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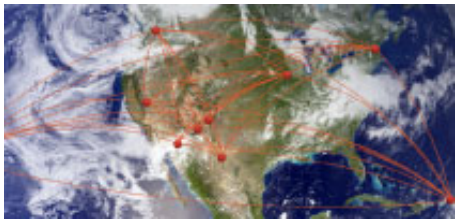

NRAO Call for Proposals: Semester 2013B

The NRAO announces the Call for Proposals for the 1 February deadline for Semester 2013B. The call is open now and will close on 1 February 2013 at 17:00 EST (22:00 UTC).

Proposal preparation and submission are via the NRAO Proposal Submission Tool (PST) available through the **NRAO Interactive Services (https://my.nrao.edu/)** . Important modifications to the PST have been made and will be in place starting 12:00 EST (17:00 UTC) Thursday, 3 January 2013. All proposal authors must be registered users. On the registration form you will be asked for contact information that will be used for notification about proposal disposition, telescope scheduling, student funding, etc. We encourage all proposers to register early.

News for Proposers

Source Lists

The NRAO now requires proposers to specify their source lists in full. This enables the Observatory to identify potential conflicts between observing programs and to better understand scheduling pressure on the instruments it operates. It may be the case that the final target list has not been selected at the time a proposal is submitted. In such cases, all potential targets and fields should be listed. The only exceptions to this requirement are for Triggered proposals to observe targets that are unknown a priori. Proposal source lists are not made public by the Observatory.

A calibration flag has been added to the source information indicating whether the source is for calibration purposes. The default is that the source is not a calibrator (False). Because of this addition the format used to import/export source lists has changed. There is a "Convert" button in the PST to convert from the old format to the new. See the PST documentation for details.

Service Observing

In the previous Call for Proposals, Semester 2013A, the NRAO **announced plans (https://science.nrao.edu/enews/5.7)** to perform service observations of Sgr A* in support of the anticipated encounter of a gas cloud with the super-massive black hole lying at the center of the Milky Way. The details of the service observations were described in the **October 2012 eNews (https://science.nrao.edu/enews/5.10/index.shtml#g2_encounter)** . The observations will take the form of: 1) baseline measurements with the VLA and VLBA in advance of the encounter; 2) multi-band monitoring of Sgr A* for an extended period of time with the VLA. These data are available to the community on a non-proprietary basis. The first photometric and imaging observations are available **here (https://science.nrao.edu/science/service-observing)** . The page will be updated on a regular basis.

In addition to the service observing described above, we encourage proposals from the community on the announced proposal deadlines for scientifically compelling observing programs of this event using **ALMA (https://almascience.nrao.edu/call-for-proposals)** , the **GBT (https://science.nrao.edu/facilities/gbt)** , the **VLA (https://science.nrao.edu/facilities/vla)** , and/or the **VLBA (https://science.nrao.edu/facilities/vlba)** . These proposals will undergo the normal peer review and time allocation process.

General Information

NRAO Semester-Based Proposal Cycle

Proposal submission deadlines are on 1 February and 1 August each year. At each deadline, proposers may request time on the Karl G. Jansky Very Large Array (VLA), the Very Long Baseline Array (VLBA) and/or the Robert C. Byrd Green Bank Telescope (GBT). The 1 February deadline applies to requests for time from 1 August through 31 January, and the 1 August deadline applies to requests for time from 1 February through 31 July. Further details about proposal submission, proposal evaluation, and time allocation are available **here (https://science.nrao.edu/observing/proposal-types)** .

Tips for Proposers

The NRAO proposal evaluation and time allocation process is panel based. That is, members of the scientific community are responsible for reviewing proposals based on their scientific merit through eight **Science Review Panels (https://science.nrao.edu/observing/proposal-types/sciencereviewpanels)** . As a means of broadening the scientific perspective of its reviewers, and of increasing the participation of the wider astronomy and astrophysics community in the science program of NRAO facilities, SRP membership is deliberately selected to include some colleagues that are not necessarily experts in radio observational techniques. This being the case, we encourage proposers to consider the following when preparing their proposals:

1. Avoid the use of radio astronomy jargon
2. Do not assume the reader is familiar with a particular observing technique - explain it briefly
3. Do not assume the reader is familiar with an earlier rationale for a developing line of research - provide adequate historical context and connect the dots as necessary
4. Describe previous observations and publications relevant to the proposed observations
5. If a particular point source or brightness temperature sensitivity is required, justify it

Filler Time

The Observatory would like to point out that there are opportunities for so-called "filler" programs on all of its telescopes. Observing programs that exploit frequencies below 10 GHz, do not have strong scheduling constraints, and could benefit from short scheduling blocks are encouraged to propose for such opportunities. The proposal should make clear in the abstract and early in the science justification that "filler" time (scheduling priority C) is being requested, not time at scheduling priority A or B.

