ALMA Cycle 8 2021 Proposer's Guide

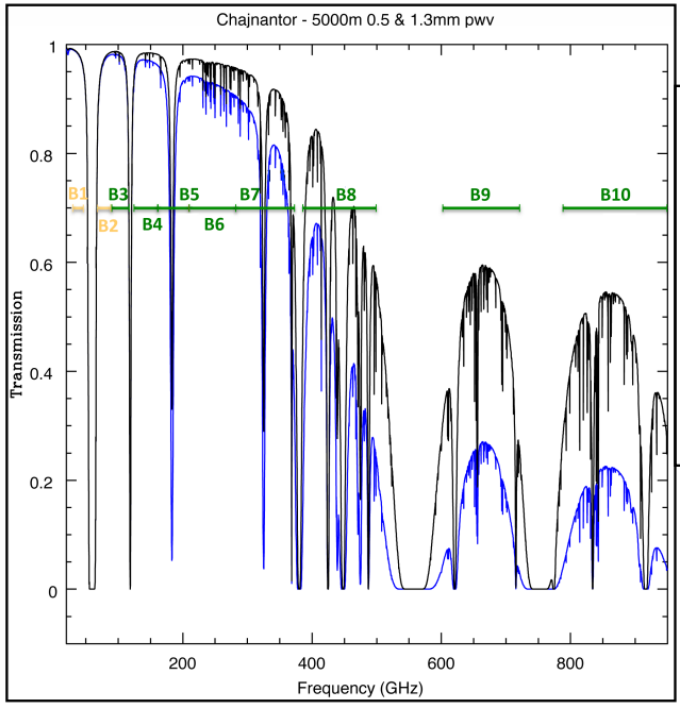
Proposal format, what's new
See Nagai-san's talk on the observing capabilities

East Asia ALMA Regional Center

ALMA Cycle 8 2021 Proposal Preparation Meeting, March 22-23, 2021

ALMA

- Interferometer consisting of 66 antennas
- Fifty 12-m antennas → 12-m Array
- Atacama Compact Array (ACA; Morita Array)
  - Twelve 7-m (7-m Arary), Four 12-m (Total Power, TP)
- From 0.32 mm to 3.6 mm (Band 3 to 10) for Cycle 8 2021



ALMA Regional Centers – interface for users

Joint ALMA Observatory

Effective array operations: Execution of programs under suitable conditions
High availability of the array for science : Repairs, Preventive maintenance

Science operations in regional centers with **functions agreed in EA, EU, and NA, in close coordination with JAO**

EA ARC

EA ALMA users

EU ARC

EU ALMA users

NA ARC

NA ALMA users

- ARC provide support for users in the respective regions so that users can concentrate on proposing observations, data analysis, and science discussion.
- Support can be optimized to the regional situation (e.g., native language, specific demands from users).

Current Status

ALMA is…

- In the process of recovering the Arrays and resuming science operations
- Trying to do the limited science operations in March 2021
  - Limited science operations → https://almascience.nao.ac.jp/news/alma-anticipates-resuming-science-observations
- Accepting Director's Discretionary Time (DDT) proposals
  - Announcement → https://almascience.nao.ac.jp/news/alma-is-now-accepting-cycle-7-ddt-proposals

ALMA has released the Call for Proposals for **Cycle 8 2021** on March 17 as planned.

This is different from the previous Cycle 8 call last year. "Cycle 8 2021" is indicated in every document for the new call.

Proposing observations in ALMA

- "Cycle" in ALMA: One year period, starting from October every year
  - Cycle 8 2021: From October 2021 to September 2022
- Calls every year
  - Main Call
    - 12-m Array, ACA
    - Call for Proposals in March
    - October 2021 to September 2022
    - 4300 hours for 12-m Array, at least 3000 for ACA each for 7-m and TP arrays
  - Supplemental Call
    - ACA stand-alone
    - Call for Proposals in September
    - January 2022 to September 2022
    - Observing time will be announced later
- DDT: Users can propose anytime in the on-going cycle

Grade A, B, C both for the 12-m Array and the ACA stand-alone (different from Cycle 7 when ACA stand-alone proposals could not get Grade C)

