

The ALMA Proposal Preparation Process

How to get started and what to expect



Erin Cox

Atacama Large Millimeter/submillimeter Array
Expanded Very Large Array



This talk is for you if...

- You are new to ALMA and 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 have a fabulous science case that will be essential to follow-up with ALMA facilities...
- You would like examples of science use cases for ALMA
- You were familiar with past Cycles and wonder what Cycle 7 capabilities are now available and what changes will be made before the Call for Proposals.

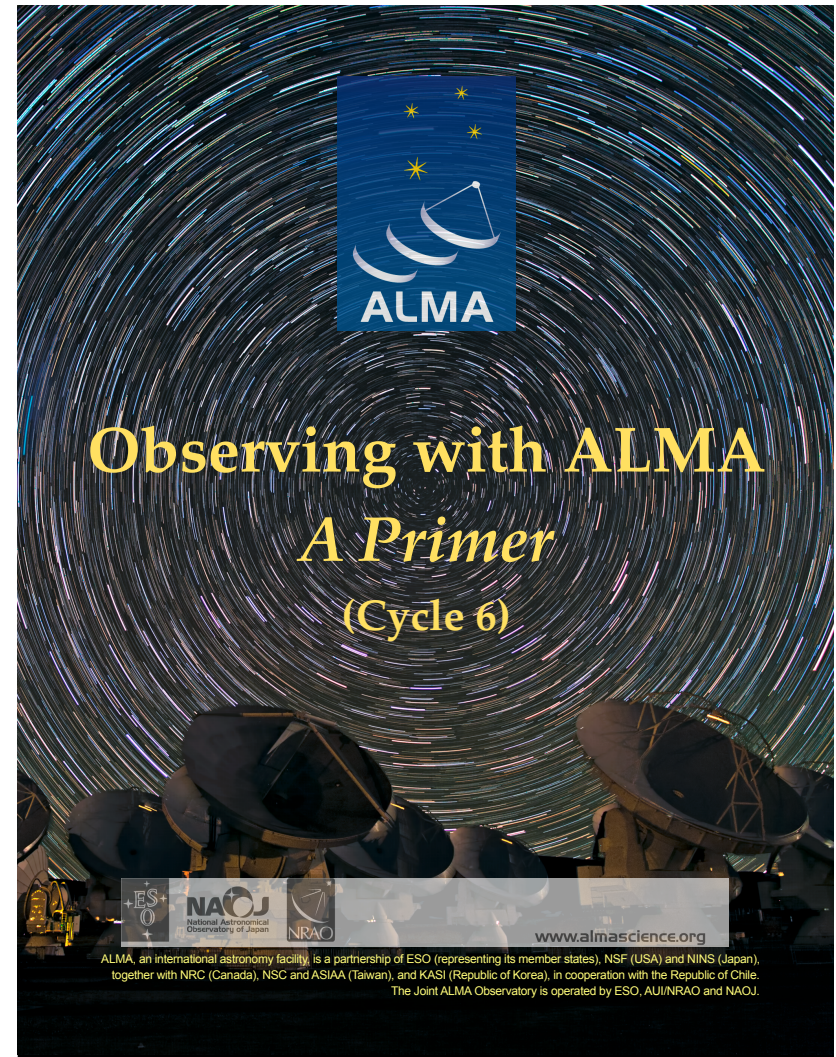
This talk will be available online for reference after this workshop.

Proposal Checklist

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- Download the Observing Tool (OT) & related guides
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 - New capabilities for Cycle 7!
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Cycle 7 Documentation & Timeline

- Call for Proposals
- Proposer's Guide
- ALMA Primer
- OT Guide
- ALMA Tech Handbook
- Timeline for Cycle 7
 - Mar. 19 – Call for Proposals
 - Apr. 17 – Proposal Deadline
 - End July – Results to PIs
 - Sept. 5 – Phase 2 submission
 - Oct. 2019 – Start of Cycle 7
 - Sept. 2020 – End of Cycle 7



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Jan 07, 2019

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Dec 19, 2018

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More...

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More...

Status

[Configuration Schedule Cycle 6 Highest Priority Projects](#)

Refereed publications: 1300

Last observed source:

Northeast_Section_of_NGC6334

Current configuration: C43-1

More...

Science Highlights - An ALMA Detection of the Radioactive Molecule ^{26}Al in a Stellar Merger Remnant.