Triggered Proposals

Those who are planning to submit a proposal of type *Triggered* are reminded that they must include well-defined trigger criteria and state applicable semesters in their request for telescope time. Furthermore, a Triggered proposal must ask for the full amount of time needed to achieve the science goals, including both initial **and** follow-up observations. Proposers should not be using Director's Discretionary Time to request follow-up of an event initially observed under a Triggered proposal**.**

High Risk Proposals

As a means of maximizing its scientific impact through cutting edge observations, the Observatory also encourages the submission of high-risk/high-reward proposals. Such proposals may involve unusual targets, nonstandard observing techniques, new post-observing data reduction and analysis, or supplementary hardware or new back ends. Please contact **Observatory Science Operations (mailto:tbastian@nrao.edu)** prior to submitting such proposals to discuss anticipated resource requirements. Observers contemplating such proposals may also wish to consider submitting an **Exploratory Time (https://science.nrao.edu/observing/proposal-types/exploratoryproposals)** proposal to request **Director's Discretionary Time (https://science.nrao.edu/observing/proposal-types/directorsdiscretionarytime)** as a means of demonstrating a proof of concept.

Opportunities for Joint Observations with Fermi or Chandra

We remind the community that it is possible to propose for observing time on NRAO facilities through the Fermi Gamma-ray Space Telescope *Joint Proposal Opportunity* or the *Cooperative Proposal Opportunity*. For Fermi, which is primarily in sky-survey mode, potential observers may propose for NRAO observations that make use of the Fermi survey data even without re-pointing of the Fermi satellite. The actual amount of NRAO observing time allocated via the Joint Fermi Process depends on the amount of proposal pressure and the scientific quality of the proposals. A maximum of 10% of the NRAO scientific observing time is made available on the VLA, the VLBA and the GBT, or up to 400-650 hours per year on each telescope. Details about joint observations with Fermi and the VLA, the VLBA or the GBT may be found **here (http://fermi.gsfc.nasa.gov/ssc/proposals/nrao.html)** . The proposal deadline for the **Fermi Cycle 6 Guest Investigator (http://fermi.gsfc.nasa.gov/ssc/proposals)** Program is 18 January 2013 at 4:30 p.m. EST.

Similarly, the community may propose for observing time on NRAO facilities through a joint program with the Chandra X-ray Observatory. For Chandra, proposals must be for observations that require both Chandra pointing and NRAO observations to carry out a scientific investigation. The NRAO has allocated up to 3% of the observing time on the VLA, the VLBA and the GBT for Chandra joint proposals. Section 4.5.5 of the Chandra call for proposals gives specifics of the joint NRAO/Chandra program. The proposal deadline for the **Chandra Cycle 15 Call for Proposals (http://cxc.harvard.edu/proposer/CfP)** is 14 March 2013 at 6 p.m. EDT.

PhD Dissertations using NRAO Facilities

Students planning to use one or more NRAO telescopes for their PhD dissertation must submit a "Plan of Dissertation Research" of no more than 1000 words with their first proposal. This plan can be referred to in later proposals. At a minimum the plan should contain a thesis timeline, an estimate of the level of NRAO telescope resources needed and, clear statements about the importance of each proposal to the thesis as a whole. The plan provides some assurance against a dissertation being impaired by an adverse review of a proposal when the full scope of the thesis is not seen. The plan can be submitted via **NRAO Interactive Services (https://my.nrao.edu/)** . Students are reminded to submit their plan comfortably in advance of the proposal deadline. New thesis plans must be in pdf format so science reviewers can easily access the plans. Students who have not yet graduated but have active plans on file should update those plans to a pdf format if they are not already in that form.