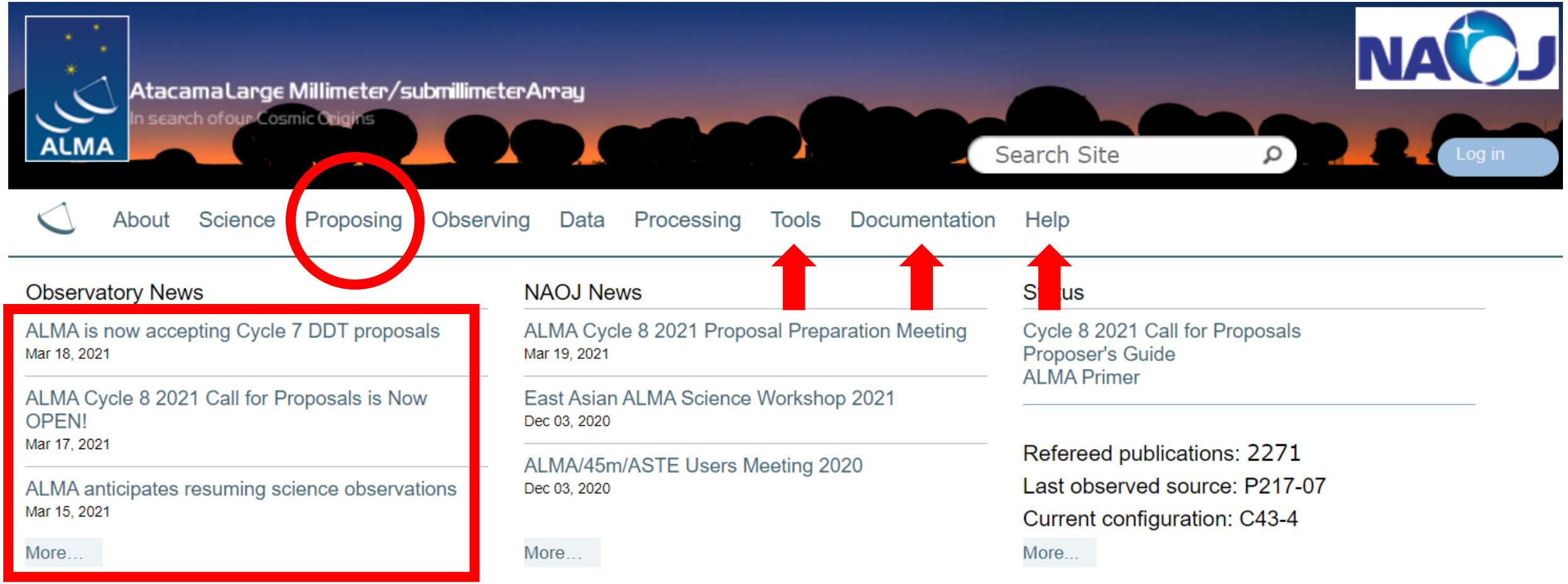
Proposing observations in ALMA

- Science observations will be scheduled taking into account many factors including, for example, weather, proposal grade and executive balance
- Priorities
  - Grade A
    - Highest grade, carried over to the next Cycle
  - Grade B
    - No carry over
  - Grade C
    - Filler
- After observations…
  - Quality assurance (meet the PI's request?) → delivered to the PI
  - Data become public after 12 months (6 months for DDT)

"Users Policies"
https://almascience.nao.ac.jp/documents-and-tools/cycle8/alma-user-policies

