



NRAO Call for Proposals: Semester 2013A

The NRAO announces the Call for Proposals for the 1 August deadline for Semester 2013A. The call is open now and will close on 1 August 2012 at 17:00 EDT (21:00 UTC).

Proposal preparation and submission are via the NRAO Proposal Submission Tool (PST) available through the [NRAO Interactive Services \(http://my.nrao.edu/\)](http://my.nrao.edu/). Important modifications to the PST have been made and will be in place starting 12:00 EDT (16:00 UTC) Monday, 9 July 2012. 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.

NRAO Response to the Anticipated G2 Encounter with Sagittarius A*

The anticipated encounter of a gas cloud with the super-massive black hole lying at the center of the Milky Way (Gillessen et al. 2012, Nature 481, 51) presents an extraordinary opportunity to probe the disruption of the gas cloud and accretion flow into the black hole during the coming months and years. The cloud is expected to reach a pericentric distance of just 3100 times the event horizon in 2013. The NRAO formed a committee, chaired by Dr. Geoffrey Bower (UC Berkeley), to make recommendations regarding the optimal response of the NRAO to this opportunity. [A copy of the committee's report is available here \(G2reportV3.pdf\)](#).

The NRAO plans to perform service observations of Sgr A* in support of this event. The observations will take the form of: 1) baseline measurements in advance of the encounter with the VLA and VLBA; 2) multi-band monitoring of Sgr A* for an extended period of time with the VLA. These data will be made available to the community in a non-proprietary fashion. The details of the service observing program are under development. We encourage community input to this process. Please contact Tim Bastian (tbastian@nrao.edu (<mailto:tbastian@nrao.edu>)) or Dale Frail (dfrail@nrao.edu (<mailto:dfrail@nrao.edu>)) to convey your comments and suggestions. The NRAO will provide the community with further details as plans are developed.

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

General News for Proposers

Full Implementation of the Semester-Based Proposal Cycle

NRAO has fully migrated from the old trimester-based proposal cycle to the new semester-based proposal cycle, with each semester lasting six months. 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 at the [Proposal Evaluation and Time Allocation \(https://science.nrao.edu/observing/proposal-types\)](https://science.nrao.edu/observing/proposal-types) web page.

Tips for Proposers

The new NRAO proposal evaluation and time allocation process, now occurring on a semester basis, 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 \(https://science.nrao.edu/observing/proposal-types/sciencereviewpanels\)](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, panel 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

Dramatic Increase in VLA Capabilities

With the formal end of EVLA construction, the VLA's capabilities are dramatically increased over previous proposal calls. Proposers are advised to read the VLA portion of this Call and to prepare the resource section of their proposals early. We also encourage proposers to submit Large proposals to the VLA. Such proposals should adhere to the NRAO [Large proposal policy \(https://science.nrao.edu/observing/proposal-types/proposaltypes/largeproppolicy\)](https://science.nrao.edu/observing/proposal-types/proposaltypes/largeproppolicy). Additionally, we encourage proposers to consider Large VLA proposals that result in the timely publication of high-impact science results.

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 Proposal (https://science.nrao.edu/observing/proposal-types/exploratoryproposals)** 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 at the **Fermi website (http://fermi.gsfc.nasa.gov/ssc/proposals/nrao.html)**. The next Fermi proposal deadline is in January 2013.

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 next Chandra proposal deadline is in March 2013.

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 (http://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 consider updating those plans to a pdf format if they are not already in that form.

Student Observing Support 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. New applications to the program may be submitted along with new observing proposals at any proposal deadline. A [general overview](https://science.nrao.edu/opportunities/student-programs/studentsupportintro) (<https://science.nrao.edu/opportunities/student-programs/studentsupportintro>) of the program is available, along with [additional details](https://science.nrao.edu/opportunities/student-programs/sos) (<https://science.nrao.edu/opportunities/student-programs/sos>).

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) (<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) (<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.

