

The ALMA Proposal Preparation Process

How to get started and what to expect



David Rebolledo

Universidad Católica del Norte, April 14th

This talk is for you if...

You are new to ALMA and ...

- You would like examples of science cases that use the ALMA facilities.
- You have not yet had experience with the relevant documentation.
- You have not downloaded the ALMA Observing Tool (OT) or even know where to get it.

You are familiar with ALMA and ...

- You have an exciting science case that requires the ALMA facilities.
- You wonder what Cycle 10 capabilities are now available.
- You would like to know what updates/changes have been made in the proposal preparation process.

This talk will be available online for reference after this workshop.

Proposal Checklist

- Read relevant documentation (CfP, Guide, Primer, etc.)
- Create/update ALMA account at the Science Portal (almascience.org)
- Download the Observing Tool (OT) & related guides
- Prepare the Scientific Justification
 - New capabilities for Cycle 10!
- Prepare Science Goals (sources, frequency & correlator setup, integration times) within the OT
- Make use of the Helpdesk & the Knowledgebase

Cycle 10 Documentation & Timeline

All documentation is available on the ALMA Website:

www.almascience.org

- Call for Proposals
- Proposer's Guide
- ALMA Primer
- *OT Quickstart Guide*
- *ALMA Technical Handbook*

- Timeline for Cycle 10
 - 12 Apr – Call for Proposals
 - 10 May – Proposal Deadline
 - August – Results to PIs
 - Oct. 2022 – Start of Cycle 10
 - Sept. 2023 – End of Cycle 10



Proposal Documentation: www.almascience.org



Proposal Information

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

About Science **Proposing** Observing Data Processing Tools **Documentation** Help

Science Highlight

Complex Organic Molecules in a Planet-Forming Disk

Integrated intensity maps of the 0.9 mm continuum emission and emission from several COMs.

Brunken et al. (2022, A&A 659, A29) have detected Complex Organic Molecules (COMs) in the highly asymmetric planet-forming disk around the young star IRS48. The disk around this star has a very pronounced 'dust and ice trap' where material accumulates, and future planet(esimals) may form. Brunken et al. report the first detection of methoxy (CH₃OCH₃) vapor in a planet-

<https://almascience.nrao.edu>

Observatory News

- ALMA Cycle 10 Pre-Announcement
Jan 18, 2023
- ALMA Cycle 9 Proposal Review: Detailed Report
Jan 12, 2023
- ALMA announces Joint Proposal agreements for JWST, VLA, and the VLT
Dec 20, 2022
- Restart of ALMA Cycle 9 observations and Cycle 10 pre-announcement status
Dec 19, 2022

[More...](#)

NRAO Events

- Jansky Lecture: Prof. Françoise Combes
Feb 14, 2023
- Jansky Lecture: Prof. Françoise Combes
Feb 15, 2023
- 38th New Mexico Symposium
Feb 17, 2023
- Jansky Lecture: Prof. Françoise Combes
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- New Eyes on the Universe: SKA & ngVLA Conference
May 01, 2023

[More...](#)

ALMA Status

Configuration Schedule

- Refereed publications: 3153
- Last observed source: BHR71_IRS2
- Current configuration: C4

[More...](#)

The ALMA Science Portal is a one-stop source for information and tools aimed at the scientific community as a whole, including proposers, archive researchers, ALMA staff, journalists, and funding agencies.

Quick Links

- [ALMA Basics](#)
- [ALMA Archive](#)

Proposal Documentation: www.almascience.org



Instructional videos



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

ALMA

About Science **Proposing** Observing Data Processing Tools Documentation Help

- ALMA Cycle 9 Call for Proposals
- ALMA Proposal Review
- Proposing Guidance
- Cycle 9 Proposer's Guide
- Cycle 9 Capabilities
- Observing Tool
- Sensitivity Calculator
- ALMA Primer Document and Instructional Videos**
- Technical Handbook
- Proposal Template
- Duplicate Observations
- DDT proposals

ALMA Primer Document and Instructional Videos

The ALMA Primer provides an introduction to the ALMA system, its capabilities, and the terminology, and to interferometry and imaging. The Primer also includes a brief introduction to (sub)millimeter astronomy and several example science projects illustrating the the present Cycle capabilities are also provided.