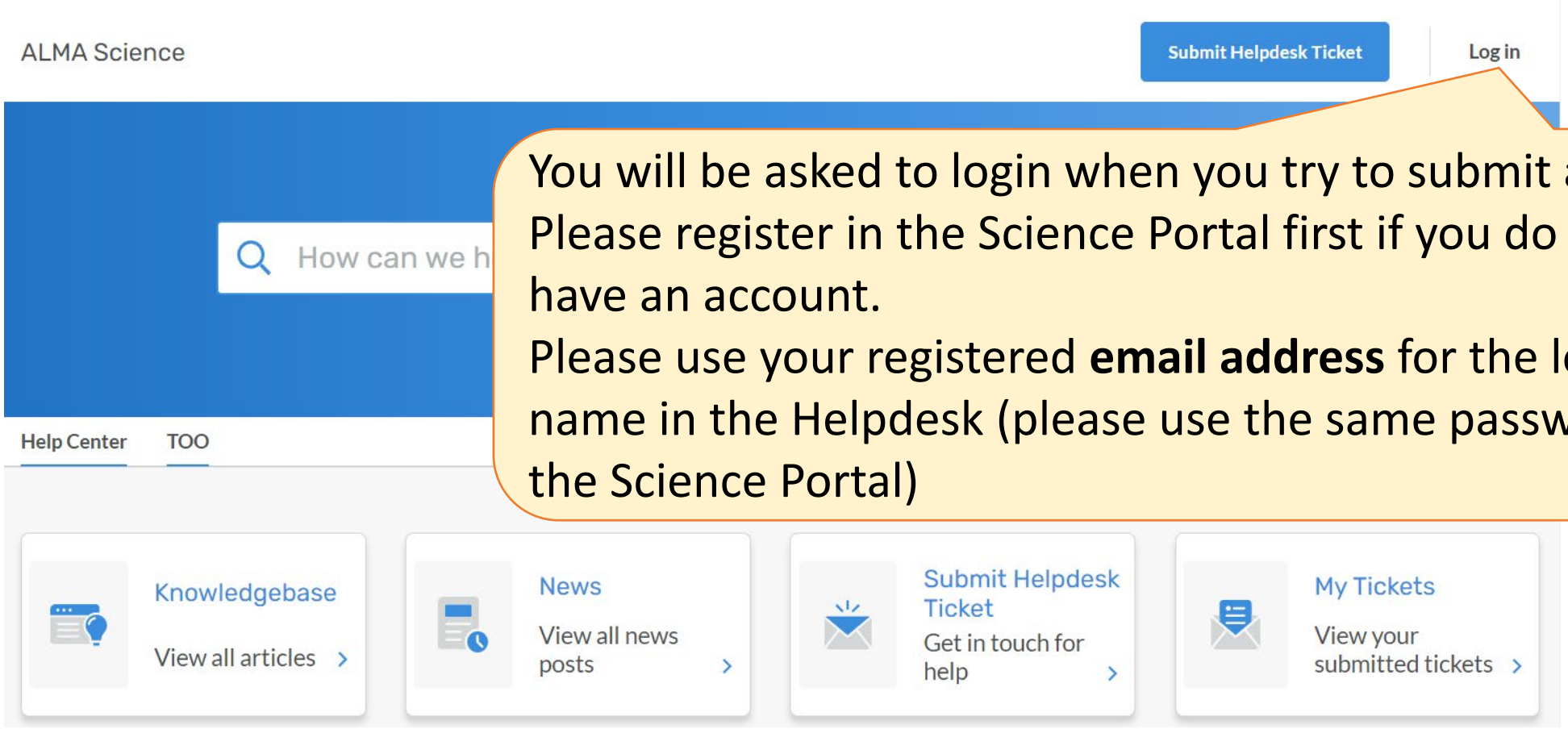
Information is in the Science Portal

https://almascience.nao.ac.jp/



… and please ask us via the Helpdesk
https://help.almascience.org/

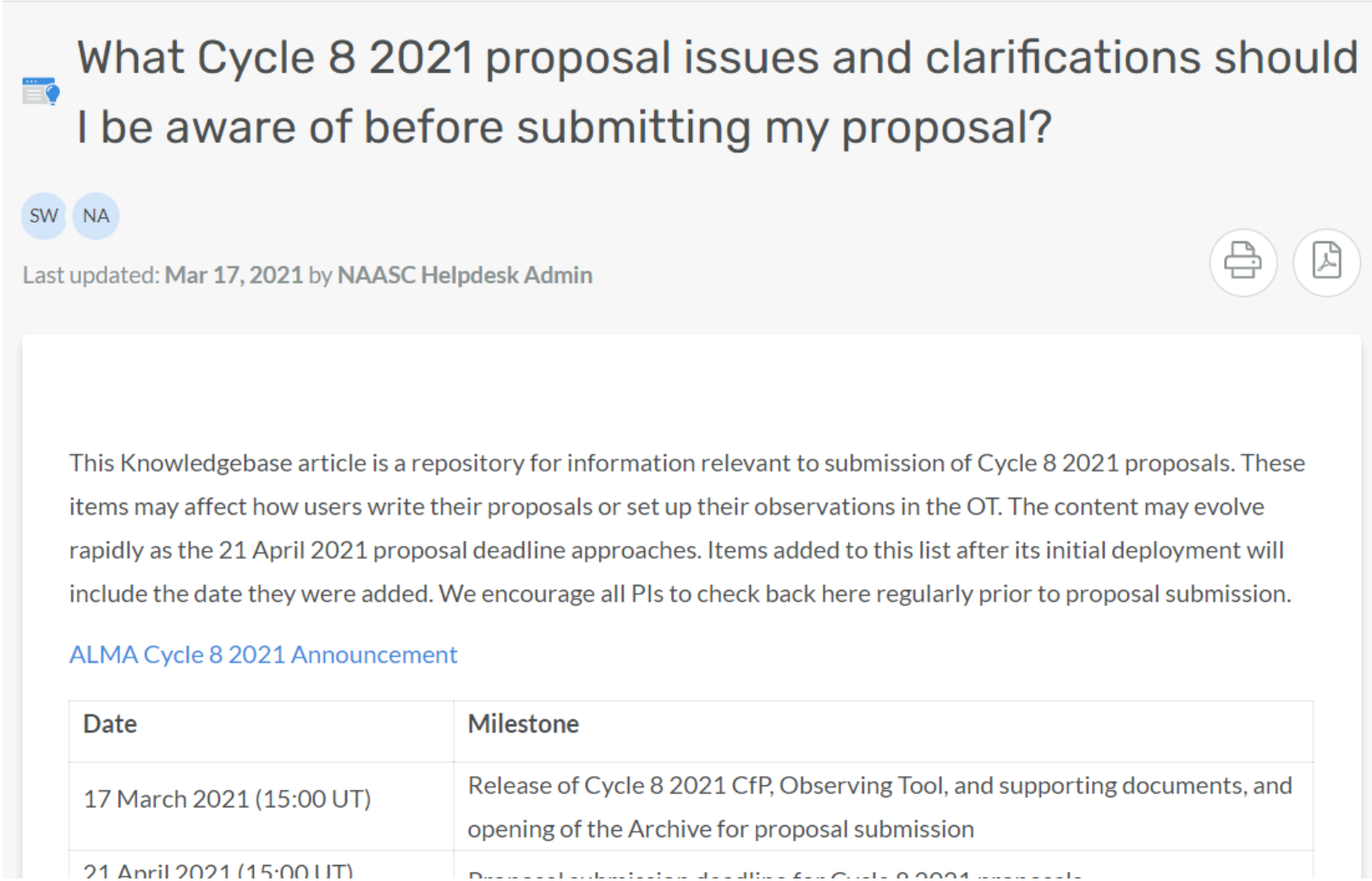
- We can accept Japanese questions although you may need to wait until the Japanese staff are available (be careful, in particular just before the deadline)



… and please ask us via the Helpdesk
https://help.almascience.org/

- Any changes, clarifications, or bugs that are discovered after the publication of the Proposer's Guide will be documented in the Knowledgebase article.

https://help.almascience.org/kb/articles/what-cycle-8-2021-proposal-issues-and-clarifications-should-i-be-aware-of-before-submitting-my-2



What Cycle 8 2021 proposal issues and clarifications should I be aware of before submitting my proposal?

