



Submitting a GBT Proposal



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with much help from Ryan Lynch



Upcoming GBT Proposal Writing Workshops!



- Two workshops planned for July 2021
 - July 22 from 2-5 pm EDT and July 27 from 9 am – 12 pm EDT
- These workshops will be like this talk, but with many more details!
 - GBT Science and GBT Capabilities
 - Online Proposal Submission Tool (live demo)
 - Sensitivity Calculator (live demo)
 - Mapping Calculator (live demo)
 - Helpdesk, tips for a good proposal, and additional discussion

Before you Begin

- Read the call for proposals in detail
- Understand the telescope and its capabilities
- Ask yourself...
 - Why is this proposal worth doing? Put yourself in the shoes of a critical referee
 - Has this been done before? What will I do differently this time?
 - Is this the right telescope for my science?
 - What do I actually need (as opposed to want) to accomplish my scientific goals?

Proposal Categories

- Regular
 - 0.3 – 8 GHz (any weather): < 400 hours and ≤ 1 year
 - 8 – 18 GHz (good weather): < 200 hours, ≤ 1 year
 - 18–27.5 / >50 GHz (excellent weather): < 100 hours, ≤ 1 year
 - Fixed time / monitoring (all weather): < 200 hours, ≤ 1 year
- Large
 - 0.3 – 8 GHz (any weather): ≥ 400 hours and > 1 year
 - 8 – 18 GHz (good weather): ≥ 200 hours, > 1 year
 - 18–27.5 / >50 GHz (excellent weather): ≥ 100 hours, > 1 year
 - Fixed time / monitoring (all weather): ≥ 200 hours, > 1 year

Proposal Categories

- Triggered proposals are submitted at the normal proposal deadlines
 - Intended for pre-planned observations of transients whose times are not known *a priori*
 - Must include clear, well-justified trigger criteria
- Director's Discretionary Time (DDT): Two types
 - Target of Opportunity: Unexpected phenomena, rapid response
 - Exploratory Time: Typically a few hours or less, intended for pilot projects taking advantage of a new idea or capability

Great, Good, or Poor

- 300-500 proposals reviewed every deadline
- Few (~10) are obviously great
- Few (~10-20) are obviously poor
- All others are good and about equal
 - We are all intelligent, good writers, etc.
- How do you make your proposal standout?

Proposal Elements

- Abstract (on the cover page) – limited to 200 words for GBT proposals
- Introduction and background information
- Project description
- Scientific justification
- Time request (including backends, observing strategy, etc.)
- Technical justification (pre-formatted)

Scientific Justification Tips

- Do
 - Be thorough but concise – this is a skill that takes practice to develop!
 - Provide a relevant introduction
 - Cite relevant literature
 - Discuss the potential impact of a successful proposal
 - Discuss the potential impact of a **null result**
- Don't
 - Assume that all referees are experts in your domain
 - Don't “blind with science” - KISS
 - Use words when a figure would suffice (and vice versa)

Technical Justification Tips

- Do
 - Make sure you are up-to-date on instrumental availability and capabilities
 - Ask observatory support staff if you have questions
 - Provide all the information that is asked for
 - Use observatory provided tools
 - Be explicit about any assumptions you are making
- Don't
 - Ask for something that is unavailable or impossible
 - Ask for an instrumental set up that is not justified by the science
 - “Pad” the time request – we conduct an independent review

Stylistic Considerations

- Don't repeat the abstract in the proposal – it is included in the cover sheet! The same goes for technical justification
- Don't add content just to reach the page limit
- Follow all formatting guidelines
 - 4-page limit for regular, triggered, DDT proposals
 - 10-page limit for large proposals
 - Includes figures, tables, references
 - All proposals: Min. 11 point font for main text (smaller font OK for figures, footnotes, but must be legible)
 - All proposals: 1-inch margins
- Remember that referees read lots of proposals – make it exciting

GBO/NRAO Proposal Calls



- August 1 and February 1 deadlines
- August deadline observing February-July
- February deadline observing August-January

Hidden Gems

- Joint proposals with
 - Hubble
 - Fermi
 - Chandra
 - Swift
 - SOFIA
- Filler time proposals

GBO/NRAO Tips

- Panel Based system
 - Eight different panels
 - Broad community representation on panels
 - Non experts on panels
- 0=best and 10=worst
- Will be given a group
 - A: active for one year, expect to complete
 - B: one semester, should get most of time
 - C: one semester, filler time
 - N: not accepted

GBT Tips

- If in doubt contact us
- Technical justification – unlimited space
 - What you are using
 - How you are using it
 - How long you need it
 - How you determined those values
- Include Overhead times
 - Pointing/focus every 0.5-2 hours
 - AutoOOF every 1-2 hours (above 30 GHz)
 - Interscan latencies
 - Slew times
 - 20-30 seconds to start scan

Common Mistakes

- Confusion Limit
 - Once you hit it you are done (unless you have knowledge of emission at higher resolution)
- $1/f$ noise (Gain variations)
 - Receiver dependent
 - Relevant when product of BW and tint exceeds certain limits
- RFI
 - Check for known emissions
 - Have a plan
- Use the GBT sensitivity calculator
 - https://dss.gb.nrao.edu/calculator-ui/war/Calculator_ui.html
- Use the GBT mapping calculator
 - <http://www.gb.nrao.edu/~rmaddale/GBT/GBTMappingCalculator.html>

Scheduling Considerations

- GBT is oversubscribed, particularly when Galactic center is up
 - If you can, ask for time that is in lower demand
- Fixed projects are becoming harder to schedule!
 - This especially impacts pulsar and VLBI observing
 - If you need **fixed** or **windowed** observations you must provide strong justification (and rank highly)
 - Be as flexible as possible with scheduling constraints
 - Make your “must-haves” clear and different from your “prefer- to-haves”

Sessions

- Only include receivers and backends that must be observed at one time
- Typical telescope period is 3-6 hours long
 - Scheduled using **average** RA and Dec of sources
 - Group sources accordingly
- Sources in a sessions should be:
 - Within a 2-3 hour RA range
 - Use $\lambda=\delta$ as a divider (avoid long slews)
 - Time visible should be the same to within 1-2 hours
- Don't restrict observable LST range too much
 - More flexibility = better chance to be scheduled

Important Websites

- Links and information for all things related to GBT proposals
 - <https://greenbankobservatory.org/science/gbt-observers/proposals/>
- Primary portal for submitting all GBO/NRAO proposals
 - <https://my.nrao.edu>
- Tool for calculating observing time and sensitivity
 - https://dss.gb.nrao.edu/calculator-ui/war/Calculator_ui.html
- Tool for planning maps
 - <https://www.gb.nrao.edu/~rmaddale/GBT/GBTMappingCalculator.html>



GREEN BANK OBSERVATORY

greenbankobservatory.org

*The Green Bank Observatory is a facility of the National Science Foundation
operated under cooperative agreement by Associated Universities, Inc.*