ALMA Primer Instructional Videos

Radio interferometry, including the ALMA system, is a complex technology. This series of instructional videos is designed to provide a basic introduction to the ALMA system. The videos are presented here as a part of the ALMA Primer Instructional Video Series at <http://www.almascience.org>. These videos are works in progress; new ones are added periodically. You can find the ALMA Primer Instructional Video Series at <http://www.almascience.org>.

If you have a suggestion for a new video, please contact the ALMA Science Office at science@alma.edu.

Concepts of Radio Interferometry

- [An Introduction to Radio Interferometry](#)
 - A brief and entertaining explanation of interferometry
 - Length 15m44s
 - Keywords: Fourier Transform, Interferometry, Resolution
- [Largest Angular Scale and Resolution](#)
 - With any interferometer, the resolution is limited by the largest angular scale you can detect. This is determined by the largest angular scale you can detect. The resolution is limited by the largest angular scale you can detect.
 - Length 4m30s

produced in 1991 to explain how the Owens Valley Radio Observatory solar array worked. The array consists of many antennas, such as ALMA and the Jansky Very Large Array. A must-watch for novices and experts!

lines; uv coverage; sidelobes; rotational synthesis; frequency synthesis

in the furthest apart antennas, but the antennas which are closest together will limit how large an object

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Create ALMA Account: www.almascience.org



Create/Log-in ALMA account

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Download the ALMA OT: www.almascience.org



Install the OT

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

About Science **Proposing** Observing Data Processing Tools Documentation Help

Observing Tool

The ALMA Observing Tool (OT) is a Java desktop application used for the preparation and submission of ALMA Phase 1 proposals and, for those which are accepted, Phase 2 materials (Scheduling Blocks). It is also used for preparing and submitting Director's Discretionary Time (DDT) proposals and Supplemental Call (ACA stand-alone) proposals. The current Cycle 9 release of the OT is configured for the present capabilities of ALMA as described in the [Cycle 9 Call For Proposals](#). Note that in order to submit proposals you will have to register with the ALMA Science Portal beforehand.

Download & Installation

The OT should run on all common operating systems and depends on a version of Java being available. In previous releases of the OT it was the responsibility of the user to ensure that a suitable version of Java was installed, but the Cycle 9 version of the OT will come with its own version of Java 11 and thus the users need no longer worry about their local Java installation. Unfortunately, as Java 11 does not include Web Start, this version of the OT is no longer available. The Cycle 9 OT can be installed in two different ways, either with a modern installer or manually with a tarball distribution.

It is recommended that the OT be installed using the ALMA OT Installer. This uses a modern graphical interface to report the progress of the installation and allows the user to change various settings from their defaults, including the amount of memory the OT may use. The installation will produce an executable file that can be used to start the OT. With the loss of Web Start, automatic updates of the tool are no longer possible, but the OT will detect if an update is available at start-up and inform the user. If problems are encountered with the installer, then the tarball must be used.

The **tarball** version must be installed manually and the instructions for doing this have not changed.

Installer **Tarball**

Documentation

Extensive documentation is available to help you work with the OT and optimally prepare your proposal:

- If you are a novice OT user you should start with the [OT Quickstart Guide](#), which takes you through the basic steps of ALMA proposal preparation.
- Audio-visual illustrations of different aspects of the OT can be found in the [OT video tutorials](#). These are recommended for novices and advanced users alike.