SW NA

Last updated: **Mar 17, 2021** by **NAASC Helpdesk Admin**

This Knowledgebase article is a repository for information relevant to submission of Cycle 8 2021 proposals. These items may affect how users write their proposals or set up their observations in the OT. The content may evolve rapidly as the 21 April 2021 proposal deadline approaches. Items added to this list after its initial deployment will include the date they were added. We encourage all PIs to check back here regularly prior to proposal submission.

ALMA Cycle 8 2021 Announcement

Date	Milestone
17 March 2021 (15:00 UT)	Release of Cycle 8 2021 CfP, Observing Tool, and supporting documents, and opening of the Archive for proposal submission
21 April 2021 (15:00 UT)	Proposal submission deadline for Cycle 8 2021 proposals

Schedule: Main Call

Date	Milestone
17 March 2021	Release of Cycle 8 2021 Call for Proposals, Observing Tool, and supporting documents, and opening of the Archive for proposal submission
21 April 2021 (15:00 UT)	Proposal submission deadline for Cycle 8 2021 Call for Proposals
3 June 2021 (15:00 UT)	Deadline to submit reviews for the distributed peer review system
August 2021	Announcement of the outcome of the proposal review process
8 September 2021	Release of ACA Supplemental Call for Proposals
1 October 2021	Start of ALMA Cycle 8 2021 Science Observations
6 October 2021	Proposal submission deadline for Cycle 8 2021 Supplemental Call
30 September 2022	End of ALMA Cycle 8 2021

Schedule: Supplemental Call

Date	Milestone
8 September 2021	Release of the Cycle 8 2021 stand-alone ACA Supplemental CfP, Observing Tool, and supporting documents, and opening of the Archive for proposal submission
6 October 2021	Supplemental Call proposal submission deadline
December 2021	Announcement of the outcome of the proposal review process
January 2022	Start of Science Observations
30 September 2022	End of ALMA Cycle 8 2021

What’s new: Capabilities

→ Nagai-san’s talk

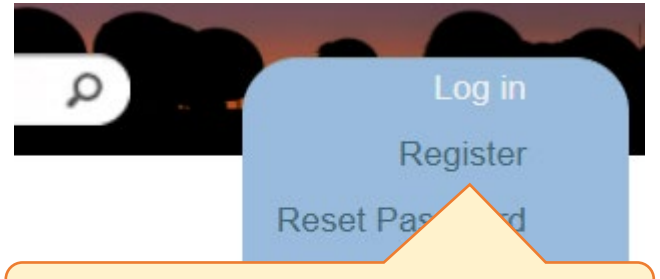
What's new: Review process

(tomorrow's session)

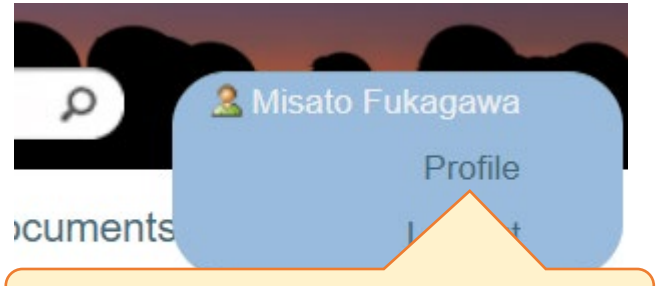
- **Dual-anonymous review**
- **Distributed peer review**
  - Proposals requesting less than 25 hours on the 12-m Array and for ACA stand-alone proposals requesting less than 150 hours on the 7-m Array will be reviewed in the distributed peer review. The PI for such proposals or a designee from the list of investigators will review and rank 10 submitted proposals from this Call, for each proposal submitted.
  - Proposals requesting more will go to the panel review
- **Large Programs proposal format and management plan**
  - Scientific Justification will be reviewed in the dual-anonymous
  - A one-page PDF statement is required for the management plan

Important!

Please register/update your “Expertise” in your user profile. This is extremely important for the proposal assignments in the distributed peer review system.

