

# Know your audience

1. Unless it's a Large Program, your reviewers are your peers, with similar expertise (but not often in the exact same area of research).
2. Try to put yourself in a reviewer's shoes as often as possible
  - *Would I understand this if I wasn't the expert?*
  - *And if I had 30 proposals to read, would I care about this specific science case?*
  - *If this wasn't my favourite target, would I care?*
3. Ask your trusted colleagues and research group to read your proposal

# Introduction in short

- **Motivation**
  - *Why do we care?*
- **Specific problem**
  - *What is the specific question you are trying to answer*
- **Context**
  - *Why couldn't previous works solve the problem?*
- **Objectives**
  - *What do we measure? What are we trying to detect?*
- **Strategy**
  - *How are you going about achieving your goal?*

## **Convey excitement!**

If by the end of page 1 the reviewer is not excited about the idea, you will not get a good rank!

# Target justification

- What is the best target to achieve the science goal?
- If the goal is **to resolve something**, it should probably be a close target!
- If the goal is to **detect** something faint, it should be the brightest target that can get you a detection
- If the target is one-of-a-kind, make sure to mention that, but have a specific question to address.

## My take:

If the proposal is written in a way: “this is a cool source, so we need more data on this”; you will not get a good rank.

## Don't expose yourself to easy shot-down points:

- If you require high resolution, could it be done at a lower resolution using a closer target?
- If you ask for three targets, could the same science be done with two or one?
- If you ask for mosaic pointings, are all of them equally necessary?

# Target justification - survey considerations

- **Clear criteria:**
  - *all protostars in a cloud*
  - *all targets brighter than xx mJy*
- **Emphasize quantified improvement**
  - *Tripling the sample size*
  - *Getting certain physical property down to 10% accuracy*

# Duplications - have my target been observed already?

- Matching frequency, angular resolution, coverage, and sensitivity
- Details in Proposer's Guide
- Check the ALMA Archive for projects that have been started and completed
- Check Projects in the Queue as well

## Duplicate Observations

In order to ensure the most efficient use of ALMA, duplicate observations of the same location on the sky with similar observing parameters (frequency, angular resolution, coverage, and sensitivity) are not permitted unless scientifically justified. Details on the duplication policy are provided in [Section 4.4](#) of the Cycle 12 Proposer's Guide and Section 6.3 of the [Users' Policies](#). It is the responsibility of the Principal Investigator (PI) to check their proposed observations against both the ALMA Archive and the spreadsheet provided below to avoid duplicate observations.

The [ALMA Archive](#) contains an up-to-date list of the PI science observations, including Cycle 10 programs that have been started or completed. The spreadsheet "Projects in the Queue" supplements the ALMA archive in that it lists the metadata for Grade A main array science goals, as well as Grade A ACA standalone science goals that have not been completed as of 2025 March 03 and are still in the observing queue. The spreadsheet lists the sensitivity and angular resolution that are expected to be achieved assuming the observations are completed in full. Observations for Grade B and C projects that have not been started by 2025 March 03 will not be used in the duplication checks conducted by ALMA even if observations are obtained later in Cycle 11.

The ongoing list of observations is provided in both Excel Workbook (xlsx) and Comma Separated Variable (CSV) text format. It includes one row for each target, rectangular mosaic, or each pointing in custom mosaics. The spreadsheet content is described at the beginning of the file, and includes target names, coordinates, properties of each spectral window, along with the resolution and sensitivity requested by the PI. A link is provided to a user-contributed python script, which contains functions to search, plot, and display source information contained in the list of ongoing observations. Instructions on how to run the script are provided in the script header. The script is made available on an "as-is" basis for convenience and is not supported by the ALMA Regional Centers (ARCs).

[ALMA Science Archive Query](#)

[Projects in the Queue \(Excel spreadsheet\)](#)

[Projects in the Queue \(CSV text file\)](#)

[Python Script](#)

# Sensitivity considerations

- **Never aim for  $< 3$  sigma detection**
  - *Usually, 5 is a good start, try to be as pessimistic in your assumptions as possible*
- **Show that you thought through how to achieve detection**
  - *Explain if you plan to bin or stack your data*
- **Non-detection is also a result!**
  - *Discuss why the non-detection will be informative and how?*

## **Don't expose yourself to easy shot-down points:**

- Did you take into account all possible reasons why the signal might be fainter than you expect?
- Did you discuss implications of the non-detection?

# Figures and other stylistic points

- Make obvious what is their purpose in the caption
- Simple, clear, easy to read, no tiny labels
- My recommendation is to mix figures with text. Nothing more discouraging than a wall of text.
- **Boldface**, underlines, *cursive*, **boxes** can be helpful, **but don't overdo it**, otherwise they are not serving the purpose.

**Figures** is what your reviewers will use to quickly recall what was the proposal about.

*Because not every single sentence requires a **highlight***

# References

- Essential and diverse references show you have done your research on the topics, and your question is relevant not only to you but to the larger community
- It might be tempting to save space by using numbers instead of names in the referencing style (Tychoniec et al. 2026), but usually this makes the proposal more difficult to read [1].
- It should not be necessary to go to references to understand your proposal.