Download the ALMA OT: www.almascience.org



OT instructional videos

The screenshot shows the ALMA website interface. At the top left is the ALMA logo and the text 'Atacama Large Millimeter/submillimeter Array In search of our Cosmic Origins'. A navigation bar contains links for 'About', 'Science', 'Proposing', 'Observing', 'Data', 'Processing', 'Tools', 'Documentation', and 'Help'. The 'Proposing' menu is open, listing various resources. The 'OT Video Tutorials' option is highlighted with a red circle, and a red arrow points from the text 'OT instructional videos' above to this option. Other menu items include 'ALMA Cycle 9 Call for Proposals', 'ALMA Proposal Review', 'Proposing Guidance', 'Cycle 9 Proposer's Guide', 'Cycle 9 Capabilities', 'Observing Tool', 'Sensitivity Calculator', 'ALMA Primer Document and Instructional Videos', 'Technical Handbook', 'Proposal Template', 'Duplicate Observations', and 'DDT proposals'. The background of the website shows a silhouette of the ALMA observatory against a sunset sky.

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Scientific Justification

- Must be:
 - 4 pages (6 for Large Programs) PDF document (20MB max file size).
 - 12+ font written in English (OT will check the font size).
 - This includes figure captions, tables and references!
 - Prepared in accordance with the dual-anonymous guidelines.
- Should:
 - Be written for a knowledgeable, but broad audience.
 - Provide a clear statement of the immediate scientific goals.
 - Demonstrate the suitability of the observations to achieve the scientific goals.
- May:
 - Embed tables and figures within the text.
 - Briefly justify the requested sensitivity and angular resolution and refer to the Technical Justification for a full justification.
 - Include simulations to justify aspects of an observation.

Scientific justification: www.almascience.org



Dual anonymous guidelines
Proposal template



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

About Science **Proposing** Observing Data Processing Tools Documentation Help

Dual-Anonymous Guidelines

ALMA is strongly committed to... rankings in Cycle 0 to Cycle 8... [ALMA Proposal Review Ranking](#)... In a dual-anonymous... identity of the proposal team... proposal rather than the prop... information will not appear or... ensure anonymity is preserved... Justification.

Guidelines are provided below... changes, especially when resu...

General Guidelines

- Do not identify the PI or
- Proposers should use th...

For example, instead

"In Smith et al.

proposers can include

"As demonstrated in Smith et al. (2018),...."

ALMA Cycle 9 Call for Proposals

[ALMA Proposal Review](#)

[Proposing Guidance](#)

Cycle 9 Proposer's Guide

Cycle 9 Capabilities

Observing Tool

Sensitivity Calculator

ALMA Primer Document and Instructional Videos

Technical Handbook

Proposal Template

Duplicate Observations

DDT proposals

...le. Analysis of the proposal... process (see [Systematics in the](#)... be written in an anonymous... the reviewers do not know the... the scientific merit of the... ALMA Observing Tool (OT), this... responsibility of the proposers to... Scientific Justification and Technical

...are in the writing style, including references. Proposers should remember to make the relevant... anonymous in Cycle 8.

...sheet, Scientific Justification, and Technical Justification.

- General Guidelines pertaining to all Programs
- [Example text](#)
- [Guidelines pertaining only to Large Programs](#)
- [Compliance](#)
- [Guidelines for Reviewers](#)
- [Frequently Asked Questions](#)



New capabilities for Cycle 10

New in Cycle 10

The following technical capabilities will be available this Cycle for the first time:

- Band 1 on the 12-m Array and for Stokes I only (no Stokes Q/U/V), anticipated to be available from March 2024
- Spectral scans that include Total Power observations
- 4x4-bit spectral modes for improved sensitivity on the 12-m Array (full polarization)
- Solar observations in full polarization in Band 3 using only the 12-m Array
- Phased array mode in Bands 1, 3, 6 and 7 (the total time available for this mode is expected to be capped at approximately 50 hours)
- VLBI in Bands 1, 3, 6 and 7, including flexible tuning for spectral lines

New in Cycle 10 will be the availability of [Joint Proposals with other facilities](#), including the Space Telescope Science Institute's James Webb Space Telescope, the National Radio Astronomy Observatory's Karl G. Jansky Very Large Array, and the European Southern Observatory's Very Large Telescope.

