How to Prepare/Submit a GBT Proposal in the PST





Speaker: Jesse Bublitz With thanks to Natalie Butterfield



1

GBO/NRAO Proposal Calls

Before you begin...

- Read the call for proposals in detail https://greenbankobservatory.org/science/gbtobservers/proposals/2023b-call-for-proposals/
- 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?







GBO/NRAO Proposal Calls

- August 1 and February 1 deadlines
 - February deadline observing August-January
 - August deadline observing February-July
- Joint proposals with
 - Chandra, Fermi, HST, XMM-Newton, Swift, VLBA, VLA
- High-Risk proposals
- Filler time proposals
- Triggered proposals



Proposal Submission Tool Overview

1) Log into my.nrao.edu 2) Click on 'Proposals' tab 3) Click on 'New Proposal'

National Radio Astronomy Observatory

Dashboard	Prop	posals	Reviews	Data Processing	Obs Prep	Helpdesk	Profile				Hi, Natalie	Sign Ou
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Trimester / Seme	ster:	GBT/	21B-326			h a	QB329	Investigating the Star Forming Potential of the Galactic Bar Dust Lanes	Natalie Butterfield	02/01/2021	02/01/2021	SUBMITTED
ALL ¢		GBT/	21B-052			t d	QG178	MUSTANG Galactic Plane survey: The inner Galaxy continued (2021B)	Adam Ginsburg	01/24/2021	01/31/2021	SUBMITTED
ALL \$		GBT/	21A-383			F 🖴	QL308	From Head to Tail: Magneto-Kinematic Mapping of an IRDC	CHI YAN LAW	08/03/2020	08/03/2020	SUBMITTED
		GBT/	21A-296			Fi 📥	QD177	Measuring 12CO(1-0) emission in the Milky Way's Nuclear Wind	Enrico Di Teodoro	08/01/2020	08/03/2020	SUBMITTED
		GBT/	'21A-363			t e	QK211	Radio Recombination Lines: Constraints on the Fermi Bubble Shell	Dhanesh Krishnarao	07/31/2020	08/03/2020	SUBMITTED
		GBT/	21A-323			۹ ۵	QB306	Molecular Inventory of Molecules in the Fermi Bubble Clouds	Natalie Butterfield	07/29/2020	08/03/2020	SUBMITTED
		GBT/	21A-190			۹ –	QB302	Investigating the Star Forming Potential of the Galactic Bar Dust Lanes	Natalie Butterfield	07/29/2020	08/03/2020	SUBMITTED
		GBT/	21A-348			fi e	QM443	Argus Mapping of IRDCs: Probing Physical Processes at the Onset of Star Formation	Lawrence Morgan	07/28/2020	08/03/2020	SUBMITTED
		GBT/	21A-086			t d	QG172	MUSTANG Galactic Plane survey: The inner Galaxy (B sem)	Adam Ginsburg	07/27/2020	08/02/2020	SUBMITTED
		VLA/	21A-281			F 📥	AC1520	The Three Little Pigs: Tracing Evolutionary Stages in the Galactic Center	Genna Crom	07/16/2020	08/03/2020	SUBMITTED
		GBT/	20B-273			Fi 📥	QB288	Investigating the Star Forming Potential of the Galactic Bar Dust Lanes	Natalie Butterfield	02/03/2020	02/03/2020	SUBMITTED
		GBT/	20B-340			۹ d	QM425	Searching for the Molecular Material Entrained in the Milky Ways Nuclear Wind	Anthony Minter	02/03/2020	02/03/2020	SUBMITTED
		GBT/	20B-276			۹ d	QD168	Measuring 12CO(1-0) in Clouds Entrained in the Milky Way Nuclear Wind	Enrico Di Teodoro	02/02/2020	02/03/2020	SUBMITTED
		GBT/	20B-319			fi e	QL296	Shaping the star forming environment in IRDCs: Magnetic field and/or Turbulence?	CHI YAN LAW	02/02/2020	02/03/2020	SUBMITTED
		GBT/	20B-167			Fi 占	QM423	GBT Argus Mapping of IRDCs - Dissecting Turbulence and Magnetic Fields	Lawrence Morgan	02/01/2020	02/03/2020	SUBMITTED
		GBT/	20B-371			۹ d	QB291	Molecular Inventory of Molecules in the Fermi Bubble Clouds	Natalie Butterfield	01/31/2020	02/03/2020	SUBMITTED
		GBT/	20B-070		2	۹ <u>۵</u>	QG162	MUSTANG Galactic Plane survey: The inner Galaxy (B sem)	Adam Ginsburg	01/30/2020	02/03/2020	SUBMITTED
		GBT/	19B-355			۹ d	QD165	Measuring CO(1-0) and NH3 Emission in Two Galactic Center HI Clouds	Enrico Di Teodoro	01/21/2020	01/30/2020	SUBMITTED
		GBT/ This is that a	2019-11-003 s an old draft propos are no longer valid (e	al and it may contain c e.g., resources).	omponents 🗙	262		Continuum Observations of the Fermi Bubbles	Natalie Butterfield	12/11/2019		DRAFT
		GBT/	19B-302			F 🔒	QM413	GBT Argus Mapping of IRDCs - Dissecting Turbulence and Magnetic Fields	Lawrence Morgan	09/24/2019	10/01/2019	SUBMITTED