Student Observing Support (SOS) Program

NRAO maintains a program to support research by students, both graduate and undergraduate, at U.S. universities and colleges. This program is intended to strengthen the proactive role of the Observatory in training new generations of telescope users. Regular or Triggered proposals submitted for the VLA, the

VLBA and the GBT are eligible. Large proposals for the VLA, the VLBA, the GBT, and any combination of these telescopes are also eligible.

Starting with Semester 2013B, new applications to the SOS program will be solicited from successful proposal principal investigators following the release of Semester 2013B proposal dispositions. An online application system will be used to collect SOS proposals from successful PIs. SOS proposals will no longer be submitted with new observing proposals. See the **NRAO SOS proposal information page (https://science.nrao.edu/opportunities/student-programs/sos)** for further information. Contact **Jeff Mangum (mailto:jmangum@nrao.edu)** with questions.

Key Science Projects

The NRAO highlights a range of highly ranked projects each semester by designating them **Key Science Projects (https://science.nrao.edu/science/key-science-projects)**. The designation of an approved observing program as a **Key Science Project (https://science.nrao.edu/science/key-science-projects)** is based on its scientific ranking from the proposal review process, nomination by the NRAO Time Allocation Committee, and approval by the Directors Review.

Very Large Array Proposals

Observing Capabilities for Semester 2013B

The 1 February 2013 deadline covers the observing period 23 August 2013 through 06 January 2014 (Semester 2013B), corresponding to the CnB, B, and BnA configurations. Although the focus of this proposal period will be the CnB, B, and BnA configurations, proposals for any configuration, including multi-configuration proposals, may be submitted. See the **VLA Configuration Plans (https://science.nrao.edu/facilities/evla/proposing/configpropdeadlines)** for further information, including plots of the estimated available observing hours as a function of LST for all configurations in the upcoming configuration cycle (PDF format).

This call offers similar general capabilities to those offered in 2013A. Both the 8-bit sampler system (up to 2 GHz bandwidth) and the 3-bit samplers (up to 8 GHz bandwidth) will be available. Details of the general capabilities are given in the **VLA Observational Status Summary (https://science.nrao.edu/facilities/vla/docs/manuals/oss2013b)** (OSS), and are summarized below:

Capability	Description
8-bit samplers	• Standard default set-ups for 2 GHz bandwidth (1 GHz BW at L-band) continuum observations (16 x 128 MHz sub-bands) • Up to 32 independent & flexibly tunable sub-bands for spectral line observing (16 per baseband) • Single, dual & full polarization • Spectral channels as narrow as 1.9 Hz (single polarization), up to 16,384 channels
3-bit samplers	• Standard default set-ups for 8 GHz bandwidth continuum observations at K/Ka/Q bands • Four tunable 2 GHz basebands, each split into 16 contiguous 128 MHz sub-bands • Spectral resolution suitable for extragalactic lines and line searches • Single, dual & full polarization

	• Spectral channels widths of 2 MHz (full pol), 1 MHz (dual pol), 0.5 MHz (single pol)
Sub-arrays	• Up to 3 independent sub-arrays using standard 8-bit continuum set-ups (2 GHz BW)
Phased array for VLBI	• See VLBA section of this Call for Proposals

Both single pointing and mosaics with discrete, multiple, field centers will be supported. Data rates of up to 20 MB/s (72 GB/hour) will be available to all users, combined with correlator integration time limits per band and per configuration, as described in the OSS. There are also some limitations on frequency settings and tuning ranges, please consult the OSS for further details. In addition, special tools are available to assist users with the development of correlator set-ups for the proposal deadline (see **VLA Proposal Preparation and Submission (https://science.nrao.edu/facilities/vla/proposing/vlapst2013b)**), and the **Exposure Calculator (https://science.nrao.edu/facilities/evla/calibration-and-tools/exposure)** has been updated. All antennas employ EVLA-style electronics and receiver systems, providing continuous frequency coverage from 1-50 GHz in the following observing bands: 1-2 GHz (L-band); 2-4 GHz (S-band); 4-8 GHz (C); 8-12 GHz (X); 12-18 GHz (Ku); 18-26.5 GHz (K); 26.5-40 GHz (Ka); and 40-50 GHz (Q).

