



NRAO Call for Proposals: Semester 2016A

The NRAO invites scientists to participate in the [NRAO Semester 2016A Call for Proposals](https://science.nrao.edu/observing/call-for-proposals/2016A) (<https://science.nrao.edu/observing/call-for-proposals/2016A>) for the Green Bank Telescope (GBT), Very Large Array (VLA), and Very Long Baseline Array (VLBA), High Sensitivity Array (HSA), and Very Long Baseline Interferometry (VLBI).

The submission deadline for Semester 2016A proposals is Monday, 3 August 2015, at 17:00 EDT (21:00 UTC).

The NRAO especially wishes to highlight new opportunities for joint observations with the **Chandra X-ray Observatory**, and continuing opportunities with the **Hubble Space Telescope** and the **Swift Gamma-Ray Burst Mission**.

Registration Open for U.S. Radio Futures Conference

Tony Beasley (NRAO Director)

U.S. Radio – Millimeter – Submillimeter Science Futures Conference
15 – 17 December 2015
Chicago, Illinois



Registration is now open for the first of three conferences that will provide the community broad opportunities to discuss potential U.S. futures for radio-millimeter-submillimeter (RMS) science in the 2020's and beyond. This conference will take place 15-17 December 2015 in Chicago, Illinois.

Funded by Associated Universities, Inc. (AUI) and the Kavli Foundation, and organized by the NRAO, this conference is structured around key science themes that reflect priorities identified in the *New Worlds, New Horizons* Decadal Survey and that require observations at RMS wavelengths to address.

The Science Organizing Committee co-chairs are Mark Reid (CfA) and Jean Turner (UCLA). Science Working Groups (SWGs) have been formed to address how next-generation RMS facilities will enable new science and discovery relevant to four major science themes.

Cradle of Life

Led by Lee Hartmann (Michigan) & Dave Wilner (CfA).

This Working Group will address science questions such as how stars form, how circumstellar disks form and evolve, and how planetary systems develop within circumstellar disks.

Formation and Evolution of Galaxies

Led by Alice Shapley (UCLA) & Min Yun (UMass).

This Working Group will address science questions such as how gas flows into and out of galaxies, the extent to which galaxy interactions can be tracked, and how our Galaxy and galaxies in the Local Group serve as models for galaxies across the Universe.

Fundamental Physics

Led by Avery Broderick (Waterloo) & Maura McLaughlin (WVU).

This Working Group will address science questions regarding how the Universe can be used as a laboratory for testing the extremes of physical laws including relativistic magneto-hydrodynamics, testing nuclear equations of state, physics near event horizons, and theories of gravity.

Cosmology & Cosmic Dawn

Led by John Kovac (Harvard) & Sarah Church (Stanford).

This Working Group will address science questions regarding the extent to which the early Universe can be probed and how the Universe made the transition from a largely neutral state to a largely ionized state.

Please visit the [conference website \(https://science.nrao.edu/science/meetings/2015/2020futures\)](https://science.nrao.edu/science/meetings/2015/2020futures) to register and for additional information.

We hope you will join us in Chicago 15-17 December for this important and exciting discussion of the future of U.S. radio-millimeter-submillimeter science.

Resumption of Student Observing Support in 2016

Tim Bastian

We are pleased to announce that support for the NRAO [Student Observing Support \(https://science.nrao.edu/opportunities/student-programs/sos\)](https://science.nrao.edu/opportunities/student-programs/sos) (SOS) program will be restored for its North American instruments in Fiscal Year 2016. The program was suspended for Fiscal Year 2015 as a result of budgetary pressures, with the exception of ALMA. The program is intended to support research using NRAO telescopes by graduate and undergraduate students at U.S. universities and colleges. SOS proposals associated with observing proposals submitted for the Very Large Array (VLA), Green Bank Telescope (GBT), the Very Long Baseline Array (VLBA) are eligible, as well as those submitted through the the North American Executive for ALMA.

The next opportunity to apply for Student Observing Support funding will occur in coordination with the NRAO 2016A observing semester. No action is required on the part of applicants at the time of proposal submission. Solicitations for applications for SOS support will be included with 2016A proposal disposition letters in November 2015, and successful ALMA Cycle 3 PIs will be contacted by e-mail in the same time frame. Outstanding applications for support for student observing with all instruments will be competitively selected early in the 2016 calendar year.