Although diffuse Galactic gamma-ray emission from the isotope of aluminum, ^{26}Al , was first detected in the 1980s, the identification of the source of emission has been hard to pinpoint due to the poor spatial resolution of gamma-ray observations. In a recent *Nature* paper, a team led by Dr. Kaminski has made use of sensitive, high-

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ALMA Science Portal @ NRAO



Interferometry: Spatial Scales

- The **sensitivity** is given by the number of antennas times their area
- The **field of view** is given by the beam of a single antenna (corresponding to the resolution for a single dish telescope or the primary beam)
- The **resolution** is given by the largest distance between antennas (called the synthesized beam)
- The **largest angular scale** that can be imaged is given by the shortest distance between antennas

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Downloading the ALMA OT



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Observing Tool

The ALMA Observing Tool (OT) is a Java application used for the preparation and submission of ALMA Phase 1 (observing proposal) and Phase 2 (telescope runfiles for accepted proposals) materials. It is also used for preparing and submitting Director's Discretionary Time (DDT) proposals. The current *Cycle 6* release of the OT is configured for the present capabilities of ALMA as described in the [Cycle 6 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 will run on most common operating systems, as long as a **64-bit version of Java 8** is installed (see the [troubleshooting page](#) if you are experiencing Java problems). The ALMA OT is available in two flavours: Web Start and tarball.

The **Web Start** application is the recommended way of using the OT. It has the advantage that the OT is automatically downloaded and installed on your computer and it will also automatically detect and install updates. There are some issues with Web Start, particularly that it does not work with the Open JDK versions of Java such as the "Iced Tea" flavour common on many modern Linux installations. The Oracle variant of Java should therefore be installed instead. If this is not possible, then the tarball installation of the OT is available.

The **tarball** version must be installed manually and will not automatically update itself, however there should be no installation issues.

Webstart

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.





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OT Video Tutorials

The OT video tutorials provide an audio-visual demonstration of different aspects of proposal preparation in the OT. Novice users should start with the first video and work their way down, while more experienced users may want to jump straight to one of the specialised videos.

OT Video Tutorial 1: Useful to Know

This video will help you get started with the OT and introduce you to some handy tips and tricks. Topics covered include navigating the OT, using the help function, the template library, time estimation, validation, opening & submitting projects including re-submissions, and the concept of non-standard modes. **Note:** this video is from Cycle 4, some things have changed slightly in Cycle 5. In particular, time constraints can now also include simultaneous 12-m and 7-m observations, and re-submissions are no longer defined by the user. Also, the time estimate interface has changed a bit.



Video 1:
Useful to Know

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ALMA Observing Strategies (Cycle 7)