Also new this Cycle, band-to-band phase calibration will be available for high frequency observations on both the 7-m Array and all 12-m Array configurations. The total time available for projects needing band-to-band phase calibration is expected to be capped.

See the Capabilities Presentation

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Preparing science goals in the OT

The screenshot displays the ALMA Observation Tool (OT) interface. The 'Project Structure' pane on the left shows a tree view under 'Unsubmitted Proposal' with 'Planned Observing' expanded to 'ScienceGoal (Copy of B6 12CO (2-1): NGC3256)'. The 'Field Setup' sub-tab is selected, showing fields for 'Source Name' (NGC3256), 'System' (J2000), 'Source Coordinates' (RA: 10:27:51.6000, Dec: -43:54:18.000), and 'Expected Source Properties' (Continuum Flux Density per Beam: 0.17400 Jy). A large red diagonal watermark reads 'see the OT presentation!'.

Preparing science goals in the OT

Technical Justification

The screenshot displays the ALMA OT software interface. On the left, the 'Project Structure' pane shows a tree view with 'Project' > 'Proposal' > 'Planned Observing' > 'ScienceGoal (J0817+1351)' > 'Technical Justification' selected. The main window has tabs for 'Spectral', 'Spatial', and 'Technical Justification'. The 'Technical Justification' tab is active, showing a form with the following sections:

- Sensitivity**
 - Requested RMS over is . For a peak flux density of , the S/N is .
 - Achieved RMS over the total bandwidth is . For a continuum flux density of , the achieved S/N is .
 - For a peak line flux of , the achieved S/N over 1/3 of the source line width (/ 3 =) is .
 - Line width / bandwidth used for sensitivity (/) = .
 - Spectral Dynamic Range (continuum flux / line rms): .
- Imaging**
 - Requested angular resolution .
 - Requested Largest Angular Scale .

Below each section is a text area for justification. A red arrow points from the 'Technical Justification' title to the 'Sensitivity' section, and another red arrow points from the 'Sensitivity' section to the 'Imaging' section.

Submitting a proposal in the OT

The screenshot shows the ALMA proposal submission web interface. On the left is a menu with options: New Proposal, New DDT Proposal, New Supplemental Call Proposal, Open Project, Open Project as New Proposal, Save, Save As..., Show ALMA Template Library, Use Project as Template, Validate, Submit Project, Preferences, Save Preferences, and Quit. The main area contains a form for 'Reviewer Information' with instructions: 'Please designate a reviewer who will participate in the distributed review process. The reviewer may be the PI of the proposal or one of the other investigators. A student (without a PhD) may serve as the reviewer only if they are the PI of the proposal and a mentor (with a PhD) is identified. The mentor does not need to be an investigator on the proposal. Reviewers are requested to update their user profiles with combinations of scientific categories and keywords which describe their research interests. See the ALMA User Registration page for more information. <https://asa.alma.cl/UserRegistration/secure/updateAccount.jsp> in the distribution of proposal assignments.' There are radio buttons for 'No' and 'Yes'. Below this is a section for 'Feedback' with tabs for 'Validation', 'Validation History', and 'Log'. A message states '1 error, 0 warnings : double-click on each row to be taken to the problem'. A table shows a validation error: 'Too much of the PDF text is smaller than 12 point.' with a suggestion to 'Please update your PDF. See the Proposer's Guide for more details.'

Click here to make sure that your project can be validated by the OT (Note the warning about incorrect font size). If it won't, you will not be able to submit it.

When you are satisfied that your proposal is complete, click here to submit your project to the ALMA Archive

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Need help?: www.almascience.org



Helpdesk
Knowledgebase

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About Science Proposing Observing Data Processing Tools Documentation Help

Help

Need help? Consider checking the ALMA Knowledgebase for answers to your inquiries. In cases where the Knowledgebase does not provide a solution, you can contact the ALMA Helpdesk. Finally, ALMA Region Centers (ARCs) are available to provide face-to-face training and assistance.