Upcoming Events

 [Some IAU General Assembly highlights are listed in the article below. \(/enews/8.6/index.shtml#iau_highlights\)](/enews/8.6/index.shtml#iau_highlights)

Aug 3 - 14, 2015 | Honolulu, HI



2015 ALMA Summer School (<https://fibp.phas.ubc.ca/>)

Aug 17 - 21, 2015 | Penticton, BC, Canada



High Frequency Science Workshop (<https://science.nrao.edu/science/meetings/2015/GBT-high-frequency-science/>)

Sep 21 - 23, 2015 | Green Bank, WV



Data Reduction Party

Sep 28 - 30, 2015 | Charlottesville, VA



Observational Evidence of Gas Accretion onto Galaxies?

(<https://science.nrao.edu/science/meetings/2015/accretion2015>)

Oct 9 - 10, 2015 | Charlottesville, VA



4th China – U.S. Workshop on Radio Astronomy Science & Technology

(https://science.nrao.edu/science/meetings/2015/4th_us_china_workshop/home)

Oct 14 - 16, 2015 | Shanghai, China



Science at Low Frequencies II Workshop (<http://lwa.phys.unm.edu/abq2015/index.html>)

Dec 2 - 4, 2015 | Albuquerque, NM



U.S. Radio – Millimeter – Submillimeter Science Futures Conference

(<https://science.nrao.edu/science/meetings/2015/2020futures>)

Dec 15 - 17, 2015 | Chicago, IL

IAU General Assembly Highlights



Commission 40 – Radio Astronomy

Working Group on Historical Radio Astronomy

The Golden Anniversary of the 1960's:

The Golden Years of Radio Astronomy

Wednesday 5 August 2015, 10:30 – 12:30 & 16:00 – 18:00

Hawaii Convention Center, Room 328

The Historical Radio Astronomy Working Group will celebrate the 50th anniversary of the remarkable discoveries that occurred during the 1960s.

[Working Group agenda \(\[http://www.atnf.csiro.au/iau-comm40/2015GA/HRA_WG_5Aug2015_agenda.pdf\]\(http://www.atnf.csiro.au/iau-comm40/2015GA/HRA_WG_5Aug2015_agenda.pdf\)\).](http://www.atnf.csiro.au/iau-comm40/2015GA/HRA_WG_5Aug2015_agenda.pdf)

Commission 40 – Radio Astronomy / IUCAF Business Meeting

Thursday 6 August 2015, 08:30 – 12:30

Hawaii Convention Center, Room 318A

A joint business meeting for Commission 40 (Radio Astronomy) and the Scientific Committee on Frequency Allocations for Radio Astronomy and Space Science (IUCAF) will include discussion of the IAU Commissions restructuring and the outcomes of a proposal for a new Radio Astronomy Commission. Goals and planning for this new Commission will be discussed, and planning for new Working Groups will be considered. The IUCAF Chair and members will report their activities towards the protection of the passive radio spectrum, and IUCAF membership will be considered. The meeting will provide a forum for broader discussion of radio astronomy spectrum requirements.

[Business Meeting agenda. \(http://www.atnf.csiro.au/iau-comm40/C40_IUCAF_business_agenda.html\)](http://www.atnf.csiro.au/iau-comm40/C40_IUCAF_business_agenda.html)

Focus Meeting 3 (FM3)

Scholarly Publication in Astronomy: Evolution or Revolution?

Thursday – Friday 6 – 7 August 2015

Hawaii Convention Center, Room 320

Focus Meeting 3 will include a panel discussion on Thursday morning, 6 August, titled *Transforming Roles for Astronomy Librarians* that features a representative from astronomy, publishing, and libraries that is expected to generate considerable discussion.

[FM3 program. \(http://astronomy2015.org/focus_meeting_3\)](http://astronomy2015.org/focus_meeting_3)

IAU Division B (Facilities, Technologies, and Data Science) Meeting

Friday 7 August & Monday 10 August 2015, 8:30 – 18:00

This meeting aims to provide high-level science-motivated summaries of recent astronomical technology advances and to look forward to future technology challenges and opportunities.

[Additional information \(http://director.tuc.noao.edu/iauDivB/meeting2015Main.htm\)](http://director.tuc.noao.edu/iauDivB/meeting2015Main.htm).

