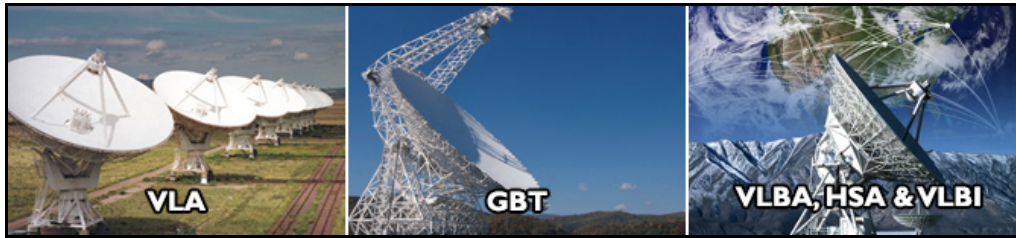


# NRAO Call for Proposals: Semester 2015A

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7 July 2014



## NRAO Call for Proposals: Semester 2015A

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The National Radio Astronomy Observatory (NRAO) invites scientists to participate in the NRAO Semester 2015A Call for Proposals 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 2015A proposals is Friday, 1 August 2014, at 17:00 EDT (21:00 UTC).**

The NRAO especially wishes to highlight new opportunities for joint observations with the Hubble Space Telescope and with the Swift Gamma-Ray Burst Mission.

### Proposal Preparation and Assistance

Proposal preparation and submission are via the NRAO Proposal Submission Tool (PST) available at [NRAO Interactive Services \(http://my.nrao.edu/\)](http://my.nrao.edu/). Note that PST use requires registration.

### Proposal Assistance

Proposers who need assistance with proposal preparation or have questions regarding the Call or NRAO telescope capabilities should contact Observatory staff via the NRAO [Helpdesk \(https://help.nrao.edu/\)](https://help.nrao.edu/).

## Semester 2015A Proposal News & Opportunities

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### New Opportunity: Joint Observations with the Hubble Space Telescope (HST)

By agreement between the NRAO and the Space Telescope Science Institute, STScI will be able to award time on NRAO facilities to highly ranked proposals that request time on both HST and NRAO telescopes. NRAO has offered up to 3% of the available time on its North American facilities, namely the Green Bank Telescope (GBT), the Very Large Array (VLA), and the Very Long Baseline Array (VLBA), for allocation by the HST Time Allocation Committee (TAC), subject to a maximum of 5% of the available time in any given VLA configuration.

In return, STScI has offered 30 orbits of HST time for allocation by the NRAO TAC to proposals submitted for the NRAO deadlines for Semester 2014B and Semester 2015A. Joint HST/NRAO proposals should be submitted to the observatory that represents the primary science facility, not to both observatories.

**HST as Primary Observatory:** NRAO observing time awarded through the HST Cycle 22 review will be implemented during the 2014B and 2015A observing semesters. The award of time on NRAO facilities will be subject to approval by the NRAO Director, after nominal review by the NRAO TAC to avoid duplication of programs. The important additional criterion for the award of NRAO time is that both the HST and the

radio data are required to meet the science goals of the project. It is not essential that the project requires simultaneous NRAO and HST observations. Under this agreement, NRAO time will only be awarded in conjunction with new HST observations (and should not be proposed for in conjunction with an Archival Research or Theory Proposal).

**NRAO as Primary Observatory:** HST time awarded through the NRAO TAC will be implemented during the course of HST Cycle 22. No orbits were awarded by the 2014B NRAO TAC and up to 30 orbits can therefore be awarded by the 2015A NRAO TAC. Proposals submitted to the NRAO requesting HST orbits must indicate that the proposal is joint with HST and must specify the number of orbits requested. The important additional criterion for the award of HST orbits is that both the HST and radio data are required to meet the science goals of the project. It is not essential that the project requires simultaneous NRAO and HST observations.

Successful proposers will submit Phase II HST proposals at the standard Phase II deadline. Funding will be available to US investigators to support HST data reduction; budgets should be submitted at the standard deadline

Proposers must always check whether appropriate archival data exist, and provide clear scientific and technical justification for any new observations of previously observed targets. Observations awarded time that duplicate observations already approved by HST or NRAO for the same time period may be canceled, or data sharing and cooperation among different groups may be necessary, as determined by the two observatories. This includes triggered proposals with similar trigger criteria, with or without previously known coordinates.

