
WRITING A GOOD TELESCOPE PROPOSAL

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This talk is based on a previous JCMT Users' Meeting presentation by Ciska Kemper (former JCMT TAC Chair)

JCMT TAC MEMBERSHIP

- TAC: Time Allocation Committee
 - General TAC only, no sub-committees by subject area
 - Size of membership varies: number has been as low as 5 and as high as 12
 - Representatives from multiple EAO partner regions
 - Typical term: ~2 years (Chair: ~3 years)
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OVERALL PROPOSAL EVALUATION PROCESS

- Starts after proposal submission deadline has passed (mid-March & mid-September for normal Calls)
 - All TAC Members read & grade all proposals (unless they are the PI/Co-I)
 - Each proposal reviewed in greater detail by its designated TAC Primary and Secondary Assessor
 - Technical Assessments by EAO Science staff normally provided within about 1 month of proposal submission
 - External reviewers for each proposal nominated by TAC Primary; aim is to obtain at least 1 external review for each proposal
 - TAC Meeting (previously in-person, now fully remote) normally in ~ May & November
 - Final TAC consensus feedback written by TAC Primary, checked by TAC Secondary & TAC Chair
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INDIVIDUAL PROPOSAL EVALUATION PROCESS

- **NOTE:** Due to sheer numbers, TAC typically only spends **~15 minutes** discussing each proposal during meeting (the same amount of time allowed for this presentation!)
 - TAC members not all experts in all fields!
 - JCMT TAC allowed to give modified allocation (more / less time, different weather band, etc.)
 - JCMT TAC typically over-allocates for a semester by **~ 50%** to allow for variations in weather, instrument availability, etc. during a semester
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PUBLICATION STATISTICS VS. TIME REQUESTED

- Historically, each publication (very roughly) represents ~ 30 hours of observing time...
 - Assuming a 50% rate for observational success, it probably still makes sense to aim to produce **1 publication for every 15 hours of observing time**
 - Good rough guideline, but be aware that good, innovative science can still be done with proposals requesting significantly less time as well!
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OVERSUBSCRIPTION A STRONG FUNCTION OF WEATHER BAND!

- Band 1 time scarce; Band 2 usually heavily oversubscribed (by a factor of ~3 - 7!)
- Band 4 & Band 5 often marginally subscribed (or even undersubscribed!) **USE THIS IF YOU CAN!**

| <i>Weather Band</i> | <i>Definition</i> | <i>CSO Tau</i> |
|---------------------|-------------------|----------------------|
| 1 | very dry | $\tau < 0.05$ |
| 2 | dry | $0.05 < \tau < 0.08$ |
| 3 | medium | $0.08 < \tau < 0.12$ |
| 4 | wet | $0.12 < \tau < 0.2$ |
| 5 | very wet | $0.2 < \tau$ |

SUCCESS RATES

Very approximately:

- 1/3 of proposals: Full time allocation
 - Usually highly-ranked proposals & many Band 4 / 5 proposals
 - 1/3 of proposals: Partial time allocation
 - Promising science cases, but observing time requests difficult to allocate (demanding weather conditions, large amounts of time)
 - 1/3 of proposals: Not allocated time
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SO...

HOW DOES ONE WRITE A
GOOD OBSERVING
PROPOSAL?



GENERATE AN IDEA...

- **Start early!**
 - Ideas may follow from **current research**, or detailed **discussions with collaborators**. This works best if one **starts early**.
 - Iteration between scientific goals and **telescope capabilities** will gradually improve the idea. Again, **start early**.
 - **Search archives and literature** for existing data that can address the scientific question partially or completely, or can complement the requested data. And... **start early!**
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FOLLOW INSTRUCTIONS IN CALL FOR PROPOSALS

- For reference, the (now closed) Call for Proposals for semester 21A is available here:
 - <https://proposals.eaobservatory.org/jcmt/semester/16/regular>
 - Content of proposal:
 - Broadly: Science Case, Technical Case (incl. **ITC calculations**) & Other Stuff
 - Any special calibrations? (Normal ones are handled by Observatory)
 - Previous proposals
 - Any data available from JCMT Archive (including Large Programs)? **JCMT Clash Tool** available
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SCIENTIFIC JUSTIFICATION (“SCIENCE CASE”)

Remember: TAC has ~ 15 minutes!

- Background; why is this subject important or interesting for the broader astronomy community?
 - Explain exact question proposal aims to address
 - Explain exactly **how** proposed observations will address this question
 - Justify in detail sample size, map size, & integration times needed. Why exactly this quantity / amount, & not more / less?
 - Try to avoid “*stamp collecting*”!
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OTHER TIPS & TRICKS

- One good approach is writing a proposal in such a way that proposed observations will **distinguish between** two (or more) competing scenarios, models or theories.
 - **Constraining parameter space** of an existing model can also be a good approach, but if using this argument, ensure that any such new constraint is demonstrably worthwhile
 - **Be specific!** Describe analysis steps that will be applied following data acquisition, results expected to be obtained, etc. Avoid vague & overambitious statements (e.g. "*These observations will further our understanding of star formation*")
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OTHER TIPS & TRICKS (2)

- Adhere to font size requirements, page limits, etc. & avoid unnecessary “buzzwords”
 - Some well-chosen figures may say more than a thousand words
 - Use **boldface** to highlight key statements, to help readability. Other typographic tools, such as bullets, may also help.
 - Keep description as simple as possible & be concise (remember: **15 minutes!**)
 - TAC members do not usually have time to follow references, so include all vital information in proposal
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PRIOR PROPOSALS & ONGOING RESEARCH

- If new proposal follows previous successful proposals on same subject, describe their status:
 - Have data been obtained, reduced, analyzed?
 - Relation to current request?
 - How much of that work is already published?

If resubmitting an unsuccessful proposal, take TAC comments into account to improve it!

ON SAMPLE SIZES & INTEGRATION TIMES

- **If time request very large, perhaps apply strategies to reduce total number of hours requested**
 - Reduce sample size?
 - Increase R.M.S. sensitivity (e.g. change observing mode, matched filtering, spectrum rebinning, etc.)?
 - Reduce size of the area to be mapped?
 - Reduce number of molecular line transitions to be observed?
 - Drop one of the two SCUBA-2 continuum bands?
 - Offer TAC options in case allocable time proves scarce

If science goal can still be achieved, do it!