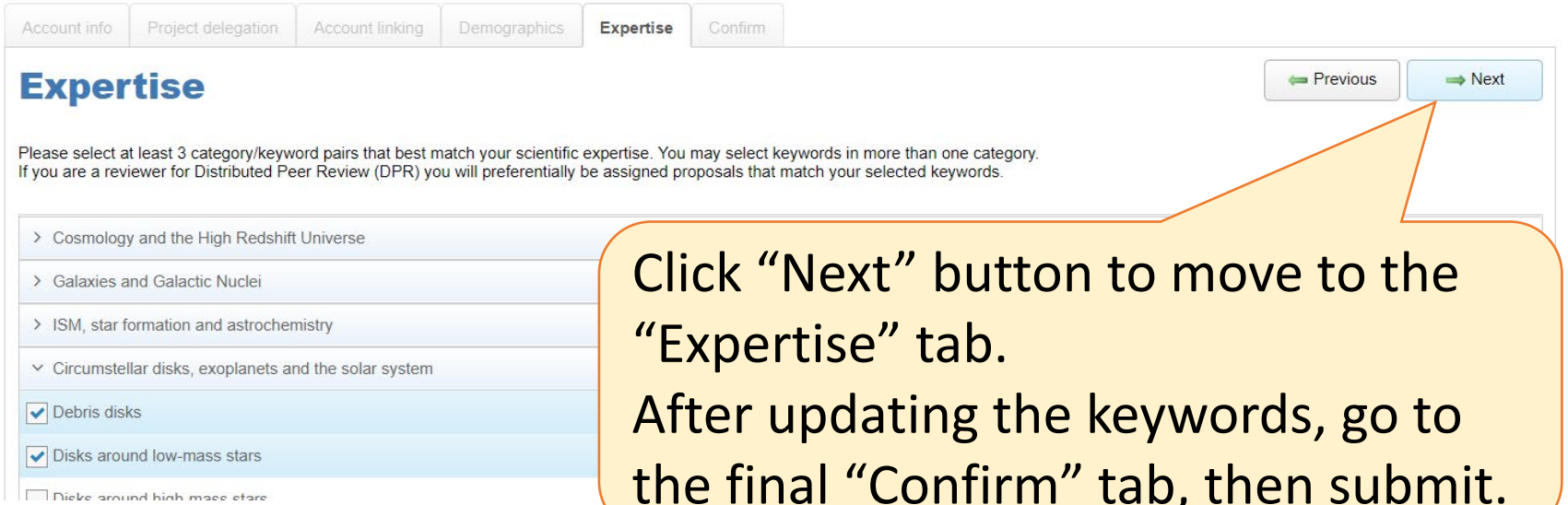


Login or newly register



Updating the profile

Please select at least 3 category/keyword pairs that best match your scientific expertise.