We will continue to offer shared risk programs to our user community for those who would like to push the capabilities of the VLA beyond those offered for general use:

- **Shared Risk Observing:** This program allows users access to capabilities that can be set up via the OPT and run through the dynamic scheduler (without intervention), but are not well tested. Shared Risk observers will automatically receive one hour of test time to verify their correlator set-up and observing procedure. Further details of this program may be found at the **Shared Risk Observing 2013B (https://science.nrao.edu/facilities/vla/proposing/sro2013b)** web page. The following capabilities are offered under the Shared Risk Observing program: correlator dump times as short as 50 ms with data rates as high as 60 MB/s; use of the 3-bit sampler system with the C/X/Ku-band receivers; use of the new low frequency system in the frequency range 230 to 470 MHz (P-band). Please refer to the **VLA Proposal Preparation and Submission (https://science.nrao.edu/facilities/vla/proposing/vlapst2013b)** web page for information about tools and other advice on proposing for Shared Risk observing capabilities.
- **Resident Shared Risk Observing:** This is an extension of the RSRO program offered during Early Science, which provides access to extended capabilities of the VLA that require additional testing, in exchange for a period of residence to help commission those capabilities. Capabilities that would fall under the RSRO program include, e.g., correlator dump times shorter than 50 ms; data rates up to 140 MB/s; use of recirculation in the correlator; more than 3 sub-arrays; on-the-fly (OTF) interferometric mosaicing; complex phased array observations (e.g., pulsar and complex VLBI observing modes). A detailed description of the VLA RSRO program for semester 2013B and beyond is available at the **Shared Risk Observing 2013B (https://science.nrao.edu/facilities/vla/proposing/sro2013b)** web page.

Up to 10% of observing hours will be made available to shared risk observations during semester 2013B.

New Low Frequency System for 2013B

A new low frequency system for the VLA has been developed in collaboration with the Naval Research Laboratory, and at least 20 antennas will be outfitted by the start of the B configuration. Use of the low

frequency system for Stokes I continuum observations at P-band (230 to 470 MHz) will be through the Shared Risk Observing program for semester 2013B. The new receivers also work at 4-band (58 to 84 MHz), but this part of the system is not yet commissioned. However, members of the community interested in helping to commission the 4-band system in return for access to **Exploratory Time (https://science.nrao.edu/observing/proposal-types/exploratoryproposals)** should apply to the Resident Shared Risk program through the alternative ("RSRO participation without a science proposal") route described at the **Shared Risk Observing 2013B (https://science.nrao.edu/facilities/vla/proposing/sro2013b)** web page.

Proposal and Observation Preparation

Proposal preparation and submission are via the Proposal Submission Tool (PST) at **NRAO Interactive Services (https://my.nrao.edu/)** . Use of the PST requires registration in the NRAO User Database. There are various tools and documentation to help users in this process. Descriptions of all updated documentation and tools along with an outline of the steps required to write a proposal are available at the **VLA Proposal Preparation and Submission (https://science.nrao.edu/facilities/vla/proposing/vlapst2013b)** web page.

All approved VLA observations are set up using the **Observation Preparation Tool (OPT) (https://science.nrao.edu/facilities/vla/docs/manuals/opt)** . Most, if not all, projects will be observed dynamically so users should submit scheduling blocks early in the configuration to maximize the opportunity of them being observed. Advice on the optimal length of scheduling blocks and other useful information may be found at the **Observing FAQ web page (https://science.nrao.edu/facilities/vla/docs/obsfaq/)** .

Information about VLA capabilities, observing strategies, calibration overhead, and proposal submission can be found in the **VLA Observational Status Summary (https://science.nrao.edu/facilities/vla/docs/manuals/oss2013b)** and at the **Proposing FAQ web page (https://science.nrao.edu/facilities/evla/proposing/frequently-asked-questions)** . Questions may also be directed to the **NRAO Helpdesk (https://science.nrao.edu/observing/helpdesk)** .