Knowledgebase/FAQ

The “[knowledgebase feature](#)” of the Helpdesk is a database of answered questions or articles on all aspects of ALMA and is also available to users who can find answers to common queries without submitting a Helpdesk ticket. Knowledgebase articles that match their query are automatically suggested.

ALMA Helpdesk

When a user submits a ticket to the [ALMA Helpdesk](#), the tickets are directed to one of the ARCs, where support staff are available to answer any question related to ALMA, including but not limited to ALMA policies, capabilities, documentation, proposal preparation, the OT, Splatalogue, and CASA. Users may also request information on workshops, tutorials, or about visiting an ARC or ARC node for assistance with data reduction and analysis. Users must be registered at the ALMA Science Portal to submit a Helpdesk ticket. Generally, ALMA staff aim to answer Helpdesk tickets within two working days.

ALMA Regional Centers

The interface between ALMA and the astronomy community is provided by the three partners through the ALMA Regional Centers (ARCs). These ARCs are located at NAOJ in Mitaka, Japan, for the [East Asian](#) partner, at ESO in Garching, Germany, for the [European](#) partner, and at NRAO in Charlottesville, USA, for the [North American](#) partner.

The ALMA helpdesk



Atacama Large Millimeter/submillimeter Array
Observer Support

ALMA Science

Submit Helpdesk Ticket

Log in

How can we help you today?

Help Center

TOO

Search Sci Portal



Knowledgebase

View all articles >



Submit Helpdesk Ticket

Get in touch for help>



My Tickets

View your tickets

>



Face to Face Visit

Arrange a visit

>

The ALMA helpdesk



Atacama Large Millimeter/submillimeter Array
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Face to Face Visit

Arrange a visit >

After submission

- Remember, you can resubmit as often as needed, but keep in mind that the server is quite busy right before the deadline.
- The proposal deadline is strictly enforced.
- Distributed peer review will be used for all proposals requesting less than 50 hours on the 12-m Array, and ACA stand-alone proposals requesting less than 150 hours on the 7-m Array.
- In this review system, for each submitted proposal the PI (or one of the delegated co-Is) will be responsible for reviewing up to 10 other submitted proposals, thus increasing the involvement of the ALMA community in the review process – **if you don't submit reviews, YOUR proposal will be rejected!**
- Large proposals will be reviewed by science review panels.
- All proposals will be subject to a technical assessment by a group of JAO and ARC experts.

After submission

- Proposals will be assessed on the basis of their overall scientific merit and its potential contribution to the advancement of scientific knowledge.
- The outcome of the proposal review process will be communicated to the PIs of all valid submitted proposals - expected around August 2023.
- Any change requests need to go to the Helpdesk, and possibly a formal change request
 - Being prompt helps ensure your project can be observed!
- Then wait – dynamic scheduling means your Contact Scientist does not know when your project will run. As observations are made, updates are shown in the SnooPI tool on the Science Portal:

<https://almascience.nrao.edu/observing/snoopi>



For more info:
<https://almascience.nrao.edu/>

The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership of Europe, North America and East Asia in cooperation with the Republic of Chile. ALMA is funded in Europe by the European Organization for Astronomical Research in the Southern Hemisphere (ESO), in North America by the U.S. National Science Foundation (NSF) in cooperation with the National Research Council of Canada (NRC) and the National Science Council of Taiwan (NSC), and in East Asia by the National Institutes of Natural Sciences (NINS) of Japan in cooperation with the Academia Sinica (AS) in Taiwan. ALMA construction and operations are led on behalf of Europe by ESO, on behalf of North America by the National Radio Astronomy Observatory (NRAO), which is managed by Associated Universities, Inc. (AUI), and on behalf of East Asia by the National Astronomical Observatory of Japan (NAOJ). The Joint ALMA Observatory (JAO) provides the unified leadership and management of the construction and operation of ALMA.



www.nrao.edu
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*The National Radio Astronomy Observatory is a facility of the National Science Foundation
operated under cooperative agreement by Associated Universities, Inc.*