyuki; Ngoc, Nguyen Bich; Park, Geumsook; Parsons, Harriet; Pyo, Tae-Soo; Qian, Lei; Rao, Ramprasad; Rawlings, Jonathan; Retter, Brendan; Richer, John; Rigby, Andrew; Sadavoy, Sarah; Saito, Hiro; Savini, Giorgio; Seta, Masumichi; Sharma, Ekta; Shimajiri, Yoshito; Shinnaga, Hiroko; Tang, Xindi; Thuong, Hoang Duc; Tomisaka, Kohji; Tram, Le Ngoc; Tsukamoto, Yusuke; Viti, Serena; Wang, Hongchi; Whitworth, Anthony; Wu, Jintai; Xie, Jinjin; Yang, Meng-Zhe; Yoo, Hyunju; Yuan, Jinghua; Yun, Hyeong-Sik; Zenko, Tetsuya; Zhang, Chuan-Peng; Zhang, Yapeng; Zhang, Guoyin; Zhou, Jianjun; Zhu, Lei; De Looze, Ilse; André, Philippe; Dowell, C. Darren; Eyres, Stewart; Falle, Sam; Robitaille, Jean-François; Van Loo, Sven "Filamentary Network and Magnetic Field Structures Revealed with BISTRO in the High-mass Star-forming Region NGC 2264: Global Properties and Local Magnetogravitational Configurations," The Astrophysical Journal, 962, 136, 2024.

Wang, Jing; Lin, Xuchen; Staveley-Smith, Lister; Yang, Dong; Walter, Fabian; Liang, Zezhong; Shi, Yong; Fu, Jian; Guo, Hong; Ho, Luis C.; Inutsuka, Shu-Ichiro; Jiang, Fangzhou; Jiang, Peng; Qu, Zhijie; Shao, Li "FEASTS Combined with Interferometry. II. Significantly Changed H I Surface Densities and Even More Inefficient Star Formation in Galaxy Outer Disks," The Astrophysical Journal, 973, 15, 2024.

Wang, Jing; Lin, Xuchen; Yang, Dong; Staveley-Smith, Lister; Walter, Fabian; Wang, Q. Daniel; Wang, Ran; Battisti, A. J.; Catinella, Barbara; Chen, Hsiao-Wen; Cortese, Luca; Fisher, D. B.; Ho, Luis C.; Ji, Suoqing; Jiang, Peng; Kauffmann, Guinevere; Kong, Xu; Liu, Ziming; Shao, Li; Wang, Jie; Wang, Lile; Wang, Shun "FEASTS Combined with Interferometry. I. Overall Properties of Diffuse H I and Implications for Gas Accretion in Nearby Galaxies," The Astrophysical Journal, 968, 48, 2024.

Wang, Ke; Wang, Yueluo; Xu, Fengwei "Massive Star Formation Starts in Subvirial Dense Clumps Unless Resisted by Strong Magnetic Fields," The Astrophysical Journal, 974, L6, 2024.

Wang, Q. Daniel; Diaz, Carlos Garcia; Kamieneski, Patrick S.; Harrington, Kevin C.; Yun, Min S.; Foo, Nicholas; Frye, Brenda L.; Jimenez-Andrade, Eric F.; Liu, Daizhong; Lowenthal, James D.; Pampliega, Belén Alcalde; Pascale, Massimo; Vishwas, Amit; Gurwell, Mark A. "X-ray detection of the most extreme star-forming galaxies at the cosmic noon via strong lensing," Monthly Notices of the Royal Astronomical Society, 527, 10584-10603, 2024.

Wang, Sai; Zhao, Zhi-Chao "Unveiling the graviton mass bounds through the analysis of 2023 pulsar timing array data releases," Physical Review D, 109, L061502, 2024.

Wang, Shouzhi; Wu, Zhongzu; Zhang, Bo; Sotnikova, Yulia; Mufakharov, Timur; Shen, Zhiqiang; Chen, Yongjun; Wu, Jianfeng "GMRT observations of hydroxyl megamaser (OHM) candidates from the ALFALFA survey," Astronomy and Astrophysics, 686, A172, 2024.

Wang, Tao; Xu, Ke; Wu, Yuxuan; Shi, Yong; Elbaz, David; Ho, Luis C.; Zhang, Zhi-Yu; Gu, Qiusheng; Wang, Yijun; Shu, Chenggang; Yuan, Feng; Xia, Xiaoyang; Wang, Kai "Black holes regulate cool gas accretion in massive galaxies," Nature, 632, 1009, 2024.

Wang, Tsan-Ming; Magnelli, Benjamin; Schinnerer, Eva; Liu, Daizhong; Jiménez-Andrade, Eric Faustino; Karoumpis, Christos; Adscheid, Sylvia; Bertoldi, Frank "A^{3}COSMOS: Dissecting the gas content of star-forming galaxies across the main sequence at 1.2 ≤z < 1.6," Astronomy and Astrophysics, 681, A110, 2024.

Wang, Wenjie; Yuan, Zunli; Yu, Hongwei; Mao, Jirong "Constraints on cosmic star formation history via a new modeling of the radio luminosity function of star-forming galaxies," Astronomy and Astrophysics, 683, A174, 2024.

Wang, Yibo; Wang, Tinggui; Jiang, Ning; Zhang, Xiaer; Zhu, Jiazheng; Shu, Xinwen; Huang, Shifeng; Zhang, Fabao; Sheng, Zhenfeng; Lin, Zheyu "ASASSN-18ap: A Dusty Tidal Disruption Event Candidate with an Early Bump in the Light Curve," The Astrophysical Journal, 966, 136, 2024.

Ward, B. A.; Eales, S. A.; Ivison, R. J.; Arumugam, V. "Little evolution of dust emissivity in bright infrared galaxies from 2 < z < 6," Monthly Notices of the Royal Astronomical Society, 530, 4887, 2024.

Weatherhead, Kierra J.; Stil, Jeroen M.; Rugel, Michael; Peters, Wendy M.; Anderson, Loren; Barnes, Ashley; Beuther, Henrik; Clarke, Tracy E.; Dzib, Sergio A.; Goldsmith, Paul; Menten, Karl M.; Nyland, Kristina E.; Sormani, Mattia C.; Urquhart, James "Spectrum and Polarization of the Galactic Center Radio Transient ASKAP J173608.2-321635 from THOR-GC and VLITE," The Astrophysical Journal, 970, 92, 2024.

Wedemeyer, Sven; Barta, Miroslav; Brajša, Roman; Chai, Yi; Costa, Joaquim; Gary, Dale; Gimenez De Castro, Guillermo; Gunar, Stanislav; Fleishman, Gregory; Hales, Antonio; Hudson, Hugh; Kirkaune, Mats; Mohan, Atul; Motorina, Galina; Pellizzoni, Alberto; Saberi, Maryam; Selhorst, Caius L.; Simoes, Paulo J. A.; Shimojo, Masumi; Skokić, Ivica; Sudar, Davor; Menezes, Fabian; White, Stephen M.; Booth, Mark; Klaassen, Pamela; Cicone, Claudia; Mroczkowski, Tony; Cordiner, Martin A.; Di Mascolo, Luca; Johnstone, Doug; Van Kampen, Eelco; Lee, Minju; Liu, Daizhong; Maccarone, Thomas; Orlowski-Scherer, John; Saintonge, Amelie; Smith, Matthew; Thelen, Alexander E. "Science development study for the Atacama Large Aperture Submillimeter Telescope (AtLAST): Solar and stellar observations," Open Research Europe, 4, 140, 2024.

Wells, M. R. A.; Beuther, H.; Molinari, S.; Schilke, P.; Battersby, C.; Ho, P.; Sánchez-Monge, Á.; Jones, B.; Scheuck, M. B.; Syed, J.; Gieser, C.; Kuiper, R.; Elia, D.; Coletta, A.; Traficante, A.; Wallace, J.; Rigby, A. J.; Klessen, R. S.; Zhang, Q.; Walch, S.; Beltrán, M. T.; Tang, Y.; Fuller, G. A.; Lis, D. C.; Möller, T.; Van Der Tak, F.; Klaassen, P. D.; Clarke, S. D.; Moscadelli, L.; Mininni, C.; Zinnecker, H.; Maruccia, Y.; Pezzuto, S.; Benedettini, M.; Soler, J. D.; Brogan, C. L.; Avison, A.; Sanhueza, P.; Schisano, E.; Liu, T.; Fontani, F.; Rygl, K. L. J.; Wyrowski, F.; Bally, J.; Walker, D. L.; Ahmadi, A.; Koch, P.; Merello, M.; Law, C. Y.; Testi, L. "Dynamical accretion flows: ALMAGAL: Flows along filamentary structures in high-mass star-forming clusters," Astronomy and Astrophysics, 690, A185, 2024.

Wen, Di; Kemball, Athol J. "Testing Primordial Black Hole Dark Matter with Atacama Large Millimeter Array Observations of the Gravitational Lens B1422+231," Universe, 10, 37, 2024.

Wenzel, Gabi; Cooke, Ilsa R.; Changala, P. Bryan; Bergin, Edwin A.; Zhang, Shuo; Burkhardt, Andrew M.; Byrne, Alex N.; Charnley, Steven B.; Cordiner, Martin A.; Duffy, Miya; Fried, Zachary T. P.; Gupta, Harshal; Holdren, Martin S.; Lipnicky, Andrew; Loomis, Ryan A.; Shay, Hannah Toru; Shingledecker, Christopher N.; Siebert, Mark A.; Stewart, D. Archie; Willis, Reace H. J.; Xue, Ci; Remijan, Anthony J.; Wendlandt, Alison E.; Mccarthy, Michael C.; Mcguire, Brett A. "Detection of interstellar 1-cyanopyrene: A four-ring polycyclic aromatic hydrocarbon," Science, 386, 810, 2024.

