Understanding The TAC Process: How to Write a Compelling Proposal

Brian Schmidt

The Research School of Astronomy & Astrophysics
the Australian National University

Current Chair of ATNF-TAC

Understanding the TAC process

Every 4 months ATNF calls for proposals for the ATCA, Parkes, Mopra, Tidbinbilla, and VLBI

These proposals are compiled, bound, and sent to the 5 members of the TAC (who are chosen from the Community)

Typically 120 proposals
oversubscription rates 1.5-2.5, depending on the term.

TAC constraints

We typically have 1 week to read the proposals before the meeting

The meeting lasts 2 days, with 12 hours dedicated to reading proposals.

Each proposal is introduced (summarised) by one member of the TAC, discussed, voted on, with comments and grades recorded.

Time Spent on Proposals – Hard Cold Reality

122 proposals: 10 minutes each = 20.3 hrs
25 proposals: 15 minutes prep =   6.3 hrs
                                                27 hrs

TAC meeting: 12 hrs/ 122 proposals = 5m55s each
Introduction, Discussion, Voting, & comment writing.

So Total TAC commitment is one week per term (3 weeks per year)

TAC - Goals

TAC tries its best to Support the Proposals it thinks are most scientifically productive

- Which proposals contribute best to our understanding of the physical world
- Which proposals are likely to generate publications/citations
- Which proposals are strategic – e.g. make the Australian Astronomical Community look good
- Which proposals support students, young astronomers, Australian Astronomers
- Support a portfolio of research types
  - Fields (e.g. Star formation, Cosmology…)
  - Risk – High Risk/Low Risk

TAC –Questions we ask?

What is the scientific output of the project
- Is this interesting? Relevant? Strategic?
- Do we gain a physical understanding?

Why use this facility?
- Why Radio – better at other wavelengths?
- Why this facility – much better at other telescopes?

Is it technically feasible/ appropriate?
- Are Exposure/arrays/frequencies appropriate and correct?
- Is Sample Size appropriate?

Will the proposers do a good job with the data?
- Previous observations reduced/published
- Track record on other work

TAC-things we do not like

Proposals with unclear scientific goal other than observations

Unpublished/unreduced observations from previous runs.

Piling on, also known as Mission Creep.

Highly complex proposals full of TLAs

Proposals with unjustified sample size

Missing critical references to previous work (esp if TAC members')

Not acknowledging other supporting proposals on this and other facilities

Playing to the TAC -Checklist

Executive Summary: Not just an abstract. Tell us in the first ½ page everything we need to know about this proposal.

- What your overarching scientific goals are
- Context to the rest of Astronomy
- Why this facility
- What Observations lead to what scientific understanding
- Is this part of a larger of proposal? (Why? Jog the TACs memory of the proposals details)

Background: What do we know, and how do these observations fit into this knowledge. Does this have relevance to other areas

Scientific Idea: What physics are we testing. Why are your proposed observations critical to further our understanding. Do you need other observations in the future for more objects. Are you adding on to an existing sample, if so, why?

Playing to the TAC – Checklist II

Sample: Why have you chosen this sample. Always justify the number of objects in sample, and Resolution / Frequency/ Signal to Noise Ratio of observations required for scientific goals. Single object proposals need to have a Very strong physical model to be tested to provide relevance.

Technical Justification: What does it take to get the required observations – are there other alternatives on other telescopes/instruments/configurations.

What have you done with previous allocations: Report on previous data taken for this proposal. You might wish to bignote the 37 publications your previous allocation of time generated. You should address why things haven't been published or reduced.

The TAC Spam-Assassin

Unique Object:

Constrain the Physics of:

Measure the Morphology:

Look for Correlations:

TAC isn't evil

TAC isn't perfect – it makes mistakes!

TAC does not have expertise in all fields of astronomy

TAC is not vindictive – it tries to be clinical. We rate proposals in order of merit, and let the scheduler do their best to schedule the highest ranked proposal.

TAC comments are not meant to be cruel – they are meant to represent the comments the TAC made on your proposal. They are meant to help you, not make you feel bad.

TAC wants to see your proposals again, even if rejected, especially if they can address comments. Sometimes it may not be clear what you should do to improve it, In this case, ask the Chair of the TAC for help. That is part of my Job.

Role Playing Exercise – Plagiarised from Paul Francis

SKA-ATNF TAC, 2020

Prof. Smiley-Scythe, ATNF-SKA: Oldest and wisest member of the TAC. Made his name by detailed statistical studies of Masers in the Large Magellanic Clouds.

Dr. Drinkwine, University of Queensland: Dynamicist using HI on high redshift galaxies to study Darkmatter.

Prof. Graham, Australian Research Council: The ARC was unhappy with the TAC process and put this astronomically wise member on to ensure their interests were represented.

Dr Sofa, University of New South Wales: Hot young scientist who studies star formation processes at high redshift.

Dr. Melatonin, University of Melbourne: One of Australia's best theorists, he seems to understand just about every aspect of physics.

Prof Smith, Australian National University: TAC chair, mild mannered, always trying to please everyone. He has seen it all.