

The NAIC-NRAO School on Single-Dish Radio Astronomy
Techniques and Applications -- July 2005

Writing Effective Telescope Proposals

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Chris Salter's credentials to present a talk on writing telescope proposals:

1. Service as a proposal referee to a major radio-astronomical national facility.
2. Service as a member of the Arecibo Scheduling Advisory Committee.
3. Long-time submitter of (often outstandingly unsuccessful) telescope proposals to many long-suffering radio telescopes world-wide.

Table 1: Single-Dish Proposal Deadlines

Telescope	Annual Deadlines
Arecibo 305-m	Feb 1st, June 1st, September 1st
ARO 12-m & SMT	February, August
CSO 10.4-m	May 31st, October 31st
Effelsberg 100-m	Feb 1st, June 1st, September 1st
FCRAO 14-m	September 15th, January 15th
GBT 100-m	Feb 1st, June 1st, September 1st
Hartbeesthoek 26-m	No fixed deadlines
IRAM 30-m	March, September
JCMT 15-m	March 15th, September 15th
Nauçay	April, October
Nobeyama 45-m	January 10th, September 1st (+ Jan 31st for "short proposals")
Onsala 20-m/25-m	April 15th, October 15th
Ooty ORT	No fixed deadlines
Parkes 64-m	June 15th, December 15th

The Arecibo Telescope Proposal System

Components that make up an Arecibo proposal;

- The Cover Sheet (web-based) containing technical details and an abstract (not more than 150 words).
- The Main Body (PostScript file) which contains;
 - a) The scientific justification.
 - b) The technical justification.

Three pages maximum unless it is a long-term (1 -- 2 yr duration) or large (requesting > 300 -- 400 hr) proposal.

Rules and regulations are at

<http://www.naic.edu/~astro/proposals/proposal.htm>

A. Proposals subdivided by discipline, and sent for refereeing;

- A -- Astronomy (5 referees)
- P -- Pulsars (4 referees)
- R -- Planetary Radar (4 referees)
- T -- Aeronomy (3 referees)

B. The referees return;

- a) A grade from 0 (reject) to 9 (absolutely fabulous).
- b) Recommended percentage of the requested time to be awarded, if scheduled.
- c) Comments and criticisms to be passed to the proposers; more detailed for lower graded proposals.

C. The Arecibo Scheduling Advisory Committee (ASAC) meets. This consists of 5 NAIC staff members, plus an external member.

ASAC members read all the proposals, consider the gradings and other recommendations of the referees, and make a technical audit of the suitability of a proposal for observation at Arecibo. Weighing all these factors up, they agree on a "ranking" for a proposal, and the amount of time it will receive, if scheduled.

The rankings are very broad;

- A -- Will be scheduled, and remain active till then.
- B -- To be scheduled only if time is available within the next two 4-month scheduling periods. Otherwise the proposer should resubmit.
- C -- Unlikely to be scheduled. The proposer is invited to resubmit.

Before Preparing Your Proposal

- Read and understand the “rules and regulations”.
- Understand the telescope.
- Become acquainted with the latest developments via <http://www.naic.edu>, and by enquiry.

Is this the Right Proposal at the Right Telescope?

- Is the proposal worth writing? Play “Devil’s Advocate”.
- Have the observations been done before? If so, why do them again?
- Is Arecibo REALLY needed?

The Scientific Justification: Do’s & Don’ts

- A succinct, informative introduction.
- Sufficient detail to sell the power of your case.
- However, don’t “blind with science”. Keep it clear and simple.
- On resubmission, make sure that you have answered the referees’ questions.
- If this work will lead to further research, describe briefly the expected developments.
- If part of a larger project, describe briefly what other observations are being made, where, and their status.

Do’s and Don’ts: Continued

- Should only an upper limit be measured, will this have scientific value and meaning?
- Can you get “more bang for your buck” -- a broadened investigation, or full “commensal” observing?

The Technical Justification

Should be a *clear and concise* elaboration and justification of the technical choices, (receiver, frequencies, backends, special requests, RFI considerations, target list, etc.) summarized in the cover sheet. Check for COMPLETE consistency between the cover sheet and technical justification. Also specify how you intend to reduce the data, mentioning code development needed, and stressing expertise in this area among your project team.

Yet More Do’s and Don’ts

- Demonstrate that you should reach the required signal-to-noise ratio in the time requested. In doing this, use the correct formula for your chosen method of observing.
- Include expected “overheads” in your time request (e.g. set-up time, slew time, calibration time, radar blanker time loss, OTF “turn-around time”, ON-OFF transition time for position switching, etc.
- Specify experimental parameters to enable cross checking, i.e. total bandwidth, channel width, assumed Tsys or SEFD, 3- or 9-level sampling, etc.
- For OTF mapping, specify scanning pattern, telescope drive speed, sampling considerations, etc.
- Don’t “pad” the time request; you may be found out!

Additional Do’s and Don’ts

- If you are proposing commensal observations, show technical compatibility with the commensal partner, and specify which project is “primary”.
- Check carefully for “howlers” such as requesting, a) sources outside of the Arecibo Dec range, b) frequencies not covered by an Arecibo receiver, c) observations at the frequency of strong, unblankable RFI, and d) impossible set-ups.
- If exact sky location is not important, choose the least over-subscribed celestial regions, all else being equal.

General Considerations

- NEVER exceed your page (or figure) limits.
- There is an abstract in the cover sheet, so do not repeat it at the heady of the proposal body.
- Get an independent third-party to read the final draft.
- Do not use jargon, undefined acronyms, etc.

Student Participation

Specify at the appropriate place in the cover sheet if your team contains a student who will use the results towards their thesis. It can only help.

When you get the Proposal Results

Do not be surprised if the referees say nice things about your proposal but grades it below average!

If your proposal is graded such that it is unlikely to be scheduled, consider modifying it and resubmitting. Be objective about the referees' comments and decide if it is worth spending more time trying to satisfy their concerns. If so, try to understand why the referees reached their conclusions, and try to make sure it won't happen next time round.

If you feel a referee has misunderstood your argument/s, unfairly damaging your chances of access to the telescope, you can write to the Director laying out your case, and requesting ASAC to reconsider the grading.

An Excellent Guide to Writing Effective Telescope Proposals

"Writing Good Observing Proposals"

by

Judith Irwin (Queen's University, Kingston, Canada)

available at,

<http://www.jach.hawaii.edu/JCMT/applying/goodprop.html>

And After Your Observations

Please, please, please fill in an Observer's Comment Sheet,
Available on-line at;

http://www.naic.edu/~astro/obs_comment.html