NRAO eNews

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(https://science.nrao.edu/science/meetings/2018/aas-231/vla)

Upcoming Events

ALMA Long Baseline Workshop (http://alma-intweb.mtk.nao.ac.jp/~diono/meetings/longBL2017/)
Oct 3 - 5, 2017 | Mielparque Kyoto, Japan

6th VLA Data Reduction Workshop (http://go.nrao.edu/vla-drw)
Oct 23 - 27, 2017 | Socorro, NM

2017 Jansky Lecture (https://science.nrao.edu/science/jansky-lecture/speakers/2017-jansky-lecturer-dr-bernard-fanaroff)
Oct 24, 2017 | Charlottesville, VA

2017 Jansky Lecture (https://science.nrao.edu/science/jansky-lecture/speakers/2017-jansky-lecturer-dr-bernard-fanaroff)
Oct 27, 2017 | Green Bank Observatory, WV

2017 Jansky Lecture (https://science.nrao.edu/science/jansky-lecture/speakers/2017-jansky-lecturer-dr-bernard-fanaroff)
Nov 3, 2017 | Socorro, NM

NRAO Town Hall at the Jan 2018 AAS Meeting (https://science.nrao.edu/science/meetings/2018/aas-231/town-hall)
Jan 11, 2018 | National Harbor, MD

The Very Large Array Today and Tomorrow: First Molecules to Life on Exoplanets (https://science.nrao.edu/science/meetings/2018/aas-231/vla)
Jan 11, 2018 | National Harbor, MD

U.S. Radio-Millimeter-Submillimeter Futures 3: Berkeley

Tony Beasley

The Kavli Foundation and Associated Universities, Inc. (AUI) funded a series of three conferences – Futures I, II & III – that were organized by the NRAO to broadly discuss potential U.S. futures for radio-millimeter-submillimeter (RMS) science in the 2020's and beyond. The final conference in this series, Futures III (http://go.nrao.edu/futures3) was held 2 - 4 August 2017 at the David Brower Center in Berkeley, California with 85 scientists in attendance from U.S. and international universities, observatories, and laboratories

representing virtually every field of astrophysics. Each of the Futures meeting has seen excellent participation from across the astronomy community, including scientists whose research is concentrated in wavelength-domains outside the radio. The focus of each of these conferences – "science" (Futures I) to "options" (Futures 2) to "choices" (Futures 3) – has contributed towards the community's thinking towards Astro2020.

Four major themes emerged from the Futures conferences, each of which demonstrated great promise for the coming decade and beyond: (1) the Cosmic Microwave Background; (2) a next generation Very Large Array (ngVLA); (3) pulsar science; and (4) Spectral-line cosmology / Epoch or Reionization. The community also expressed strong interest in an exciting range of midscale projects, reinforcing the importance of such efforts in a healthy community.

Moving forward to Astro2020, community and NRAO attention will now pivot to a more focused series of meetings, beginning in June 2018, that will be designed to realize the carefully-considered RMS science and facilities choices made by the community via the Kavli Futures series.

The NRAO is grateful to the Kavli Foundation, especially Chris Martin and Miyoung Chun, and to AUI for their vision and generous financial support.

2018 Jansky Fellowship Program

The Jansky Fellowship Program supports outstanding postdoctoral scientists whose research is broadly related to the mission and scientific goals of the National Radio Astronomy Observatory (NRAO), which operates two world-class research facilities: the Atacama Large Millimeter/submillimeter Array and the Very Large Array.

As a Jansky Fellow, you will have a unique opportunity to contribute to and learn from the development and delivery of the largest and most capable radio telescopes in the world. Research that employs NRAO telescopes in multi-wavelength collaborations is encouraged. Candidates with interests in radio astronomy techniques, instrumentation, computation, and theory are encouraged to apply. Applicants should describe how their research or technical interests couple with NRAO telescopes or science.

Appointments may be made at either of the NRAO sites: Socorro, New Mexico, or Charlottesville, Virginia. In compelling cases, a 'split appointment' Jansky Fellowship split between a university and an NRAO site, or a 'non-resident' Jansky Fellowship hosted at a university within the United States may be offered. Non-resident Jansky Fellows are encouraged to develop a research program that fosters close ties with the NRAO, and should present a compelling case why residence at their proposed host university will accomplish this. They are also strongly encouraged to make frequent and/or long term visits to NRAO sites during their Fellowship.