Wethers, C. F.; Aalto, S.; Privon, G. C.; Stanley, F.; Gallagher, J.; Gorski, M.; König, S.; Onishi, K.; Sato, M.; Yang, C.; Beswick, R.; Barcos-Munoz, L.; Combes, F.; Diaz-Santos, T.; Evans, A. S.; Garcia-Bernete, I.; Henkel, C.; Imanishi, M.; Martín, S.; Muller, S.; Nishimura, Y.; Ricci, C.; Rigopoulou, D.; Viti, S. "Double, double, toil, and trouble. The tails, bubbles, and knots of the local compact obscured nucleus galaxy NGC 4418," Astronomy and Astrophysics, 683, A27, 2024.

Weżgowiec, M.; Jamrozy, M.; Chyży, K. T.; Hardcastle, M. J.; Kuźmicz, A.; Heald, G.; Shimwell, T. W. "The twisted jets and magnetic fields of the extended radio galaxy 4C 70.19," Astronomy and Astrophysics, 691, A193, 2024.

White, Stephen M.; Shimojo, Masumi; Iwai, Kazumasa; Bastian, Timothy S.; Fleishman, Gregory D.; Gary, Dale E.; Magdalenic, Jasmina; Vourlidas, Angelos "Electron Cyclotron Maser Emission and the Brightest Solar Radio Bursts," The Astrophysical Journal, 969, 3, 2024.

Wielgus, Maciek; Issaoun, Sara; Martí-Vidal, Iván; Emami, Razieh; Moscibrodzka, Monika; Brinkerink, Christiaan D.; Goddi, Ciriaco; Fomalont, Ed "The internal Faraday screen of Sagittarius A*," Astronomy and Astrophysics, 682, A97, 2024.

Williams, A. L.; Heald, G.; Wilcots, E. M.; Zweibel, E. G. "Disentangling Magnetic Fields in NGC 6946 with Wide-band Polarimetry," The Astrophysical Journal, 961, 238, 2024.

Williams, Christina C.; Alberts, Stacey; Ji, Zhiyuan; Hainline, Kevin N.; Lyu, Jianwei; Rieke, George; Endsley, Ryan; Suess, Katherine A.; Sun, Fengwu; Johnson, Benjamin D.; Florian, Michael; Shivaei, Irene; Rujopakarn, Wiphu; Baker, William M.; Bhatawdekar, Rachana; Boyett, Kristan; Bunker, Andrew J.; Cameron, Alex J.; Carniani, Stefano; Charlot, Stephane; Curtis-Lake, Emma; Decoursey, Christa; De Graaff, Anna; Egami, Eiichi; Eisenstein, Daniel J.; Gibson, Justus L.; Hausen, Ryan; Helton, Jakob M.; Maiolino, Roberto; Maseda, Michael V.; Nelson, Erica J.; Pérez-González, Pablo G.; Rieke, Marcia J.; Robertson, Brant E.; Saxena, Aayush; Tacchella, Sandro; Willmer, Christopher N. A.; Willott, Chris J. "The Galaxies Missed by Hubble and ALMA: The Contribution of Extremely Red Galaxies to the Cosmic Census at 3 < z < 8," The Astrophysical Journal, 968, 34, 2024.

Williams, Thomas G.; Lee, Janice C.; Larson, Kirsten L.; Leroy, Adam K.; Sandstrom, Karin; Schinnerer, Eva; Thilker, David A.; Belfiore, Francesco; Egorov, Oleg V.; Rosolowsky, Erik; Sutter, Jessica; Depasquale, Joseph; Pagan, Alyssa; Berger, Travis A.; Anand, Gagandeep S.; Barnes, Ashley T.; Bigiel, Frank; Boquien, Médéric; Cao, Yixian; Chastenet, Jérémy; Chevance, Mélanie; Chown, Ryan; Dale, Daniel A.; Deger, Sinan; Eibensteiner, Cosima; Emsellem, Eric; Faesi, Christopher M.; Glover, Simon C. O.; Grasha, Kathryn; Hannon, Stephen; Hassani, Hamid; Henshaw, Jonathan D.; Jiménez-Donaire, María J.; Kim, Jaeyeon; Klessen, Ralf S.; Koch, Eric W.; Li, Jing; Liu, Daizhong; Meidt, Sharon E.; Méndez-Delgado, J. Eduardo; Murphy, Eric J.; Neumann, Justus; Neumann, Lukas; Neumayer, Nadine; Oakes, Elias K.; Pathak, Debosmita; Pety, Jérôme; Pinna, Francesca; Querejeta, Miguel; Ramambason, Lise; Romanelli, Andrea; Sormani, Mattia C.; Stuber, Sophia K.; Sun, Jiayi; Teng, Yu-Hsuan; Usero, Antonio; Watkins, Elizabeth J.; Weinbeck, Tony D. "PHANGS-JWST: Data-processing Pipeline and First Full Public Data Release," The Astrophysical Journal Supplement Series, 273, 13, 2024.

Winnberg, A.; Brand, J.; Engels, D. "Water vapour masers in long-period variable stars. III. Mira variables U Her and RR Aql," Astronomy and Astrophysics, 686, A251, 2024.

Wolf, V.; Stecklum, B.; Caratti O Garatti, A.; Boley, P. A.; Fischer, Ch.; Harries, T.; Eislöffel, J.; Linz, H.; Ahmadi, A.; Kobus, J.; Haubois, X.; Matter, A.; Cruzalebes, P. "The accretion burst of the massive young stellar object G323.46-0.08," Astronomy and Astrophysics, 688, A8, 2024.

Wolnik, K.; Jurusik, W.; Jamrozy, M. "Spectral aging analysis of the 3C 219 double-double radio galaxy," Astronomy and Astrophysics, 691, A76, 2024.

Wood, Callan M.; Miller-Jones, James C. A.; Bahramian, Arash; Tingay, Steven J.; Prabu, Steve; Russell, Thomas D.; Atri, Pikky; Carotenuto,

Francesco; Altamirano, Diego; Motta, Sara E.; Hyland, Lucas; Reynolds, Cormac; Weston, Stuart; Fender, Rob; Körding, Elmar; Maitra, Dipankar; Markoff, Sera; Migliari, Simone; Russell, David M.; Sarazin, Craig L.; Sivakoff, Gregory R.; Soria, Roberto; Tetarenko, Alexandra J.; Tudose, Valeriu "Swift J1727.8-1613 Has the Largest Resolved Continuous Jet Ever Seen in an X-Ray Binary," The Astrophysical Journal, 971, L9, 2024.

Worthen, Kadin; Chen, Christine H.; Brittain, Sean D.; Lu, Cicero X.; Rebollido, Isabel; Brennan, Aoife; Matrà, Luca; Melis, Carl; Delgado, Timoteo; Roberge, Aki; Mazoyer, Johan "Vertical Structure of Gas and Dust in Four Debris Disks," The Astrophysical Journal, 962, 166, 2024.

Wright, Melvyn; Mcguire, Brett A.; Ginsburg, Adam; Hirota, Tomoya; Bally, John; Hwangbo, Ryan; Bhadra, T. Dex; John, Chris; Dave, Rishabh "Accretion and Outflow in Orion-KL Source I," The Astrophysical Journal, 974, 150, 2024.

Wu, Jintai; Qiu, Keping; Poidevin, Frédérick; Bastien, Pierre; Liu, Junhao; Ching, Tao-Chung; Bourke, Tyler L.; Ward-Thompson, Derek; Pattle, Kate; Johnstone, Doug; Koch, Patrick M.; Arzoumanian, Doris; Lee, Chang Won; Fanciullo, Lapo; Onaka, Takashi; Hwang, Jihye; Le Gouellec, Valentin J. M.; Soam, Archana; Tamura, Motohide; Tahani, Mehrnoosh; Eswaraiah, Chakali; Li, Hua-Bai; Berry, David; Furuya, Ray S.; Coudé, Simon; Kwon, Woojin; Lin, Sheng-Jun; Wang, Jia-Wei; Hasegawa, Tetsuo; Lai, Shih-Ping; Byun, Do-Young; Chen, Zhiwei; Chen, Huei-Ru Vivien; Chen, Wen Ping; Chen, Mike; Cho, Jungyeon; Choi, Youngwoo; Choi, Yunhee; Choi, Minho; Chrysostomou, Antonio; Chung, Eun Jung; Dai, Sophia; Di Francesco, James; Diep, Pham Ngoc; Doi, Yasuo; Duan, Hao-Yuan; Duan, Yan; Eden, David; Fiege, Jason; Fissel, Laura M.; Franzmann, Erica; Friberg, Per; Friesen, Rachel; Fuller, Gary; Gledhill, Tim; Graves, Sarah; Greaves, Jane; Griffin, Matt; Gu, Qilao; Han, Ilseung; Hayashi, Saeko; Hoang, Thiem; Houde, Martin; Inoue, Tsuyoshi; Inutsuka, Shu-Ichiro; Iwasaki, Kazunari; Jeong, Il-Gyo; Könyves, Vera; Kang, Ji-Hyun; Kang, Miju; Karoly, Janik; Kataoka, Akimasa; Kawabata, Koji; Kim, Shinyoung; Kim, Mi-Ryang; Kim, Kyoung Hee; Kim, Kee-Tae; Kim, Jongsoo; Kim, Hyosung; Kim, Gwanjeong; Kirchschlager, Florian; Kirk, Jason; Kobayashi, Masato I. N.; Kusune, Takayoshi; Kwon, Jungmi; Lacaille, Kevin; Law, Chi-Yan; Lee, Hyeseung; Lee, Chin-Fei; Lee, Sang-Sung; Lee, Jeong-Eun; Li, Dalei; Li, Di; Li, Guangxing; Liu, Sheng-Yuan; Liu, Tie; Liu, Hong-Li; Lu, Xing; Lyo, A. -Ran; Mairs, Steve; Matsumura, Masafumi; Matthews, Brenda; Moriarty-Schieven, Gerald; Nagata, Tetsuya; Nakamura, Fumitaka; Nakanishi, Hiroyuki; Ngoc, Nguyen Bich; Ohashi, Nagayoshi; Park, Geumsook; Parsons, Harriet; Peretto, Nicolas; Priestley, Felix; Pyo, Tae-Soo; Qian, Lei; Rao, Ramprasad; Rawlings, Jonathan; Rawlings, Mark; Retter, Brendan; Richer, John; Rigby, Andrew; Sadavoy, Sarah; Saito, Hiro; Savini, Giorgio; Seta, Masumichi; Sharma, Ekta; Shimajiri, Yoshito; Shinnaga, Hiroko; Tang, Ya-Wen; Tang, Xindi; Thuong, Hoang Duc; Tomisaka, Kohji; Tram, Le Ngoc; Tsukamoto, Yusuke; Viti, Serena; Wang, Hongchi; Whitworth, Anthony; Xie, Jinjin; Yang, Meng-Zhe; Yen, Hsi-Wei; Yoo, Hyunju; Yuan, Jinghua; Yun, Hyeong-Sik; Zenko, Tetsuya; Zhang, Guoyin; Zhang, Chuan-Peng; Zhang, Yapeng; Zhou, Jianjun; Zhu, Lei; Looze, Ilse De; André, Philippe; Dowell, C. Darren; Eyres, Stewart; Falle, Sam; Robitaille, Jean-François; Van Loo, Sven "A Tale of Three: Magnetic Fields along the Orion Integral-shaped Filament as Revealed by the JCMT BISTRO Survey," The Astrophysical Journal, 977, L31, 2024.