Square Kilometre Array Observatory: Current Status and Science Program

Sunday 9 August 2015, 09:00 – 17:00

Hawaii Convention Center, Room 323AB

[Additional information & program. \(http://astronomers.skatelescope.org/meetings-2/2015-ska-iau-ga/\)](http://astronomers.skatelescope.org/meetings-2/2015-ska-iau-ga/)

Focus Meeting 14 (FM14)

The Gravitational Wave Symphony of Structure Formation

10:30 – 18:00, Wednesday, 12 August 2015

08:30 – 10:00, Thursday, 13 August 2015

Hawaii Convention Center, Room 320

The topics of this Focus Meeting are at the intersection of galaxy evolution and fundamental physics, including how studies of galaxy mergers can inform the detection of gravitational waves, and how the detection and study of gravitational waves can constrain models for galaxy mergers.

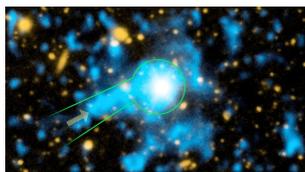
[FM14 program \(http://astronomy2015.org/focus_meeting_14\)](http://astronomy2015.org/focus_meeting_14).

Observational Evidence of Gas Accretion Onto Galaxies?

A Workshop at the NA ALMA Science Center (NAASC)

9 - 10 October 2015

NRAO – Charlottesville, Virginia, USA



Registration is open for the 2015 NRAO North American ALMA Science Center (NAASC) Workshop: "Observational Evidence of Gas Accretion Onto Galaxies?"

Please visit the workshop website to register and for information regarding the meeting format and logistics:

<https://science.nrao.edu/science/meetings/2015/accretion2015/>

[\(https://science.nrao.edu/science/meetings/2015/accretion2015/\)](https://science.nrao.edu/science/meetings/2015/accretion2015/)

In the spirit of facilitating all interested attendees to participate in the workshop, the NAASC is offering modest

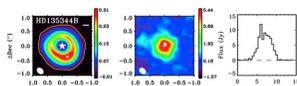
financial support, considered on a case-by-case basis, to help mitigate attendance challenges. Please see the registration page on the workshop website for more information about this program.

This NAASC Accretion Workshop will focus on examining direct observational evidence of the putative process of concentrating the baryon content of the Universe into dark haloes and will review and discuss:

1. the basic physical processes and theoretical expectations from simulations that current and future observations would meaningfully confront;
2. the latest observations on the reservoirs of baryons in the IGM and CGM at different redshifts, filaments in the IGM, the intra-cluster medium, and neutral IGM;
3. observations of the exchange of gas of all phases between the reservoirs of baryons and galaxies/haloes in the general field, group and cluster environments, and in the larger structure of filaments; and
4. future observations and possible special purpose instruments or telescopes/missions that could facilitate direct observations of gas accretion onto galaxies.

We look forward to seeing you in Charlottesville in October!

Probing for Planets Inside the Dust Cavities of Young Stellar Disks



Submillimeter continuum image (left), and CO(6-5) emission image (middle) and line profile (right) of HD 135344B. The color bars are in units of Jy per beam (left) and Jy km/s per beam (middle).

The high resolution and sensitivity of ALMA have greatly enhanced the ability to assess the clearing mechanisms – e.g., planets or substellar companions, photo evaporation, grain growth – of circumstellar material which give rise to dust cavities in young stellar disks. In a recent publication by [van der Marel and her collaborators \(http://adsabs.harvard.edu/abs/2015A%26A...579A.106V\)](http://adsabs.harvard.edu/abs/2015A%26A...579A.106V), the authors analyze ALMA CO(6-5) and 650 GHz observations of a sample of well-studied transition disks to measure their gas and dust surface densities. By making use of a model that calculates the thermal and chemical state of the disk to simultaneously analyze the spectral energy distribution, the submillimeter continuum visibilities and the CO data, the authors were able to constrain the gas and dust surface density profiles, and to assess the amount of gas and dust within the cavity. The authors find that the density profiles are consistent with the clearing of the cavity by one or more companions.

Reference: *Gas Density Drops Inside Dust Cavities of Transitional Disks Around Young Stars Observed with ALMA*, N. van der Marel (Leiden), E.F. Van Dishoeck (Leiden, MPIfE), S. Bruderer (MPIfE), L. Perez (NRAO), and A. Isella (Rice), 2015 A&A, 576, A106.