VLA Proposals

Observing Capabilities for Semester 2013A

The 1 August 2012 deadline covers the observing period 25 January 2013 through 19 August 2013 (Semester 2013A), corresponding to the D, DnC, and C configurations. This will be the first semester of full VLA operations following the completion of EVLA construction. Although the focus of this proposal period will be the D, DnC, C 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) (<https://science.nrao.edu/facilities/evla/proposing/configpropdeadlines>) for further information, including an estimate of available observing hours as a function of LST for all configurations in the upcoming configuration cycle.

This call offers substantially increased general capabilities as compared to the last two configuration cycles of Early Science. 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/evla/docs/manuals/oss-2013a) (<https://science.nrao.edu/facilities/evla/docs/manuals/oss-2013a>) (OSS), and are summarized below:

Capability	Description
8-bit samplers	<ul style="list-style-type: none"> 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

- 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
- 64 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 \(https://science.nrao.edu/facilities/evla/proposing/vlapst\)](https://science.nrao.edu/facilities/evla/proposing/vlapst)), and the [Exposure Calculator \(https://science.nrao.edu/facilities/evla/calibration-and-tools/exposure\)](https://science.nrao.edu/facilities/evla/calibration-and-tools/exposure) has been updated to incorporate the new bandwidths and performance of the 3-bit samplers. 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 will allow 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 2013A \(https://science.nrao.edu/facilities/evla/early-science/shared-risk-observing-2013a\)](https://science.nrao.edu/facilities/evla/early-science/shared-risk-observing-2013a) web page. Capabilities that would fall under the Shared Risk Observing program include, e.g., dump times as short as 50 ms with data rates as high as 60 MB/s; limited and relatively simple correlator

recirculation to provide higher spectral resolution; use of the 3-bit sampler system with flexible sub-band bandwidths; use of sub-arrays with the 3-bit sampler system. Please refer to the [VLA Proposal Preparation and Submission \(https://science.nrao.edu/facilities/evla/proposing/vlapst\)](https://science.nrao.edu/facilities/evla/proposing/vlapst) 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; complex recirculation set-ups; 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 2013A and beyond is available at the [Shared Risk Observing 2013A \(https://science.nrao.edu/facilities/evla/early-science/shared-risk-observing-2013a\)](https://science.nrao.edu/facilities/evla/early-science/shared-risk-observing-2013a) web page.

Up to 25% of observing hours will be made available to shared risk observations during semester 2013A.

We continue work on a new low frequency system in collaboration with the Naval Research Laboratory, but we have not yet completed a full evaluation of its performance, and no proposals to use frequencies lower than 1 GHz will be considered for this call. However, members of the community interested in helping to commission the new system in return for access to [Exploratory Director's Discretionary Time \(https://science.nrao.edu/observing/proposal-types/exploratoryproposals\)](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 2013A \(https://science.nrao.edu/facilities/evla/early-science/shared-risk-observing-2013a\)](https://science.nrao.edu/facilities/evla/early-science/shared-risk-observing-2013a) web page.

Proposal preparation and submission are via the Proposal Submission Tool (PST) at [NRAO Interactive Services \(https://my.nrao.edu/\)](https://my.nrao.edu/). Use of the PST requires registration in the NRAO User Database. For this proposal deadline 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 \(https://science.nrao.edu/facilities/evla/proposing/vlapst\)](https://science.nrao.edu/facilities/evla/proposing/vlapst) web page.

All approved VLA observations are set up using the [Observation Preparation Tool \(OPT\) \(http://science.nrao.edu/evla/observing/opt.shtml\)](http://science.nrao.edu/evla/observing/opt.shtml). 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 may be found at the [Observing FAQ web page \(https://science.nrao.edu/facilities/evla/observing/FAQ/\)](https://science.nrao.edu/facilities/evla/observing/FAQ/).