Be aware that some HST targets might not require new NRAO observations because the joint science goals can be met using:

- non-proprietary archival data from the VLA or VLBA [that are online](http://science.nrao.edu/facilities/vla/archive/index) (<http://science.nrao.edu/facilities/vla/archive/index>)
- VLA continuum images from sky surveys at a wavelength of 20cm and at a FWHM resolution of [45 arcseconds](http://www.cv.nrao.edu/nvss/) (<http://www.cv.nrao.edu/nvss/>) or [5 arcseconds](http://sundog.stsci.edu/top.html) (<http://sundog.stsci.edu/top.html>).

All scientific data from NRAO telescopes have a proprietary period during which the data are reserved for the exclusive use of the observing team. The NRAO data archive policy and proprietary periods [are online](https://science.nrao.edu/observing/proposal-types/datapolicies) (<https://science.nrao.edu/observing/proposal-types/datapolicies>), and apply to data taken through the joint HST-NRAO program.

## **New Opportunity: Joint Observations with Swift Gamma-Ray Burst Mission**

Swift is a robotic, multi-wavelength observatory with instruments covering the following energy bandpasses: 15-150 keV (Burst Alert Telescope; BAT), 0.3-10 keV (X-ray Telescope; XRT), and 160-800 nm (UltraViolet/Optical Telescope; UVOT). The primary goal of this mission is to determine the origin of gamma-ray bursts (GRBs) and use these bursts to probe the early universe. Swift is also a valuable asset for obtaining multi-wavelength images, spectra, and light curves on interesting Targets of Opportunity (ToOs) and other non-transient sources. With nearly instantaneous data dissemination, Swift is the premier observatory for discovery and follow-up of gamma-ray bursts (GRBs) and other transient sources.

To foster correlative observations, a joint Swift/NRAO observing program has been established, detailed in a [Memorandum of Understanding \(http://swift.gsfc.nasa.gov/proposals/nrao.html\)](http://swift.gsfc.nasa.gov/proposals/nrao.html). By this agreement, the Swift Program permits NRAO to award up to 300 kiloseconds of Swift observing time per year. This award of time shall occur without further scientific review by the Swift mission, provided compelling justification is provided to NRAO that such observations substantially enhance the scientific reach of the proposed observations.

- Proposed observing time on Swift may be time-constrained, including coordinated and monitoring observations, and Targets of Opportunity, if full justification is included in the proposal. Note that proposed Swift observing time can include monitoring that precedes, follows and/or (for TOOs) triggers NRAO observing time.
- Swift data sets obtained under this agreement will not be proprietary to the PI and will be immediately released publicly via the HEASARC data archive. No funds will be awarded from the Swift Project for such joint NRAO/Swift investigations. However, successful U.S.-based investigators are eligible for funding via the "Correlative Observations" Opportunity (see below).
- The peer-reviewed NRAO proposal-evaluation process will identify programs with sufficient merit to be allocated observing time by NRAO, and those that fall within the agreed-on range of joint programs will be allocated Swift observing time without additional scientific review if they to be judged technically feasible. The Swift Project will perform feasibility checks on the proposed observations and reserves the right to reject any observation determined to be technically unfeasible for any reason. Such a rejection could jeopardize the entire proposed science program and impact the award of NRAO observing time as well.

Similarly, NRAO permits the Swift GI Program to award NRAO observing time. The Swift GI program was announced in the 2014 NASA ROSES program solicitation (D.5). Cycle 11 proposals are due on 25 September 2014. Cycle 11 observations will commence on or around 1 April 2015, and last approximately 12 months. Further details on the Cycle 11 program will be posted on the [Swift web pages \(http://swift.gsfc.nasa.gov/proposals\)](http://swift.gsfc.nasa.gov/proposals) in August 2014.