[1] - Tychoniec et al. 2026

# The main components of the proposal

1. Abstract
2. Scientific Justification
- 3. Observing Tool setup and Technical Justification**  
**-> Talk by Katharina Immer**

# In the scientific justification: keep the essentials

- Why this line (H36 $\alpha$ )?: The intrinsic line flux of a certain submm-RL under some atmospheric condition is not straightforward to predict, which is a risk for highest resolution observations. In this regard, H36 $\alpha$  is a reasonable choice as we already know the line flux (Fig.2). In addition, this line falls to the good atmospheric window (Band 4), which is ideal for long baseline observations.
- Why this spatial resolution (0".036)?: With this highest resolution achievable for H36 $\alpha$ , we can resolve the line-emitting region into 3–4 spatial elements along the north-west direction ( $\sim 2 - 2.5$  pc extent; Fig.2a). Hence we can assess detailed internal spatial and velocity structures.
- Why this  $dV$  (75 km s $^{-1}$ )?: This is the same value as we adopted to extract the line spectrum in Fig.2b, which ensures that this  $dV$  works well as the line is quite broad.
- Why this depth (87  $\mu$ Jy beam $^{-1}$ )?: We will detect the expected line emission within the beam at sufficiently high S/N to model the profile. See details in the following.

[https://www2.nao.ac.jp/~eaarc/Meetings/ALMA\\_PPM2024/files/PPM\\_Cycle11\\_tips\\_TI.pdf](https://www2.nao.ac.jp/~eaarc/Meetings/ALMA_PPM2024/files/PPM_Cycle11_tips_TI.pdf)

# From the guidelines: what the reviewers are looking for?

## 1. Scientific Merit

- Does the proposal clearly indicate which important, outstanding questions will be addressed?
- Will the proposed observations have a high scientific impact on this particular field and address the specific science goals of the proposal?

*Note: ALMA encourages reviewers to consider well-designed high-risk/high-impact proposals even if there is no guarantee of a positive outcome or detection.*

- Does the proposal clearly describe how the data will be analyzed in order to achieve the science goals?

# From the guidelines: what the reviewers are looking for?

## 2. Suitability of Observations

- Is the choice of target (or targets) clearly described and well justified?
- Are the requested signal-to-noise ratio, angular resolution, largest angular scale, and spectral setup sufficient to achieve the science goals well justified?
- Does the proposal justify why new observations are needed to achieve the science goals?
- For Joint Proposals (see the Proposer's Guide), does the proposal clearly describe why observations from multiple observatories are required to achieve the science goals?

*Important:* Base your assessment solely on the content of the proposal according to the above criteria. Proposals may contain references to published papers (including preprints) as per standard practice in scientific literature. Consultation of those references should not, however, be required for a general understanding of the proposal.

# Large Programs

- Longer proposal (7 pages)
- Team expertise to be submitted separately
- The Scientific Justification for Large Programs must include additional information:
  - scheduling feasibility
  - data reduction plan and computing resources
  - data products
  - publication plan

# How does it work in practice

- What resolution (and largest angular scales) is needed for my science case?  
**This determines the ALMA configurations you need.**
- When are the configurations scheduled, and what are the LST ranges?  
**This determines when your source can be observed at a given resolution.**

Yes, it is possible that your desired configuration is not optimal for given sources in this Cycle, so multi-cycle planning is sometimes required!

# Where to find information

## 1. Call for Proposals and Proposers Guide

<https://almascience.eso.org/proposing/proposers-guide>

## 2. ALMA Primer

<https://almascience.eso.org/documents-and-tools/cycle13/alma-science-primer>

## 3. ALMA Technical Handbook

<https://almascience.eso.org/documents-and-tools/cycle13/alma-technical-handbook>

## 4. ALMA User Policies

<https://almascience.eso.org/documents-and-tools/cycle13/alma-user-policies>

## 5. I-TRAIN lectures

<https://almascience.eso.org/tools/eu-arc-network/i-train>

## 6. Helpdesk Knowledgebase

<https://help.almascience.org/kb>

**Did not find an answer?**

Write a ticket / contact your ARC Node

# Sensitivity calculator

## Sensitivity Calculator

The **ALMA Sensitivity Calculator (ASC)** will calculate the necessary integration times for a given sensitivity (or vice versa) for your ALMA observing project. Input and output parameters are explained below, but for an in-depth explanation of how the ASC works, please consult Chapter 9 of the [ALMA Technical Handbook](#).

The ASC has been configured so that inputs are allowed that conform to the final design specification of ALMA e.g. the maximum number of allowed antennas for the 12-m array is 50 and the highest resolution must not exceed that corresponding to a maximum baseline of 16 km. This allows users to prepare for future Cycles.

Please be aware of the following limitations:

- Integration times refer only to the on-source time (no overheads are taken into account)
- For DSB receivers (B9 and 10) the contribution to the system temperature from the image sideband is assumed to be twice that in the signal sideband
- The ASC is not able to add the source contribution to the system temperature and therefore the times for particularly bright sources e.g. planets or the Sun, will be underestimated
- The effects of shadowing are not taken into account

In order for the ASC to work, your browser must have JavaScript enabled.