Information about VLA capabilities, observing strategies, calibration overhead, and proposal submission can be found in the [VLA Observational Status Summary \(https://science.nrao.edu/facilities/evla/docs/manuals/oss-2013a\)](https://science.nrao.edu/facilities/evla/docs/manuals/oss-2013a) and at the [Proposing FAQ web page \(https://science.nrao.edu/facilities/evla/proposing/frequently-asked-questions\)](https://science.nrao.edu/facilities/evla/proposing/frequently-asked-questions). Questions may also be directed to the [NRAO Helpdesk \(https://science.nrao.edu/observing/helpdesk\)](https://science.nrao.edu/observing/helpdesk).

GBT Proposals

The **1 August 2012 deadline** is for the Semester 2013A observing period: **1 February 2013 through 31 July 2013**. 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, MUSTANG (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)** (<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/~rmaddale/GBT/ReceiverPerformance/PlaningObservations.htm)**" (<http://www.gb.nrao.edu/~rmaddale/GBT/ReceiverPerformance/PlaningObservations.htm>).

Pulsar Observing: The **[GBT Sensitivity Calculator](https://dss.gb.nrao.edu/calculator-ui/war/Calculator_ui.html)** (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: A new single beam Ku-band receiver is being developed with a nominal frequency range to cover 11.0 - 18.0 GHz. The receiver will use linear polarized feeds and should have a system temperature slightly below the dual-beam Ku receiver. The receiver is being developed for widebandwidth pulsar and continuum observations and may not have good baseline performance for spectral line observations. We will consider shared-risk proposals for this receiver at the 1 August 2012 proposal deadline. When proposing, please use the nominal system temperature for the dual-beam Ku receiver.

C-band Receiver: It is possible that the C-band receiver will be upgraded (if funds and resources become available) to include the 6-8 GHz frequency range. We will consider shared-risk proposals for the 1 August 2012 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 12B semester. Please see the **[GBT Proposer's Guide](https://science.nrao.edu/facilities/gbt/proposing/GBTpg.pdf)** (<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 new and improved **[GBT Sensitivity Calculator](https://dss.gb.nrao.edu/calculator-ui/war/Calculator_ui.html)** (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)** (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](http://enews/4.7/index.shtml#3)**" (<http://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/>).

VLBA, HSA, & VLBI Proposals

Observing Capabilities for Semester 2013A

The 1 August 2012 deadline applies to all types of **VLBA** (<https://science.nrao.edu/facilities/vlba>) and **HSA** (<https://science.nrao.edu/facilities/vlba/proposing/HSA>) proposals requesting time in semester 2013A (2013 February 1 through 2013 July 31), or multi-semester proposals. It also applies to global mm VLBI proposals for all GMVA observations in 2013. Please see the **instructions** (<http://www.nrao.edu/admin/do/vlba-gvbi.shtml>) for submitting VLBA, HSA, and global VLBI proposals.

Several recently announced or completely new capabilities will be available in semester 2013A. Details of these, and other capabilities, may be found in the **VLBA Observational Status Summary** (<https://science.nrao.edu/facilities/vlba/docs/manuals/oss>). The new capabilities are summarized below:

- **New C-band receivers:** Upgrading of C-band receiver systems remains on schedule, with the tenth VLBA station to be completed in August 2012. Proposals may request dual-polarization observations using two identically tuned 512-MHz VLBA IFs, or single-polarization observations within two independently tunable 512-MHz IFs, subject to the standard VLBA recording modes and data rates. The 512-MHz IFs can be tuned to any frequency in the 4-8 GHz range.
- **Wideband observing:** Two options are now available for recording at aggregate recording rates exceeding the legacy data system's maximum of 512 Mbps (corresponding to 64-MHz bandwidth per IF input in a typical 2-IF case). The full set of observing options are enumerated below. Any one of these 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.
 - A well-established but relatively new option provides sixteen 32-MHz sub-bands, with a fixed 2048-Mbps recording rate. The sub-bands can be selected flexibly between two VLBA IFs; typically these are different polarizations, but different frequency ranges in the new C-band receiver are also possible. Sub-band placement is restricted to 32-MHz steps along the frequency axis. The Polyphase Filterbank (PFB) FPGA code supporting this option was available in previous calls for proposals, and has been in regular use for scientific observations since 2012 February 19.
 - New Digital Downconverter (DDC) FPGA code is available to observe sub-bands of 128- and 64-MHz bandwidth, on a shared-risk basis. As many as four sub-bands can be used, which can