Wu, Jin-Zhi; Dong, Xiao-Bo; Qian, Lei; Liu, Wen-Juan; Xie, Fu-Guo; Peng, Bo "A Uniformly Selected Sample of Low-mass Black Holes in Seyfert 1 Galaxies. III. Radio Sources from the SKA Pathfinders and Beyond," The Astrophysical Journal Supplement Series, 271, 64, 2024.

Wu, Yu-Mei; Chen, Zu-Cheng; Bi, Yan-Chen; Huang, Qing-Guo "Constraining the graviton mass with the NANOGrav 15 year data set," Classical and Quantum Gravity, 41, 075002, 2024.

Wu, Yuxiao; Pan, Zhichen; Qian, Lei; Ransom, Scott M.; Eatough, Ralph P.; Wang, Bojun; Freire, Paulo C. C.; Liu, Kuo; Yan, Zhen; Luo, Jintao; Zhang, Liyun; Li, Minghui; Yin, Dejiang; Li, Baoda; Li, Yifeng; Dai, Yinfeng; Li, Yaowei; Zhang, Xinnan; Liu, Tong; Pan, Yu "The Discovery of Three Pulsars in the Globular Cluster M15 with FAST," The Astrophysical Journal, 974, L23, 2024.

Wu, Zhongzu; Sotnikova, Yulia; Mufakharov, Timur; Shen, Zhiqiang; Chen, Yongjun; Wang, Shouzhi; Wu, Jiangfeng "Continuum and spectral-line observations of the OH megamaser galaxy IRAS 01298-0744," Astronomy and Astrophysics, 687, A193, 2024.

Xia, Tian-Ye; Shen, Juntai; Li, Zhi; Feng, Huai-Jin; Sjouwerman, Loránt O.; Pihlström, Ylva M.; Lewis, Megan O.; Stroh, Michael C. "The Milky Way Bar Potential Constrained by the Kinematics of SiO Maser Stars in BAaDE Survey," The Astrophysical Journal, 976, 139, 2024.

Xie, Zhang-Liang; Bañados, Eduardo; Belladitta, Silvia; Mazzucchelli, Chiara; Schindler, Jan-Torge; Davies, Frederick; Venemans, Bram P. "Recognizing Blazars Using Radio Morphology from the VLA Sky Survey," The Astrophysical Journal, 964, 98, 2024.

Xu, Fengwei; Wang, Ke; Liu, Tie; Tang, Mengyao; Evans, Neal J., Ii; Palau, Aina; Morii, Kaho; He, Jinhua; Sanhueza, Patricio; Liu, Hong-Li; Stutz, Amelia; Zhang, Qizhou; Chen, Xi; Li, Pak Shing; Gómez, Gilberto C.; Vázquez-Semadeni, Enrique; Li, Shanghuo; Mai, Xiaofeng; Lu, Xing; Liu, Meizhu; Chen, Li; Li, Chuanshou; Shi, Hongqiong; Ren, Zhiyuan; Li, Di; Garay, Guido; Bronfman, Leonardo; Dewangan, Lokesh; Juvela, Mika; Lee, Chang Won; Zhang, S.; Yue, Nannan; Wang, Chao; Ge, Yifei; Jiao, Wenyu; Luo, Qiuyi; Zhou, J.-W.; Tatematsu, Ken'Ichi; Chibueze, James O.; Su, Keyun; Sun, Shenglan; Ristorcelli, I.; Toth, L. Viktor "The ALMA Survey of Star Formation and Evolution in Massive Protoclusters with Blue Profiles (ASSEMBLE): Core Growth, Cluster Contraction, and Primordial Mass Segregation," The Astrophysical Journal Supplement Series, 270, 9, 2024.

Xu, Fengwei; Wang, Ke; Liu, Tie; Zhu, Lei; Garay, Guido; Liu, Xunchuan; Goldsmith, Paul; Zhang, Qizhou; Sanhueza, Patricio; Qin, Shengli; He, Jinhua; Juvela, Mika; Tej, Anandmayee; Liu, Hongli; Li, Shanghuo; Morii, Kaho; Zhang, Siju; Zhou, Jianwen; Stutz, Amelia; Evans, Neal J.; Kim, Kee-Tae; Liu, Shengyuan; Mardones, Diego; Li, Guangxing; Bronfman, Leonardo; Tatematsu, Ken'Ichi; Lee, Chang Won; Lu, Xing; Mai, Xiaofeng; Jiao, Sihan; Chibueze, James O.; Su, Keyun; Tóth, Viktor L. "The ALMA-QUARKS Survey. II. The ACA 1.3 mm Continuum Source Catalog and the Assembly of Dense Gas in Massive Star-Forming Clumps," Research in Astronomy and Astrophysics, 24, 065011, 2024.

Xu, Fuxiang; Wang, Ran; Li, Jianan; Neri, Roberto; Pensabene, Antonio; Decarli, Roberto; Shao, Yali; Bañados, Eduardo; Cox, Pierre; Bertoldi, Frank; Feruglio, Chiara; Walter, Fabian; Venemans, Bram P.; Omont, Alain; Riechers, Dominik; Wagg, Jeff; Menten, Karl M.; Fan, Xiaohui "Constraining the Excitation of Molecular Gas in Two Quasar-starburst Systems at z ~ 6," The Astrophysical Journal, 977, 190, 2024.

Xu, Wancheng; Cui, Lang; Liu, Xiang; An, Tao; Cao, Hongmin; Jiang, Pengfei; Ho, Luis C.; Chang, Ning; Yang, Xiaolong; Shen, Yuling; Tan, Guiping; Han, Zhenhua; Fan, Junhui; Zhang, Ming "Very Long Baseline Array Observations of Parsec-scale Radio Emission in Dual Active Galactic Nuclei," The Astrophysical Journal, 969, 36, 2024.

Xu, Zhilei; Kim, Honggeun; Hewitt, Jacqueline N.; Chen, Kai-Feng; Kern, Nicholas S.; Rath, Eleanor; Byrne, Ruby; Gorce, Adélie; Pascua, Robert; Martinot, Zachary E.; Dillon, Joshua S.; Hazelton, Bryna J.; Liu, Adrian; Morales, Miguel F.; Abdurashidova, Zara; Adams, Tyrone; Aguirre, James E.; Alexander, Paul; Ali, Zaki S.; Baartman, Rushelle; Balfour, Yanga; Beardsley, Adam P.; Bernardi, Gianni; Billings, Tashalee S.; Bowman, Judd D.; Bradley, Richard F.; Bull, Philip; Burba, Jacob; Carey, Steven; Carilli, Chris L.; Cheng, Carina; Deboer, David R.; Acedo, Eloy De Lera; Dexter, Matt; Eksteen, Nico; Ely, John; Ewall-Wice, Aaron; Fagnoni, Nicolas; Fritz, Randall; Furlanetto, Steven R.; Gale-Sides, Kingsley; Glendenning, Brian; Gorthi, Deepthi; Greig, Bradley; Grobbelaar, Jasper; Halday, Ziyaad; Hickish, Jack; Jacobs, Daniel C.; Julius, Austin; Kariseb, Maccalvin; Kerrigan, Joshua; Kittiwisit, Piyanat; Kohn, Saul A.; Kolopanis, Matthew; Lanman, Adam; La Plante, Paul; Loots, Anita; Macmahon, David Harold Edward; Malan, Lourence; Malgas, Cresshim; Malgas, Keith; Marero, Bradley; Mesinger, Andrei; Molewa, Mathakane; Mosiane, Tshegofalang; Murray, Steven G.; Neben, Abraham R.; Nikolic, Bojan; Nuwegeld, Hans; Parsons, Aaron R.; Patra, Nipanjana; Pieterse, Samantha; Razavi-Ghods, Nima; Robnett, James; Rosie, Kathryn; Sims, Peter; Smith, Craig; Swarts, Hilton; Tan, Jianrong; Thyagarajan, Nithyanandan; Van Wyngaarden, Pieter; Williams, Peter K. G.; Zheng, Haoxuan; Hera Collaboration "Direct Optimal Mapping Image Power Spectrum and its Window Functions," The Astrophysical Journal, 971, 16, 2024.