- No more than 5% of the NRAO scientific observing time will be made available on NRAO's VLA, GBT and VLBA, or up to 200-300 hours per year on each telescope. The allocation of time on the Atacama Large Millimeter/Submillimeter Array (ALMA) is not covered by this agreement.
- The Swift Mission Project will make funding available to successful U.S.-based investigators who request NRAO observing time through the Swift GI process.
- Only proposals falling in the NRAO Regular proposals and Triggered proposals categories are eligible for observing time through this joint opportunity. NRAO Large Proposals (those requesting 200 hours or more) will not be eligible for time, but will be eligible for funding via the "Correlative Observations" Opportunity (see below).
- Radio data acquired through the Swift GI Program will be the property of the proposers for the standard NRAO 12-month proprietary period. Unless the users petition for an extension of the proprietary period, the data will then become publicly available in the NRAO Archive.
- The peer-reviewed Swift GI proposal-evaluation process will identify programs with sufficient merit to be

allocated observing time and funding by Swift, and those that fall within the agreed-on range of NRAO observing time will be allocated NRAO observing time without additional scientific review, if judged technically feasible. NRAO will perform feasibility checks on the proposed observations and reserves the right to reject any observation determined for any reason to be technically unfeasible or to jeopardize NRAO instrumentation. Such a rejection could jeopardize the entire proposed science program and impact the award of Swift observing time as well.

All successful NRAO investigators may be eligible for Swift GI funding, provided their observing programs complement the Swift science program. These programs do not necessarily need to involve joint observing programs as detailed above. In making their case for such funding, proposers should address how the use of NRAO time will enhance the Swift science return. The extent to which such proposed "correlative investigations" will augment the science return from Swift will be considered in the proposal evaluation process, and the peer-reviewed Swift GI proposal-evaluation process will identify programs with sufficient merit to be allocated funding by Swift. Hence, proposals falling in the NRAO Regular proposals, Triggered proposals, and Large proposals categories, are eligible for funding through this opportunity.

For all correlative investigations funded by Swift, rapid public availability of the data or results is strongly encouraged. Public data availability for correlative studies should be discussed in these proposals and will be considered in the evaluation of the proposals. Funded correlative proposals involve requests for Swift GI funding that are made subsequent to NRAO approval of observing time. The award of NRAO observing time will not be a guarantee of Swift funding; likewise, the granting of observing time is not contingent on Swift funding.

### **New Opportunity: Large Millimeter Telescope to join High Sensitivity Array for 3mm VLBI**

Following a successful 3mm VLBI run between the [Large Millimeter Telescope Alfonso Serrano](http://www.lmtgtm.org/) (<http://www.lmtgtm.org/>) (LMT) in Mexico and the VLBA in May 2014 (see the associated [NRAO eNews article](https://science.nrao.edu/enews/7.6/) (<https://science.nrao.edu/enews/7.6/>)), the LMT is now being offered for inclusion in the High Sensitivity Array (HSA) operating at 3mm, enabling combinations of the LMT with the VLBA, and optionally the GBT, for semester 2015A. Access to this capability is provided through the [VLBA Resident Shared Risk Observing \(RSRO\) program](https://science.nrao.edu/facilities/vlba/proposing/rsro). (<https://science.nrao.edu/facilities/vlba/proposing/rsro>) Proposals should be submitted through the NRAO Proposal Submission Tool for the NRAO 2015A proposal deadline.

### **Continuing Opportunity: Joint Observations with Fermi Gamma-ray Space Telescope**

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) (<http://fermi.gsfc.nasa.gov/ssc/proposals/nrao.html>). The next Fermi proposal deadline is in January 2015.

## Continuing Opportunity: Joint Observations with Chandra X-ray Observatory

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 2015.

## 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 [Science Support and Research \(mailto:tbastian@nrao.edu\)](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 \(https://science.nrao.edu/observing/proposal-types/exploratoryproposals\)](https://science.nrao.edu/observing/proposal-types/exploratoryproposals) to request [Director's Discretionary Time \(https://science.nrao.edu/observing/proposal-types/directorsdiscretionarytime\)](https://science.nrao.edu/observing/proposal-types/directorsdiscretionarytime) as a means of demonstrating a proof of concept.

## Commensal Proposals

NRAO telescopes and backends are sufficiently flexible in many cases to allow two experiments to run commensally. To the degree that this enhances science return from the telescopes, NRAO wishes to support commensal projects subject to resource and scheduling constraints. Groups wishing to carry out commensal observations should submit independent science cases as separate *primary* and *secondary* proposals.

A primary proposal controls the telescope pointings and requests the full amount of telescope hours required to fulfill the science objectives detailed in the proposal. Secondary proposal(s) are to run commensally with the primary pointings but make no formal request for an allocation of telescope time. However, when preparing a secondary commensal proposal, please ensure that a nominal amount of time is requested for a session (e.g., 0.1 hrs), even if it is a dummy session. Each proposal must contain estimates of the full resources needed (correlator setup, data rates, etc.) to carry out their specific part of the project.

