



# ALMA Cycle 10 Proposal Preparation Workshop

Presented by Allegro Fellows

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EUROPEAN ARC

ALMA Regional Centre || Allegro

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# Introduction to ALMA

Aida Ahmadi



# ALMA at the Chajnantor plateau in the **Atacama Desert** in **Chile**

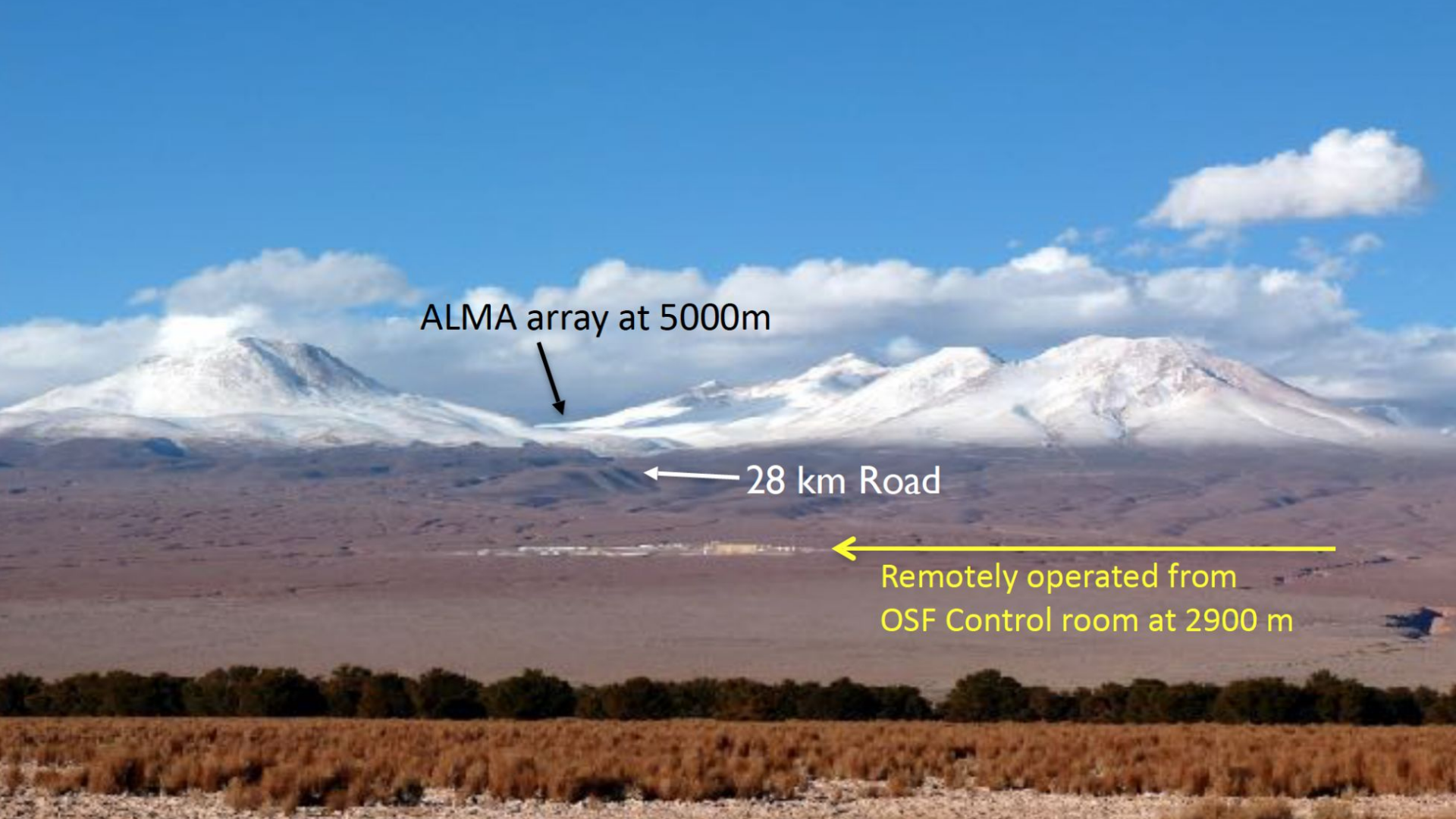




# ALMA at the Chajnantor plateau in the **Atacama Desert** in **Chile**







ALMA array at 5000m



← 28 km Road



Remotely operated from  
OSF Control room at 2900 m

## The Main Array: 50x 12-m antennas





**The Main Array:** 50x 12-m antennas

**The ALMA Compact Array (ACA):** 12x 7-m antennas





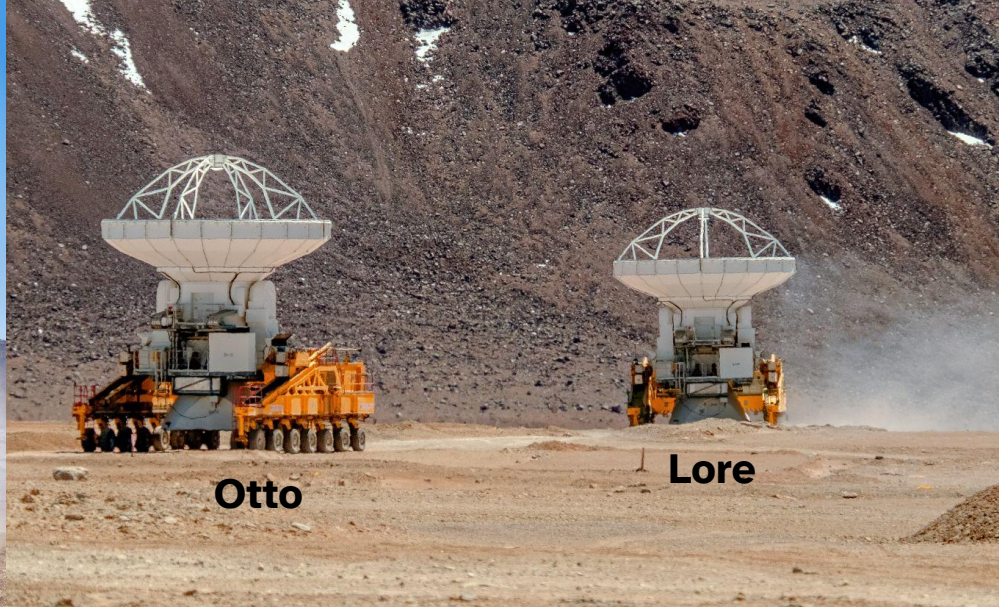
**The Main Array:** 50x 12-m antennas

**The ALMA Compact Array (ACA):** 12x 7-m antennas

**The Total Power (TP) Array:** 4x 12-m antennas







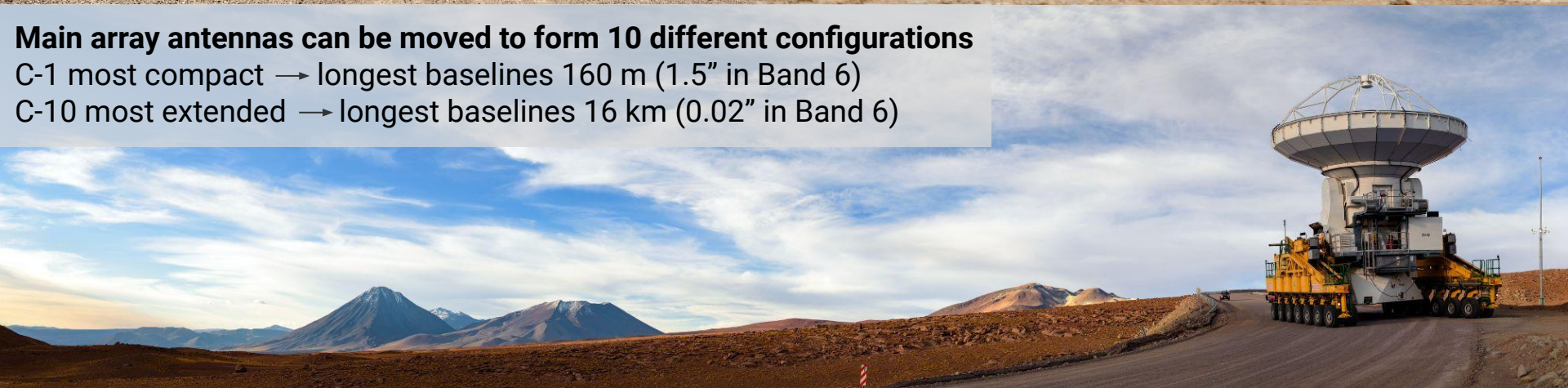
Otto

Lore

**Main array antennas can be moved to form 10 different configurations**

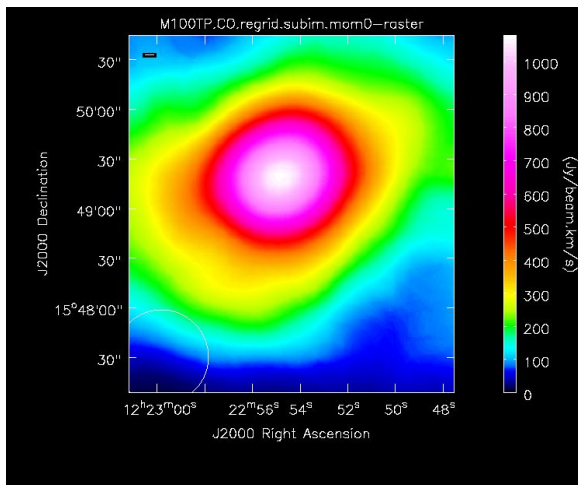
C-1 most compact → longest baselines 160 m (1.5" in Band 6)

C-10 most extended → longest baselines 16 km (0.02" in Band 6)

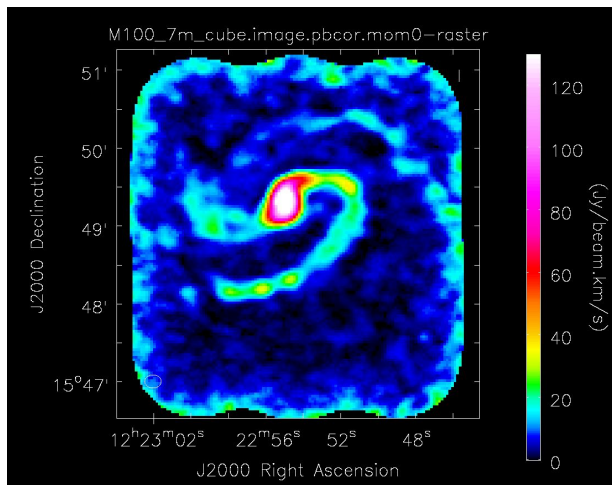


# Observations at various scales

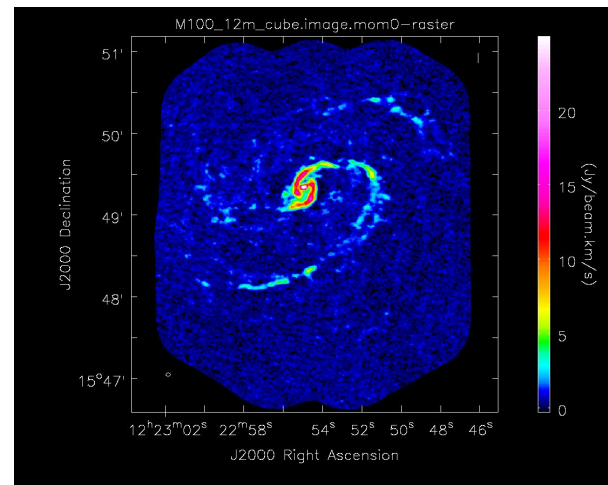
Total Power



7-m array (ACA)