All Jansky Fellows are expected to spend at least 75% of their time on self-directed research. Jansky Fellows are also encouraged to spend 10-25% of their Fellowship on activities related to the development and delivery of radio astronomy techniques, capabilities, or outreach activities, using those opportunities to develop their own broad skill set.

The NRAO Jansky Fellowship Program provides numerous opportunities for early career scientists to acquire a deep knowledge and understanding of the state-of-the-art in radio astronomy and to establish themselves as innovative, independent research scientists. Jansky Fellows are encouraged to develop research collaborations with NRAO scientific staff, scientists at U.S. universities, and their colleagues in the international astronomical

community. An annual, multi-day NRAO Postdoctoral Symposium fosters collaboration between Jansky Fellows and the Observatory's scientific staff.

The starting salary for the 2018 Jansky Fellowship program will be $67,500 per year for an initial two-year appointment with possible renewal for a third year. A research budget of up to $17,000 per year is provided for travel and computing support. Fellows are also eligible for page charge support, vacation accrual, health insurance, and a relocation allowance. Up to $3,000 per year is provided to non-NRAO institutions hosting a Jansky Fellow to defray local institutional expenses.

The deadline for 2018 Jansky Fellowship Program application materials, including letters of reference, is **Wednesday, 1 November 2017 at 11:59 pm EDT**. Award offers will be made starting in early January 2018. Fellowships normally begin in September 2018.

For more information about the Jansky Fellowship Program and instructions on how to apply, please visit the Program website (https://science.nrao.edu/opportunities/postdoctoral-programs/jansky) . Questions or assistance with the application procedure, as well as requests for additional information on the Jansky Fellowship Program may be sent to Jansky2018@nrao.edu (mailto:Jansky2018@nrao.edu) . NRAO is an equal opportunity employer.

Poster Abstract Deadline for AAS – ngVLA Special Session

Eric Murphy & Joan Wrobel

As a reminder, the NRAO will convene a Special Session titled *The Very Large Array Today and Tomorrow: First Molecules to Life on Exoplanets* on 11 January 2018 in National Harbor, Maryland, near Washington, D.C. duringthe 231st Meeting of the American Astronomical Society (AAS).

This Special Session will feature an associated poster session with contributed presentations, scheduled for 11 January 2018. The poster session will be a forum for the community to showcase its cutting-edge discoveries with the Karl G. Jansky Very Large Array (VLA). It will also be a forum for the community to showcase its bold ideas about future scientific opportunities that would be enabled by a next-generation VLA (ngVLA).

Please consider showcasing your VLA discoveries or ngVLA ideas in this associated poster session. When submitting a contributed poster abstract to the AAS, you will have the option of requesting that your presentation be included in this Special Session.

AAS poster abstracts are due 9:00 p.m. EDT, Tuesday, 3 October 2017.

ALMA Program News

Al Wootten

Credit: Sergio Andres Otarola Lanio

Cycle 5

ALMA science observations have continued through August, as recovery from the exceptional May snowstorms continues. Some distant antenna stations remain inaccessible for antenna relocation. For this reason, configurations have been modified. Antennas are located in a version of C43-8 (0.12 arcsec beam at 100 GHz, 110-8500m baselines) into August and will move to longer baselines for later

observations when conditions on Chajnantor allow. Configuration files are included in the recent Common Astronomy Software Applications (CASA) package releases.

The dispositions from the Call for ALMA Proposals for Cycle 5 have been distributed. Of the 1661 proposals submitted, 132 received the highest priority of Grade A, 301 proposals received Grade B, and 262 proposals received Grade C. The Grade A and B proposals requested an estimated 3706 hours of execution time on the 12m Array. Together with the estimated 300 - 400 hours of Cycle 4 Grade A proposals that will be carried forward to Cycle 5, this constitutes the 4000 h of 12m Array time expected to be available for successful executions in Cycle 5. A full report is available on the ALMA science portal (https://almascience.nrao.edu/) .

ALMA Development: A Science Sustainability Program
The Cycle 5 Fiscal Year (FY) 2018 ALMA Development Project program has reached the next stage of the award process. On the basis of reviews by a panel of experts and funding capacity, which was unfortunately limited, several projects were selected to advance for possible Cycle 5 funding in FY2018, pending approval by the ALMA Management Team, ALMA Director, and ALMA Board.