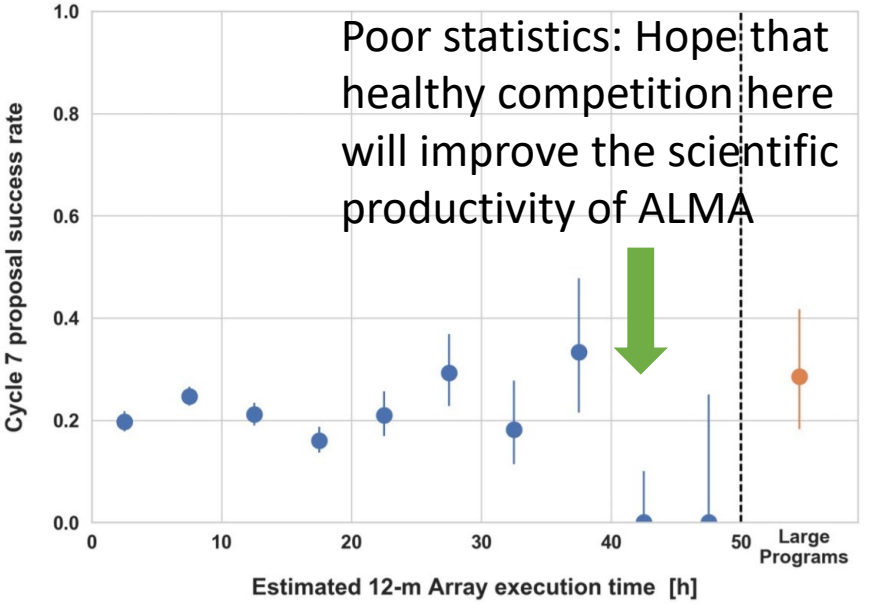


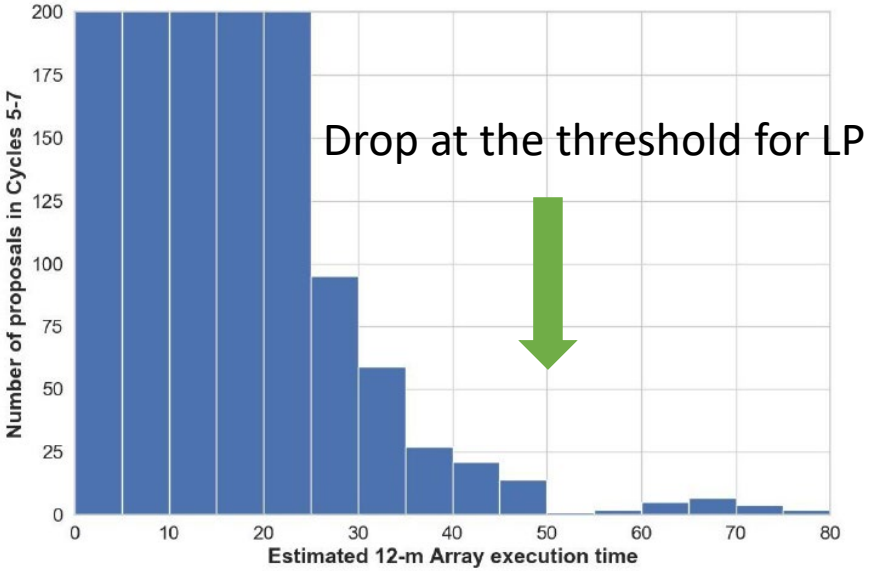
Click “Next” button to move to the “Expertise” tab.
After updating the keywords, go to the final “Confirm” tab, then submit.

What's new: Prioritizing larger projects

Following recommendations from ASAC and ALMA IVC, ALMA is taking further steps to encourage large, more ambitious proposal submissions.

- No cap on the total amount of time that can be allotted to Large Programs as of Cycle 8 2021. However, Large Programs will still be limited to filling no more than 50% of the time in a given LST and configuration so that smaller programs will be able to compete at each configuration and LST.
- Proposals that request more than 25 hours on the 12-m Array (including Large Programs) will have priority when filling at least 10% of the available time for Grade A and B proposals. If the total amount of time for the Large Programs recommended by the APRC sum to less than 430 hours on the 12-m Array, then the highest ranked proposals requesting between 25 and 50 hours will be given next priority in building the queue.