be selected arbitrarily between two IFs, and placed at 250-kHz steps on the frequency axis. However, sub-bands cannot span either of two IF zone boundaries, at 640 and 896 MHz. This code is currently in commissioning, and is expected to be operational when semester 2013A observations begin. Only the two bandwidths mentioned above are offered for 2013A. With the maximum of four sub-bands, the corresponding recording rates are 2048 and 1024 Mbps, respectively. Development of the DDC firmware continues, toward its primary goal of supporting narrowband spectroscopic observations.

- The VLBA's legacy data system remains available. This option should be requested for spectroscopic observations at bandwidths of 16 MHz or narrower. Since both the technical specifications and the scientific justification at these bandwidths are identical to those for the DDC described in (b) above, such observations will be transferred to use the DDC once commissioning of its narrowband modes is complete, without specific request or proposal.
- **Mark 4 format:** Conversion of DiFX correlator output to the Haystack Mark 4 format will be available in semester 2013A. This option may be selected via a checkbox in the "Correlation Parameters" column of the NRAO Proposal Submission Tool's "Resources" section. FITS-IDI output will be produced and archived in all cases, even when Mark 4 output is chosen.

High Sensitivity Array

The phased VLA ("Y27") will be available for semester 2013A, after a three-year gap during construction of the EVLA. The VLA will be in the D, DnC, and C configurations at this time. HSA proposals can request the phased VLA in conjunction with the VLBA, and for processing at the Socorro DiFX correlator. Phased-array data will be limited to two VLA subband pairs, in any combination of polarizations, but with each pair in different IFs (AC and BD). Maximum compatible channelizations are: 4 x 128 MHz (with the VLBA operating in Wideband Observing case (b) above); 4 x 64 MHz (also case (b)); 4 x 32 MHz (case (a)); or 4 x 16 MHz (case (c)). Bandwidths must be uniform at each station, across the entire VLBI array, and throughout the entire duration of the observation. The use of a single VLA antenna ("Y1") in conjunction with the VLBA will only be available through the **VLBA Resident Shared Risk Observing program** (<https://science.nrao.edu/facilities/vlba/observing/rsro>). Further details are available in both instruments' Observational Status Summaries.

Proposals to use the GBT as part of the HSA, in any of the Wideband Observing cases described above, will be considered for semester 2013A. 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 2013A. Both Effelsberg and Arecibo can be requested in HSA proposals for cases (a) (2048-Mbps recording) and (c) (for 512-Mbps recording), but we cannot guarantee their participation in case (a) at this time.

Global mm VLBI Array

Proposals to use the GMVA should assume a data rate of 512 Mbps in sensitivity calculations. If higher data rates are available at the time of observation the PIs of approved proposals will be contacted and offered the higher rate as default.

Scheduling Considerations for Semester 2013A

The VLBA has a number of large, multi-year proposals which now cause the schedule to be highly subscribed over most GST ranges, many of which are high frequency (15 GHz and above). In addition, many current VLBA projects use long scheduling blocks (10 - 24 hours), which can leave large gaps in the overall schedule and reduce scheduling efficiency. Proposals requiring scheduling blocks longer than 8 hours should justify in the proposal why shorter scheduling blocks cannot be used. In addition, we particularly encourage new proposals that can use low frequencies, short scheduling blocks (1 - 4 hours), and flexible start times. Such proposals will have the highest probability of being observed.

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. Both the phased-VLA and the geodetic Mark 4 format announced above were developed through RSRO programs, and proposals for additional RSRO proposals to expand the phased-VLA capabilities are encouraged. A number of additional areas are suggested at the [VLBA RSRO program](https://science.nrao.edu/facilities/vlba/observing/rsro) (<https://science.nrao.edu/facilities/vlba/observing/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) (<https://science.nrao.edu/observing/helpdesk>) with questions about the VLBA RSRO program or VLBA capabilities.

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