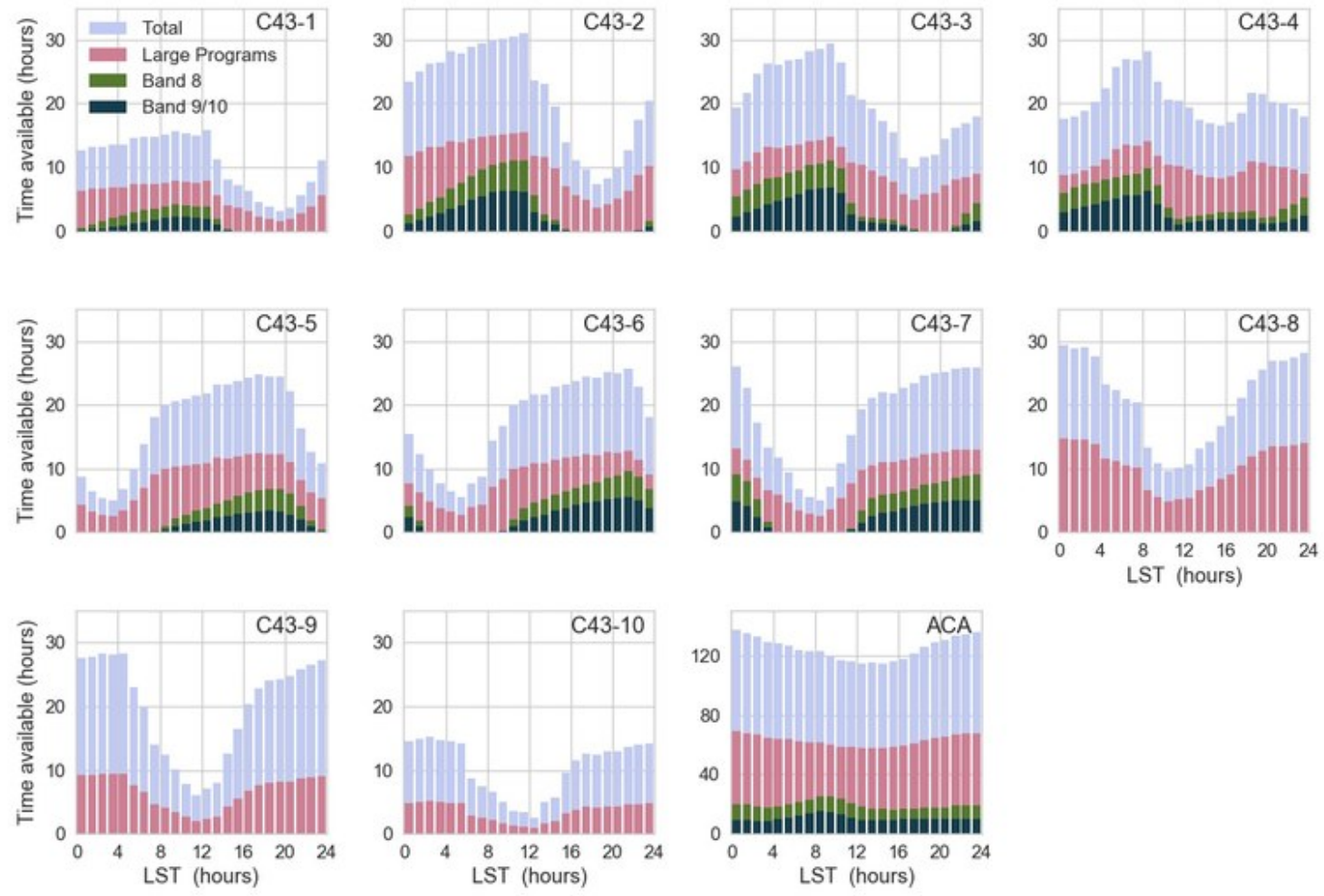
Cycle 7 configuration schedule is ideal for long baselines in Chilean winter (typically best weather conditions)

Cycle 8 will NOT go to the longest baselines

Start date	Configuration	Longest baseline	LST for best observing conditions
2019 October 1	C43-4	0.78 km	~ 22—10 h
2019 October 20	C43-3	0.50 km	~ 23—11 h
2019 November 10	C43-2	0.31 km	~ 1—13 h
2019 November 30	C43-1	0.16 km	~ 2—14 h
2019 December 20	C43-2	0.31 km	~ 4—15 h
2020 January 10	C43-3	0.50 km	~ 5—17 h
2020 February 1	No observations due to maintenance		
2020 March 1	C43-4	0.78 km	~ 8—21 h
2020 March 20	C43-5	1.4 km	~ 9—23 h
2020 April 20	C43-6	2.5 km	~ 11—1 h
2020 May 20	C43-7	3.6 km	~ 13—3 h
2020 June 20	C43-8	8.5 km	~ 15—5 h
2020 July 11	C43-9	13.9 km	~ 16—6 h
2020 July 30	C43-10	16.2 km	~ 17—7 h
2020 August 20	C43-9	13.9 km	~ 19—8 h
2020 September 10	C43-8	8.5 km	~ 20—9 h



ALMA Observing Strategies (Cycle 7)



- Histograms of the anticipated amount of observing time available versus LST for the antenna configurations in Cycle 7. Also shown are histograms of the time available for Large Programs, as well as high frequency observations (Bands 8, 9, and 10) based on historical PWV data

Science Case

Must include:

- Astronomical Importance
- Estimated intensity, S/N

May include:

- Figures
- Tables
- References

Free-form PDF document

- 12+ font, English only ** new: the OT will check font size!
- 20 MB file size
- 4 pages (6 for Large Projects)

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Cycle 7 Capabilities

- **Antennas:** At least 43 antennas in the 12-m Array, ten 7-m antennas (for short baselines) and three 12-m antennas (for single dish maps)
- **Receiver bands:** 3, 4, 5, 6, 7, 8, 9, & 10 (wavelengths of about 3.1, 2.1, 1.5, 1.3, 0.87, 0.74, 0.44, and 0.35 mm, respectively)
- **Baselines:** Maximum baselines up to 3.7 km for Bands 8 – 10 and up to 16.2 km for Bands 3 - 7
- Spectral line, continuum, and mosaic observations