Green Bank Telescope Proposals

The **1 February 2013 deadline** is for the Semester 2013B observing period: **1 August 2013 through 31 January 2014**. Proposals will be considered for the following receivers: 290-920 MHz (PF1), 910-1230 MHz (PF2), 1.15-1.73 GHz (L), 1.73-2.60 GHz (S), 3.8-6.1 GHz (C), shared-risk 6-8 GHz (C), 8.0-12.0 GHz (X), 12.0-15.4 GHz (Ku), shared-risk 11.0-18.0 GHz (Ku-wideband), 18.0-26.0 (KFPA), 26.0-39.5 GHz (Ka), 38.2-49.8 GHz (Q) receivers, shared-risk MUSTANG1.5 (80-100 GHz Bolometer Array) and 67-93.3 GHz (W).

Available observing modes include spectral line (including cross-polarization), continuum, pulsar, and VLBI/VLBA. The VLBA back end with Mark5A disk recorder may be used as a high-time resolution (> 2 ns) backend for single-dish observing.

Details of all GBT observing modes are in the **GBT Proposer's Guide (https://science.nrao.edu/facilities/gbt/proposing/GBTpg.pdf)** . Proposers should also consult the more general document "**The Performance of the GBT: A Guide for Planning Observations (http://www.gb.nrao.edu/%7Ermaddale/GBT/ReceiverPerformance/PlaningObservations.htm)** ."

Mustang1.5: The Mustang bolometer array will undergo an upgrade. The receiver cryogenics will be redesigned such that the receiver can be kept cool at all elevations and will allow observations below 30 degrees elevation.We will accept shared-risk proposals to help commission the upgraded Mustang bolometer array in the 13B semester.

450 and 600 MHz feeds: Digital TV transmissions above 470 MHz will make observing very difficult with these two feeds of the PF1 receiver. Available RFI plots do not show the strength of these signals as they overpower the system - they are too low by a factor of 50 to 100 at minimum. Observers should consult the GBT support scientists before submitting a proposal for these feeds.

VLBI Observing: Beginning with the 13B semester the GBT will no longer provide setup and overhead time prior to the beginning of the VLBI observations. All VLBI proposals requesting the GBT should include any needed setup and overhead time in the time request of their proposals.

Pulsar Observing: The **GBT Sensitivity Calculator (https://dss.gb.nrao.edu/calculator-ui/war/Calculator_ui.html)** has been updated to include pulsar observing modes. All pulsar observers should use the GBT Sensitivity Calculator results in their Technical Justification.

Ku-wideband Receiver: The new single beam Ku-band receiver covering 11.0 - 18.0 GHz will be available for shared risk observations. The receiver was developed for widebandwidth pulsar and continuum observations and does not have good baseline performance for spectral line observations. The receiver does not have a noise diode so special attention should be given to calibration of any obsevation. We will consider shared-risk proposals for this receiver at the 1 February 2013 proposal deadline. When proposing, please use the nominal system temperature for the dual-beam Ku receiver.

C-band Receiver: The C-band receiver will be upgraded to include the 6-8 GHz frequency range. We will consider shared-risk proposals for the 1 February 2013 deadline for observations in the 6-8 GHz range.

VErsatile GBT Astronomical Spectrometer (VEGAS): A new FPGA spectrometer is under development for the GBT. Shared-risk proposals to use VEGAS will be considered for the 13B semester. Please see the **GBT Proposer's Guide (https://science.nrao.edu/facilities/gbt/proposing/GBTpg.pdf)** for more information on VEGAS.

New Sensitivity Calculator: All proposers, **including pulsar proposers**,should use the **GBT Sensitivity Calculator (https://dss.gb.nrao.edu/calculator-ui/war/Calculator_ui.html)** . Please see the GBT Sensitivity Calculator **User's Guide (https://dss.gb.nrao.edu/docs/Calculator_ug.pdf)** for further instructions. The new Sensitivity Calculator results can be cut and pasted into the Technical Justification section of the proposal. This will streamline the creation of your Technical Justification and will increase your chances of getting a positive technical review.

Proposers requesting GBT participation in High Sensitivity Array (HSA), Very Long Baseline Array (VLBA), or global Very Long Baseline Interferometry (VLBI) observations should consult the "**VLBA, HSA, and VLBI (/enews/4.7/index.shtml#3)** " section below.