Xue, Ci; Remijan, Anthony; Faure, Alexandre; Momjian, Emmanuel; Hunter, Todd R.; Loomis, Ryan A.; Herbst, Eric; Mcguire, Brett "Maser Activity of Organic Molecules toward Sgr B2(N)," The Astrophysical Journal, 967, 164, 2024.

Yamaguchi, Masayuki; Muto, Takayuki; Tsukagoshi, Takashi; Nomura, Hideko; Hirano, Naomi; Nakazato, Takeshi; Ikeda, Shiro; Tamura, Motohide; Kawabe, Ryohei "ALMA 2D super-resolution imaging of Taurus-Auriga protoplanetary disks: Probing statistical properties of disk substructures," Publications of the Astronomical Society of Japan, 76, 437, 2024.

Yamanaka, Itsuki; Hatsukade, Bunyo; Egusa, Fumi; Hashimoto, Tetsuya; Niino, Yuu; Hsu, Tzu-Yin; Kaneko, Hiroyuki; Kohno, Kotaro "ALMA Reveals Spatially Resolved Properties of Molecular Gas in the Host Galaxy of FRB 20191001A at z = 0.2340," The Astrophysical Journal, 969, 122, 2024.

Yamato, Yoshihide; Aikawa, Yuri; Guzmán, Viviana V.; Furuya, Kenji; Notsu, Shota; Cataldi, Gianni; Öberg, Karin I.; Qi, Chunhua; Law, Charles J.; Huang, Jane; Teague, Richard; Le Gal, Romane "Detection of Dimethyl Ether in the Central Region of the MWC 480 Protoplanetary Disk," The Astrophysical Journal, 974, 83, 2024.

Yamato, Yoshihide; Notsu, Shota; Aikawa, Yuri; Okoda, Yuki; Nomura, Hideko; Sakai, Nami "Chemistry of Complex Organic Molecules in the V883 Ori Disk Revealed by ALMA Band 3 Observations," The Astronomical Journal, 167, 66, 2024.

Yan, Xi; Lu, Ru-Sen; Jiang, Wu; Krichbaum, Thomas P.; Xie, Fu-Guo; Shen, Zhi-Qiang "Multifrequency Very Long Baseline Interferometry Imaging of the Subparsec-scale Jet in the Sombrero Galaxy (M104)," The Astrophysical Journal, 965, 128, 2024.

Yan, Y. T.; Henkel, C.; Menten, K. M.; Wilson, T. L.; Wootten, A. "Discovery of widespread non-metastable ammonia masers in the Milky Way," Astronomy and Astrophysics, 686, A205, 2024.

Yang, Ai Yuan; Feng, Yi; Tsai, Chao-Wei; Li, Di; Shi, Hui; Wang, Pei; Yang, Yuan-Pei; Zhang, Yong-Kun; Niu, Chen-Hui; Yao, Ju-Mei; Cui, Yu-Zhu; Su, Ren-Zhi; Li, Xiao-Feng; Zhang, Jun-Shuo; Zhu, Yu-Hao; Cotton, W. D. "The Variability of Persistent Radio Sources of Fast Radio Bursts," The Astrophysical Journal, 976, 165, 2024.

Yang, Dongting; Liu, Hong-Li; Liu, Tie; Tej, Anandmayee; Liu, Xunchuan; He, Jinhua; Garay, Guido; Stutz, Amelia; Zhu, Lei; Qin, Sheng-Li; Xu, Fengwei; Li, Pak-Shing; Juvela, Mika; García, Pablo; Goldsmith, Paul F.; Zhang, Siju; Tang, Xindi; Sanhueza, Patricio; Li, Shanghuo; Lee, Chang Won; Das, Swagat Ranjan; Jiao, Wenyu; Mai, Xiaofeng; Gorai, Prasanta;