Common Parameters

Declination	<input type="text" value="00:00:00.00"/>	✓
Polarisation	<input type="text" value="Dual"/>	
Observing Frequency	<input type="text" value="345"/>	GHz ▼
Observing Band	<input type="text" value="ALMA_RB_07"/>	
Bandwidth per Polarization	<input type="text" value="7.500000"/>	GHz ▼
Water Vapour	<input checked="" type="radio"/> Automatic Choice <input type="radio"/> Manual Choice	
Column Density	<input type="text" value="0.913mm (3rd Octile)"/>	
Trx, tau, Tsky	<input type="text" value="72 K, 0.158, 39.538 K"/>	
Tsys	<input type="text" value="153.278 K"/>	

# Sensitivity calculator

## Sensitivity Calculator

The **ALMA Sensitivity Calculator (ASC)** will calculate the necessary integration times for a given sensitivity (or vice versa) for your ALMA observing project. Input and output parameters are explained below, but for an in-depth explanation of how the ASC works, please consult Chapter 9 of the [ALMA Technical Handbook](#).

The ASC has been configured so that inputs are allowed that conform to the final design specification of ALMA e.g. the maximum number of allowed antennas for the 12-m array is 50 and the highest resolution must not exceed that corresponding to a maximum baseline of 16 km. This allows users to prepare for future Cycles.

Please be aware of the following limitations:

- Integration times refer only to the on-source time (no overheads are taken into account)
- For DSB receivers (B9 and 10) the contribution to the system temperature from the image sideband is assumed to be twice that in the signal sideband
- The ASC is not able to add the source contribution to the system temperature and therefore the times for particularly bright sources e.g. planets or the Sun, will be underestimated
- The effects of shadowing are not taken into account

In order for the ASC to work, your browser must have JavaScript enabled.

Common Parameters

Declination	<input type="text" value="00:00:00.00"/>	✓
Polarisation	<input type="text" value="Dual"/>	
Observing Frequency	<input type="text" value="345"/>	GHz ▼
Observing Band	<input type="text" value="ALMA_RB_07"/>	
Bandwidth per Polarization	<input type="text" value="7.500000"/>	GHz ▼
Water Vapour	<input checked="" type="radio"/> Automatic Choice <input type="radio"/> Manual Choice	
Column Density	<input type="text" value="0.913mm (3rd Octile)"/>	
Trx, tau, Tsky	<input type="text" value="72 K, 0.158, 39.538 K"/>	
Tsys	<input type="text" value="153.278 K"/>	

# Do

- **Make the reviewer's job easy:** highlight key points, write a good abstract, and provide useful figures
- Make your proposal **memorable** and **exciting**. The goal is to get the reviewer excited about your idea, even if this is not their immediate field of expertise.
- Take into account feedback from previous cycles, but remember that it will be read by different group of experts
- Proofread your proposal several times
- Send it to the co-Investigator in advance; everybody likely has their own proposals



# Don't

- Reduce the font size or adjust margins of the template
- Reveal your or your co-I's identities
- Set range of resolution and plan to narrow it down later on
- Be vague: "improve our understanding", "help to constrain models"
- Oversell your proposal: "holy grail", "rosetta stone" are rarely applicable and they raise doubts



# Use of Generative AI

*Proposal preparation: Investigators may use GAI to assist with proposal preparation tasks, such as refining and organizing text. Investigators are fully responsible for:*

- Ensuring that any content produced with GAI is scientifically accurate, original, and free from plagiarism.*
- Properly citing all original source material referenced in content created using GAI, in accordance with academic standards.*

## **My advice:**

- Don't ask AI to generate your citations. In most cases, it is hallucinating, and a few things trigger reviewers more than a made-up citation. But if you do it, then you probably deserve a 10 anyway (priv. comm.)

<https://almascience.eso.org/documents-and-tools/cycle12/alma-user-policies>

# Reviewing ALMA proposal

- For each submitted proposal (except Large Program) you will have to review 10 proposals, if you want your proposal to be considered
- If you don't have a PhD, you will need a mentor
- Just treat other proposals like you would like your proposal to be treated: be professional, read it carefully, allocate enough time in advance, provide constructive feedback, focus on the proposal not on the proposers, don't try to guess proposer's identity.

# Reviewing ALMA proposal

- Summary not necessary but it gives PI some confidence you understood the proposal and didn't for example mixed it with other proposal in the pool (which is sometimes a suspicion)
- List strenghts, what did you like about the proposal
- List weaknesses, with suggestions for improvements
- Don't try to find flaws in proposal, it's fine to state:  
*No weaknesses, but others were slightly more compelling*

# Reviewing ALMA proposal

- Summary not necessary but it gives PI some confidence you understood the proposal and didn't for example mixed it with other proposal in the pool (which is sometimes a suspicion)
- List strenghts, what did you like about the proposal
- List weaknesses, with suggestions for improvements
- Don't try to find flaws in proposal, it's fine to state:  
*No weaknesses, but others were slightly more compelling*
- Pay attention to the grading: **1 is the best and 10 is the worst**