Two North America Projects were selected for advancement.

1. *A Significant Upgrade to the ALMA Correlator*, Principal Investigator (PI) Rich Lacasse (NRAO), co-Investigators Escoffier, Greenberg, Saez, Ojeda, Baudry, Webber. An upgrade to the 64-antenna ALMA correlator is proposed which will: (a) increase the frequency resolution by a factor of eight, providing extended high resolution spectral grasp while providing the increased resolution needed for the lower frequency bands; (b) provide four-bit correlation, improving efficiency and achieving the same sensitivity as currently but in 30% less time; (c) double the processed bandwidth; and (d) provide higher time resolution. Auxiliary upgrades to the archive, receivers, and digital part of the system will also be needed to realize all of these. Together, these improvements make ALMA significantly more efficient at all bands.
2. *Enabling New Science with the ALMA Phasing System (APS) Phase 2*, PI Lynn Matthews (MIT), co-Investigators Crew, Fish, Hecht. The objectives of the APP Phase 2 are to further improve APS operations and enable a significantly greater diversity of scientific capabilities with a phased ALMA. Major components of the proposed Phase 2 work include: (a) improving the management of baseband delays in the correlator to enhance sensitivity and simplify data analysis; (b) enabling spectral line Very Long Baseline Interferometry; (c) extending the frequency range where phasing is offered to encompass Bands 1-7; and other enhancements.

ALMA Ambassadors

The North American ALMA Science Center (NAASC) is accepting applications for the ALMA Ambassadors Postdoctoral Program. The Program provides training and a $10,000 USD research grant (other forms of payment are available, see below) to postdoctoral researchers interested in expanding their ALMA / interferometry expertise and sharing that knowledge with their home institutions through the organization of ALMA Cycle 6 proposal preparation workshops.

The NAASC will sponsor selected postdocs at the National Radio Astronomy Observatory headquarters in Charlottesville, Virginia for three days in February 2018 to receive in-depth training. Training will include topics related to ALMA proposal writing, including: interferometry basics, ALMA science capabilities, recent ALMA headlines, use of the Observing Tool, and guidance with speaking on these topics. The postdocs will then host a local proposal preparation workshop at their home institution – similar to an abbreviated version of

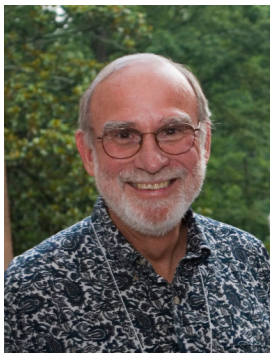
Community Day and *NRAO Live!* events from previous observing cycles – in advance of the Cycle 6 ALMA proposal deadline in April 2018.

All talk materials, supplies, and infrastructure for the workshops are provided by the NAASC. A $10,000 monetary grant is offered in support of the selected postdocs' independent research programs. If the awardee is not able to receive the monetary grant, the NAASC can offer up to $10,000 in science travel reimbursement (must be used within 12 months of training) or up to $10,000 for the host institution to support students or summer researchers. Postdocs with some radio or submillimeter interferometry experience are preferred. Postdocs must be based at a U.S. institution. Although not required, we will consider multiple postdoctoral applicants from the same institution.

Deadline to apply is 1 December 2017. To apply, please send a CV and a completed application (https://science.nrao.edu/facilities/alma/ambassadors-program) to Katelyn Sevin (mailto:ksevin@nrao.edu?subject=ALMA%20Ambassadors%20Program) .

Robert L. Brown Outstanding Doctoral Thesis Award

Ken Kellermann & Sheila Marks



The Robert L. Brown Outstanding Doctoral Dissertation Award is administered by Associated Universities Inc. (AUI) and the National Radio Astronomy Observatory (NRAO) on behalf of Bob Brown's friends and family to honor Bob's life and career. The Award is given each year to a recent recipient of a doctoral degree from any recognized degree granting institution in the United States, whose doctoral thesis is substantially based on new observational data obtained at an AUI facility (NRAO, Green Bank Observatory, Long Baseline Observatory, Atacama Large Millimeter/submillimeter Array) and considered to be of an exceptionally high scientific standard.