The GBT is scheduled by the **Dynamic Scheduling System (DSS) (http://www.gb.nrao.edu/DSS)** . The DSS system is fully described in the **GBT Proposer's Guide (https://science.nrao.edu/facilities/gbt/proposing/GBTpg.pdf)** and the **GBT Observer's Guide (https://science.nrao.edu/facilities/gbt/observing/GBTog.pdf)** . The **GBT observing policies (https://science.nrao.edu/facilities/gbt/observing/policies)** describe the remote observing restrictions.

Technical questions, questions about the proposal process or about the PST should be sent to the **NRAO helpdesk (http://help.nrao.edu/)** .

Very Long Baseline Array, High Sensitivity Array, & Very Long Baseline Interferometry Proposals

The 1 February 2013 deadline applies to all types of Very Long Baseline Array (**VLBA (https://science.nrao.edu/facilities/vlba)**) and High Sensitivity Array (**HSA (https://science.nrao.edu/facilities/vlba/proposing/HSA)**) proposals requesting time in semester 2013B (2013 August 1 through 2014 January 31), or multi-semester proposals. It also applies to global mm VLBI proposals for the Autumn 2013, or later, sessions. Please see the **instructions (http://www.nrao.edu/admin/do/vlba-gvlbi.shtml)** for submitting VLBA, HSA, and global VLBI proposals.

VLBA Observing Capabilities for Semester 2013B

Details of the following capabilities may be found in the **VLBA Observational Status Summary (OSS) (https://science.nrao.edu/facilities/vlba/docs/manuals/oss2013b)**. In what follows, a "channel" refers to a single contiguous frequency range (of any bandwidth), observed in a single polarization, that is sampled, filtered, and recorded as a separate entity.

- **Sensitivity Upgrade instrumentation:** Data systems developed by the VLBA Sensitivity Upgrade project, and partially operational for scientific observations since February 2012, will support the full range of VLBA observations in semester 2013B. Two separate observing systems will be available within the new "RDBE" digital backend units, and can be requested in the NRAO Proposal Submission Tool's "Resources" section via the drop-down menu at the top of the "Observing Parameters" column.
    - The Polyphase Filterbank (PFB) observing system provides sixteen 32-MHz channels, with a fixed 2048-Mbps recording rate, the maximum rate supported by the Mark 5C recorder. The channels can be selected flexibly between two VLBA IFs; typically these are different polarizations, but less common modes, described in the **VLBA OSS (https://science.nrao.edu/facilities/vlba/docs/manuals/oss2013b/sig-path/signal-path)**, are also possible. Channel placement is restricted to 32-MHz steps along the frequency axis. This system has been used regularly in wideband scientific observations for nearly a year.
    - The Digital Downconverter (DDC) observing system is considerably more flexible than the PFB. As described in further detail in the **VLBA OSS (https://science.nrao.edu/facilities/vlba/docs/manuals/oss2013b/sig-path/rdbe)**, a total of 1, 2, 4, or 8 channels can be selected arbitrarily from up to four input IFs. Channels can be placed at arbitrary 250-kHz steps on the frequency axis. Available channel bandwidths range from 1 MHz to 128 MHz by factors of 2, but must all be identical within an observing scan. Use of the 128 MHz bandwidth is restricted to 4 (or fewer) channels to keep within the 2048 Mbps rate limitation of the Mark 5C recording system. Extremely narrow bands can be accommodated by observing at 1 MHz bandwidth, and selecting a narrower range using the DiFX correlator's spectral zoom mode.

  Wideband science will be possible using either the PFB observing system, at its fixed 2048 Mbps data rate, or the DDC system at 2048 Mbps or lower rates. We expect that our pool of recording media will support the highest data rates for approximately half of all observing hours. Spectroscopic and other narrow-band observations will generally be best supported by the DDC system, which incorporates scientifically compatible counterparts for all modes of the VLBA legacy system, as detailed under "Suggestions for Observing System Selection" in the relevant section of the **VLBA OSS (https://science.nrao.edu/facilities/vlba/docs/manuals/oss2013b/sig-path/rdbe)**. The legacy VLBA data system is expected to be decommissioned during 2013, and is no longer available for new proposals, including Director's Discretionary Time proposals.