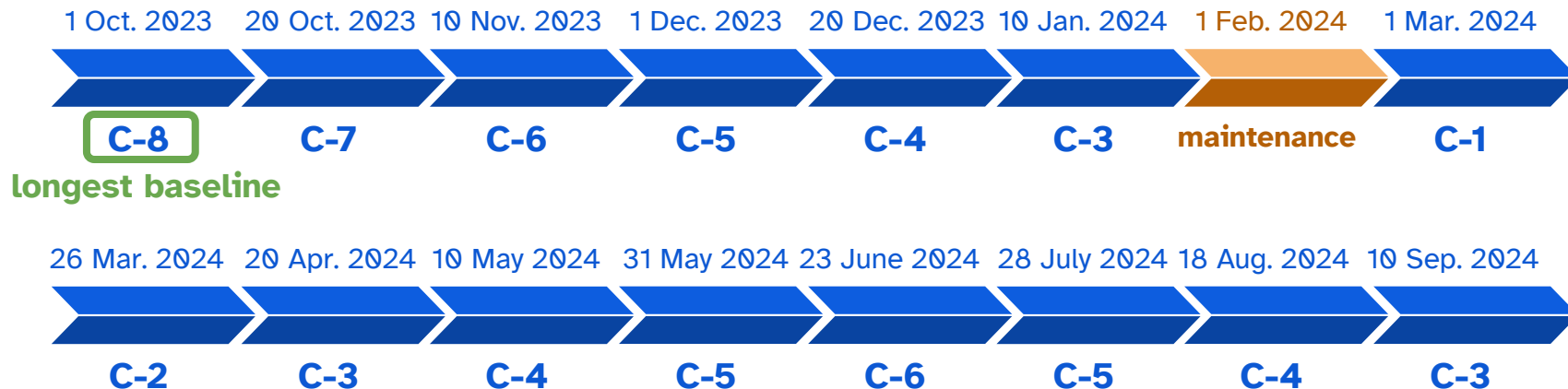
12-m array





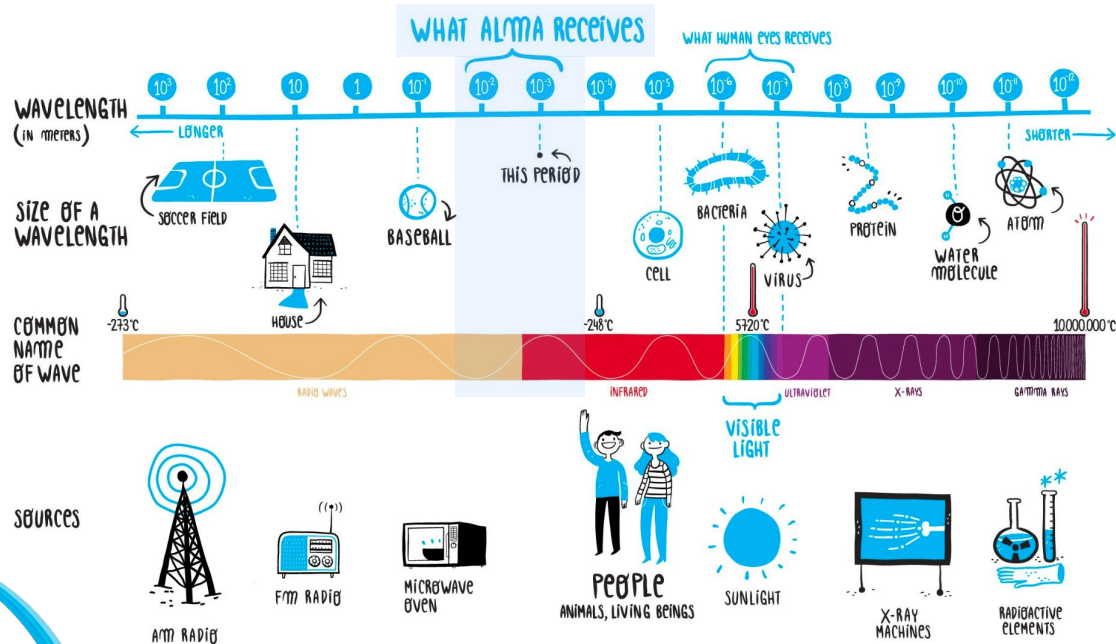


# Configuration schedule - Cycle 10



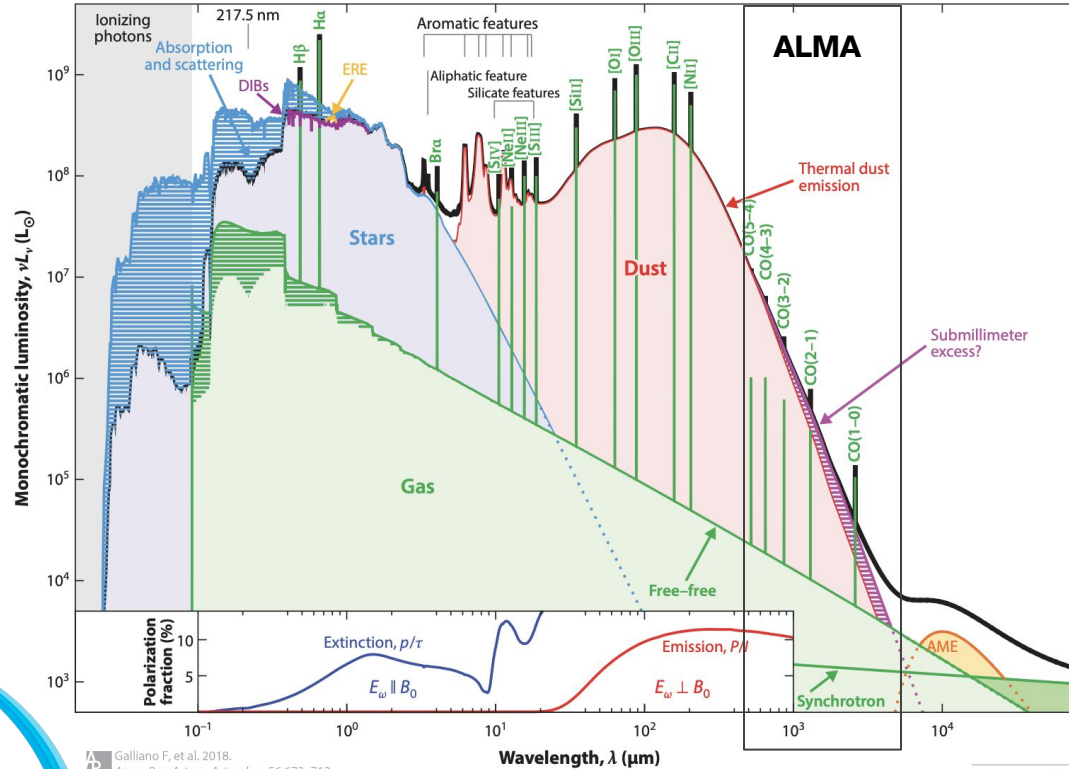
# What does ALMA see?

## THE ELECTROMAGNETIC SPECTRUM





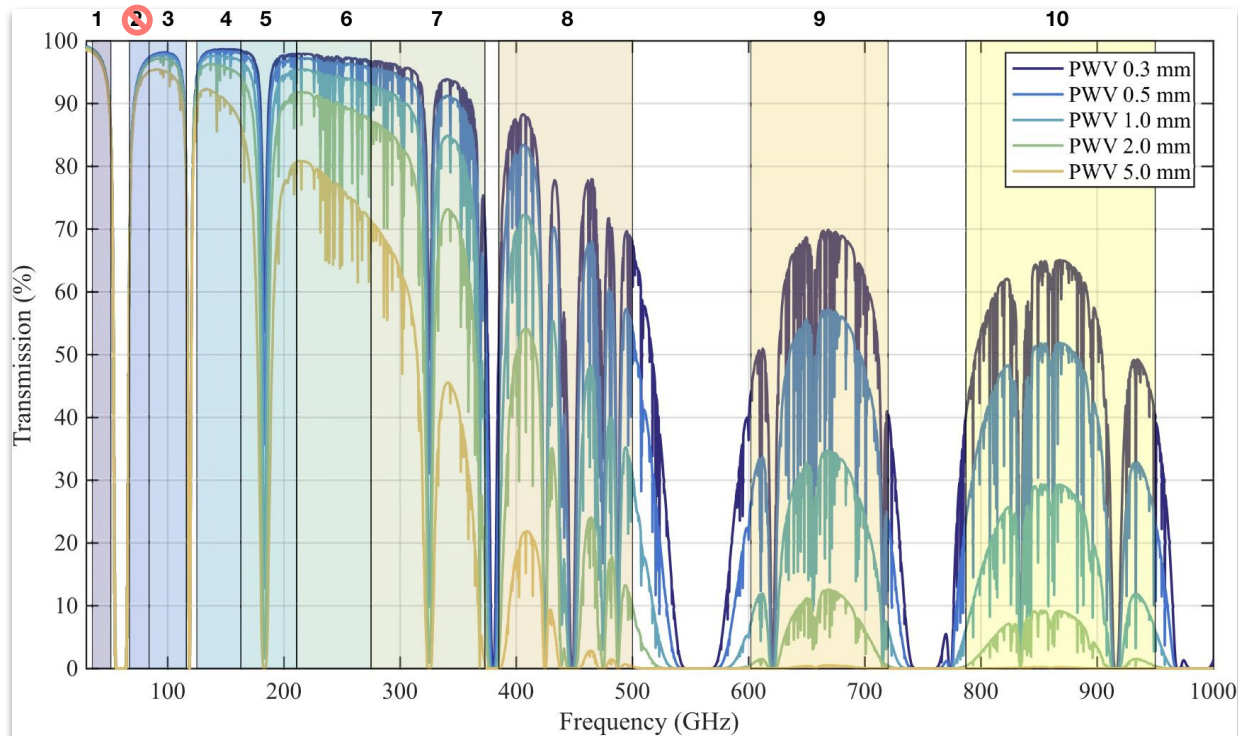
# What can ALMA see?



# Atmospheric Transmission & ALMA Bands


new in Cycle 10

Band	$\nu$ (GHz)	$\lambda$ (mm)
1	35 – 50	8.5 – 6
3	84 – 116	3.6 – 2.6
4	125 – 163	2.4 – 1.8
5, 6, 7	158 – 373	1.9 – 0.8
8	385 – 500	0.78 – 0.60
9	602 – 720	0.50 – 0.42
10	787 – 950	0.38 – 0.32





A circular image showing a bright, textured surface, likely a celestial body like a planet or moon, with a prominent bright spot in the center. The image is predominantly orange and yellow, with darker, mottled regions. The bright spot in the center is surrounded by a darker, more textured area. The overall appearance is that of a high-contrast, possibly infrared or ultraviolet, image of a celestial object.



R Aql

ATOMIUM

Figure 1 is a  $^{13}\text{C}$  NMR spectrum of the FAUST L1551 IRS5. The x-axis represents the chemical shift in ppm, ranging from 233 to 234.6. The y-axis represents the intensity, with a scale from 0 to 20. The spectrum shows a dense collection of peaks, with several labeled with chemical structures. The labels are color-coded: red for  $\text{CH}_3\text{OH}$ ,  $\text{CH}_2\text{DOH}$ ,  $\text{HCOOCH}_3$ ,  $\text{CH}_3\text{CH}_2\text{OH}$ , and  $\text{CH}_2\text{DOH}$ ; and blue for  $\text{CH}_3\text{OH}$ ,  $\text{CH}_2\text{DOH}$ ,  $\text{HCOOCH}_3$ ,  $\text{CH}_3\text{CH}_2\text{OH}$ , and  $\text{CH}_2\text{DOH}$ . The spectrum is a complex series of peaks, with some labeled in red and others in blue.