GBT Observer Training Workshop – February 2022



Proposal Submission Tool Overview

National Radio Astronomy Observatory

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Dashboard Proposals	Reviews	Data Processing	Obs Prep	Helpdesk	Profile		Hi, Natalie	Sign Out			
My Proposals Available Authors Available Organizations Monday 19 July 2021											
								Edit Help			
Validate Print Submit	GENER	AL					« < Gene	aral > »			
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My Proposals GBT/2021-06-018 General Authors	NRAO	Observing Proposal						Create Date: 07/19/2021 Modify Date: 07/19/2021 Submit Date: Total Time: 0			
Technical Justification	For inform	For information regarding the confidentiality - and the public release of information - of proposal details see here.									
Resources	Title										
Disposition Letter	This is a bla	This is a blank proposal created on Monday July 19, 2021									
GBT/2021-01-009	Туре	Туре									
GBT/21B-326 GBT/21B-052	Regular	Regular									
GBT/21A-383	Sponsored	Sponsored Proposal									
GBT/21A-296 GBT/21A-363	Not Sponso	red									
GBT/21A-323	Scientific	Category									
GBT/21A-348	Abstract										
GBT/20B-273	Joint										
GBT/20B-340	Not a Joint	Not a Joint Proposal									
GBT/20B-319	Observing	Observing Type(s)									
GBT/20B-371	Dissertatio	Dissertation Research Plan									
GBT/19B-355	Dissertation	Dissertation Research Plan(s) not required									
GBT/19B-302	Related Pr	oposals									
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Proposal Help Desk

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Proposal Submission Tool Overview

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Proposal Help Desk 🎋

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6

Proposal Type

Regular and Large Proposals

Regular

-0.3 - 8 GHz (any weather): < 400 hours and ≤ 1 year -8 - 18, 27.5 - 50 GHz (good weather): < 200 hours and ≤ 1 year -18 - 27.5, >50 GHz (excellent weather): < 100 hours and ≤ 1.5 years - Fixed time / monitoring (all weather): < 200 hours and ≤ 1 year

Large

-0.3 - 8 GHz (any weather): ≥ 400 hours or > 1 year -8 - 18, 27.5 - 50 GHz (good weather): ≥ 200 hours or > 1 year -18-27.5, >50 GHz (excellent weather): ≥ 100 hours or > 1.5 years - Fixed time / monitoring (all weather): ≥ 200 hours or > 1 year



Proposal Type

Triggered and DDT Proposals

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)

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







Parts of a GBT Proposal

General Information

title, abstract, proposal type, Science category, observing type, joint proposal?

Authors

- Add authors to the proposal, all authors must be registered users Science Justification
- Upload your science justification (must be < 4 pages, unless large proposal)
 Technical Justification
 - 9 justification questions that need to be addressed

Sources

• List your target source(s) information

Resources

• Setting up your backend information (receiver, BW, etc)

Sessions

- Setting up your observing sessions
- Pulls information from Sources and Resources sections







Science 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" Keep it simple
- 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





Technical Justification 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



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





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







Proposal Reviews

Panel Based system

- Nine 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

YouTube: Green Bank Observatory 26 January 2023 - Dr. Toney Minter

Proposal Review Time line

- ~ 1 month before deadline: proposal call released
- ~2 weeks before deadline: status update to all active proposals
- 1 week after deadline: preparing for reviews
- · 2-4 weeks after deadline: individual science and technical reviews
- Week 5: prepare and release information to SRPs
- Week 6-7: Science Review Panels meet
- Week 8: Finalize scores, determine time available
- Week 9: Pre-grades and release info to TAC
- Week 10: Large proposal review
- Week 11: Update information for TAC
- Week 12: Time Allocation Meeting
- Week 13: Update from TAC meeting and release info for Director's Review
- Week 14: Director's Review
- Week 15: Prepare and Release Dispositions



GBO Colloquium - January 26,





GBT Observer Training Workshop – February 2022

Proposal Reviews

Great, Good, and Poor Proposals

- 300-500 proposals reviewed every deadline.
- Few (~10) are obviously great.
- Few (~10-20) are obviously poor.
- All others are good and about equal.

How do you make your proposal standout?





Common mistakes

Confusion Limit

– Once you hit it you can't go deeper (unless you have knowledge of emission at higher resolution)

1/f noise (Gain variations)

- Receiver dependent
- Relevant when product of BW and t_{int} exceeds certain limits (GBT Memo 282)
- 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
 - <u>http://www.gb.nrao.edu/~rmaddale/GBT/GBTMappingCalculator.html</u>







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"







Important Websites

- Links and information for all things related to GBT proposals
 - https://greenbankobservatory.org/science/gbtobservers/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/calculatorui/war/Calculator_ui.html
- Tool for planning maps
 - https://www.gb.nrao.edu/~rmaddale/GBT/GBTMappingCa lculator.html









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