Zhang, Yichen; Ren, Zhiyuan; Tóth, L. Viktor; Hwang, Jihye; Bronfman, Leonardo; Tatematsu, Ken'Ichi; Dewangan, Lokesh; Chibueze, James O.; Zhang, Suinan; Wu, Gang; Xie, Jinjin "The ALMA-QUARKS Survey: Fibers' Role in Star Formation Unveiled in an Intermediate-mass Protocluster Region of the Vela D Cloud," The Astrophysical Journal, 976, 241, 2024.
Yang, Haifeng; Fernández-López, Manuel; Li, Zhi-Yun; Stephens, Ian W.; Looney, Leslie W.; Lin, Zhe-Yu Daniel; Harrison, Rachel "Turbulent Vortex with Moderate Dust Settling Probed by Scattering-induced Polarization in the IRS 48 System," The Astrophysical Journal, 963, 134, 2024.
Yang, Qiancheng; Liu, Qiong; Kennedy, Grant M.; Wyatt, Mark C.; Dodson-Robinson, Sarah; Akeson, Rachel; Liao, Nenghui "First ALMA observations of the HD 105211 debris disc: A warm dust component close to a gigayear-old star," Astronomy and Astrophysics, 686, A206, 2024.
Yang, Xiaolong; Yao, Su; Gallo, Luigi C.; Yang, Jun; Ho, Luis C.; Gu, Minfeng; Baan, Willem A.; Svoboda, Jiri; Wang, Ran; Liu, Xiang; Hong, Xiaoyu; Wu, Xue-Bing; Zhao, Wei "Unveiling the Small-scale Jets in the Rapidly Growing Supermassive Black Hole IZw1," The Astrophysical Journal, 966, 151, 2024.
Yang, Yang; Li, Jiang-Tao; Wiegert, Theresa; Li, Zhiyuan; Guo, Fulai; Irwin, Judith; Wang, Q. Daniel; Dettmar, Ralf-Juergen; Beck, Rainer; English, Jayanne; Ji, Li "CHANG-ES. XXX. 10 kpc Radio Lobes in the Sombrero Galaxy," The Astrophysical Journal, 966, 213, 2024.
Yarovova, Anastasiya D.; Moiseev, Alexei V.; Gerasimov, Ivan S.; Vučetić, Milica M.; Egorov, Oleg V.; Ilić, Dragana; Mereminskiy, Ilya A.; Pakhomov, Yury V.; Sholukhova, Olga N. "Nature of the diffuse emission sources in the H I supershell in the galaxy IC 1613," Monthly Notices of the Royal Astronomical Society, 529, 4930, 2024.
Ye, Claire S.; Kremer, Kyle; Ransom, Scott M.; Rasio, Frederic A. "Single Millisecond Pulsars from Dynamical Interaction Processes in Dense Star Clusters," The Astrophysical Journal, 961, 98, 2024.
Ye, Claire S.; Kremer, Kyle; Ransom, Scott M.; Rasio, Frederic A. "Lower-mass-gap Black Holes in Dense Star Clusters," The Astrophysical Journal, 975, 77, 2024.
Ye, Xue-Mei; Wei, Da-Ming; Zhu, Yi-Ming; Jin, Zhi-Ping "Optical Transient Source AT2021lfa: A Possible Dirty Fireball"", Research in Astronomy and Astrophysics, 24, 045011, 2024.
Yen, Hsi-Wei; Williams, Jonathan P.; Sai, Jinshi; Koch, Patrick M.; Han, Ilseung; Jørgensen, Jes K.; Kwon, Woojin; Lee, Chang Won; Li, Zhi-Yun; Looney, Leslie W.; Narang, Mayank; Ohashi, Nagayoshi; Takakuwa, Shigehisa; Tobin, John J.; De Gregorio-Monsalvo, Itziar; Lai, Shih-Ping; Lee, Jeong-Eun; Tomida, Kengo "Early Planet Formation in Embedded Disks (eDisk). XV. Influence of Magnetic Field Morphology in Dense Cores on Sizes of Protostellar Disks," The Astrophysical Journal, 969, 125, 2024.
Yfantis, A. I.; Mościbrodzka, M. A.; Wielgus, M.; Vos, J. T.; Jimenez-Rosales, A. "Fitting the light curves of Sagittarius A* with a hot-spot model. Bayesian modeling of QU loops in the millimeter band," Astronomy and Astrophysics, 685, A142, 2024.
Yi, Kunwoo; Park, Jongho; Nakamura, Masanori; Hada, Kazuhiro; Trippe, Sascha "Jet collimation and acceleration in the flat spectrum radio quasar 1928+738," Astronomy and Astrophysics, 688, A94, 2024.
Yi, Zhu; You, Zhi-Qiang; Wu, You "Model-independent reconstruction of the primordial curvature power spectrum from PTA data," Journal of Cosmology and Astro-Particle Physics, 2024, 066, 2024.
Yiu, T. W. H.; Vedantham, H. K.; Callingham, J. R.; Günther, M. N. "Radio emission as a stellar activity indicator," Astronomy and Astrophysics, 684, A3, 2024.
Yoon, Ilsang "A Simple Model of the Radio-Infrared Correlation Depending on Gas Surface Density and Redshift," The Astrophysical Journal, 975, 15, 2024.
Yoshida, Tomohiro C.; Nomura, Hideko; Furuya, Kenji; Teague, Richard; Law, Charles J.; Tsukagoshi, Takashi; Lee, Seokho; Rab, Christian; Öberg, Karin I.; Loomis, Ryan A. "The First Spatially Resolved Detection of ^{13}CN in a Protoplanetary Disk and Evidence for Complex Carbon Isotope Fractionation," The Astrophysical Journal, 966, 63, 2024.
Yoshida, Tomohiro C.; Nomura, Hideko; Law, Charles J.; Teague, Richard; Shibaike, Yuhito; Furuya, Kenji; Tsukagoshi, Takashi "Outflow Driven by a Protoplanet Embedded in the TW Hya Disk," The Astrophysical Journal, 971, L15, 2024.
Young, Olivia; Lam, Michael T. "Redeveloping a CLEAN Deconvolution Algorithm for Scatter-broadened Radio Pulsar Signals," The Astrophysical Journal, 962, 131, 2024.
Yu, Qingzheng; Fang, Taotao; Xu, Cong Kevin; Feng, Shuai; Feng, Siyi; Gao, Yu; Jiang, Xue-Jian; Lisenfeld, Ute "CO Observations of Early-mid Stage Major Mergers in the MaNGA Survey," The Astrophysical Journal Supplement Series, 273, 2, 2024.
Yu, Sijie; Chen, Bin; Sharma, Rohit; Bastian, Timothy S.; Mondal, Surajit; Gary, Dale E.; Luo, Yingjie; Battaglia, Marina "Detection of long-lasting aurora-like radio emission above a sunspot," Nature Astronomy, 8, 50, 2024.
Yuan, Z. S.; Gao, X. Y.; Wen, Z. L.; Han, J. L. "Four Late-type Galaxies with Double Radio Lobes and Properties of Such Galaxies," Research in Astronomy and Astrophysics, 24, 045007, 2024.
Yusef-Zadeh, F.; Wardle, M.; Arendt, R.; Hewitt, J.; Hu, Y.; Lazarian, A.; Kassim, N. E.; Hyman, S.; Heywood, I. "Detection of large-scale synchrotron radiation from the molecular envelope of the Sgr B cloud complex at the Galactic centre," Monthly Notices of the Royal Astronomical Society, 527, 1275, 2024.
Yusef-Zadeh, F.; Zhao, Jun-Hui; Arendt, R.; Wardle, M.; Heinke, C. O.; Royster, M.; Lang, C.; Michail, J. "G359.13142-0.20005: a steep spectrum radio pulsar candidate with an X-ray counterpart running into the Galactic Centre Snake (G359.1-0.2)," Monthly Notices of the Royal Astronomical Society, 530, 254, 2024.
Yusef-Zadeh, F.; Zhao, Jun-Hui; Arendt, R.; Wardle, M.; Royster, M.; Rudnick, L.; Michail, J. "The interaction of a large-scale nuclear wind with the high velocity HII region G0.17+0.15," Monthly Notices of the Royal Astronomical Society, 530, 235, 2024.
Zabel, Nikki; Loni, Alessandro; Sarzi, Marc; Serra, Paolo; Chawla, Arjun; Davis, Timothy A.; Kleiner, Dane; Loubser, S. Ilani; Peletier, Reynier "A resolved, multiwavelength study of gas-rich dwarf galaxies in the Fornax cluster using MUSE, MeerKAT, and ALMA," Monthly Notices of the Royal Astronomical Society, 535, 2538, 2024.
Zamponi, Joaquin; Maureira, María José; Liu, Hauyu Baobab; Zhao, Bo; Segura-Cox, Dominique; Ko, Chia-Lin; Caselli, Paola "Exploring the dust grain size and polarization mechanism in the hot and massive Class 0 disk IRAS 16293-2422 B," Astronomy and Astrophysics, 682, A56, 2024.
Zanchettin, Maria Vittoria; Massardi, Marcella; Salvestrini, Francesco; Bischetti, Manuela; Feruglio, Chiara; Fiore, Fabrizio; Lapi, Andrea "The Resolved Star Formation Law in NGC 7469 from JWST, ALMA, and VLA," The Astrophysical Journal, 970, 75, 2024.
Zanella, A.; Iani, E.; Dessauges-Zavadsky, M.; Richard, J.; De Breuck, C.; Vernet, J.; Kohandel, M.; Arrigoni Battaia, F.; Bolamperti, A.; Calura, F.; Chen, C.-C.; Devereaux, T.; Ferrara, A.; Mainieri, V.; Pallottini, A.; Rodighiero, G.; Vallini, L.; Vanzella, E. "Unveiling [C II] clumps in a lensed star-forming galaxy at z ~ 3.4," Astronomy and Astrophysics, 685, A80, 2024.
Zapata, Luis A.; Fernández-López, Manuel; Sanhueza, Patricio; Girart, Josep M.; Rodríguez, Luis F.; Cortés, Paulo; Koch, Patrick; Beltrán, Maria T.; Pattle, Kate; Beuther, Henrik; Saha, Piyali; Jiao, Wenyu; Xu, Fengwei; Lu, Xing Walker; Olguin, Fernando; Li, Shanghuo; Stephens, Ian W.; Kang, Ji-Hyun; Cheng, Yu; Choudhury, Spandan; Morii, Kaho; Chung, Eun Jung; Wang, Jia-Wei; Hwang, Jihye; Lyo, A. -Ran; Zhang, Q.; Chen, Huei-Ru Vivien "Magnetic Fields in Massive Star-forming Regions (MagMaR). IV. Tracing the Magnetic Fields in the O-type Protostellar System IRAS 16547-4247," The Astrophysical Journal, 974, 257, 2024.
Zavala, Jorge A.; Bakx, Tom; Mitsuhashi, Ikki; Castellano, Marco; Calabro, Antonello; Akins, Hollis; Buat, Veronique; Casey, Caitlin M.; Fernandez-Arenas, David; Franco, Maximilien; Fontana, Adriano; Hatsukade, Bunyo; Ho, Luis C.; Ikeda, Ryota; Kartaltepe, Jeyhan; Koekemoer, Anton M.; Mckinney, Jed; Napolitano, Lorenzo; Pérez-González, Pablo G.; Santini, Paola; Serjeant, Stephen; Terlevich, Elena; Terlevich, Roberto; Yung, L. Y. Aaron "ALMA Detection of [O III] 88 μm at z = 12.33: Exploring the Nature and Evolution of GHZ2 as a Massive Compact Stellar System," The Astrophysical Journal, 977, L9, 2024.
Zhai, Sai; Shi, Yong; Zhang, Zhi-Yu; Wang, Jun-Zhi; Gao, Yu; Gu, Qiusheng; Wang, Tao; Du, Kaiyi; Yu, Xiaoling; Li, Xin "The H I-rich ultra-diffuse galaxies follow the extended Schmidt law," Monthly Notices of the Royal Astronomical Society, 527, 2691, 2024.
Zhang, C.; Liu, Tie; Ren, Z.-Y.; Zhu, Feng-Yao; Liu, H.-L.; Wang, Ke; Wu, J.-W.; Li, D.; Jiao, Sihan; Tatematsu, K.; Juvela, Mika; Lee, Chang Won; Jiao, Wenyu; Bronfman, Leonardo; Zhou, Jianwen; Xu, Feng-Wei; Tej, Anandmayee; Hwang, Jihye; Soam, Archana; Das, Swagat; Chibueze, James O. "ATOMS: ALMA Three-millimeter Observations of Massive Star-forming regions - XVI. Neutral versus ion line widths," Monthly Notices of the Royal Astronomical Society, 533, 4234-4247, 2024.
Zhang, Fabao; Shu, Xinwen; Yang, Lei; Sun, Luming; Zhang, Zhumao; Wang, Yibo; Mou, Guobin; Zhang, Xue-Guang; Zhou, Tianyao; Peng, Fangkun "Delayed and Fast-rising Radio Flares from an Optical and X-Ray-detected Tidal Disruption Event in the Center of a Dwarf Galaxy," The Astrophysical Journal, 962, L18, 2024.
Zhang, S.; Cyganowski, C. J.; Henshaw, J. D.; Brogan, C. L.; Hunter, T. R.; Friesen, R. K.; Bonnell, I. A.; Viti, S. "Filamentary mass accretion towards the high-mass protobinary system G11.92-0.61 MM2," Monthly Notices of the Royal Astronomical Society, 533, 1075, 2024.
Zhang, Shaohua; Luo, Zhijian; Shi, Xiheng; Shu, Chenggang; Xiao, Hubing; Zhou, Hongyan "A Comparative Study of Ultraluminous Infrared Galaxies in the IRAS and SDSS Surveys," The Astrophysical Journal Supplement Series, 274, 5, 2024.
Zhang, Siju; Liu, Tie; Wang, Ke; Zavagno, Annie; Garay, Guido; Liu, Hongli; Xu, Fengwei; Liu, Xunchuan; Sanhueza, Patricio; Soam, Archana; Zhou, Jian-Wen; Li, Shanghuo; Goldsmith, Paul F.; Zhang, Yong; Chibueze, James O.; Lee, Chang Won; Hwang, Jihye; Bronfman, Leonardo; Dewangan, Lokesh K. "ATOMS: ALMA three-millimeter observations of massive star-forming regions - XVIII. On the origin and evolution of dense gas fragments in molecular shells of compact H II regions," Monthly Notices of the Royal Astronomical Society, 535, 1364, 2024.
Zhang, Wenjun; Zhou, Jianjun; Esimbek, Jarken; Baan, Willem; He, Yuxin; Tang, Xindi; Li, Dalei; Ji, Weiguang; Wu, Gang; Ma, Yingxiu; Li, Jiasheng; Zhou, Dongdong; Tursun, Kadirya; Komesh, Toktarkhan "Kinematics and star formation of hub-filament systems in W49A," Astronomy and Astrophysics, 688, A99, 2024.
Zhang, X.; Qiu, K.; Zhang, Q.; Cao, Y.; Cheng, Y.; Liu, J.; Wang, Y.; Lu, X.; Pan, X. "Surveys of clumps, cores, and condensations in Cygnus X.