New Capabilities

- Band 7 observations at longest baselines (16.2 km)
- Solar observations in Band 7 in compact configurations
- Spectral scans are standard modes
- Data rate limitations will be significantly relaxed – long baseline AND high spectral resolution modes possible
- Improved sensitivity limit for full spectral resolution linear polarization

Large Projects (started in Cycle 4)

- Any project >50 hours, or standalone ACA > 150 hours
- Standard observing modes
- Automatic 'A' grade
- +2 pages for Science Case
 - Data/Project Mgmt. Plans
 - Enhanced Data Products

ToO (Target of Opportunity)

- Transient events– both frequent and unpredictable events (gamma ray bursts, gravity waves)
- Use regular proposal submission
- Observing modes and sensitivity must be specified
- Target can be left blank
- Needed: triggers and max response time

VLBI

- Submit to appropriate VLBI network by independent deadline
- 5% of available time

DDT (Director's Discretionary Time)

- Submitted at any time for current cycle.
- **Immediate (within 3 weeks of acceptance)** observation of a sudden/unexpected event.
- Observations of a highly competitive scientific topic, motivated by developments that have taken place after the proposal deadline.
- Proposals asking for follow-up observations of a program recently completed by ALMA (or other observatory) where quick implementation will yield breakthrough results.

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Project Structure

Proposal Program

Unsubmitted Proposal

- Project
 - Proposal
 - Planned Observing
 - ScienceGoal (Copy of B6 12CO (2-1): NGC3256)
 - General
 - Field Setup**
 - Spectral Setup
 - Calibration Setup
 - Control and Performance
 - Technical Justification

Template library. Turn the keys on the JTree below & r...

- Template library. Turn the keys on the JTree below
 - Proposal
 - Planned Observing
 - ScienceGoal (B3 spectral sweep CO)
 - ScienceGoal (B7 continuum: COSMO)
 - ScienceGoal (B7 CO(9-8): Cosmic Ey
 - ScienceGoal (B9 continuum: Cosmic
 - ScienceGoal (B3 spectral sweep: PK)
 - ScienceGoal (B3 continuum: GRB To
 - ScienceGoal (B6 continuum: GRB To
 - ScienceGoal (B7 continuum: GRB To
 - ScienceGoal (B6 continuum: GRB To
 - ScienceGoal (B3 continuum: GRB To
 - ScienceGoal (B6 12CO (2-1): NGC32
 - ScienceGoal (B6 13CO (2-1): NGC32
 - ScienceGoal (B6 spectral line: Massi
 - ScienceGoal (B9 spectral line: Massi
 - ScienceGoal (B3 continuum: Protoste
 - ScienceGoal (B6 continuum: Protoste

Editors

Spectral Spatial **Field Setup**

Source Name Resolve

Choose a Solar System Object? Name of object

System Sexagesimal display? Parallax

Source Coordinates RA PM RA

Dec PM DEC

Source Radial Velocity z Doppler Type

Target Type Individual Pointing(s) 1 Rectangular Field

Expected Source Properties

Peak Continuum Flux Density per Beam

Continuum Polarization Percentage %

Peak Line Flux Density per Beam

Line Width

Line Polarization Percentage %

Rectangle

Coords Type ABSOLUTE RELATIVE

System

Field Center Coordinates Offset(Longitude)

Offset(Latitude)

Feedback

Validation Validation History Log

Description	Suggestion



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 - ScienceGoal (B6 continuum: GRB To) [x]
 - ScienceGoal (B3 continuum: GRB To) [x]
 - ScienceGoal (B6 12CO (2-1): NGC3256) [x]
 - ScienceGoal (B6 13CO (2-1): NGC3256) [x]
 - ScienceGoal (B6 spectral line: Massive Star) [x]
 - ScienceGoal (B9 spectral line: Massive Star) [x]
 - ScienceGoal (B3 continuum: Protostar) [x]
 - ScienceGoal (B6 continuum: Protostar) [x]

Editors

Spectral Spatial Field Setup

Source Name: NGC3256 [Resolve]