During the proposal review and time allocation process it will be determined if the combination of the observing set-up and the positions by the primary or secondary proposals conflict with any approved projects. In the case of a conflict, some data restrictions may be applied to the primary and/or the secondary commensal proposal. If the primary and secondary proposals use the same back-end resources (VLA-WIDAR, GBT-VEGAS, etc) it may be necessary for technical reasons to require that the investigators on both primary and commensal projects be given full access to all data.

## 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. A list of all active VLA proposals of type Triggered is [available \(http://www.aoc.nrao.edu/~schedsoc/ActiveTriggeredProposalsVLA.txt\)](http://www.aoc.nrao.edu/~schedsoc/ActiveTriggeredProposalsVLA.txt).

## Source Lists

The Observatory 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.

## Dissertation Plans

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 must be referred to in later proposals for time allocations relevant to the thesis work described in the plan. It is the responsibility of the student to ensure that the information contained in the plan is up-to-date at the time a given proposal is submitted. By the same token, a proposal for work that is relevant to a student thesis should refer to the plan and clearly state the relevance of the proposal to the plan. At a minimum the plan should contain:

1. An overview of the research program
2. The thesis timeline, including the expected date of completion
3. An estimate of the NRAO telescope resources needed to complete the program of research
4. 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 \(http://my.nrao.edu/\)](http://my.nrao.edu/). Students are reminded to submit their plan comfortably in advance of the proposal deadline. 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.

## 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 \(https://science.nrao.edu/observing/proposal-types/sciencereviewpanels\)](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.

## Useful Resources & Tools

**Note:** you must be a registered NRAO user to access many of these resources. Please go to [NRAO Interactive Services \(http://my.nrao.edu/\)](http://my.nrao.edu/). If you are already a registered user, you are encouraged to update your profile.

### Proposal Submission Tool

The Proposal Submission Tool and associated documentation is accessed through [NRAO Interactive Services \(http://my.nrao.edu/\)](http://my.nrao.edu/).

### Proposal Finder Tool

The [Proposal Finder Tool \(http://library.nrao.edu/proposals\)](http://library.nrao.edu/proposals) (PFT) may be used to search cover sheets of proposals approved for time on NRAO telescopes. The PFT returns the proposal's authors, title, abstract, and, if available, approved hours.

### Green Bank Telescope (GBT)

- [The Proposer's Guide for the Green Bank Telescope \(https://science.nrao.edu/facilities/gbt/proposing/GBTpg.pdf\)](https://science.nrao.edu/facilities/gbt/proposing/GBTpg.pdf)
- [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)
- [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)

### Very Large Array (VLA)

- [VLA Observational Status Summary \(https://science.nrao.edu/facilities/vla/docs/manuals/oss\)](https://science.nrao.edu/facilities/vla/docs/manuals/oss)
- [VLA Proposal Preparation and Submission \(https://science.nrao.edu/facilities/vla/docs/manuals/oss/proposing/\)](https://science.nrao.edu/facilities/vla/docs/manuals/oss/proposing/)
- [Guide to Observing with the VLA \(https://science.nrao.edu/facilities/vla/docs/manuals/obsguide\)](https://science.nrao.edu/facilities/vla/docs/manuals/obsguide)
- [VLA Configuration Plans and Science Time Available \(https://science.nrao.edu/facilities/vla/proposing/configpropdeadlines\)](https://science.nrao.edu/facilities/vla/proposing/configpropdeadlines)
- [VLA Exposure Calculator \(https://science.nrao.edu/facilities/vla/docs/manuals/propvla/determining/source\)](https://science.nrao.edu/facilities/vla/docs/manuals/propvla/determining/source)

## **Very Long Baseline Array (VLBA), High Sensitivity Array (HSA)**

- [VLBA Observational Status Summary \(https://science.nrao.edu/facilities/vlba/docs/manuals/oss\)](https://science.nrao.edu/facilities/vlba/docs/manuals/oss)
- [VLBI at the VLA \(https://science.nrao.edu/facilities/vla/docs/manuals/obsguide/modes/vlbi\)](https://science.nrao.edu/facilities/vla/docs/manuals/obsguide/modes/vlbi)
- [VLBI on the GBT \(http://www.gb.nrao.edu/~fghigo/gbt/vlbinf.html\)](http://www.gb.nrao.edu/~fghigo/gbt/vlbinf.html)
- [Observing with the High Sensitivity Array \(https://science.nrao.edu/facilities/vlba/proposing/HSA-Tips\)](https://science.nrao.edu/facilities/vlba/proposing/HSA-Tips)
- [EVN Sensitivity Calculator \(http://www.evbi.org/cgi-bin/EVNcalc\)](http://www.evbi.org/cgi-bin/EVNcalc)



## Green Bank Telescope (GBT) Proposals

The 1 August 2014 deadline is for the Semester 2015A GBT observing period: 1 February – 31 July 2015.

