



National Centre for Radio Astrophysics

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

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Announcement of Opportunity: Cycle 47

(October 2024 – March 2025)

Observations with the

Giant Metrewave Radio Telescope (GMRT)

Khodad, India

Proposal Deadline: Monday, July 15, 2024, 17:00 IST

The National Centre for Radio Astrophysics (NCRA) invites proposals for observations with the GMRT for Observation Cycle 47 (October 2024 to March 2025). The deadline for receiving these proposals is 17:00 IST (UTC+5.5 hrs), Monday, July 15, 2024. The proposals will be reviewed and evaluated by the GMRT Time Allocation Committee (GTAC), which will make recommendations for allocation of observing time for each proposal.

Status of the GMRT: The upgraded GMRT (uGMRT) is available for observations with the full array of 30 antennas supporting 4 upgraded wideband receiver systems: 120-250 MHz (Band-2), 250-500 MHz (Band-3), 550-850 MHz (Band-4) and 1000-1460 MHz (Band-5), in regular release mode. All the uGMRT observations are carried out with the 30-antenna back-end supporting a choice of 100, 200 or 400 MHz processing bandwidth for the correlator (along with a zoom mode for spectral line observations), with the choice of 2048, 4096, 8192, or 16384 channels, as well as the corresponding IA/PA beamformer outputs for pulsar observations. Some new and advanced modes of the uGMRT will only be available on a shared risk basis, meaning that (a) these new features and modes may not be fully tested and guaranteed for performing as per the specs, and the user shares the risk of failure and/or under performance of these modes of the system, and should be ready to use these on an "as is, where is" basis for their observations; (b) as a corollary of the above, no make-up time will be allotted for under-performance of the system in these modes. *The GMRT is now formally available for VLBI observations in collaboration with the European VLBI Network (EVN). Approved EVN proposals that request GMRT time will undergo independent evaluation for technical feasibility and potential conflicts with regular GTAC observations. VLBI proposals that meet the GMRT requirements will be scheduled on a best-effort basis.*

Current technical details about the upgraded GMRT, available frequency bands and usable bandwidths, system parameters, modes in regular release and shared risk categories, and expected performance information can be found in the updated GMRT specifications and status document at <http://www.ncra.tifr.res.in/ncra/gmrt/gtac>.

Observing slots and configurations: Science observations will be scheduled round the clock except for Wednesday 09:00 hours to Thursday 18:00 hours (each week) as this slot is reserved for maintenance and test activities. A dummy schedule at <http://www.ncra.tifr.res.in/ncra/gmrt/gtac> shows the distribution of the observing slots over the duration of Cycle 47. As can be noted, there are fewer time slots available for scheduling in the LST range of 16 to 24 hrs, and we request the users to note this when preparing their observing proposals. The observatory will strive to maintain the target of 26 working antennas for every GTAC approved observation.

The legacy GMRT Software Backend (GSB) is being de-commissioned and will not be available from Cycle 47 onward. Hence, proposals can use only the GMRT Wideband Backend (GWB), that serves the uGMRT. The control and monitor system has been upgraded to the new Tango based GMRT Control (TGC) system. A command file generator is available at <http://www.ncra.tifr.res.in/~seccr-ops/cmd/cmd.html> for users to create command files with the new syntax.

Proposal submission and processing: Proposals are to be submitted online via the NCRA Archive and Proposal Management System (NAPS), available at <https://naps.ncra.tifr.res.in>, which provides a password authenticated, web browser based interface for proposal submission. The proposals can be submitted only by the PIs, but all co-Is also need to be registered users of the system. All PIs and co-Is since GTAC Cycle 15 are already registered users. *The page limit for the scientific justification document of all proposals requesting upto 200 hours is 4 pages while the*

page limit for large proposals (> 200 hours) is 6 pages, with a font size of 11pt or larger. The total number of hours requested per band per observing epoch should be an integer value. Proposers are required to submit 2 additional documents along with the scientific justification document: a technical justification document, and the output from the GMRT Exposure Time Calculator (ETC) available at <http://www.ncra.tifr.res.in/etc>. First time users can contact gmrtoptions@ncra.tifr.res.in for any assistance in preparing their observing proposal. For any unresolvable problems with the NAPS interface, please contact the help desk at proposal@ncra.tifr.res.in.