Choose a Solar System Object? Name of object: Unspecified

System: J2000 Sexagesimal display? Parallax: 0.00000 [mas]

Source Coordinates: RA: 10:27:51.6000 PM RA: 0.00000 [mas/yr]
Dec: -43:54:18.0000 PM DEC: 0.00000 [mas/yr]

Source Radial Velocity: 0.000 [km/s] [hel] z: 0.000000000 Doppler Type: RELATIVISTIC

Target Type: Individual Pointing(s) 1 Regular Field

Expected Source Properties

Peak Continuum Flux Density per Beam: 0.17400 [Jy]

Continuum Polarization Percentage: 0.0 %

Peak Line Flux Density per Beam: 0.00000 [Jy]

Line Width: 0.00000 [km/s]

Line Polarization Percentage: 0.0 %

Rectangle

Coords Type: ABSOLUTE RELATIVE

System: J2000

Field Center Coordinates: Offset(Longitude): 0.00000 [arcsec]
Offset(Latitude): 0.00000 [arcsec]

See the OT presentation!

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ALMA Science Portal @ NRAO



I could use a hand...

ALMA



Have no fear, the ALMA Helpdesk is here...

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General ALMA Queries (13)

Early Science - Cycle 1 (31)

Resources & Observer Support (12)

Project Planning (14)

ALMA Observing Tool (OT) (29)

Proposal Handling (5)

Archive & Data Retrieval (4)

Offline Data Reduction and/or CASA (14)

Development Program (1)

Live Chat Software by Kayako

Please type your search query here

SEARCH

Knowledgebase

General ALMA Queries (13)

- Can I submit a ticket in Japanese?
- How close can ALMA observe to the Sun?

Project Planning (14)

- What should I include for the content of the Technical Justification and in what format should I submit it?
- Where can I find the online ALMA observing simulator developed by the University of Manchester?

Early Science - Cycle 1 (31)

- Can I use "breakpoints" in ALMA cycle 1?
- The Cycle 1 Technical Handbook has some gaps in its discussion of ALMA receivers (SSB, 2SB, DSB). What else can you tell me about them?

ALMA Observing Tool (OT) (29)

- What do I do if I can't get the OT to work?
- How do I deal with targets with unspecified coordinates in the OT?

Resources & Observer Support (12)

- How do I arrange a visit to one of the ARCs?
- Where can I find ALMA documentation and manuals?

Proposal Handling (5)

- May I submit an identical proposal to more than one category, e.g. submitting a proposal on distant galaxies both to cosmology and to galaxy categories?
- Which category should I submit a proposal on distant galaxies: "cosmology/high-z" or "Galaxies/Nudei"?





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Knowledgebase

- General ALMA Queries (14)
- Early Science - Cycle 2
- Early Science - Cycle 1 (31)
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Please type your question here