ALMA Science Primer for more: <https://almascience.eso.org/proposing/early-science-primer>



# Proposal types

- **Regular**
  - Projects requesting < 50 hours on the 12-m Array or < 150 hours on the 7-m Array
- **Large Programs**
  - Projects requesting > 50 hours on the 12-m Array (with or without accompanying ACA time) or > 150 hours on the 7-m Array in stand-alone mode
- **Target of Opportunity (ToO)** for certain classes of astronomical transient events that occur at frequent and unpredictable intervals (e.g. gamma ray bursts)
- **mm-VLBI** and **Phased Array** proposals (anticipated to be in March/April 2024)
- **Joint Proposals** (partnered with JWST, VLA, & VLT)





# Submission procedure

ALMA proposals consist of **two parts**:

1. The **technical details** that are set up in the ALMA Observing Tool (OT)
2. The **Scientific Justification** that must be uploaded in the OT:
  - 4 pages for Regular, ToO, VLBI, Phased Array, and DDT proposals
  - 6 pages for Large Programs
  - Must follow certain rules (e.g. be anonymised)
  - Formatting templates available: <https://almascience.eso.org/proposing/proposal-template>
  - Tips for writing a good proposal:
    - I-TRAIN presentation:  
[https://almascience.eso.org/euarcdata/itrain13/HowToWriteReview\\_ITRAIN.pdf](https://almascience.eso.org/euarcdata/itrain13/HowToWriteReview_ITRAIN.pdf)
    - I-TRAIN video: <https://www.youtube.com/watch?v=FP8H-ObMMnU>



# Duplicate observations

- **Duplicate observations** of the same location on the sky with similar observing parameters (frequency, angular resolution, coverage, and sensitivity) are **not permitted!**
- It is the responsibility of the proposers to check for duplicates:
  - For more information see:  
<https://almascience.eso.org/proposing/duplications>
  - Check the ALMA Science Archive: <https://almascience.eso.org/aq/>
  - Use ALminer: a Python-based code to effectively query, analyse, and visualize the ALMA science archive <https://alminer.readthedocs.io/>







# **ALMA Science Archive**

## **Live demo**

**<https://almascience.eso.org/aq/>**



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# Dual Anonymous Review Process

Andrés Pérez-Sánchez







# Dual anonymous review process

- In order to **reduce the systematic bias** during the selection of the proposals, ALMA requires all proposals to be written in the anonymous fashion:
  - The reviewers of the proposal do not know who is in the proposal team, and the proposal team do not know who is reviewing the proposal.
- The primary goal of the dual anonymous process is to ensure reviewers will **focus on the scientific merits of the proposals**, rather than on the proposal team members/“prestige”.



# Dual anonymous review process

A number of studies reported the results of the analysis of the **final proposal rankings** for different telescope facilities:

- Gender-Related Systematics in the **HST** Proposal Selection. (**Reid 2014**)
- Gender Systematics in Telescope Time Allocation at **ESO**. (**Patat 2016**)
- Gender-Related Systematics in the **NRAO** and **ALMA** Proposal Review Processes. (**Lonsdale et al. 2016**)
- Systematics in the **ALMA** Proposal Review Rankings. (**Carpenter 2020, Carpenter et al. 2022**)

## Bias identified:

- Gender.
- Experienced vs Young Researchers.
- Demographic or Regional affiliation.





# The anonymous fashion

- **General guidelines** <https://almascience.eso.org/proposing/alma-proposal-review/dual-anonymous>
- It is the responsibility of the proposers to **ensure anonymity of all team members in the proposal**.



# The anonymous fashion

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- It is the responsibility of the proposers to **ensure anonymity of all team members in the proposal**.
- Use **third person** and **neutral wording** when referring to your work.
  - “In Pérez et al. (1997), we demonstrated...”
  - “As demonstrated in Pérez et al. (1997)...”



# The anonymous fashion

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- Use **third person** and **neutral wording** when referring to your work.
  - “In Pérez et al. (1997), we demonstrated...”
  - “As demonstrated in Pérez et al. (1997)...”
- **Do not self-identify** when mentioning your previous proposals.
  - “The data from our pilot study (2022.1.01770.S, P.I. Durango)”
  - “The data from program (2022.1.01770.S)”





# The anonymous fashion

- **General guidelines** <https://almascience.eso.org/proposing/alma-proposal-review/dual-anonymous>
- It is the responsibility of the proposers to **ensure anonymity of all team members in the proposal**.
- Reference to **Software**
  - Public: Normal citation.
  - Private Software: Cite as “obtained via **private communication**”. **Do not include name after.**
    - We use our group’s archive mining tool ALminer...
    - We use the archive mining tool ALminer...

# The Observing Tool

Ashley Bemis



# Cycle 10 OT Resources

[https://almascience.eso.org/  
documents-and-tools](https://almascience.eso.org/documents-and-tools)

## Phase 1 & 2

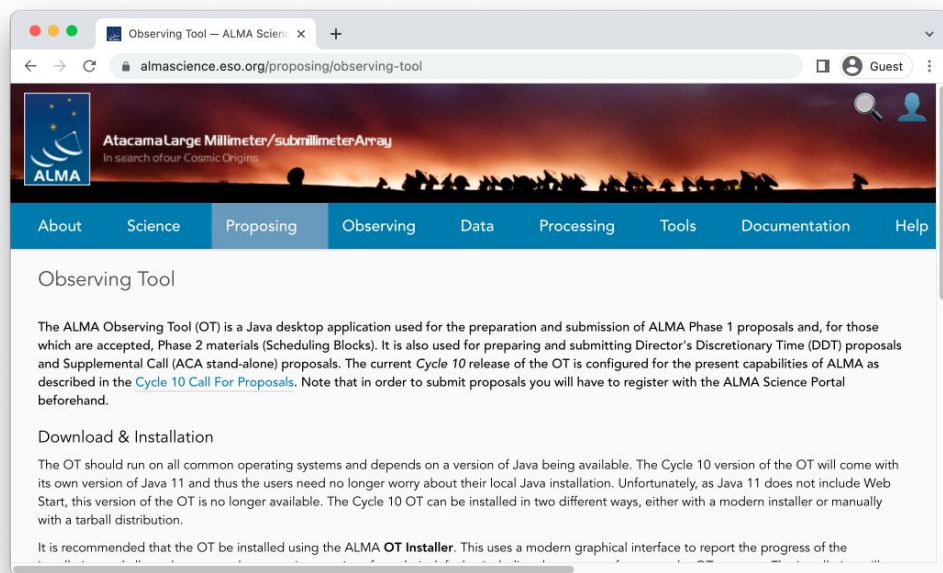
ALMA Phase 1 (observing proposal) and Phase 2 (telescope runfiles for accepted proposals) materials are submitted through the [ALMA Observing Tool \(OT\)](#). Below are documentation which will aid the created and submitted of Phase 1 and Phase 2 with the OT.

Document	Description
<a href="#">OT Quickstart</a>	A Quick Start Guide for using the Observing Tool
<a href="#">OT User Manual</a>	Describes how to use the Observing Tool for preparing ALMA proposals
<a href="#">OT Reference Manual</a>	An in-depth description of the Observing Tool
<a href="#">Video Tutorials</a>	Video how-to for the Observing Tool
<a href="#">Known OT issues</a>	For those instances when OT problems are encountered
<a href="#">Phase 2 Quickstart Guide</a>	A Quick Start Guide for approved ALMA observing proposals - the process of Phase 2
<a href="#">A User's Guide to ALMA Scheduling Blocks</a>	(Cycle 4) Guide to understanding the structure and content of ALMA Scheduling Blocks (SBs) using the Observing Tool (OT)





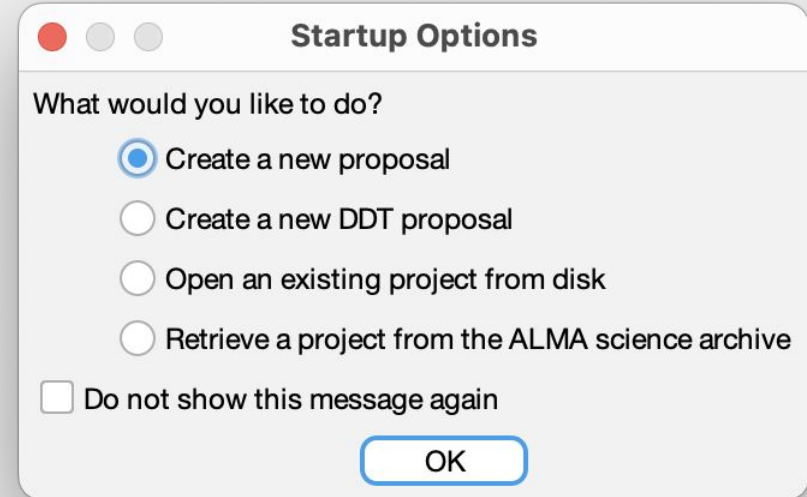
# Acquiring the OT



<https://almascience.eso.org/proposing/observing-tool>

- Download installer or tarball, recommendation: installer
- No automatic updates
  - OT will notify when one is available

# Main Startup Options



1. **Create a new proposal:** Start from scratch
2. **Retrieve project from archive:** download previously submitted project, save, & **use as template**

# First Steps

ALMA Observing Tool (Cycle 10 (Phase1)) - Project

File Edit View Tool Search Help Perspective 1

Project Structure

Unsubmitted Proposal

Project

Proposal

Proposals Program Spectral Spatial

Proposal Type

☒ Regular ☐ Target Of Opportunity ☐ VLBI

☐ Large Program ☐ Phased Array

Scientific Category

☐ Cosmology and the High Redshift Universe ☒ Galaxies and Galactic Nuclei ☐ ISM, star formation and astrochemistry

☐ Circumstellar disks, exoplanets and the solar system ☐ Stellar Evolution and the Sun

Please select one or two keywords

Starbursts, star formation

Active Galactic Nuclei (AGN)/Quasars (QSO)

Spiral galaxies

Merging and interacting galaxies

Surveys of galaxies

Student project ☐

Joint Proposals

Is this a Joint Proposal? ☐ Yes ☒ No

Investigators

Type	Full name	Email	Affiliation	ALMA ID
PI	Not set	Not set	Not set	Not set

## Project & Proposal

- Select PI, add co-Is
- Basic proposal information
  - Title, Abstract
  - Proposal Type
  - Scientific Category Keywords
- Designate Reviewer
- Justify duplicate observations
  - **Check the ALMA archive!**
- Attach scientific justification