Proposals will be reviewed by the GTAC with external refereeing as needed and the proposers intimated of the time allocation. The GTAC may seek inputs from the GMRT Observatory on matters relating to the technical justification of the proposals. Proposals requiring more than 200 hours of observing time will be treated as “large proposals”. They will be reviewed in a manner appropriate for each one of them and, if necessary, the time allocation will be split over several cycles. Target of Opportunity (ToO) proposals can also be submitted for the regular cycle, which will be reviewed by the GTAC in the usual manner, but any time allotted will be scheduled dynamically, as and when the specified trigger conditions are met. The exact procedure for triggering a ToO observations will be informed to the PIs. ToO proposals with significant overlap of science goals and trigger criteria may be asked to share the data. The total time allotted for such GTAC ToO proposals will not be more than 5% of the total GTAC time allocation for the cycle. The policy document for GTAC ToO proposals can be found at <http://www.ncra.tifr.res.in/ncra/gmrt/gtac>.

In addition to the regular GTAC proposals, a Director’s Discretionary Time (DDT) facility is also available. DDT time is meant for special uses, such as (i) pilot observations/feasibility studies which might lead to future GTAC proposals; (ii) urgent confirmatory observations; (iii) ToO observations, primarily intended for short-lived or time-dependent astronomical phenomena. The page limit for DDT proposals is 3 pages. DDT time allocations are subject to the availability of time, convincing urgency and goals which match the use cases mentioned above, and are cleared by the Centre Director, NCRA. Requests for these should also be submitted via NAPS, using the option for DDT proposals. DDT proposals can be submitted at any time of the year.

Scheduling and observing : After a proposal has been allotted time and scheduled, queries related to the observing schedule should be sent to the GMRT scheduling team at gmrtschedule@ncra.tifr.res.in. For other aspects of the observations, please write to the GMRT Operations team at gmrtoptions@ncra.tifr.res.in. Queries regarding travel logistics can be addressed to the Secretary for Operations at secr-ops@ncra.tifr.res.in. DDT and ToO observations will be scheduled in the empty “white” slots in the GMRT schedule, without affecting the scheduled GTAC observations, as far as possible. The GMRT supports absentee observing for the standard interferometric and beamformer modes with the existing legacy system, as well as with the regular, full release interferometric and beamformer modes of the uGMRT system. Users who would like to avail of this facility should prepare and send their set up configuration, command files and source list at least 10 days before their observations to gmrtoptions@ncra.tifr.res.in.

A set of tools are available at <http://www.ncra.tifr.res.in/ncra/gmrt/gmrt-users/observing-help> for help with the observations. There is a possibility of downtime due to power outages, wind (particularly during May-August), ionospheric activity, RFI etc. There is some scope for make up for time lost due to such reasons. In case of such requirements, users should send an email requesting compensatory telescope time to gmrtoptions@ncra.tifr.res.in giving details of the problems. The observatory will, on a best effort basis, try to schedule all the observations in the lower frequencies (i.e. Bands 2, 3 & 4) during night time, prioritised as per the GTAC rankings of the proposals.

Post observations, the interferometric data will be made available for download from NAPS, after an interval of one day. NCRA encourages first time users to get in touch with the GMRT Operations team to become familiar with the recommended observing and calibration procedures. A CASA based Pipeline-cum-Toolkit is now available at <https://github.com/ruta-k/CAPTURE-CASA6> for producing continuum images from the uGMRT.

Data Release : Interferometric data from all standard observations with the GMRT will be made public 18 months after the date of observation. For all ToO / DDT observations, the corresponding period is 3 months. The status and details of all the observations since 2002 can be obtained from <https://naps.ncra.tifr.res.in/goa>.

**Centre Director
NCRA-TIFR**