- **4-IF option for new C-band receivers:** The VLBA's new 4-8 GHz C-band receivers have been operational for scientific observations since August 2012. For observations in semester 2013B, this receiver will support two dual-polarization IF pairs, which can be placed arbitrarily along the entire 4-

8 GHz range. This capability, similar to the existing 13/4-cm mode, is described in further detail in the **VLBA OSS (https://science.nrao.edu/facilities/vlba/docs/manuals/oss2013b/sig-path/signal-path)** .

High Sensitivity Array (HSA)

The phased VLA ("Y27") will be available for semester 2013B. The VLA will primarily be in the CnB, B, and BnA configurations at this time (see the **VLA Configuration Plans (https://science.nrao.edu/facilities/vla/proposing/configpropdeadlines)**). HSA proposals can request the phased VLA in conjunction with the VLBA and other HSA telescopes, and must be correlated at the DiFX correlator in Socorro. Phased-VLA observing will be limited to two VLA subband pairs, in any combination of polarizations, but with each pair in different IFs (AC and BD). Any matching bandwidths available on the VLA as well as the VLBA DDC data system described above can be used. Bandwidths must be uniform at each station, across the entire VLBI array, and throughout the entire duration of the observation. In particular, VLA phasing and VLBI observing must be carried out at the same bandwidth. Bandwidths narrower than 16 MHz are not expected to be useful in most cases, and have not been tested at this time. Such observations are therefore available only on a shared-risk basis. Further details are available in the VLA section of this Call for Proposals, in the document **VLBI at the VLA (https://science.nrao.edu/facilities/vla/docs/manuals/obsguide/modes/vlbi)** , and in the **VLBA OSS (https://science.nrao.edu/facilities/vlba/docs/manuals/oss2013b/prop-prep/phsd-vla)** .

Observing with a single VLA antenna ("Y1") in conjunction with the VLBA will only be available through the **VLBA Resident Shared Risk Observing (https://science.nrao.edu/facilities/vlba/proposing/rsro)** program.

Proposals to use the GBT as part of the HSA will be considered for semester 2013B. The GBT will be equipped with the full VLBA Sensitivity Upgrade instrumentation, and will be able to support all the observing configurations described in the VLBA Observing Capabilities section above. A table of **Available Receivers and Bands (http://www.gb.nrao.edu/%7Efghigo/gbtdoc/vlbinfo.html)** compares the frequency ranges of GBT receivers with their VLBA counterparts, and includes sensitivity data and special capabilities. Note that all proposals to use the GBT as part VLBI must include time to set up the telescope (pointing, focus, etc.) prior to the start of the observation. This can take 0.5-1 hr depending on the frequency (see Chapter 6 of the **GBT Proposer's Guide (https://science.nrao.edu/facilities/gbt/proposing/GBTpg.pdf)**).

The Effelsberg and Arecibo HSA stations have also installed the same wideband equipment, but their implementation is not yet complete. Pending results from planned tests, we expect Effelsberg to be available as part of the HSA in semester 2013B. Both Effelsberg and Arecibo can be requested in HSA proposals, but we cannot guarantee their participation at this time.

Scheduling Considerations for Semester 2013B

Dynamic scheduling from a finite queue of observing blocks, combined with occasional poor weather and/or antenna downtime, can sometimes make it difficult to completely fill the schedule with fixed LST observing blocks. Proposals for projects that can tolerate less than the full array or that can observe in poor weather, or especially projects that can be scheduled flexibly in segments of one to a few hours with arbitrary start times and lengths, are strongly encouraged. Flexibly scheduled blocks should be based on a script, provided by the PI, that can be run by VLBA Operations shortly before observe time, without the need to consult the observers.

VLBA Resident Shared Risk Observing Program

The VLBA Resident Shared Risk Observing (RSRO) program provides users with early access to new capabilities in exchange for a period of residency in Socorro to help commission those capabilities. The

phased-VLA system announced above was developed through RSRO programs, and NRAO encourages additional RSRO proposals to expand the phased-VLA capabilities. A number of additional areas are suggested at the **VLBA RSRO program (https://science.nrao.edu/facilities/vlba/proposing/rsro)** webpage, although we encourage other innovative ideas for new VLBA observing modes from the community as well. Please contact the **NRAO Helpdesk (https://science.nrao.edu/observing/helpdesk)** with questions about the VLBA RSRO program or VLBA capabilities.

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