A Pulsar Test for Variations in G

F.J. Lockman

Some pulsars are such stable clocks that they can advance our understanding of gravity. Pulsar J1713+0747 is a milli-second pulsar with a white dwarf companion in a wide orbit. The pulsar rotates at a frequency of 218.8 Hz with an intrinsic spin down frequency of $-4 \times 10^{-16} \text{ sec}^{-2}$. The orbital period is ~ 68 days, the orbit is highly inclined to the line-of-sight and is circular to better than one part in 10,000. The system's distance has been measured accurately through a timing parallax, and it is one of the few in which the 3-dimensional binary orbit orientation is completely known. The mass of the pulsar and companion object have been determined via measurement of the relativistic Shapiro delay.

These properties make J1713+0747 an extremely good laboratory for tests of theories of gravity, and a recent paper (W.W. Zhu et al., 2015) summarizes the results of 21 years of study with the Arecibo Observatory and the NRAO Green Bank Telescope, measurements that reduce pulse arrival time residuals to an rms of 92 nanoseconds.

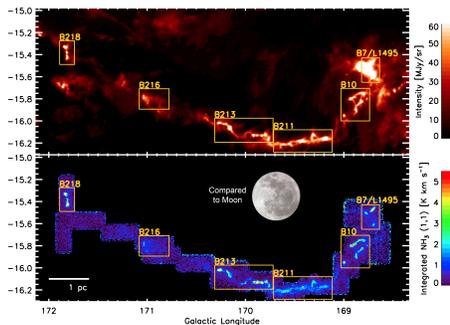
These measurements detect for the first time an apparent change in binary orbital period not intrinsic to the binary, but resulting from the combination of the differential acceleration of the system in the Galactic gravitational potential and the transverse motion of the system relative to the Earth. The intrinsic orbital delay is consistent with zero, as is expected from General Relativity. The measurements constrain any change in the gravitational constant at the 95% confidence level to $[G\text{-dot}/G] = (0.6 \pm 1.1) \times 10^{-12} \text{ yr}^{-1}$.

Thus, G must vary much more slowly than the average expansion rate of the Universe. Though not as stringent a limit as derived from measurements in the Solar System, it is the best limit on $G\text{-dot}/G$ from pulsar binary systems, and applies to a location more than 1 kpc from the Earth.

Reference: *Testing Theories of Gravitation Using 21-Year Timing of Pulsar Binary J1713+0747*, W.W. Zhu (UBC, MPIfR) et al., 2015, arXiv:1504.00662, submitted ApJ.

The Physical Properties of Filaments & Dense Cores

F.J. Lockman



Taurus molecular clouds mapped in NH_3 lines by the GBT. [Upper panel] Dust emission at 500-microns from the Herschel Observatory traces the column density structure of the filaments. [Lower panel] $\text{NH}_3(1,1)$ emission identifies the dense cores in the filaments. The Full Moon is included for scale.

Filamentary structures are important in star formation because most dense cores form within filaments, and stars in turn form within dense cores. Emission from the ammonia (NH_3) lines at 24 GHz can be used to understand physical conditions within filaments as the molecule is easily observed in dense cores. It can provide an accurate measure of gas kinetic temperature and, thus, an accurate determination of non-thermal motions within the region.

The Green Bank Telescope (GBT) K-band focal plane array has been used by Y.M. Seo (Arizona) et al to map NH_3 from the L1495-B218 star-forming filament over an area more three degrees on the sky, the largest NH_3 map published to date. With 31" angular resolution, 0.02 pc at the distance of the cloud, the observations have revealed structures ranging from 0.05 to 9.5 M_\odot . They are very cold with a median kinetic temperature of 9.5 K, and gas temperatures tend to decrease toward the dense core centers. The non-thermal velocity width is considerably narrower than that of CO lines from the same regions, suggesting that the nonthermal motions in the gas traced by NH_3 have been significantly dissipated compared to those found in the more diffuse portions of the filaments.

More than 50 structures were studied in this filament. Some are gravitationally bound and associated with star formation, but others are gravitationally unbound and pressure-confined. These GBT observations suggest that a dense core may form as a pressure-confined structure, evolve to a gravitational bound core, and finally collapse to form a protostar.

Reference: *An ammonia spectral map of the L1495-B218 filaments in the Taurus molecular cloud: I. Physical properties of filaments and dense cores*, Y.M. Seo (Arizona) et al., 2015, ApJ, 805,

ALMA Program News

Al Wootten



Credit: Pablo Carillo (ESO/NAOJ/NRAO)

A view of the construction on the new ALMA Residencia from the OSF holography tower. When complete, this facility will be home to on-duty ALMA staff and will replace the temporary housing at the OSF.