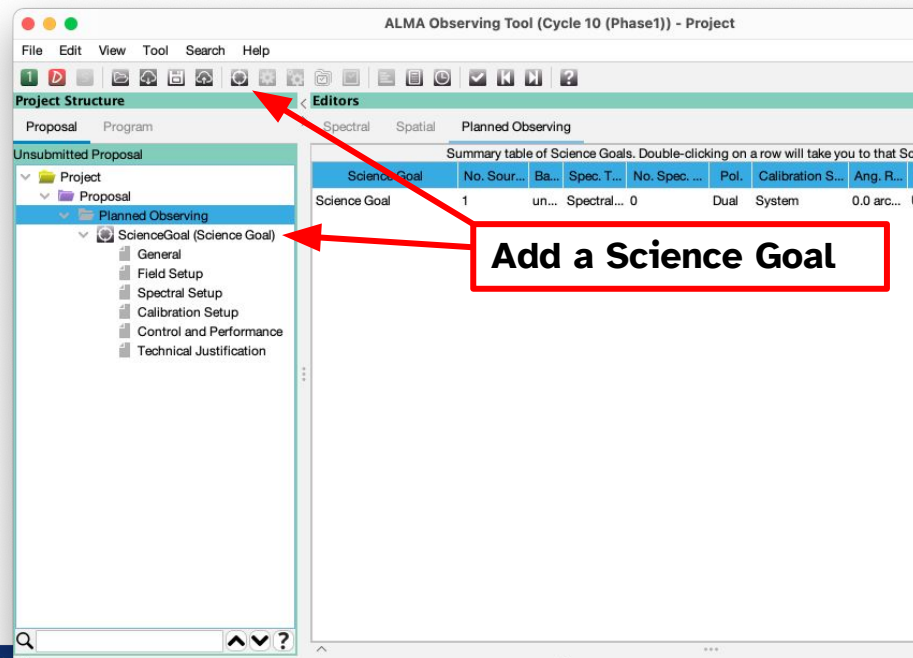


# Set Reviewer



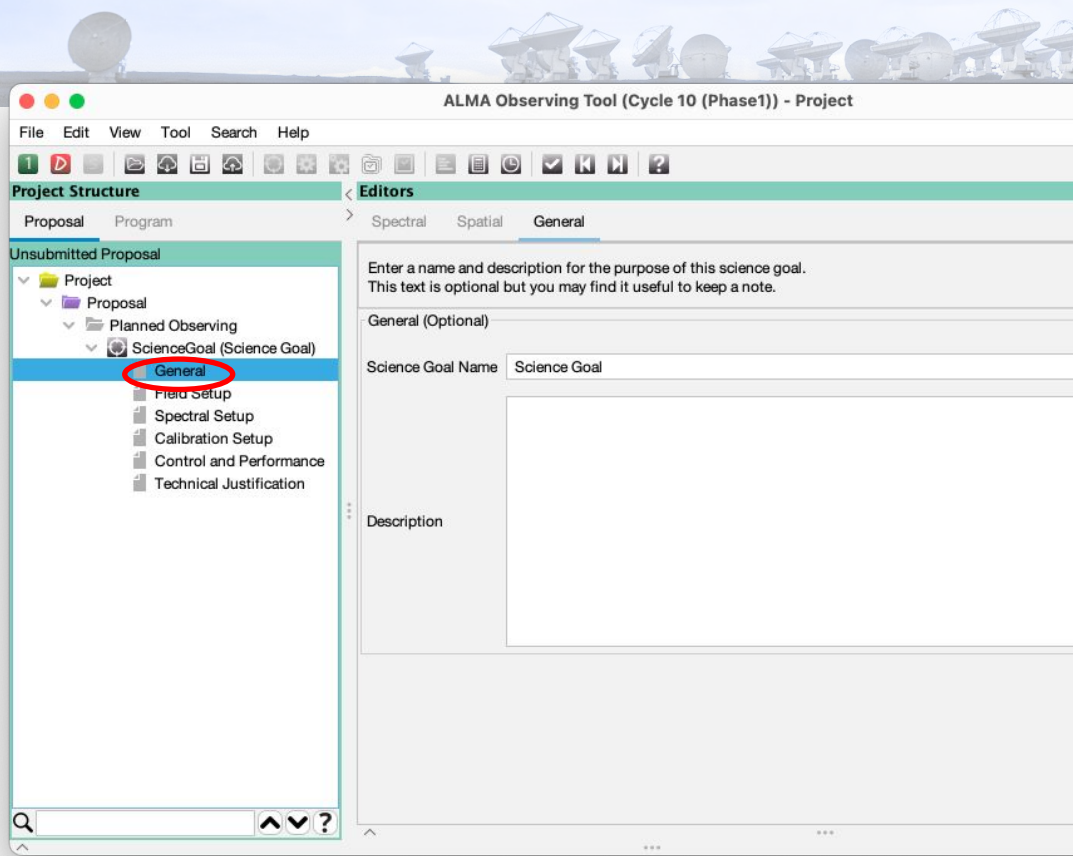
- **Choose reviewer among CO-Is:**  
Recommendation: **review no more than 30 proposals, max 50**
- **Reviewer without PhD:** ensure a mentor is chosen, does not have to be CO-I

# Setting up a Science Goal



## Science Goal:

1. General
2. Field Setup
3. Spectral Setup
4. Calibration
5. Control and Performance
6. Technical Justification



# General

- Give each Science Goal a unique name
- Add description



# Field Setup

- Input source information
  - Coordinates
  - Source properties
- Adjust pointings / mosaic

ALMA Observing System Software (OSS) Field Setup window.

**Project Structure:**

- Project
  - Proposal
    - Planned Observing
      - ScienceGoal (Science Goal)
        - General
          - Field Setup**
          - Spectral Setup
          - Calibration Setup
          - Control and Performance
          - Technical Justification

**Spatial Image:**

Image File Name: shley1.jsky3/cache/jsky18219018830734678864.fits

FOV Parameters

Representative Frequency (Sky): 114.617 GHz

**Antennae:**

Source

Source Name: Antennae

Choose a Solar System Object? ☐ Name of object: Unspecified

System: ICRS Sexagesimal display? ☒

Source Coordinates

RA: 12:01:53.1700

Dec: -18:52:37.920

Source Radial Velocity

1705.000 km/s hel z 0.005703533 Doppler Type RELATIVISTIC

Target Type

☐ Individual Pointing(s) ☒ 1 Rectangular Field

Expected Source Properties

Peak Continuum Flux Density per Synthesized Beam: 0.00000 Jy

Continuum Linear Polarization: 0.0 per cent

Continuum Circular Polarization: 0.0 per cent

Peak Line Flux Density per Synthesized Beam: 0.00000 Jy

Line Width: 0.00000 km/s

Line Linear Polarization: 0.0 per cent

Line Circular Polarization: 0.0 per cent

Rectangle

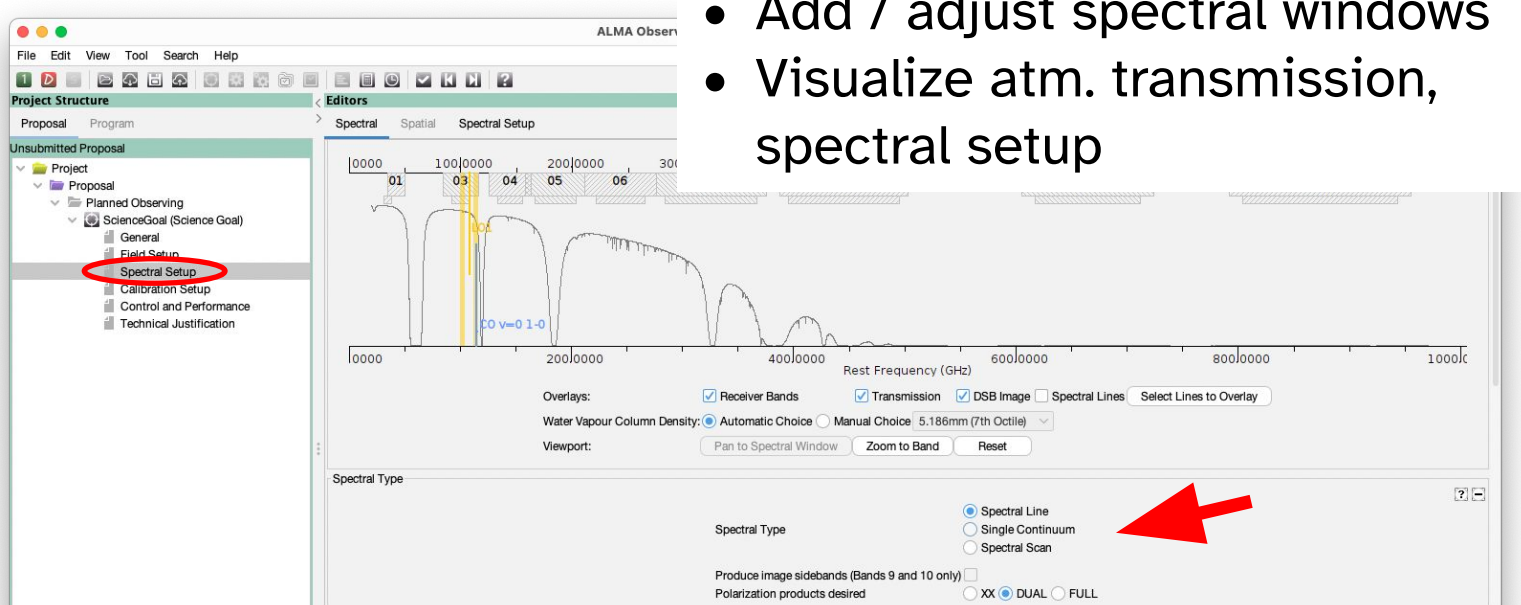
Coords Type: ☒ Relative ☐ Absolute

Field Centre Coordinates

Offset(Longitude): -3.68369 arcsec

# Spectral Setup

- Select Spectral Type
- Polarization
- Add / adjust spectral windows
- Visualize atm. transmission, spectral setup



# Spectral Setup (cont'd.)

- Four basebands
- Can have 4 SPWS each
- Input SPW manually OR
- Center on spectral line

The screenshot displays the ALMA Spectral Setup interface. On the left, the 'Project Structure' pane shows a tree view with 'Spectral Setup' highlighted. The main area is divided into two panes: 'Editors' and 'Spectral Setup'. The 'Spectral Setup' pane shows four basebands. Baseband-1 is populated with a spectral window centered on a spectral line.

Fraction	Centre Freq (rest, hel)	Centre Freq (sky, hel)	Transition	Bandwidth, Resolution (smoothed)	Spec. Avg.	Representative Window
1(Full)	115.27120 GHz	114.61748 GHz	CO v=0 1-0	234.375 MHz( 613 km/s), 976.563 kHz( 2.554 km/s) (4-bit)	4	<input checked="" type="radio"/>

Buttons for Baseband-1: Add spectral window centred on a spectral line, Add spectral window manually, Delete, ☐ Show image spectral windows

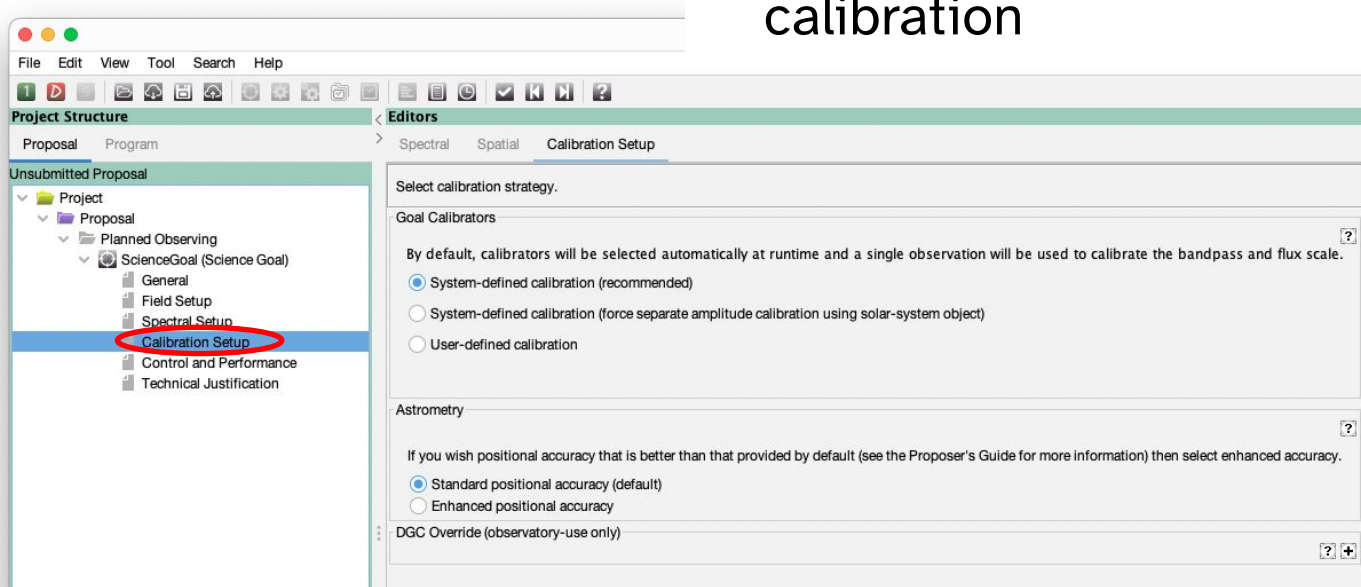
Buttons for Baseband-2: Add spectral window centred on a spectral line, Add spectral window manually, Delete, ☐ Show image spectral windows