Details of all GBT observing modes are in the [The Proposer's Guide for the Green Bank Telescope](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>). Proposers should make sure that they are familiar with the latest versions of these documents before writing their proposal.

The GBT receivers, backends, and observing modes that are available in Semester 2015A are listed in Tables 1 and 2 below.

**Table 1: GBT Receivers**

Receiver	Frequency Range
Prime Focus 1	290-920 MHz
Prime Focus 2	910-1230 MHz
L-band	1.15-1.73 GHz
S-band	1.73-2.60 GHz
C-band (shared risk)	3.8-8.0 GHz
X-band	8.0-11.6 GHz
Ku-band	12.0-15.4 GHz
K-band Focal Plane Array (7 pixels)	18.0-26.0 GHz
Ka-band	26.0-39.5 GHz
Q-band	38.2-49.8 GHz
W-band	67-93.3 GHz
MUSTANG 1.5 bolometer array (shared risk)	80-100 GHz
ARGUS (shared risk)	75-115.3 GHz, Private PI instrument

**Table 2: GBT Backends and Observing Modes**

Backend	Observing Modes
Versatile Green Bank Astronomical Spectrometer (VEGAS)	Continuum, pulsar, spectral line
Digital Continuum Receiver (DCR)	Continuum
Green Bank Ultimate Pulsar Processing Instrument (GUPPI)	Pulsar
Mark V Very Long Baseline Array Disk Recorder	Very Long Baseline Interferometry
Caltech Continuum Backend (CCB)	Continuum
Zspectrometer	Private PI instrument
Radar	Private PI instrument

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 15A semester.

Observers interested in shared-risk observations using the ARGUS instrument should contact the [NRAO helpdesk \(https://help.nrao.edu/\)](https://help.nrao.edu/) for further information. All ARGUS proposals must have permission from the instrument development team.

All Very Long Baseline Interferometry (VLBI) proposals requesting the GBT should include any needed setup and overhead time in the time request of their proposals.

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 10 to 50 at minimum. Observers should consult the GBT support scientists before submitting a proposal for these feeds.

If you are considering mapping with the GBT such that there are major turns or moves (end of rows in raster map, change in position for pointed maps, etc.) that occur with a cadence faster than every 30 seconds, you will need to consult with a GBT support scientist to ensure that the GBT can safely withstand the stresses induced by the mapping motions.

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

## **GBT Proposal Preparation**

Proposers should consult the [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) and the [GBT Observer's Guide \(http://www.gb.nrao.edu/gbtprops/obsman/GBTog.pdf\)](http://www.gb.nrao.edu/gbtprops/obsman/GBTog.pdf). All proposers, including pulsar proposers, should use 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). Please see the Calculator's [User's Guide \(https://dss.gb.nrao.edu/docs/Calculator\\_ug.pdf\)](https://dss.gb.nrao.edu/docs/Calculator_ug.pdf) for instructions. The 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.

The [GBT observing policies \(https://science.nrao.edu/facilities/gbt/observing/policies\)](https://science.nrao.edu/facilities/gbt/observing/policies) describe the telescope's remote observing restrictions.

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 section of this Call.

## **GBT Shared Risk Observing**

Observers requesting instruments that are shared-risk will be expected to travel to Green Bank for observations. The observers will be expected to help commission the instruments, to help debug observing and data reduction software, as well as helping to develop data reduction and calibration schemes.

NRAO will accept shared-risk proposals in Semester 2015A from observers willing to help commission the upgraded Multiplexed SQUID TES Array at Ninety GHz (MUSTANG 1.5, 80-100 GHz) bolometer array. The GBT C-band receiver is being upgraded to cover the 3.8-8.0 GHz frequency range. Proposals to use ARGUS (75-115.3 GHz) will also be accepted with the instrument development team's permission. NRAO will consider shared-risk proposals for Semester 2015A observations with these receivers.