From its most compact configuration in early May, ALMA has now cycled to its most extended Cycle 2 configuration (see [ALMA status page](https://almascience.nrao.edu/observing/alma-status-page) (<https://almascience.nrao.edu/observing/alma-status-page>)). During the recently completed week-long Early Science session, data was obtained on more than 150 Schedule Block elements of projects. The 12m array will remain in the C34-6/7 extended configuration (baselines to 1.5km) throughout July, August and September. Precipitable water vapor has been quite low, with periods much less than a millimeter for most nights, allowing high frequency projects to be observed.

The 12 ALMA Program Review Committee panels met in Osaka, Japan 22-26 June to come to a preliminary ranking of the 1582 proposals received for Cycle 3. The final ranking of the proposals is expected to be announced in early August, and Cycle 3 observing will start 1 October. Around the world, preparations are being made for the Cycle 4 call expected in April 2016.

As announced in a [Science Portal News Item](https://almascience.nrao.edu/news/announcement-of-intent-to-release-a-new-installment-of-science-verification-data-2) (<https://almascience.nrao.edu/news/announcement-of-intent-to-release-a-new-installment-of-science-verification-data-2>), a new installment of ALMA Science Verification data is planned for release on 28 July. This release will include data from Total Power antennas, the Morita Array, and the 12m array along with a guide to the combination of the data in CASA. This release will also include polarization data for 3C238, along with a guide to the calibration and imaging of these data. An ALMA Status Update will soon appear at the Science Portal.

The submission deadline in response to the ALMA North America Call for Development Studies issued in March was 12 June. Fifteen valid proposals were received from 56 proposers representing 20 institutions requesting a total of \$2.528M. The available funding for this Call is \$1M. The proposals are being distributed to referees. The funded studies are expected to begin 1 October 2015.

The first ALMA Development Projects are reaching fruition. The first ALMA Band 5 cartridge, delivered from ESO with North America providing the local oscillator portion, was integrated into a dewar at the Operations Support Facility (OSF) at the ALMA site. It passed its final acceptance in June and further units are being integrated. Integration of Band 5 (164-211 GHz) is expected to be complete in 2017. Further tests of the ALMA phasing hardware – which will provide a phased ALMA as an element in a millimeter very long baseline network – will occur at the end of this month. Testing continues of the fiber optic network that is replacing a microwave link and connecting the Array Operations Site (AOS) and OSF to the JAO and the world.

[North American ALMA Science Center Memo 115](http://library.nrao.edu/public/memos/naasc/NAASC_115.pdf) (http://library.nrao.edu/public/memos/naasc/NAASC_115.pdf) has been posted online: *Doubling the Bandwidth of the 64-Antenna ALMA Correlator*, by R. Escoffier, R. Lacasse, J. Greenberg, A. Saez, A. Baudry, J. Webber. Memo 115 describes a method of doubling the bandwidth of the baseline ALMA correlator. The proposed approach is to use the present correlator infrastructure as much as possible, but replace most of the circuit cards. This approach will minimize hardware costs, software development costs, and ALMA operations disruptions. The entire NAASC Memos series is [available on-line](#)

<http://library.nrao.edu/naasc.shtml>.

CASA 4.4.0 Released

Juergen Ott & the CASA Team



We are pleased to announce release 4.4.0 of the Common Astronomy Software Applications (CASA) package.

CASA is being developed by NRAO, ESO, and NAOJ and is used for the offline reduction and analysis of both ALMA and VLA data. CASA is fully scriptable. Full support is provided for ALMA and VLA but almost any data that can be written in uvfits format can be imported and reduced in CASA (e.g., CARMA, SMA, ATCA).

CASA 4.4.0 is available from the [CASA homepage \(http://casa.nrao.edu\)](http://casa.nrao.edu). Please follow the links to *Obtaining CASA*.

Supported OSs are:

- Linux (64bit): RedHat 5 & 6
- Mac OS: 10.9 & 10.10

Support for Mac OS 10.8 has been discontinued.