Temperature and nonthermal velocity dispersion revealed by VLA NH_3 observations," Astronomy and Astrophysics, 684, A142, 2024.
Zhang, Xu; Xiong, Ding-Rong; Gao, Quan-Gui; Yang, Gui-Qin; Lu, Fang-Wu; Na, Wei-Wei; Qin, Long-Hua "The fundamental plane of blazars based on the black hole spin-mass energy," Monthly Notices of the Royal Astronomical Society, 529, 3699, 2024.
Zhang, Y. H.; Dannerbauer, H.; Pérez-Martínez, J. M.; Koyama, Y.; Zheng, X. Z.; D'Eugenio, C.; Emonts, B. H. C.; Calvi, R.; Chen, Z.; Daikuhara, K.; De Breuck, C.; Jin, S.; Kodama, T.; Lehnert, M. D.; Naufal, A.; Shimakawa, R. "ASW^{2}DF: Census of the obscured star formation in a galaxy cluster in formation at z = 2.2," Astronomy and Astrophysics, 692, A22, 2024.
Zhang, Yan-Kun; Chen, Xi; Wang, You-Xin; Song, Shi-Min; Liu, Jun-Ting; Lu, Ying "Masers and Star Formation Activities in W51A," The Astronomical Journal, 168, 10, 2024.
Zhang, Ziwei E.; Sakai, Nami; Ohashi, Satoshi; Murillo, Nadia M.; Chandler, Claire J.; Svoboda, Brian; Ceccarelli, Cecilia; Codella, Claudio; Cacciapuoti, Luca; O'Donoghue, Ross; Viti, Serena; Aikawa, Yuri; Bianchi, Eleonora; Caselli, Paola; Charnley, Steven; Hanawa, Tomoyuki; Jímenez-Serra, Izaskun; Liu, Hauyu Baobab; Loinard, Laurent; Oya, Yoko; Podio, Linda; Sabatini, Giovanni; Vastel, Charlotte; Yamamoto, Satoshi "FAUST. XIV. Probing the Flared Disk in L1527 with Sulfur-bearing Molecules," The Astrophysical Journal, 966, 207, 2024.
Zhao, Mengke; Zhou, Jianjun; Baan, Willem A.; Hu, Yue; Lazarian, A.; Tang, Xindi; Esimbek, Jarken; He, Yuxin; Li, Dalei; Ji, Weiguang; Chang, Zhengxue; Tursun, Kadirya "Magnetic Field of Molecular Gas Measured with the Velocity Gradient Technique. II. Curved Magnetic Field in kpc-scale Bubble of NGC 628," The Astrophysical Journal, 967, 18, 2024.
Zhao, Xiurui; Marchesi, Stefano; Ajello, Marco; Civano, Francesca; Gilli, Roberto; Lanzuisi, Giorgio; López, Iván E.; Boorman, Peter G.; Silver, Ross; Torres-Albà, Nuria; Pizzetti, Andrealuna "An X-Ray Significantly Variable, Luminous, Type 2 Quasar at z = 2.99 with a Massive Host Galaxy," The Astrophysical Journal, 975, 24, 2024.
Zhao, Yue; D'Antona, Francesca; Milone, Antonino P.; Heinke, Craig; Zhao, Jiaqi; Lugger, Phyllis; Cohn, Haldan "Exploration of faint X-ray and radio sources in the massive globular cluster M14: a UV-bright counterpart to Nova Ophiuchus 1938," Monthly Notices of the Royal Astronomical Society, 527, 11491, 2024.
Zheng, Xuechen; Zhang, Yuze; Röttgering, Huub "Alignments in the orientation of radio jets from AGN and their host galaxies," Astronomy and Astrophysics, 686, A169, 2024.
Zhong, Yuxing; Inoue, Akio K.; Sugahara, Yuma; Morokuma-Matsui, Kana; Komugi, Shinya; Kaneko, Hiroyuki; Fudamoto, Yoshinobu "Revisiting the dragonfly galaxy II. Young, radiatively efficient radio-loud AGN drives massive molecular outflow in a starburst merger at z = 1.92," Monthly Notices of the Royal Astronomical Society, 529, 4531, 2024.
Zhou, D.; Greve, T. R.; Gullberg, B.; Lee, M. M.; Di Mascolo, L.; Dicker, S. R.; Romero, C. E.; Chapman, S. C.; Chen, C.-C.; Cornish, T.; Devlin, M. J.; Ho, L. C.; Kohno, K.; Lagos, C. D. P.; Mason, B. S.; Mroczkowski, T.; Wagg, J. F. W.; Wang, Q. D.; Wang, R.; Brinch, M.; Dannerbauer, H.; Jiang, X.-J.; Lauritsen, L. R. B.; Vijayan, A. P.; Vizgan, D.; Wardlow, J. L.; Sarazin, C. L.; Sarmiento, K. P.; Serjeant, S.; Bhandarkar, T. A.; Haridas, S. K.; Moravec, E.; Orlowski-Scherer, J.; Sievers, J. L. R.; Tanaka, I.; Wang, Y.-J.; Zeballos, M.; Laza-Ramos, A.; Liu, Y.; Hassan, M. S. R.; Jwel, A. K. M.; Nazri, A. A.; Lim, M. K.; Ibrahim, U. F. S. U. "The RAdio Galaxy Environment Reference Survey (RAGERS): Evidence of an anisotropic distribution of submillimeter galaxies in the 4C 23.56 protocluster at z = 2.48," Astronomy and Astrophysics, 690, A196, 2024.
Zhou, J. W.; Dib, S.; Juvela, M.; Sanhueza, P.; Wyrowski, F.; Liu, T.; Menten, K. M. "Gas inflows from cloud to core scales in G332.83-0.55: Hierarchical hub-filament structures and tide-regulated gravitational collapse," Astronomy and Astrophysics, 686, A146, 2024.
Zhou, J. W.; Dib, S.; Wyrowski, F.; Liu, T.; Li, S. H.; Sanhueza, P.; Juvela, M.; Xu, F. W.; Liu, H. L.; Baug, T.; Peng, Y. P.; Menten, K. M.; Bronfman, L. "Feedback from protoclusters does not significantly change the kinematic properties of the embedded dense gas structures," Astronomy and Astrophysics, 682, A173, 2024.
Zhou, J. W.; Dib, Sami; Davis, Timothy A. "Molecular clouds as hubs in spiral galaxies: gas inflow and evolutionary sequence," Monthly Notices of the Royal Astronomical Society, 534, 683, 2024.
Zhou, Jian-Wen; Davis, Timothy "Hierarchical hub-filament structures and gas inflows on galaxy-cloud scales," Publications of the Astronomical Society of Australia, 41, e076, 2024.
Zhou, Wei; Chen, Zhiwei; Jiang, Zhibo; Feng, Haoran; Jiang, Yu "M17 MIR: A Massive Star Is Forming via Episodic Mass Accretion," The Astrophysical Journal, 969, L6, 2024.
Zhou, Xin; Su, Yang; Yang, Ji; Chen, Yang; Jiang, Zhibo "Discovery of an old supernova remnant candidate through carbon monoxide line emission," Astronomy and Astrophysics, 683, A107, 2024.
Zinchenko, I. I.; Liu, S.-Y.; Su, Y.-N. "Fine structure and kinematics of the ionized and molecular gas in the jet and disk around S255IR NIRS3 from high-resolution ALMA observations," Astronomy and Astrophysics, 692, A181, 2024.
Zuo, Zihao; Zhu, Shifu; Brandt, W. N.; Garmire, Gordon P.; Vito, F.; Wu, Jianfeng; Xue, Yongquan "The X-ray enhancements of radio-loud quasars at high redshift: New results at z = 4-7," Monthly Notices of the Royal Astronomical Society, 530, 360, 2024.
Zurlo, A.; Weber, P.; Pérez, S.; Cieza, L.; Ginski, C.; Van Holstein, R. G.; Principe, D.; Garufi, A.; Hales, A.; Kastner, J.; Rigliaco, E.; Ruane, G.; Benisty, M.; Manara, C. "The environment around young eruptive stars. SPHERE/IRDIS polarimetric imaging of seven protostars," Astronomy and Astrophysics, 686, A309, 2024.

APPENDIX B: ADVISORY COMMITTEES

The memberships of various NRAO, ALMA, and Computing committees are given below. These committees provide feedback to the Director's Office and Observatory management on issues including user needs, operation efficiencies, staff feedback, computing requirements, and communications with the community. Appointment end-dates are indicated for some committees.

NRAO Time Allocation Committees

Semester 24A

- Poonam Chandra, GWT panel, NRAO
- Joeri van Leeuwen, PCO panel, ASTRON
- Chenoa Tremblay, ISM panel, SETI
- Tracy Clarke, NGA Panel, NRL
- Stephen White (chair), SSP panel, AFRL
- Jaime Pineda, SFM panel, MPE
- Preeti Kharb, LLA panel, NCRA-TIFR
- Robert Laing, HLA panel, SKAO
- Danielle Lucero, EGS panel, Virginia Tech
- James Bartlett, HIZ panel, University of Paris/JPL

Semester 24B

- Laura Spitler, GWT panel, MPIfR
- Joeri van Leeuwen, PCO panel, ASTRON
- Chenoa Tremblay, ISM panel, SETI
- Tracy Clarke, NGA Panel, NRL
- Stephen White (chair), SSP panel, AFRL
- Jaime Pineda, SFM panel, MPE
- Violette Impellizzeri, LLA panel, Leiden
- Robert Laing, HLA panel, SKAO
- Danielle Lucero, EGS panel, Virginia Tech
- James Bartlett, HIZ panel, University of Paris/JPL

ALMA North American Science Advisory Committee

- Sean Andrews, Harvard-Smithsonian Center for Astrophysics (2026)
- Sara Ellison, University of Victoria (2026)
- Leslie Looney, University of Illinois Urbana-Champaign (2027)
- Meredith MacGregor, Johns Hopkins University (2027)
- Brett McGuire, Massachusetts Institute of Technology (2025)
- Stefanie Milam (Chair), NASA/GSFC (2025)
- Kazushi Sakamoto, Academia Sinica Institute of Astronomy & Astrophysics (2026)
- Karin Sandstrom, University of California, San Diego (2027)