Buttons for Baseband-3: Add spectral window centred on a spectral line, Add spectral window manually, Delete, ☐ Show image spectral windows

Buttons for Baseband-4: Add spectral window centred on a spectral line, Add spectral window manually, Delete, ☐ Show image spectral windows

# Calibration Setup

- In most cases, keep default calibration
- Must justify user-defined calibration





# Control and Performance

proposal

Planned Observing

ScienceGoal (Science Goal)

General

Field Setup

Spectral Setup

Calibration Setup

Control and Performance

Technical Justification

## Configuration Information

Antenna Beamsize ( $1.13 \cdot \lambda / D$ )	12m	50.803 arcsec	7m	87.091 arcsec	
Number of Antennas	12m	43	7m	10	TP 3
ACA 7m configuration      Most compact 12m configuration      Most extended 12m configuration					
Longest baseline		0.049 km	0.161 km	8.548 km	
Synthesized beamsize		10.987 arcsec	2.955 arcsec	0.085 arcsec	
Shortest baseline		0.009 km	0.015 km	0.113 km	
Maximum recoverable scale		58.298 arcsec	24.893 arcsec	1.242 arcsec	

## Desired Performance

Desired Angular Resolution (Synthesized Beam) ☒ Single ☐ Range ☐ Any ☐ Standalone ACA

0.40000 arcsec

Largest Angular Structure in source

70.00000 arcsec

Desired mosaic sensitivity

0.5 K equivalent to

Bandwidth used for Sensitivity

User Frequency Width 5.00000 km/s

Override OT's sensitivity-based time estimate (must be justified)

☐ Yes ☒ No

Science Goal Breakdown:

time estimate, clustering, beam and configurations

Planning and Time Estimate

Simultaneous 12-m and ACA observations

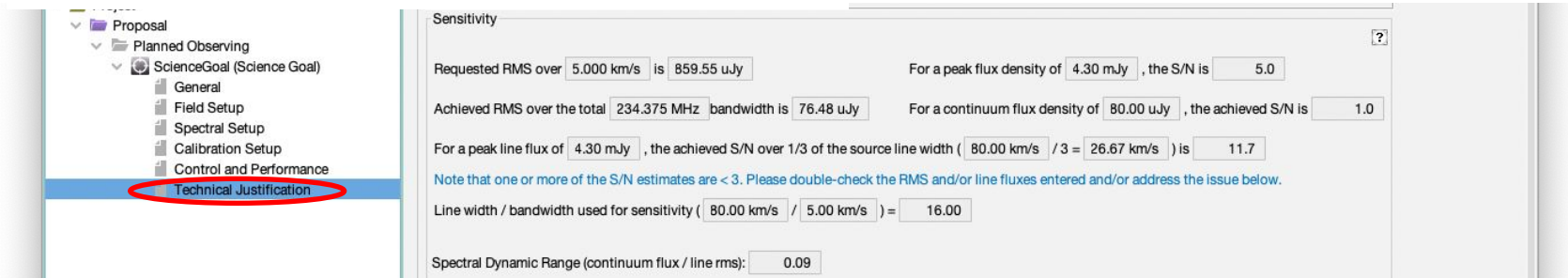
☐ Yes ☒ No

Are the observations time-constrained?

☐ Yes ☒ No

- Choose Resolution + LAS
- Specify sensitivity per specified bandwidth
- Get time estimate + required array configs.

# Technical Justification



**Proposal**

- Planned Observing
  - ScienceGoal (Science Goal)
    - General
    - Field Setup
    - Spectral Setup
    - Calibration Setup
    - Control and Performance
    - Technical Justification**

**Sensitivity**

Requested RMS over 5.000 km/s is 859.55 uJy

Achieved RMS over the total 234.375 MHz bandwidth is 76.48 uJy

For a peak flux density of 4.30 mJy, the S/N is 5.0

For a continuum flux density of 80.00 uJy, the achieved S/N is 1.0

For a peak line flux of 4.30 mJy, the achieved S/N over 1/3 of the source line width ( 80.00 km/s / 3 = 26.67 km/s ) is 11.7

Note that one or more of the S/N estimates are < 3. Please double-check the RMS and/or line fluxes entered and/or address the issue below.

Line width / bandwidth used for sensitivity ( 80.00 km/s / 5.00 km/s ) = 16.00

Spectral Dynamic Range (continuum flux / line rms): 0.09

- Justify RMS and requested S/N
  - Explain how you determined required sensitivity
  - Do you achieve your science goals with this?
- Justify angular resolution and LAS
  - What spatial scale do you need to resolve in your source?
  - Is there large scale emission?
- Justify correlator setup + spectral resolution

ALMA Observing Tool (Cycle 10 (Phase1)) - Project

File Edit View Tool Search Help

Perspective 1

**Project Structure**

Proposal Program

Unsubmitted Proposal

Project

Proposal

Planned Observing

ScienceGoal (Science Goal)

General

Field Setup

Spectral Setup

Calibration Setup

Control and Performance

Technical Justification

**Editors**

Spectral Spatial Proposal

Proposal Information

Validate your proposal and check for issues / errors

Proposal Type

Regular

Large

Scientific Category

Cosmic

Redshift

Circumgalactic

exoplanet system

Results shown here

Must fix before submission!

**Feedback**

Validation Validation History Log

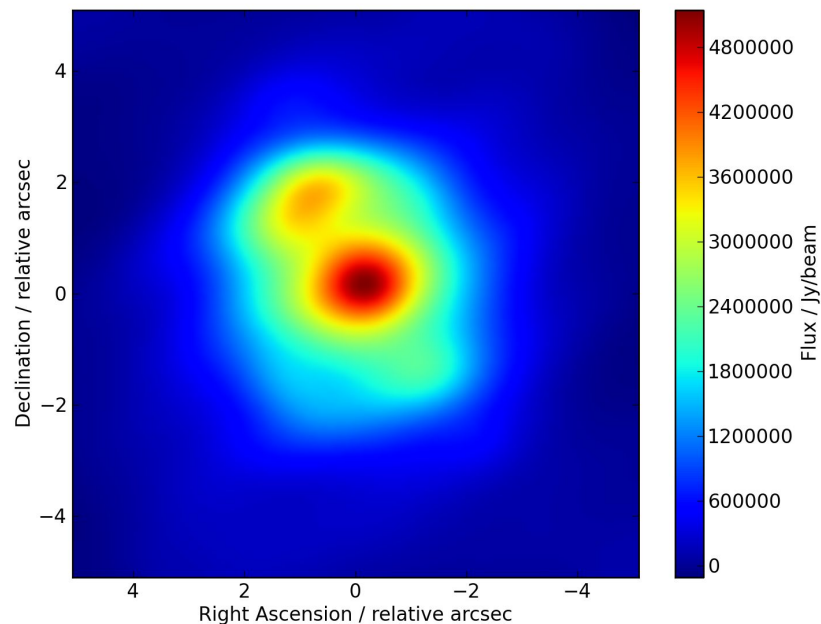
8 errors, 2 warnings : double-click on each row to be taken to the problem

Description	Suggestion
No Principal Investigator specified	Select the top level Project node in the tree and fill in the Principal Investigator field
No Project Name specified	Select the top level Project node in the tree and fill in the Project Name field
Abstract appears to be empty	Select the proposal node in the Proposal tab and edit your abstract
No document found - you must add a Science Case to your proposal	Select the proposal node in the Proposal tab and add your document
No reviewer has been defined	Please select a reviewer from the list of investigators
Not all basebands have been used	Adding wide spectral windows in empty basebands can improve calibration



# ALMA simulations

Alex Hygate







# Why simulate your proposed observations?

- Determine proposal feasibility
- Investigate different observing setups
- Improve proposal quality



# What you need to simulate

- Basic source properties
  - Flux
  - Sky position
- A source model
- Observing setup
  - Desired resolution
  - Observing frequency
  - Desired sensitivity
  - Observing time
  - Atmospheric pwv

Intrinsic to the source



# What you need to simulate

- Basic source properties

- Flux
- Sky position

Intrinsic to the source

- A source model

E.g. a simulation, model or image of a similar source

- Observing setup

- Desired resolution
- Observing frequency
- Desired sensitivity
- Observing time
- Atmospheric pwv



# What you need to simulate

- Basic source properties

- Flux
- Sky position

Intrinsic to the source

- A source model

E.g. a simulation, model or image of a similar source

- Observing setup

- Desired resolution
- Observing frequency
- Desired sensitivity
- Observing time
- Atmospheric pwv

Enter **these** into the ALMA sensitivity calculator or the observing tool to get **these**





# Simulation tools

- 3 options:

- 1) Observation Support Tool (website)
- 2) simalma (CASA task)
- 3) simobserve + simanalyze (CASA tasks)

More control

Greater ease  
of use



# Simulation tools

- 3 options:

1) **Observation Support Tool (website)**

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More control



Greater ease  
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# Observation Support Tool (OST)

Web tool <http://almaost.ib.man.ac.uk/>

- Easy to use
- Minimal computing needs (only needs a web browser)
- Requires internet access
- Reliant on website availability
- May need to wait in the queue...

[http://almaost.ib.man.ac.uk/cgi-bin/almaost/aa\\_status\\_v3](http://almaost.ib.man.ac.uk/cgi-bin/almaost/aa_status_v3)

ALMA  
EUROPEAN ARC  
ALMA Regional Centre || UK

ALMA Observation Support Tool

Version 9.0

OST NEWS HELP QUEUE LIBRARY ACKNOWLEDGE ALMA HELPDESK

WARNING: Issues with Gmail accounts. (more info). OST Team

Array Setup:

Instrument: ALMA

Select the desired ALMA antenna configuration.  
Full ALMA means the simulations will be done with the full capabilities ALMA will achieve in the future (e.g. observing with 50 antennas, or Band 10 Configuration 10 observations); some of these may not yet be offered in the current cycle.  
Selecting cycle-specific configurations will simulate the capabilities of ALMA in that cycle, and therefore some observations might be restricted (you will be notified if this is the case). Please, refer to the ALMA documentation for each cycle capabilities.

Sky Setup:

Source model: OST Library: M51

Choose a library source model or supply your own.

Upload: Browse... No file selected.

You may upload your own model here (max 10MB). This must be a FITS file with the extension .fits included in the name of the file, e.g. model.fits.

Declination: -95d00m00.0s

Ensure correct formatting of this string (+/-00d00m00.0s).

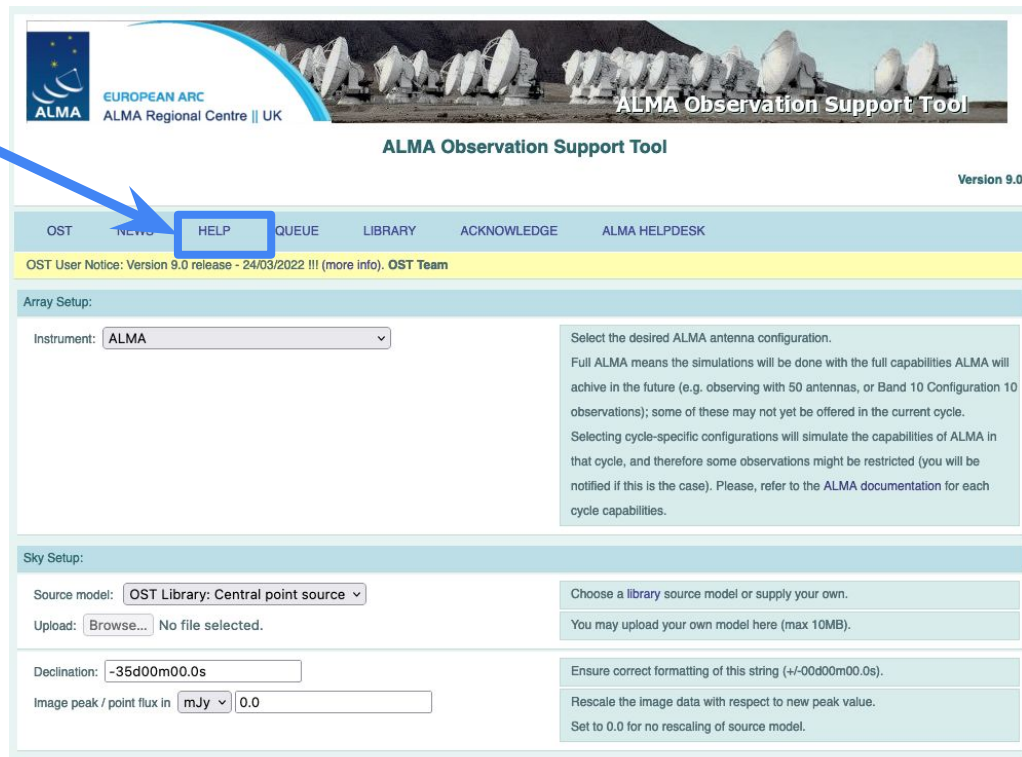
Image peak / point flux in mJy 0.0

Rescale the image data with respect to new peak value.  
Set to 0.0 for no rescaling of source model.