What’s new: OT

- No separate Java installation
- No web start anymore

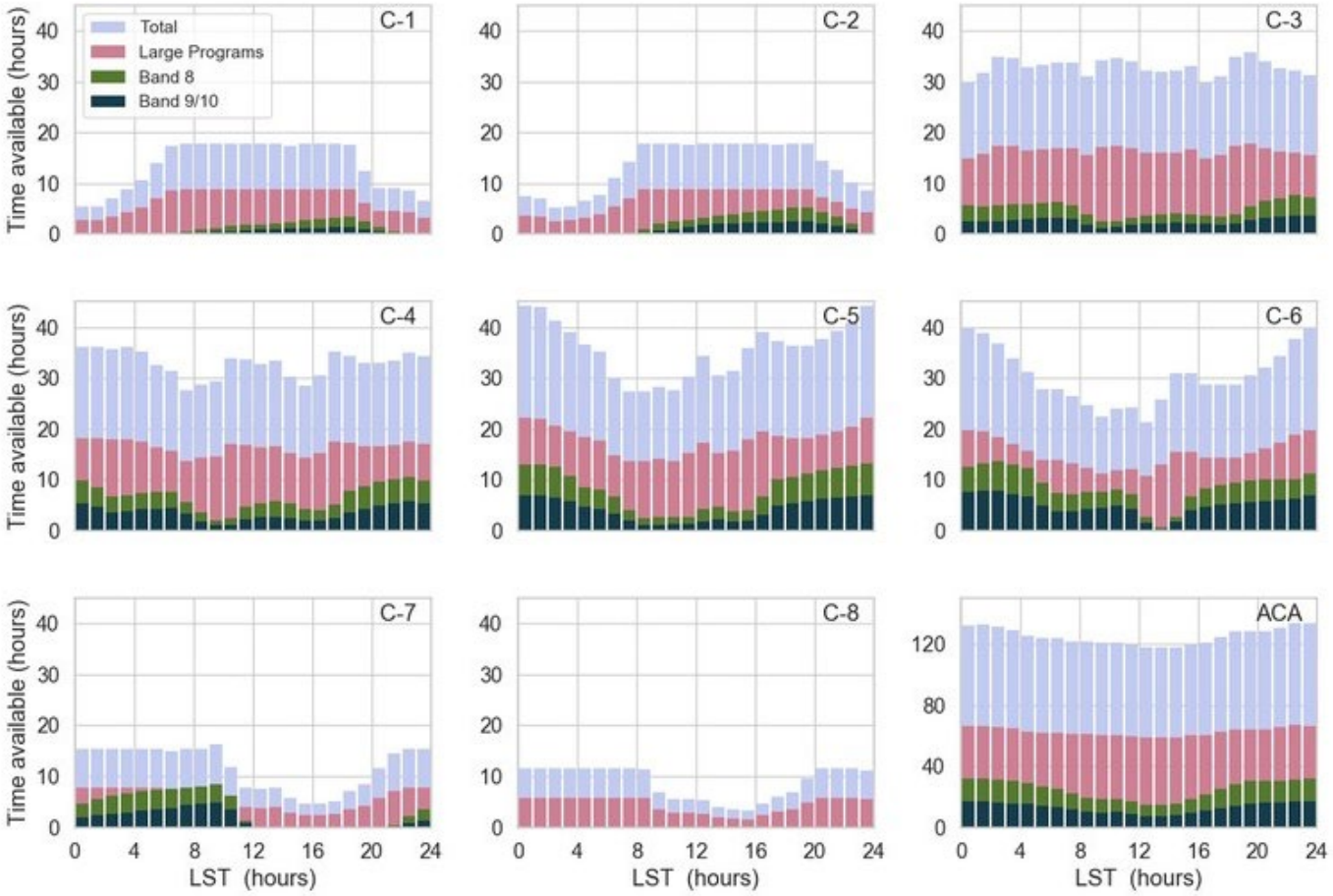
→ Ishii-san’s talk

Proposal types

- Regular, Target of Opportunity, Large Program, VLBI and phased-array, DDT
  - Regular
    - Estimated execution time does not exceed 50 hours on the 12-m Array or 150 hours on the 7-m Array in stand-alone mode.
  - Large Program
    - Estimated execution time >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.
    - Large Programs should not involve time-critical or ToO observations, and may not include full polarization measurements, Solar observations, VLBI, Phased Array mode, or Astrometric observations.

Please ask any support to the ARC for the
proposal planning including for Large Programs.
Please do not hesitate to submit Helpdesk tickets.

Scheduling consideration



- Weather → Proposer's Guide
- Please ask us a help for the planning, in particular for Large Programs
  - Helpdesk
    - https://help.almascience.org/
  - Article on how to plan the Large Program
    - https://help.almascience.org/kb/articles/are-there-policies-specific-to-large-programs

Scheduling consideration

Table A-1: Angular Resolutions (AR) and Maximum Recoverable Scales

Config	Lmax		Band 3	Band 4	Band 5	Band 6	Band 7
	Lmin		100 GHz	150 GHz	185 GHz	230 GHz	345 GHz
7-m	45 m	AR	12.5"	8.4"	6.8"	5.5"	3.6"
	9 m	MRS	66.7"	44.5"	36.1"	29.0"	19.3"
C-1	161 m	AR	3.4"	2.3"	1.8"	1.5"	1.0"
	15 m	MRS	28.5"	19.0"	15.4"	12.4"	8.3"
C-2	314 m	AR	2.3"	1.5"	1.2"	1.0"	0.67"
	15 m	MRS	22.6"	15.0"	12.2"	9.8"	6.5"
C-3	500 m	AR	1.4"	0.94"	0.77"	0.62"	0.41"
	15 m	MRS	16.2"	10.8"	8.7"	7.0"	4.7"
C-4	784 m	AR	0.92"	0.61"	0.50"	0.40"	0.27"
	15 m	MRS	11.2"	7.5"	6.1"	4.9"	3.3"
C-5	1.4 km	AR	0.54"	0.36"	0.30"	0.24"	0.16"
	15 m	MRS	6.7"	4.5"	3.6"	2.9"	1.9"
C-6	2.5 km	AR	0.31"	0.20"	0.17"	0.13"	0.089"

- Angular resolution
  - PIs can request a range of resolutions if scientifically acceptable.
  - If the PI selects a single value or a range < 20% around its centre value, a range of 20% around the single or centre value specified will be enforced.

PIs are encouraged to think about the range of acceptable angular resolutions, although with the consideration of the declination of their targets (beam elongation).

- Starting in Cycle 7, the time-estimate dialogue in the OT will show the expected 2-D beam shape and maximum axial ratio based on observations near transit.
- Note also that if the requested range includes both long-baseline and more compact configurations, only the latter will be considered.

Other notes

- Supplemental Call for ACA stand-alone
  - January 2022 to September 2022
  - Available observing time will be announced later
  - While stand-alone ACA proposals accepted from the Main Call may be assigned priority "A", "B", or "C", all accepted proposals from the Supplemental Call will be assigned priority "C". Proposals submitted to the Supplemental Call will be peer reviewed through the distributed system.
  - ACA stand-alone polarization is not offered in the Supplemental Call.
  - There will be no LST restriction on proposals at the time of submission.
  - Any stand-alone ACA proposal rejected in the Main Call may be modified to address comments from the reviewers and submitted to the Supplemental Call.

Scheduling consideration

- No C-9/10 in Cycle 8 2021. The overall schedule may be modified depending on such as the proposal pressure in the different configurations. Pressure for LST → Proposer's Guide

Complete Cycle 7 Configuration Schedule

Start date	Config	min - max baseline (m)	beam (")[1]	maximum recoverable scale (")[1]
2019-10-01	C43-4	15-784	0.92"	11.2"
2019-10-20	C43-3	15-500	1.4"	16.2"
2019-11-10	C43-2	15-314	2.3"	22.6"
2019-11-30	C43-1	15-161	3.4"	29.0"
2019-12-20	C43-2	15-314	2.3"	22.6"
2020-01-10	C43-3	15-500	1.4"	16.2"
2020-02-01	February Maintenance Period			
2020-03-01	C43-4	15-784	0.92"	11.2"
2021-03-20	C43-5	15-1400	0.54"	6.7"
2021-04-24	C43-6	15-2500	0.31"	4.1"
2021-05-27	C43-7	64-3600	0.21"	2.6"
2021-06-20	C43-8	110-8500	0.096"	1.4"
2021-07-11	C43-9	368-13900	0.057"	0.81"
2021-07-30	C43-10	244-16200	0.042"	0.50"
2021-08-20	C43-9	368-13900	0.057"	0.81"
2021-09-10	C43-8	110-8500	0.096"	1.4"