NRAO Users Committee

- Sean Andrews (Vice-Chair, Center for Astrophysics)
- Alessandra Corsi (Texas Tech University)
- Jane Huang (Columbia University)
- Melodie Kao (University of California, Santa Cruz)
- Adam Leroy (Ohio State University)
- Duncan Lorimer (West Virginia University)
- Karen Masters (Haverford College)
- Brett McGuire (Chair, MIT)
- Stefanie Milam (NASA/GSFC)
- Elisabeth (Betsy) A.C. Mills (University of Kansas)
- Cherry Ng (University of Toronto)
- Jennie Paine (University of Maryland, Baltimore County / NASA GSFC)
- Daniel Perley (Liverpool John Moores University)
- Kazushi Sakamoto (Academia Sinica IAA)
- Melissa Soriano (NASA Jet Propulsion Laboratory)
- Tony Wong (University of Illinois Urbana-Champaign)

Data Management and Software (Panel of the Users Committee)

- Jane Huang (NA - Chair)
- Olga Bayandina (EU)
- Abhijeet Borkar (EU)
- Ruta Kale (IN)
- Jihyun Kang (EA)
- Adam Leroy (NA)
- Kristina Nyland (NA)
- Imke de Pater (NA)
- Yu-Nung Su (NA)
- Yoshimasa Watanabe (EA)

NRAO Visiting Committee

- Paul Abell, NASA Johnson Space Center (2027)
- Lewis Ball, SKAO (2025)
- Alessandra Corsi, The Johns Hopkins University (2027)
- Jeremy Darling, University of Colorado at Boulder (2025)
- Kevin Marvel, American Astronomical Society (2027)
- Lynn Matthews, MIT Haystack Observatory (2025)
- Margaret Meixner, Jet Propulsion Laboratory (2027)
- Beth Willman, LSST Corporation (2025)

APPENDIX C: FINANCIAL SUMMARY

Functional Work Breakdown Structure Element	**CSA-V**	**CSA-A**	**ICC**	**Total**
Administrative Services	$15,704	$10,875	$-7,636	$18,943
Development Programs	$3,527	$27,260	$567	$31,364
Director's Office	$3,363	$4,117	$2,407	$9,886
Education & Public Outreach	$979	$883	$0	$1,862
Science Operations	$9,649	$9,765	$3,490	$22,904
Telescope Operations	$24,357	$31,461	$410	$56,229
Grand Totals	**$57,589**	**$84,361**	**$-762**	**$141,188**

All figures are $k USD

Fiscal Year 2024 = 1 October 2023 to 30 September 2024
CSA = Cooperative Support Agreement
V = VLA/VLBA
A = ALMA
ICC = Internal Common Costs

APPENDIX D: REFERENCES

Banados et al. 2024, arXiv:2408.12299

Bonnefoy et al. 2024, Icarus 411, 115950

de Kleer et al. 2024, arXiv:2409:12364

Harshan et al. arXiv:2408.12310

Hunter et al. 2024

Ikeda et al. 2024, arXiv:2408.03374

Lambrides et al. 2024, ApJL 961, L25

Moscadelli et al. 2024 arXiv:2408.11968

NANOGrav consortium 2024 arXiv:2408.10166

Nhan et al, 2024

Peng et al. 2024, arXiv:2409.12028

Plant et al. 2024, 2406.17280

Remijian et al. 2024 arXiv:2409.16435

Schouwn et al. 2024 arXiv:2409.20549

Speedie et al. 2024 Nature 633, 58

Walters et al. arXiv:2407:13060

Zanchettin et al. 2024, arXiv:2406.07901

APPENDIX E: ACRONYMS

Acronym	Definition
AA	Antenna Article
AAAS	American Association for the Advancement of Science
AAB	Antenna Assembly Building
AAG	Astronomy and Astrophysics Research Grants
AAS	American Astronomical Society
ACA	Atacama Compact Array
ACDC	ASIAA CASA Development Center
ACU	Antenna Control Unit
AD	Assistant Director
ADAPT	ALMA Data Processing Toolchain
ADMIN	Administration
ADMIT	ALMA Data Mining Toolkit
ADS	Astrophysics Data System
AGN	Active Galactic Nuclei
ALMA	Atacama Large Millimeter/submillimeter Array
ALPACA	ALMA Large Proposal of gAlactic Cold gAs
ANID	Agencia Nacional de Investigación y Desarrollo
AoD	Astronomer on Duty
AOS	Array Operations Site (ALMA, Chile)
APP2	ALMA Phasing System Phase 2
APR	Annual Progress Report
ARC	ALMA Regional Center
ARDG	Algorithm Research and Development Group
ARKS	ALMA survey to Resolve exoKuiper belt Substructures
ASG	ALMA Science Group
ASKAP	Australian Square Kilometer Array Pathfinder
ASIAA	Academia Sinica Institute for Astronomy and Astrophysics
ASIC	Application Specific Integrated Circuit
ASMH	Advanced Spectrum Monitoring Hardware
ATCA	Australia Telescope Compact Array
AT.CBF	ALMA Talon Correlator/Beamformer, now ATAC
AU	Astronomical Unit
AUI	Associated Universities, Incorporated
BE	Back End
BEAM-ME	Blazars Entering the Astrophysical Multi-Messenger Era

Acronym	Definition
BI	Broader Impacts
BIPOC	Black, Indigenous, and people of color
BUD	Budget
CAN	Controller Area Network
CAP	Contracts and Procurement
CARTA	Cube Analysis and Rendering Tool for Astronomy
CASA	Common Astronomy Software Applications
CCA	Cold Cartridge Assembly
CCE	Common Computing Environment
CDL	Central Development Laboratory
CDP	Correlator Data Processing
CDR	Critical Design Review
CHTC	Center for High Throughput Computing
CIS	Computing and Information Services
CLOA	Central Local Oscillator Article
cm	Centimeter
CMB	Cosmic Microwave Background
CMMS	Computerized Maintenance and Management System
CND	Circum-Nuclear Disk
CNGI	CASA Next Generation Infrastructure
CO	Carbon Monoxide
CoDR	Conceptual Design Review
COMPASS	Complex Organic Molecules in Protostars with ALMA Spectral Surveys
COSMIC-SETI	Commensal Open-Source Multimode Interferometer Cluster Search for Extraterrestrial Intelligence
COSMOS	Cosmic Evolution Survey
COVID-19	Coronavirus Disease 2019
CPDS	Cartridge Power Distribution System
CRISTAL	[C ii] Resolved ISm in STar-forming galaxies with ALMA
CSP	Central Signal Processor
CTS	CCA Test Set
CV	Charlottesville, VA
DA	Data Analyst
DAPPER	Dark Ages Polarimeter Pathfinder
DART	Double Asteroid Redirection Test
dB	Decibel
DDT	Director’s Discretionary Time

Acronym	Definition
DESI	Dark Energy Spectroscopic Instrument
DiFX	Distributed FX correlator
DMS	Data Management and Software Department
DPR	Distributed Peer Review
DRXA	Data Receiver Article
DSACore	Dynamic Scheduling Algorithm
DSOC	Domenici Science Operations Center
DSP	Digital Signal Processing
EA	East Asian
ECT	Exposure Calculator Tool
EHS	Environmental Health and Safety
EHT	Event Horizon Telescope
EL	Elevation
EM	Electromagnetic
EMC	Electromagnetic Compatibility
EOC	Extension and Optimization of Capabilities
EOS	Emergency Operations Status
EPO	Education and Public Outreach
ER	Edgemont Road
ERP	Enterprise Resource Planning
ESO	European Southern Observatory
ETK	Electronic Time Keeping
EU	European Union
FCC	Federal Communications Commission
FE	Front End
FEHV	Front End Handling Vehicle
FEMC	Front End Monitor and Control
FETMS	Front End Test and Measurement System
FOW	Fiber Optic Wrap
FPGA	Field-Programmable Gate Array
FRB	Fast Radio Burst
FRM	Focus Rotation Mount
FTE	Full-Time Equivalent
FY	Fiscal Year (1 October through 30 September)
GBO	Green Bank Observatory
Gbps	Giga-bits per second
GHz	Gigahertz

Acronym	Definition
GMC	Giant Molecular Clouds
GMRT	Giant Metrewave Radio Telescope
GMVA	Global 3mm VLBI Array
GO	General Observing
GOST	General Observing Setup Tool
GPS	Global Positioning System
GPU	Graphic Processing Units
GRB	Gamma Ray Burst
GUI	Graphical User Interface
GW	Gravitational Wave
HBCU	Historically Black Colleges and Universities
HBT	Heterojunction bipolar transistor
HEMT	high-electron-mobility transistor
HERA	Hydrogen Epoch of Reionization Array
HFSS	High Frequency Structure Simulator
HI	Hydrogen
HiLS	Hardware in the Loop Simulator
HPC	High Performance Computing
HQ	Headquarters
HR	Human Resources
HRIS	Human Resource Information System
HSA	High Sensitivity Array
HVAC	Heating, Ventilation, and Air Conditioning
Hz	Hertz
IAU	International Astronomical Union
ICC	Internal Common Cost
IDC	Indirect Cost
IDIA	South African Institute for Data Intensive Astronomy
IEEE	Institute of Electrical and Electronics Engineers
IET	Integrated Engineering Team
IF	Intermediate Frequency
IGM	Intergalactic Medium
InP	Indium Phosphide
IPT	Integrated Product Team
IR	Infrared
IRD	Integrated Receiver Development
ISM	Interstellar Medium