# Observation Support Tool (OST)

- Detailed help pages:

<http://almaost.jb.man.ac.uk/help/>



The screenshot shows the ALMA Observation Support Tool (OST) interface. At the top, there is a banner with the ALMA logo, the text "EUROPEAN ARC ALMA Regional Centre || UK", and a photograph of the ALMA observatory. The title "ALMA Observation Support Tool" is displayed in the top right corner, along with "Version 9.0". Below the banner is a navigation bar with links: OST, NEWS, HELP (highlighted with a blue box and a blue arrow), QUEUE, LIBRARY, ACKNOWLEDGE, and ALMA HELPDESK. A yellow banner below the navigation bar reads "OST User Notice: Version 9.0 release - 24/03/2022 !!! (more info). OST Team". The main content area is divided into two sections: "Array Setup:" and "Sky Setup:". The "Array Setup:" section includes a dropdown menu for "Instrument" set to "ALMA" and a text box for "Select the desired ALMA antenna configuration." with a detailed explanation of ALMA capabilities. The "Sky Setup:" section includes a dropdown menu for "Source model" set to "OST Library: Central point source", a "Browse..." button for uploading a model, and text boxes for "Declination" (set to "-35d00m00.0s") and "Image peak / point flux in" (set to "mJy" and "0.0"). There are also instructions for ensuring correct formatting and rescaling of the image data.



# Observation Support Tool (OST)

- Detailed help pages:  
<http://almaost.jb.man.ac.uk/help/>
- E.g. what is image peak flux?  
<http://almaost.jb.man.ac.uk/help/#impeak>

ALMA

EUROPEAN ARC  
ALMA Regional Centre || UK

ALMA Observation Support Tool

ALMA Observation Support Tool

Version 9.0

OST NEWS **HELP** QUEUE LIBRARY ACKNOWLEDGE ALMA HELPDESK

OST User Notice: Version 9.0 release - 24/03/2022 !!! (more info). OST Team

Array Setup:

Instrument: ALMA

Select the desired ALMA antenna configuration.  
Full ALMA means the simulations will be done with the full capabilities ALMA will achieve in the future (e.g. observing with 50 antennas, or Band 10 Configuration 10 observations); some of these may not yet be offered in the current cycle.  
Selecting cycle-specific configurations will simulate the capabilities of ALMA in that cycle, and therefore some observations might be restricted (you will be notified if this is the case). Please, refer to the ALMA documentation for each cycle capabilities.

Sky Setup:

Source model: OST Library: Central point source

Upload: Browse... No file selected.

Declination: -35d00m00.0s

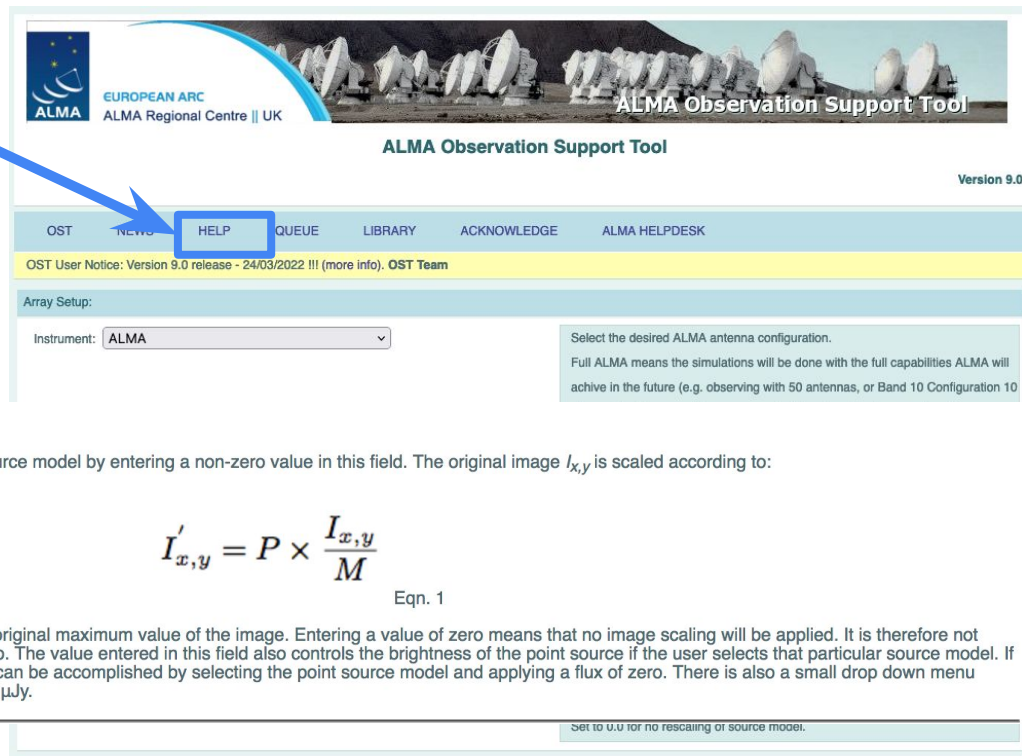
Image peak / point flux in mJy 0.0

Choose a library source model or supply your own.  
You may upload your own model here (max 10MB).

Ensure correct formatting of this string (+/-00d00m00.0s).  
Rescale the image data with respect to new peak value.  
Set to 0.0 for no rescaling of source model.

# Observation Support Tool (OST)

- Detailed help pages:  
<http://almaost.jb.man.ac.uk/help/>
- E.g. what is image peak flux?  
<http://almaost.jb.man.ac.uk/help/#impeak>



ALMA EUROPEAN ARC ALMA Regional Centre || UK

ALMA Observation Support Tool

Version 9.0

OST NEWS **HELP** QUEUE LIBRARY ACKNOWLEDGE ALMA HELPDESK

OST User Notice: Version 9.0 release - 24/03/2022 !!! (more info). OST Team

Array Setup:

Instrument: ALMA

Select the desired ALMA antenna configuration.  
Full ALMA means the simulations will be done with the full capabilities ALMA will achieve in the future (e.g. observing with 50 antennas, or Band 10 Configuration 10)

**Image Peak / Point Flux**

The user can arbitrarily scale the brightness of the source model by entering a non-zero value in this field. The original image  $I_{x,y}$  is scaled according to:

$$I'_{x,y} = P \times \frac{I_{x,y}}{M}$$

Eqn. 1

where  $P$  is the value entered in the field and  $M$  is the original maximum value of the image. Entering a value of zero means that no image scaling will be applied. It is therefore not possible to scale an image such that all pixels are zero. The value entered in this field also controls the brightness of the point source if the user selects that particular source model. If a simulation of a pure noise field is required then this can be accomplished by selecting the point source model and applying a flux of zero. There is also a small drop down menu which selects the unit of the value entered: Jy, mJy or  $\mu$ Jy.

Set to 0.0 for no rescaling of source model.



# Observation Support Tool (OST)

Submission:

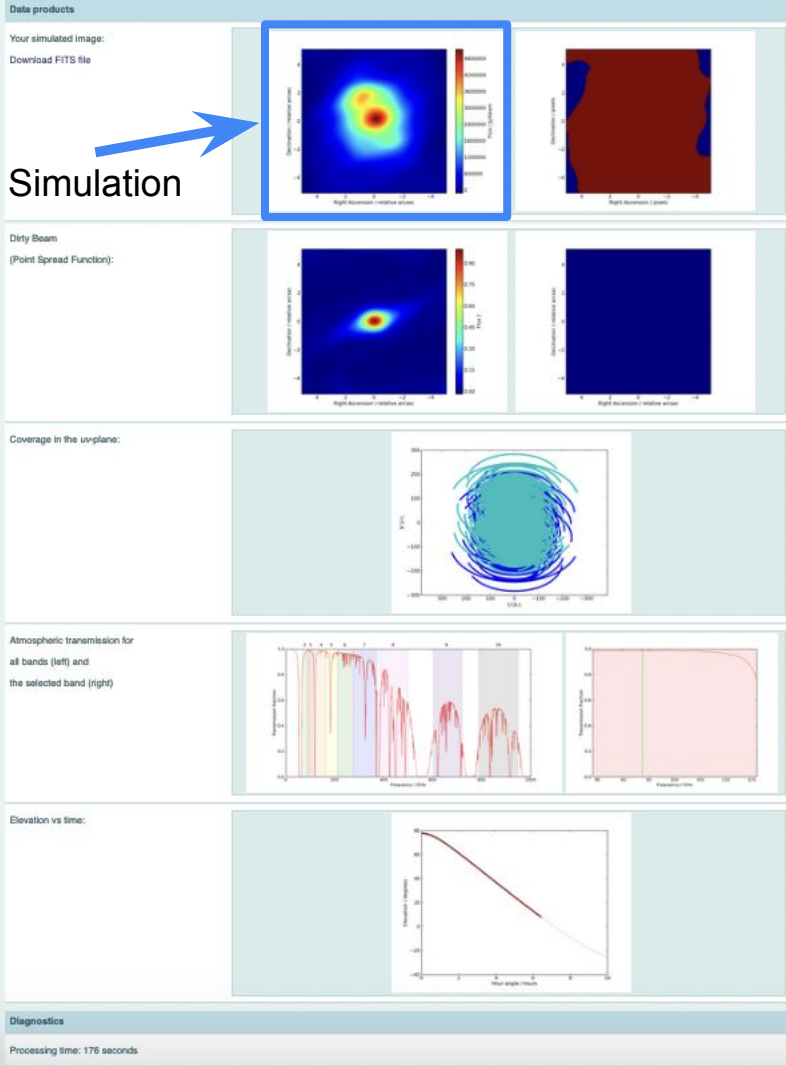
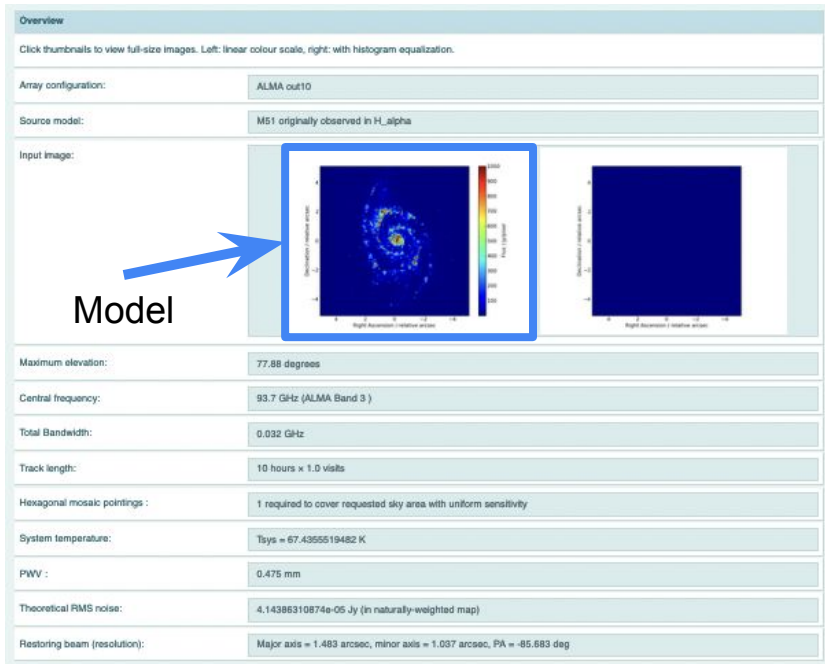
Your email address is

(Information on how we use your email address here).