Major new features include:

- On-The-Fly calibration (with some limitations) is supported in the *plotms* task using 'cal library'
- *importasdm* lazy mode can process all ASDM data
- *plotms* can colorize by observation id and intent
- *plotms* can plot SIGMA and SIGMA_SPECTRUM
- *initweights* has more options, including initialization by existing SIGMA and WEIGHT for WEIGHT_SPECTRUM
- robust statistics algorithms in *imstat* and *ia.statistics*
- *simalma* can process multiple configurations
- *mstransform* can average across fields
- a linear mosaic (*lm*) tool to mosaic weighted images
- single dish tasks that operate on MSes:
 - *tsdcal* creates and applies calibration tables
 - *tsdbaseline* for baseline subtraction of MS and baseline table creation
 - a new tool, *sdms*, to process single dish MSes.

The CASA 4.4 release notes provide a full list of new features.

We encourage you to subscribe to the following subscription mailman lists:

Casa-announce for announcement of new releases, workshops, etc.: [subscribe here](http://listmgr.nrao.edu/mailman/listinfo/casa-announce) (<http://listmgr.nrao.edu/mailman/listinfo/casa-announce>).

Casa-users for critical bugs and code updates: [subscribe here](http://listmgr.nrao.edu/mailman/listinfo/casa-users) (<http://listmgr.nrao.edu/mailman/listinfo/casa-users>).

If you have any questions, please consult the [NRAO helpdesk](http://help.nrao.edu/) (<http://help.nrao.edu/>) for VLA-VLBA-GBT questions or the [ALMA helpdesk](http://help.almascience.org/) (<http://help.almascience.org/>) for ALMA related questions. CASA also supports an [online discussion forum](https://science.nrao.edu/forums) (<https://science.nrao.edu/forums>).

New Mexico Operations Transitions

Tony Beasley



Mark McKinnon

After several years of remarkable service, Dale Frail will step down in September 2015 from his current role as the NRAO Assistant Director for New Mexico Operations. On behalf of NRAO and the entire radio astronomy community, let me thank Dale for his extraordinary efforts in leading the Observatory's New Mexico Operations team, and we look forward to Dale's return from his scientific sabbatical in 2016.

I am pleased to announce that Mark McKinnon will be taking on an interim role as the Assistant Director For New Mexico Operations, beginning late September 2015. Mark has a long history in Socorro and at the NRAO, most recently as the North American Project Manager for ALMA, and currently as Director of the New Initiatives Office and Project Manager for the Next Generation Very Large Array. Please join me in welcoming Mark to his new role.

Recruitment for a permanent NRAO Assistant Director for New Mexico Operations will begin after the NRAO re-competition outcome is announced by the National Science Foundation and the National Science Board in November 2015.

Recent Media Releases



[ALMA Witnesses Assembly of Galaxies in the Early Universe for the First Time](https://public.nrao.edu/news/pressreleases/alma-galaxy-assembly)
(<https://public.nrao.edu/news/pressreleases/alma-galaxy-assembly>)

22 Jul 2015



[Green Bank Telescope Joins "Breakthrough Listen"](https://public.nrao.edu/news/pressreleases/gbt-breakthrough-listen)
(<https://public.nrao.edu/news/pressreleases/gbt-breakthrough-listen>)

20 Jul 2015



[Image Release: Astronomy Summer School Radar Observations Shine New Light on Near-Earth Asteroid](https://public.nrao.edu/news/pressreleases/radar-2015-hm10) (<https://public.nrao.edu/news/pressreleases/radar-2015-hm10>)

14 Jul 2015



[ALMA Detects First Traces of Carbon 'Smog' Permeating Atmospheres of Early Galaxies](https://public.nrao.edu/news/pressreleases/alma-finds-carbon-smog-in-early-galaxies)
(<https://public.nrao.edu/news/pressreleases/alma-finds-carbon-smog-in-early-galaxies>)

24 Jun 2015

[Magnetic-Field Discovery Gives Clues to Galaxy Formation Processes](#)



<https://public.nrao.edu/news/pressreleases/galaxy-magnetic-field>

18 Jun 2015



[ALMA Weighs Supermassive Black Hole at Center of Distant Spiral Galaxy](https://public.nrao.edu/news/pressreleases/alma-weigh-black-hole)

<https://public.nrao.edu/news/pressreleases/alma-weigh-black-hole>

18 Jun 2015



[VLA Reveals Bashful Black Hole in Neighboring Galaxy](https://public.nrao.edu/news/pressreleases/bashful-black-hole)

<https://public.nrao.edu/news/pressreleases/bashful-black-hole>

17 Jun 2015

Career Opportunities

[Research Engineer in Millimeter and Submillimeter Wavelength Electronics](https://cw.na1.hgnccloud.com/nrao/loadJobPostingDetails.do?jobPostingID=101340&source=jobList)

<https://cw.na1.hgnccloud.com/nrao/loadJobPostingDetails.do?jobPostingID=101340&source=jobList>): The NRAO seeks a Research Engineer in Millimeter and Submillimeter Wavelength Electronics. The successful candidate will be a member of the NRAO Scientific Staff and will join the millimeter/sub-millimeter receiver group in the Central Development Laboratory in Charlottesville, VA. She/he will play a leading role in a program of design and development of low-noise millimeter/submillimeter wavelength instrumentation for astrophysical observations. This has been identified by NRAO as a key technology area for the next generation of radio telescope instrumentation.