Award

The Award is available to degree recipients of any nationality and consists of $1000 USD, a framed certificate, and an invitation to give a colloquium at the NRAO.

Application Guidelines

To be eligible, the applicant must have successfully defended the thesis during the calendar year of the Award. The deadline for receipt of applications and supporting materials for the 2017 Award is 31 December 2017.

Applicants should send an e-mail describing their dissertation, the date of their successful thesis defense, the date of the degree award, and the name and contact information of the primary thesis supervisor to RLBrownAward@nrao.edu (mailto:RLBrownAward@nrao.edu) .

A copy of the thesis as a pdf file should be sent via e-mail to the same address or made available via a link given in the e-mail. Published papers or papers in press, or portions thereof, based substantially on the dissertation should accompany the application or made available via a link given in the e-mail. Verification of the successful thesis defense and statement that the applicant has successfully completed all university requirements for the Ph.D. should be sent to RLBrownAward@nrao.edu (mailto:RLBrownAward@nrao.edu) .

Selection

The winning applicant will be selected by a committee appointed by the NRAO Director. If, in the opinion of

the committee, in any given year none of the theses are sufficiently meritorious, the award will not be given in that year.

Questions should be addressed to RLBrownAward@nrao.edu (mailto:RLBrownAward@nrao.edu) .

Recent Media Releases

Star-formation Fuel Tanks Found Around Distant Galaxies (https://public.nrao.edu/news/2017-alma-turbulent-starburst/)
30 August 2017

VLA Reveals Distant Galaxy's Magnetic Field (https://public.nrao.edu/news/vla-reveals-magnetic-field/)
25 August 2017

Career Opportunities

Scientist (Open Rank) (http://jobs.jobvite.com/nrao/job/o9Pq5fwd) **:** The Green Bank Observatory (GBO) is actively seeking an enthusiastic and energetic scientist to join the GBO staff in Green Bank, West Virginia. The GBO oversees the development and operation of the Robert C. Byrd Green Bank Telescope, the world's largest fully steerable telescope, as well as numerous smaller telescopes, which are used for a variety of scientific and educational purposes.

Post Doc (http://jobs.jobvite.com/nrao/job/ozxG5fwB) **:** The Green Bank Observatory is actively seeking candidates for the Green Bank Post Doc position. The successful applicant will be working with observers and instruments for the 100m Robert C. Byrd Green Bank Telescope (GBT), the world's largest, fully-steerable telescope. Job duties can range from aiding observers on the telescope, providing support for GBT observers, reviewing GBT proposals for technical details, aiding scientists and engineers in improving the overall performance of the GBT, and helping test or commission new and refurbished instruments on the GBT.

Jansky Fellowships (http://jobs.jobvite.com/nrao/job/o95N5fwQ) **:** The Jansky Fellowship Program supports outstanding postdoctoral scientists whose research is broadly related to the mission and scientific goals of the National Radio Astronomy Observatory (NRAO). As a Jansky Fellow, you will have a unique opportunity to contribute to and learn from the development and delivery of the largest and most capable radio telescopes in the world. The NRAO Jansky Fellowship Program provides numerous opportunities for early career scientists to acquire a deep knowledge and understanding of the state-of-the-art in radio astronomy and to establish themselves as innovative, independent research scientists.

From the Archives

Ellen Bouton

About this month's photo:A transit of Venus occurs when Venus passes between the sun and a superior planet, making Venus visible as a small black dot against the solar disk. Transits of Venus are rare, with two transits eight years apart occurring roughly every 243 years. There were two transits in the 21st century: 8 June 2004 and 5/6 June 2012.

In this photo, taken behind the NRAO Technology Center in Charlottesville, in the very early morning on 8 June 2004, are: (Left to right): Hannah Mangum (feet only!), unidentified, Samantha Mangum (yellow sweater) and Holly Mangum (pink sweater) seated on curb, Mark Adams, Mary Mayo, unidentified (in red bandana), David Duani adjusting the sunspotter, Mary Bridle, Charles Blue, Ellen Bouton, and Pat Murphy. The two (apparently chilly) small boys are unidentified. The sunspotter uses mirrors and a lens to project a solar image onto a white viewing screen. The mini radio telescope was assembled by Charles Blue in his father's basement. If you can provide IDs for the unidentified individuals, please contact Ellen Bouton (#).

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)

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