Warning: gmail accounts don't  
currently work  
-> use a different e-mail!



# OST results



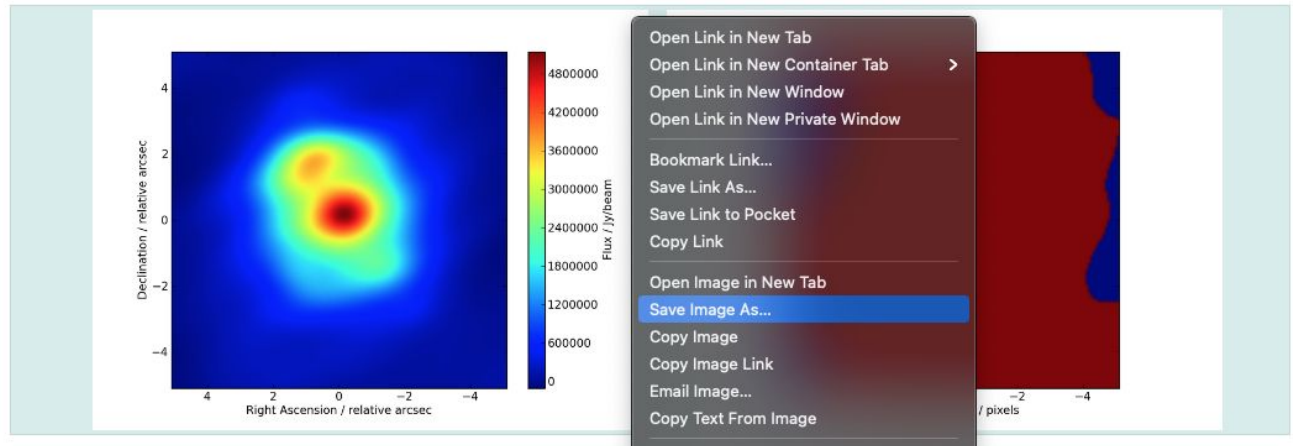


# OST results

## Data products

Your simulated image:

[Download FITS file](#)



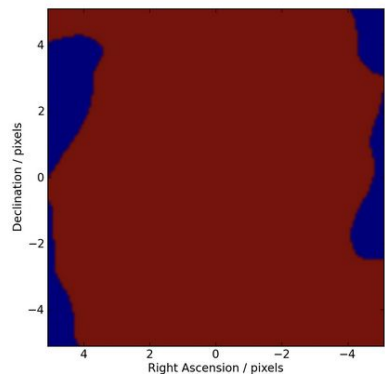
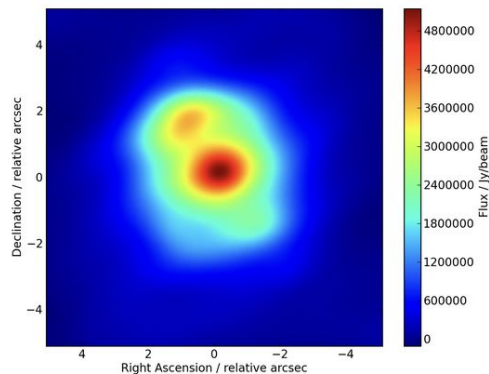
**A plot of your simulated image is ready to  
download and include in your proposal!**

# OST results

## Data products

Your simulated image:

[Download FITS file](#)



Or download the **FITS file** for custom plotting

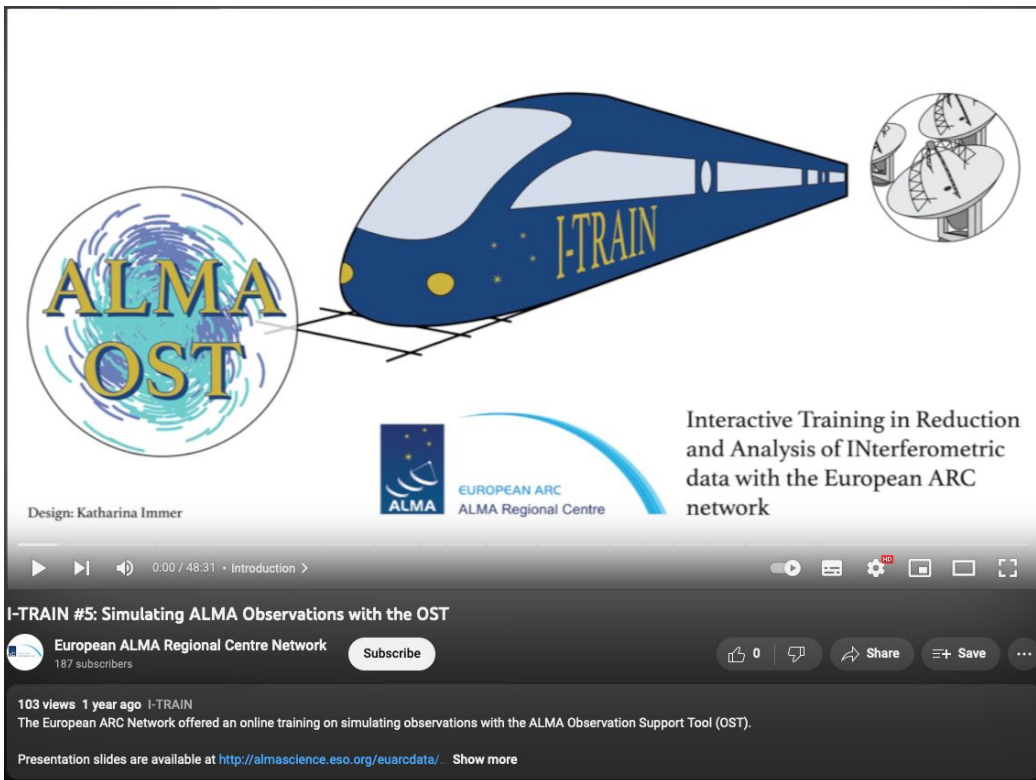
# OST video tutorial

Video:

- [https://www.youtube.com/watch?v=nXqIj2\\_JYEK](https://www.youtube.com/watch?v=nXqIj2_JYEK)

Slides:

- [https://almascience.eso.org/euarcdata/itrain05/OST\\_iTRAIN.pdf](https://almascience.eso.org/euarcdata/itrain05/OST_iTRAIN.pdf)





# Simulation tools

- 3 options:

- 1) Observation Support Tool (website)

- 2) **simalma (CASA task)**

- 3) simobserve + simanalyze (CASA tasks)

More control

Greater ease  
of use





# Simalma

- Simulate on your own computer
- Some limitations (but should cover most cases)
- Casaguide tutorial:  
[https://casaguides.nrao.edu/index.php?title=Simalma\\_\(CASA\\_6.4.1\)](https://casaguides.nrao.edu/index.php?title=Simalma_(CASA_6.4.1))
- See full details of the task:  
<https://casadocs.readthedocs.io/en/stable/api/tt/casatasks.simulation.simalma.html>



# Simulation tools

- 3 options:


- 1) Observation Support Tool (website)

- 2) simalma (CASA task)

- 3) **simobserve + simanalyze (CASA tasks)**

More control

Greater ease  
of use



# Simobserve + Simanalyze

- More flexibility :
  - Not limited to ALMA - e.g. simulate the VLA (for dual proposals!)
  - Control more settings of atmospheric noise corruption
- More effort to simulate
  - More settings that you can get wrong!
  - **If you want quick results the OST or simalma may be a better choice!**
- Worked tutorial (only available for CASA 5):

[https://casaguides.nrao.edu/index.php?title=Protoplanetary\\_Disk\\_Simulation\\_\(CASA\\_5.4\)](https://casaguides.nrao.edu/index.php?title=Protoplanetary_Disk_Simulation_(CASA_5.4))

# CASA simulations video tutorial

Video:

- <https://www.youtube.com/watch?v=XlKH8XMDmHI>



The video player interface shows a video titled "ALMA simulations with CASA". The video content features a blue high-speed train labeled "I-TRAIN" moving from left to right. To the left of the train is a circular image of a spiral galaxy, and to the right is a circular inset showing three ALMA radio telescope antennas. The video player includes a play button, a progress bar, and various control icons. Below the video player, the video title "I-TRAIN #15: ALMA simulations with CASA" is displayed, followed by the channel name "European ALMA Regional Centre Network" with 187 subscribers. A "Subscribe" button is present. The video has 111 views and was uploaded 9 months ago. The description states: "In this training you will learn how to use CASA to produce simulated (mock) ALMA datasets in various formats, and for various array configurations (or combinations thereof). There are three levels at which this can be done: using the CASA tools directly (which requires relatively low-level programming), using CASA tasks (which only require input parameters), or using an online browser-based interface to these tasks which is build and designed by the UK ARC node: the OST. Several example input files and scri: Show more".

ALMA simulations with CASA

I-TRAIN

Interactive Training in Reduction and Analysis of Interferometric data with the European ARC network

Design Katha In 00:50:48

ALMA EUROPEAN ARC ALMA Regional Centre

I-TRAIN #15: ALMA simulations with CASA

European ALMA Regional Centre Network 187 subscribers

Subscribe

111 views 9 months ago I-TRAIN

In this training you will learn how to use CASA to produce simulated (mock) ALMA datasets in various formats, and for various array configurations (or combinations thereof). There are three levels at which this can be done: using the CASA tools directly (which requires relatively low-level programming), using CASA tasks (which only require input parameters), or using an online browser-based interface to these tasks which is build and designed by the UK ARC node: the OST. Several example input files and scri: Show more





# A note about noise & time calculations

- Noise can differ between the ALMA Sensitivity Calculator/observing tool the OST and casa simulations.
- You should use the observing tool noise for your technical justification, not the simulated noise
  - <https://almascience.eso.org/proposing/sensitivity-calculator>