[Millimeter Wavelength Electronics Engineer](https://cw.na1.hgnccloud.com/nrao/loadJobPostingDetails.do?jobPostingID=101320&source=jobList) (<https://cw.na1.hgnccloud.com/nrao/loadJobPostingDetails.do?jobPostingID=101320&source=jobList>):

The NRAO seeks an Engineer with expertise in millimeter/submillimeter wavelength electronics. The successful candidate will join the millimeter/sub-millimeter receiver group in the Central Development Laboratory in Charlottesville, VA. She/he will be involved in a program of design and development of low-noise millimeter/sub-millimeter wavelength instrumentation for astrophysical measurements. This has been identified by NRAO as a key technology area for the next generation of radio telescope instrumentation.

[Assistant Scientist](https://cw.na1.hgnccloud.com/nrao/loadJobPostingDetails.do?jobPostingID=101240&source=jobList): (<https://cw.na1.hgnccloud.com/nrao/loadJobPostingDetails.do?jobPostingID=101240&source=jobList>)

The NRAO in Socorro, NM is accepting applicants for an Assistant Scientist. The staff scientist recruited for this position is expected to facilitate and enable cutting-edge science by community members and work to enhance the observing capabilities for the Very Large Array. The ideal candidates will contribute to the overall NRAO mission and must be able to demonstrate success working within a collaborative environment that promotes motivation, leadership, and team building.

[Research Associate](https://cw.na1.hgnccloud.com/nrao/loadJobPostingDetails.do?jobPostingID=101560&source=jobList): (<https://cw.na1.hgnccloud.com/nrao/loadJobPostingDetails.do?jobPostingID=101560&source=jobList>)

The NRAO is now accepting applicants for a Research Associate position. The North American ALMA Science Center at NRAO in Charlottesville, VA is seeking a Post-Doctoral Scholar to join our team as a Research Associate. The successful applicant will work under the supervision of Dr. Mark Lacy on data from infrared surveys with the Spitzer Space Telescope. The successful applicant will work on problems of data analysis and photometry in the SERVS and Deepdrill near-infrared surveys and other surveys covering these fields, including the Dark Energy Survey in the optical, the ground-based VIDEO near-infrared survey, and the HerMES survey with Herschel in the far-infrared.

For additional information on these openings and other NRAO career opportunities, please

visit the [NRAO – Career Opportunities web pages \(https://cw.na1.hgncloud.com/nrao/index.do\)](https://cw.na1.hgncloud.com/nrao/index.do).

From the Archives

Ellen Bouton



About this month's photograph: July 2015 is the 50th anniversary of the 9 July 1965 detection of radio recombination lines by Bertil Hoglund and Peter Mezger. The detection, using the brand new 140-foot telescope, before its formal dedication in October 1965, ushered in a whole new field of radio astronomy research. In this photo, taken 2.5 weeks later on 27 July 1965, Peter Mezger, Troy Henderson, Bertil Hoglund, and Neil Albaugh are in the 140-foot telescope control room, perhaps considering other observations to undertake with NRAO's wonderful new instrument. Or perhaps they are planning their forthcoming hike to Cheat

Mountain Falls (see [From the Archives in the 11 July 2012 eNews \(https://science.nrao.edu/enews/5.8/index.shtml#archives\)](https://science.nrao.edu/enews/5.8/index.shtml#archives)).

From the Archives is an ongoing series illustrating NRAO and U.S. radio astronomy history via images selected from our collections of individuals' and institutional papers. If readers have images they believe would be of interest to the Archives, please contact [Ellen Bouton \(#\)](#).

Contact the Editor ([mailto:mtadams@nrao.edu?subject=NRAO eNews Editor](mailto:mtadams@nrao.edu?subject=NRAO%20eNews%20Editor))



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