Acronym	Definition
ISM	International Staff Member
IT	Information Technology
ITU-R	International Telecommunication Union-Radio (communications sector)
IUCAF	Scientific Committee on Frequency Allocations for Radio Astronomy and Space Science
JAO	Joint ALMA Observatory
JDE	JD Edwards
JIVE	Joint Institute for VLBI in Europe
JPL	Jet Propulsion Laboratory
JWST	James Webb Space Telescope
JVLA	Jansky Very Large Array
k	1000
K	Kelvin
kHz	kiloHertz
km	kilometer
kpc	kiloparsecs
LA	Los Alamos
LIGO	Laser Interferometer Gravitational-Wave Observatory
LLC	Line Length Corrector
LNA	Low Noise Amplifier
LO	Local Oscillator
LPR	Local Oscillator Photonics Receiver
LRP	Long Range Plan
LRU	Line Replaceable Unit
LSAMP	Louis Stokes Alliance for Minority Participation
LSM	Local Staff Members
LSST	Large Synoptic Survey Telescope
LTCC	Low Temperature Co-Fired Ceramic
LWA	Long Wavelength Array
m	meter
M	Million
MA	Main Array
mas	milliarcsecond
Mbps	Mega-bits per second
M&C	Monitor and Control
mG	milliGauss
MHD	magnetohydrodynamic

Acronym	Definition
MHz	Megahertz
MIS	Management Information Services
MIT	Massachusetts Institute of Technology
MK	Mauna Kea
mm	millimeter
MMIC	Monolithic Millimeter-wave Integrated Circuit
MOJAVE	Monitoring Of Jets in Active galactic nuclei with VLBA Experiments
MREFC	Major Research Engineering Facility Construction
MRI	Medical Resonance Imaging
MS	Measurement Sets
msec	millisecond
MSI	Minority-Serving Institution
MSIP	Mid-Scale Innovations Program
MSMRx	Millimeter and Submillimeter Receivers
MTBF	Mean Time Between Failures
MTS	Mixer Test Set
MTTR	Mean Time to Repair
MVP	Minimum Viable Product
μas	Micro-arcsecond
μJy	microJansky
Myr	Million years
NA	North American
NAASC	North American ALMA Science Center
NAC	National Astronomy Consortium
NANOGrav	North American Nanohertz Observatory for Gravitational Waves
NAOJ	National Astronomical Observatory of Japan
NASA	National Aeronautics and Space Administration
Nb	Niobium
Nb/AlN/Nb	Niobium-Aluminum Nitride-Niobium
NEO	Near Earth Object
ngVLA	Next Generation Very Large Array
NICER	Neutron Star Interior Composition Explorer Mission
NINE	National and International Non-Traditional Exchange
NIS	Network Information Services
NM	New Mexico
NOEMA	Northern Extended Millimeter Array
NRAO	National Radio Astronomy Observatory

Acronym	Definition
NRC	National Research Council
NRC-HIA	National Research Council of Canada – Herzberg Institute of Astrophysics
NRL	Naval Research Laboratory
NSBP	National Society of Black Physicists
NSF	National Science Foundation
NSF-AST	National Science Foundation – Division of Astronomical Sciences
NTIA	National Telecommunications and Information Administration
OCA	Office of Chilean Affairs
OLC	Observatory Leadership Cohort
OMC	Observatory Monitor and Control GUI
OMT	OrthoMode Transducer
OPT	Observation Preparation Tool
OSF	Operations Support Facility (ALMA, Chile)
OST	Observing Scheduling Tool
OT	Observing Tool
P2G	Phase 2 Group
PAA	Parque Astronómico Atacama
PanSTARRS	Panoramic Survey Telescope and Rapid Response System
PAS	Provisional Acceptance on Site
PATh	Partnership to Advance Throughput Computing
pc	parsec
PDR	Preliminary Design Review
PEMP	Performance Evaluation and Management Plan
PEP	Performance Evaluation Process
PFI	Partnerships for Innovation
PFT	Proposal Finder Tool
PHANGS	Physics at High Angular Resolution in Nearby GalaxieS
PHT	Proposal Handling Tool
PI	Principal Investigator
PING	Physics Inspiring the Next Generation
PMD	Program Management Department
PM/SE	Project Manager/Systems Engineer
POETS	Protostellar Outflows at the EarliesT Stages
POP	Program Operating Plan
POSE	Pathways to Enable Open-Source Ecosystems
PRCZ	Puerto Rico Coordination Zone
PROMEMCI	Programa de Mentoría para Mujeres Científicas

Acronym	Definition
ProVoca	Promovamos Vocaciones Científicas
PST	Proposal Submission Tool
PT	Pie Town
PWI	Primarily White Institutions
Q1, Q2	Quarter 1 (October – December), Quarter 2 (January – March)
Q3, Q4	Quarter 3 (April – June), Quarter 4 (July – September)
QA	Quality Assurance
QDR	Quad Data Rate
QL	QuickLook
R&D	Research and Development
RA	Research Associate
RADIAL	Radio Astronomy Data Imaging and Analysis Labs
RADPS	Radio Astronomy Data Processing System
RCT	Resource Catalog Tool
REU	Research Experiences for Undergraduates
RF	Radio Frequency
RFI	Radio Frequency Interference
RFP	Request for Proposal
RHEL	Red Hat Enterprise Linux
RIS	Raytheon Intelligence and Space
RML	Regularized Maximum Likelihood
rms	radio, millimeter and submillimeter
ROACH	Reconfigurable Open Architecture Computing Hardware
RSG	Red Supergiants
RSRO	Resident Shared Risk Observing
RTE	Research and Training Experience
SAC	Science Advisory Council
SAS	Sub Array Switch
SB	Scheduling Block
SC	Saint Croix
SCG	Science Computing Group
SCO	Santiago Central Office
SCREAM	Scalable, Reconfigurable, and Modular
SDM	Science Data Model
SEDLE	Socorro Electronics Division's Laboratory Experience for Undergraduates
SE	Single Epoch
SE	Systems Engineering

Acronym	Definition
SECI	Single Epoch continuum images
SEPIA	Swedish-ESO PI receiver for APEX
SETI	Search for Extra Terrestrial Intelligence
SFR	Star Formation Rate
SIS	Scientific Information Services
SIS	Superconductor–Insulator–Superconductor
SKA	Square Kilometre Array
SLA	Service Level Agreement
SMBH	Supermassive Black Hole
SMS	Short Message Service
SOP	Standard Operating Procedure
SOS	Student Observing Support
SPIE	International Society for Optics and Photonics
SRAO	Science Ready Archive and Operations
SRDP	Science Ready Data Products
SRO	Shared Risk Observing
SRP	Science Review Panel
SSR	Science Support and Research
STE(A)M	Science, Technology, Engineering, (Arts), and Mathematics
STINGAR	Shared Threat Intelligence for Network Gatekeeping and Automated Response
STFC	Science and Technology Facilities Council
submm	submillimeter
SUS	Scientific User Support
SW	Software
SWaP	Size, Weight, and Power
SysML	Systems Modeling Language
TAC	Time Allocation Committee
TAO	University of Tokyo Atacama Observatory
TARS	Tethered Aerostat Radar System
TMCDB	Telescope Monitor and Control Database
TDE	Tidal Disruption Events
THz	TeraHertz
TKIP	Traveling wave Kinetic Inductance Parametric amplifiers
TMCDB	Telescope Monitor and Control Database
TP	Total Power
TTA	Telescope Time Allocation
TTO	Technology Transfer Office

Acronym	Definition
UDP	User Datagram Protocol
UNM	University of New Mexico
UPS	Uninterruptable Power Supply
URM	Under-Represented Minority
URSI	Union Radio Scientifique Internationale
U.S.	United States of America
USNO	United States Naval Observatory
UV	Ultraviolet
UVA	University of Virginia
UVML	University of Virginia Microfabrication Laboratory
V	volt
VA	Virginia
VBER	VLBA Back End Retrofit
VEGAS	VErsatile GBT Astronomical Spectrometer
VFD	Variable Frequency Drive
VLA	Very Large Array
VLASS	VLA Sky Survey
VLBA	Very Long Baseline Array
VLBI	Very Long Baseline Interferometry
VLITE	VLA Low Band Ionospheric and Transient Experiment
VNDA	VLBA New Digital Architecture
VO	Virtual Observatory
VSAC	ngVLA Science Advisory Council
VTAC	ngVLA Technical Advisory Council
WBS	Work Breakdown Structure
WCA	Warm Cartridge Assembly
WFH	Work From Home
WFO	Work-For-Others
WIDAR	Wideband Interferometric Digital ARchitecture
WiE	Women in Engineering
WISE	Wide-field Infrared Survey Explorer
WMP	Workforce Management Plan
WSU	Wideband Sensitivity Upgrade
WV	West Virginia
YIG	Yttrium Iron Garnet
yr	year
YUPPI	"Y" Ultimate Pulsar Processing Instrument

science.nrao.edu
public.nrao.edu
ngvla.nrao.edu
almascience.nrao.edu
greenbankobservatory.org

NRAO Headquarters and North American Science Center
National Radio Astronomy Observatory
520 Edgemont Road
Charlottesville, Virginia U.S.A. 22903-2475
+1-434-296-0211

NRAO - Central Development Laboratory
National Radio Astronomy Observatory
1180 Boxwood Estate Road
Charlottesville, Virginia U.S.A. 22903-4608
+1-434-296-0358

NRAO - Pete V. Domenici Science Operations Center
National Radio Astronomy Observatory
P.O. Box 0
Socorro, New Mexico U.S.A. 87801-0387
+1-575-835-7000

NRAO/AUI - Chile
NRAO/AUI
Av. Alonso de Cordova 2860
Office 702
Vitacura, Santiago Chile, 7630440
+56-2-2210-9600

Green Bank Observatory
155 Observatory Road, Box 2
Green Bank, West Virginia U.S.A. 24944
+1-304-456-2011

The NSF National Radio Astronomy Observatory and NSF Green Bank Observatory are facilities of the U.S. National Science Foundation operated under cooperative agreement by Associated Universities, Inc.