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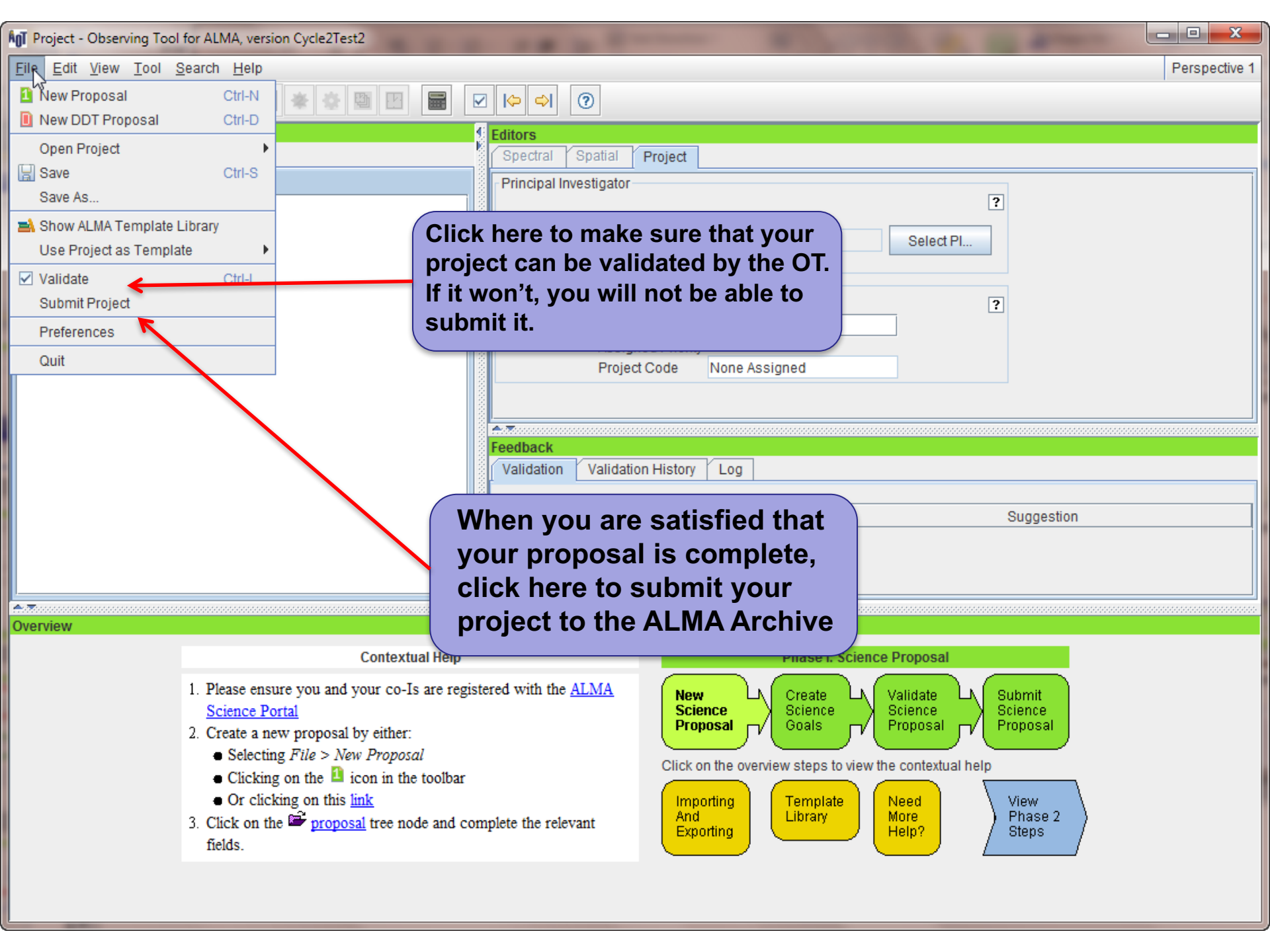
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Latest Updates

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help.almascience.org

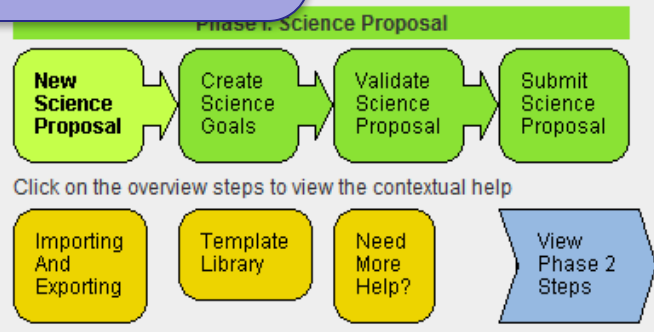
ALMA Helpdesk @ NRAO (logged in view)



Click here to make sure that your project can be validated by the OT. 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

- Contextual Help
1. Please ensure you and your co-Is are registered with the [ALMA Science Portal](#)
 2. Create a new proposal by either:
 - Selecting *File > New Proposal*
 - Clicking on the icon in the toolbar
 - Or clicking on this [link](#)
 3. Click on the [proposal](#) tree node and complete the relevant fields.



After submission

- Remember, you can resubmit as often as needed, but keep in mind that the server is quite busy right before the deadline
- Standard and ToO proposals will be reviewed by the ALMA Proposal Review Committee (APRC) and the ALMA Review Panels (ARP).
- All proposals will be subject to Technical Assessment by a selected group of JAO and ARC experts.
- Proposals will be assessed on the basis of the overall scientific merit of the proposed investigation and its potential contribution to the advancement of scientific knowledge.
- Following approval by the Directors Council, the outcome of the Proposal Review Process will be communicated to the PIs of all valid submitted proposals, expected at the end of July 2019.

After submission

- Phase II (Creating and Queuing Scheduling Blocks)
 - PIs review their scheduling blocks by **Sept. 5, 2019**
 - 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 doesn't 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.