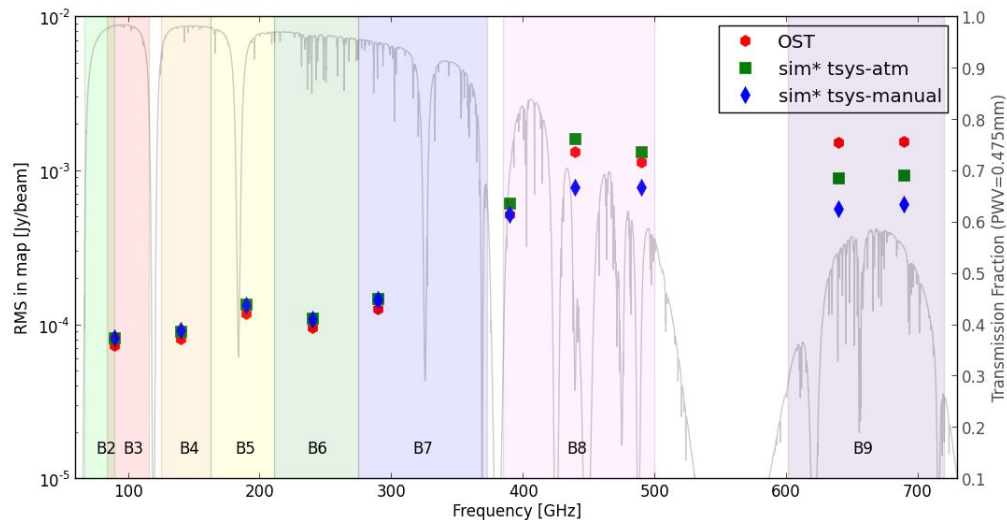


Image from: <https://almaost.jb.man.ac.uk/help/#noise>



# ALMA Simulations Resources

- Observation Support Tool (OST) <http://almaost.ib.man.ac.uk/>
  - Help pages: <http://almaost.ib.man.ac.uk/help/>
  - Extended video tutorial: [https://www.youtube.com/watch?v=nXqIi2\\_JYEk](https://www.youtube.com/watch?v=nXqIi2_JYEk)
- CASA documentation: <https://casa.nrao.edu/casadocs/latest/>
  - CASA simulations in general: <https://casadocs.readthedocs.io/en/stable/notebooks/simulation.html>
  - simalma: [https://casa.nrao.edu/casadocs/latest/global-task-list/task\\_simalma/about](https://casa.nrao.edu/casadocs/latest/global-task-list/task_simalma/about)
  - simobserve: [https://casa.nrao.edu/casadocs/latest/global-task-list/task\\_simobserve/about](https://casa.nrao.edu/casadocs/latest/global-task-list/task_simobserve/about)
  - simanalyze: [https://casa.nrao.edu/casadocs/latest/global-task-list/task\\_simanalyze/about](https://casa.nrao.edu/casadocs/latest/global-task-list/task_simanalyze/about)
- CASA guides: [https://casaguides.nrao.edu/index.php?title=Simulating\\_Observations\\_in\\_CASA\\_5.4](https://casaguides.nrao.edu/index.php?title=Simulating_Observations_in_CASA_5.4)
  - (some guides available in CASA 6 versions, others are only available in CASA 5 versions)
  - simalma: [https://casaguides.nrao.edu/index.php?title=Simalma\\_\(CASA\\_6.4.1\)](https://casaguides.nrao.edu/index.php?title=Simalma_(CASA_6.4.1))
  - simobserve+ simanalyze  
[https://casaguides.nrao.edu/index.php?title=Protoplanetary\\_Disk\\_Simulation\\_\(CASA\\_5.4\)](https://casaguides.nrao.edu/index.php?title=Protoplanetary_Disk_Simulation_(CASA_5.4))
- CASA simulations video tutorial: <https://www.youtube.com/watch?v=XIKH8XMDmHI>
- Download CASA: [https://casa.nrao.edu/casa\\_obtaining.shtml](https://casa.nrao.edu/casa_obtaining.shtml)

➔ **Allegro maintains CASA installations on our computers, which can be used for simulations**

**Contact us at [alma@strw.leidenuniv.nl](mailto:alma@strw.leidenuniv.nl) with questions or requests for assistance with simulating your proposed ALMA observations**



# Distributed peer review

Alex Hygate



EUROPEAN ARC

ALMA Regional Centre || Allegro



# Reviewer assignment rules

- Each proposal must designate someone (usually the PI) to review 1 proposal set (10 proposals) for all proposals except large programmes
  - A large programme is >50 hours 12m time (regardless of 7m time) or 150 hours of standalone 7m time



# Reviewer assignment rules

- Each proposal must designate someone (usually the PI) to review 1 proposal set (10 proposals) for all proposals except large programmes
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- You can review a maximum of 5 proposal sets (50 proposals), but the recommended maximum is 3 proposal sets (30 proposals)
  - If you have more than 5 proposals you must designate (willing!) co-Is as the reviewer





# Reviewer assignment rules

- Each proposal must designate someone (usually the PI) to review 1 proposal set (10 proposals) for all proposals except large programmes
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- You can review a maximum of 5 proposal sets (50 proposals), but the recommended maximum is 3 proposal sets (30 proposals)
  - If you have more than 5 proposals you must designate (willing!) co-Is as the reviewer
- If you don't have a PhD, you must either:
  - Designate a mentor with a PhD (e.g. your PhD supervisor).
  - Designate a (willing!) co-I to do the reviews.



# Mentor guidelines

Reviewers participating in the distributed review process who do not have a PhD are required to have a mentor who will assist with the proposal review. The mentors are specified in the OT when preparing the proposal. In general, the role of the mentor is to provide whatever guidance is necessary for the reviewer during the review process. They have access to the proposals and the reviews of their mentees through the Reviewer Tool in read-only mode.

Specific roles of a mentor include:

1. Work with the reviewer to declare any conflicts of interest on the assigned proposals. The conflicts of interest criteria apply to both the reviewer and the mentor.
2. Provide advice to the reviewer as needed on the scientific assessment of the proposals.
3. Provide guidance to the reviewer on providing constructive feedback to the PIs.
4. Review the comments to the PI before they are submitted.

<https://almascience.eso.org/proposing/alma-proposal-review/guidelines-for-reviewers#guidementors>

# Expertise areas

- ALMA account page:  
<https://asa.alma.cl/UserRegistration/secure/updateAccount.jsp>
- Select your expertise areas so that you get appropriate proposals
- Set your expertise areas by 16 May 2023, 15:00 UTC

Atacama Large Millimeter/submillimeter Array  
In search of our Cosmic Origins

ESO NRAO NAOJ

Account info Project delegation Demographics **Expertise** Conflicts of interest Confirm

**Expertise**

Please select the category/keyword pair/s that best match your scientific expertise. You may select keywords in more than one category.  
If you are a reviewer for Distributed Peer Review (DPR) you will preferentially be assigned proposals that match your selected keywords.

☒ Cosmology and the High Redshift Universe

☐ Lyman Alpha Emitters/Blobs (LAE/LAB)

☐ Lyman Break Galaxies (LBG)

☐ Starburst galaxies

☒ Sub-mm Galaxies (SMG)

☐ High-z Active Galactic Nuclei (AGN)

☐ Gravitational lenses

☐ Damped Lyman Alpha (DLA) systems

☐ Cosmic Microwave Background (CMB)/Sunyaev-Zel'dovich Effect (SZE)

☐ Galaxy structure & evolution

☐ Gamma Ray Bursts (GRB)

☐ Galaxy Clusters

> Galaxies and Galactic Nuclei

> ISM, star formation and astrochemistry

> Circumstellar disks, exoplanets and the solar system

> Stellar Evolution and the Sun

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# Expertise areas

- ALMA account page:  
<https://asa.alma.cl/UserRegistration/secure/updateAccount.jsp>
- You cannot use the tabs to navigate the webpage, only the arrows in the top right

Atacama Large Millimeter/submillimeter Array  
In search of our Cosmic Origins

ESO NRAO NAOJ

Account info Project delegation Demographics **Expertise** Conflicts of interest Confirm

**Expertise**

Please select the category/keyword pair/s that best match your scientific expertise. You may select keywords in more than one category.  
If you are a reviewer for Distributed Peer Review (DPR) you will preferentially be assigned proposals that match your selected keywords.

Previous Next

☒ Cosmology and the High Redshift Universe

☐ Lyman Alpha Emitters/Blobs (LAE/LAB)

☐ Lyman Break Galaxies (LBG)

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☒ Sub-mm Galaxies (SMG)

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☐ Galaxy Clusters

> Galaxies and Galactic Nuclei

> ISM, star formation and astrochemistry


> Circumstellar disks, exoplanets and the solar system

> Stellar Evolution and the Sun

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Date	Milestone
12 April 2023 (15:00 UT)	Release of Cycle 10 Call for Proposals, Observing Tool, and supporting documents, and opening of the Archive for proposal submission
10 May 2023 (15:00 UT)	Proposal submission deadline for Cycle 10 Call for Proposals
<b>01 June 2023, (15:00 UTC)</b>	<b>Deadline to submit list of proposals with a conflict of interest</b>
<b>28 June 2023 (15:00 UT)</b>	<b>Deadline to submit reviews for the distributed peer review system</b>
August 2023	Announcement of the outcome of the proposal review process
1 October 2023	Start of ALMA Cycle 10 Science Observations (anticipated)

**Don't forget the review deadline - it is mandatory!**

**Not submitting your reviews = rejected proposal!**

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







# Distributed peer review webinars

ALMA will offer webinars presenting the distributed peer review and with Q&A session

- Session 1: [Thursday May 25, 17:00 UTC](#)
- Session 2: [Friday May 26, 13:00 UTC](#)
- Session 3: [Wednesday May 31, 2:00 UTC](#)
- Attend whichever is convenient for you
- Details will be e-mailed to you and posted here:  
<https://almascience.eso.org/proposing/alma-proposal-review/alma-proposal-review>

Guidelines also available in text form here:

<https://almascience.eso.org/proposing/alma-proposal-review/guidelines-for-reviewers#guidementors>



# Code of conduct and confidentiality

All participants in the review process are expected to behave in an ethical manner.

- Reviewers will judge proposals solely on their scientific merit.
- Reviewers will be mindful of bias in all contexts.
- Reviewers will declare all major conflicts of interest.
- The proposal reviews will be constructive and avoid any inappropriate language.

All proposal materials related to the review process are strictly confidential.

- The assigned proposals may not be distributed or used in any manner not directly related to the review process.
- Any data, intellectual property, and non-public information shown in the proposals may be used only for the purpose of carrying out the requested proposal review.
- The assigned proposals and the reviews may not be discussed with anyone other than the Proposal Handling Team, the APRC, or the assigned mentor when applicable.
- All electronic and paper copies of the proposal materials must be destroyed as soon as a reviewer completes the proposal review process.

<https://almascience.nrao.edu/proposing/alma-proposal-review/guidelines-for-reviewers#ethics>



# Distributed Proposal Review Resources

Proposer's guide:

- <https://almascience.eso.org/proposing/proposers-guide#autotoc-item-autotoc-51>

Explanation:

- <https://almascience.eso.org/proposing/alma-proposal-review/distributed-peer-review>

FAQ:

- <https://almascience.eso.org/proposing/alma-proposal-review/frequently-asked-questions>

Guidelines for reviewers:

- <https://almascience.eso.org/proposing/alma-proposal-review/guidelines-for-reviewers>

ALMA account page:

- <https://asa.alma.cl/UserRegistration/secure/updateAccount.jsp>

ALMA reviewer tool

- <https://almascience.eso.org/proposing/alma-proposal-review/reviewer-tool>

How to use the reviewer tool:

- <https://almascience.eso.org/proposing/alma-proposal-review/how-to-use-the-reviewer-tool>

# Network support

- After the successful execution and data delivery of your project, you can ask for face-to-face support for regular or advanced data reduction
- Face-to-face support can also be requested for the purposes of proposal preparation or archival research
- Support: high-performance computing resources; remote or on-site user support
- Helpdesk tickets submitted via the Science Portal are passed to the relevant node
- You may also contact the nodes directly

## European ARC Network





# Want to know more?

- **ALMA Proposer's Guide for Cycle 10**  
<https://almascience.eso.org/proposing/proposers-guide>
- **ALMA Primer**  
<https://almascience.eso.org/proposing/early-science-primer>
- **ALMA Primer videos**  
<https://almascience.eso.org/tools/alma-primer-videos>
- **ALMA explained: a series of 3-minute videos**  
[https://www.eso.org/sci/facilities/alma/arc/ALMA\\_explained\\_videos.html](https://www.eso.org/sci/facilities/alma/arc/ALMA_explained_videos.html)
- **ALMA Science Archive**  
<https://almascience.eso.org/aq/>

**Contact Allegro!**  
alma@strw.leidenuniv.nl



EUROPEAN ARC

ALMA Regional Centre || Allegro





# Need help?

- E-mail us your questions or request a meeting with the Allegro staff to discuss your proposal
- Contact us on the #Allegro channel in slack
- Dedicated drop-in sessions in our offices (HL-1122) from 14:00-16:00 on:
  - April 24
  - May 1
  - May 8
- If you are planning to submit a Large Programme, contact us early so that we can explore the many ways we can support your project and help optimise your program.

**We wish you a relaxed and successful proposal  
preparation time!**

**Contact Allegro!**

[alma@strw.leidenuniv.nl](mailto:alma@strw.leidenuniv.nl)

