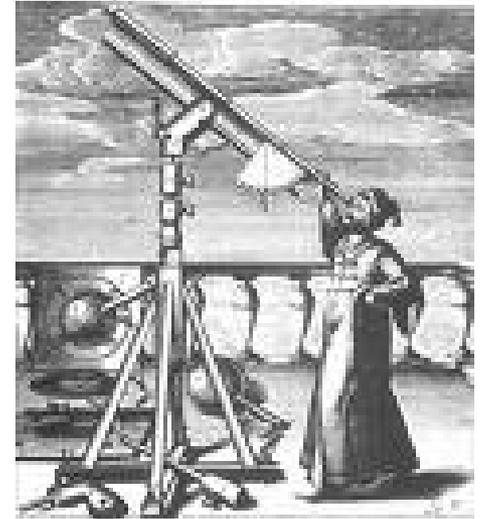


# Writing Effective Telescope Proposals



Chris Salter (NAIC)



# Why is Chris Salter Presenting this Talk?

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

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

# Single-Dish Proposal Deadlines

Telescope	Annual Deadlines
Arecibo 305-m	March 1st, September 1st
ARO 12-m & SMT	SMT: September 1st, 2013
CSO 10.4-m	April 15th, October 31st(?), to be decommissioned 2016
Effelsberg 100-m	February 10th, June 10th, October 10th
GBT 100-m	February 1st, August 1st
Hartebeesthoek 26-m	No fixed deadlines
IRAM 30-m	March 15th, September 15th
JCMT 15-m	March 15th, September 15th
Nançay	May, November
Nobeyama 45-m	Sept 3rd (+ Dec 24th for "short proposals"), Dec 10th
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 or PDF file) which contains;

The scientific justification.

The technical justification.

**Four pages maximum** unless it is a large (requesting  $\geq 300$  hr), or a short ( $\leq 3$  hr), proposal, which should be of 7 or 1 page maximum respectively .

Rules and regulations are at;

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

and *<http://www.naic.edu/~astro/AreciboProposalProcedures.pdf>*

# Proposal Handling

(A) Proposals are subdivided by discipline, and sent to a number of Anonymous referees for evaluation;

A – Astronomy (8 referees)

P – Pulsars (6 referees)

R – Planetary Radar (4 referees)

T – Atmospheric Physics

(B) Each referee returns;

a) A grade from 0 (Oh Dear!) to 9 (Absolutely Fabulous!)

b) A recommended percentage of the requested observing time to be awarded, if scheduled.

c) Comments and criticisms to be passed to the proposers; more detailed for lower graded proposals.

# Proposal Handling (Continued)

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

The ASAC members read all the proposals, consider the gradings and other recommendations of the referees, and make a technical audit of the suitability of each proposal for observation at Arecibo. Weighing up all these factors, 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 in requested semester/s; if not possible, scheduled in the subsequent relevant semester.

B -- Scheduled (at least in part) if time is available within the next relevant semester. If not complete at that time, proposer should consider resubmitting.

C – Project will not 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. Not all referees will be experts in your field.

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 this is part of a larger project, describe briefly what other observations are being made, where, and their status.

# Do's and Don'ts: Continued

If only an upper limit were to be measured, would 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.) as summarized in the cover sheet. Check for COMPLETE consistency between the scientific case, the cover sheet and technical justification. 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 can reach the required signal-to-noise ratio in the time requested. In doing this, use the correct formula for your chosen observing method.

Include expected “overheads” in your time request (e.g. set-up, slew and 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  $T_{\text{sys}}$  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 declination range, b) frequencies not covered by an Arecibo receiver, c) observations at the frequencies of strong, unblankable RFIs, and d) impossible set-ups.

If the exact sky location is not important (e.g. for a blind survey), all else being equal, choose the least over-subscribed of celestial regions.

# General Considerations

**NEVER** exceed your page (or figure) limits.

There is an abstract in the cover sheet, so **do not** repeat it at the head of the proposal body.

Get an independent third-party to read your final draft.

Do not use jargon, undefined acronyms, etc.

## Student Participation

Specify at the appropriate place on the cover sheet if your team contains a student for whom the results are central to their thesis research. Include an additional 1-page summary of their thesis proposal. It can only help!

# General Considerations (contd.)

Broader Impacts: Apart from student participation, detail other educational and “public outreach” aspects. An “Outreach abstract” explaining your scientific objective to the general public (in  $\leq 150$  words) is requested on the cover sheet.

Detail the outcome of the PI's recent Arecibo observations in a brief final section of a few sentences, (and/or, when relevant, a publication list).

Large multi-year projects: While specifying the **total** observing time required for the study, request only that needed for the next relevant semester (or 2 semesters, if appropriate). A full progress report should be given in “continuation” proposals.

All large projects ( $\geq 300$  hr) are required to have a web page (URL given in proposal), specifying scientific objectives, current observational and data-release status, etc.

# When you get the Decision on your Proposal

Do not be surprised if a referee 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.

# And After Your Observations

**Please, please, PLEASE**, fill in an Observer's Comment Sheet.  
This is available on-line at;

*[http://www.naic.edu/~astro/obs\\_comment.html](http://www.naic.edu/~astro/obs_comment.html)*

**We do try to listen and act accordingly.**