Cycle 8 2021

Start date	Configuration	L
1-Oct-21	C-8	8
20-Oct-21	C-7	3
20-Nov-21	C-6	2
1-Dec-21	C-5	1
20-Dec-21	C-4	(
10-Jan-22	C-3	(
1-Feb-22	No observations	
1-Mar-22	C-1	(
20-Mar-22	C-2	(
20-Apr-22	C-3	(
20-May-22	C-4	(
20-Jun-22	C-5	1
11-Jul-22	C-6	2
30-Jul-22	C-5	1
20-Aug-22	C-4	(
10-Sep-22	C-3	(

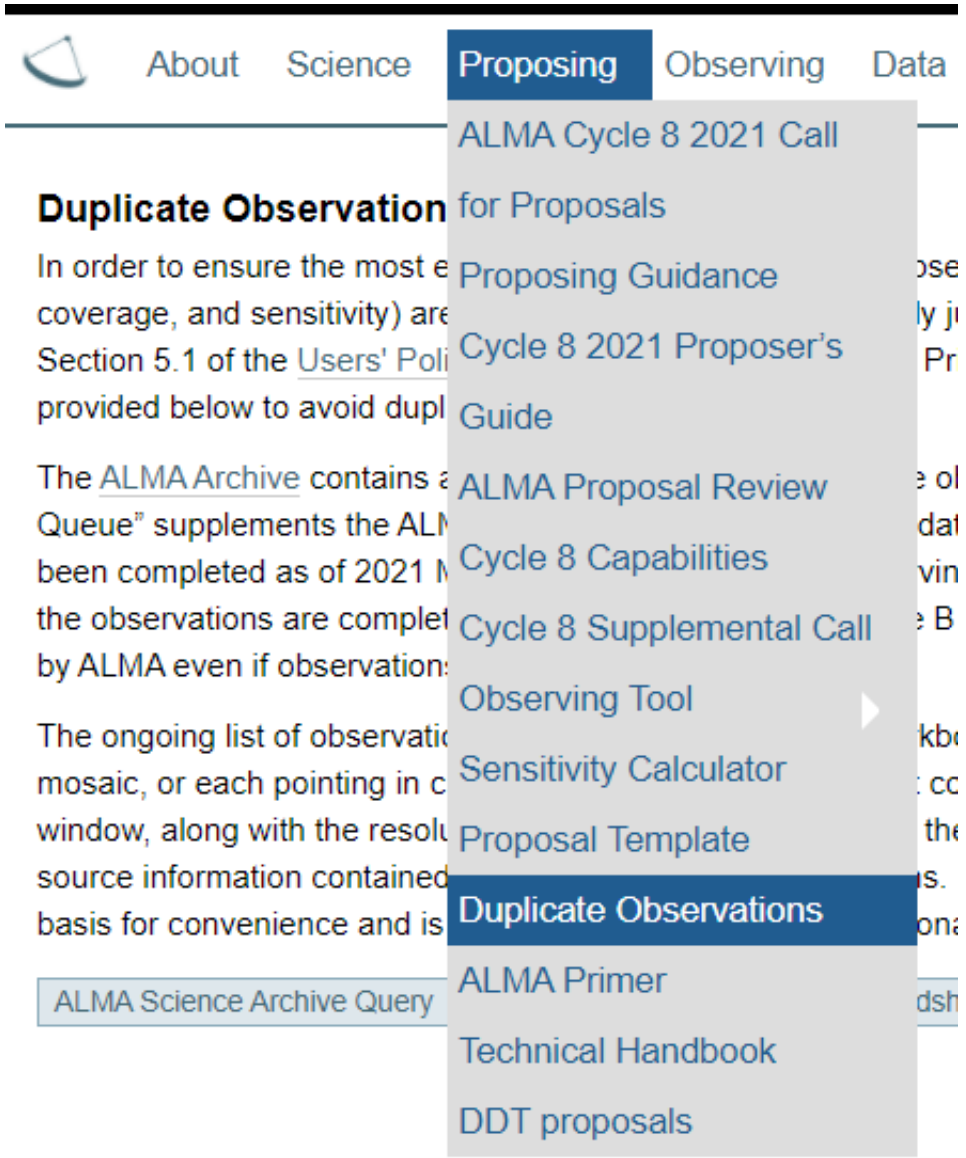
Cycle 9

Start date	Configuration
1-Oct-22	C-3
20-Oct-22	C-2
10-Nov-22	C-1
30-Nov-22	C-2
20-Dec-22	C-3
10-Jan-23	C-4
1-Feb-23	No observation
1-Mar-23	C-4
20-Mar-23	C-5
20-Apr-23	C-6
20-May-23	C-7
20-Jun-23	C-8
11-Jul-23	C-9
30-Jul-23	C-10
20-Aug-23	C-9
10-Sep-23	C-8

Duplications

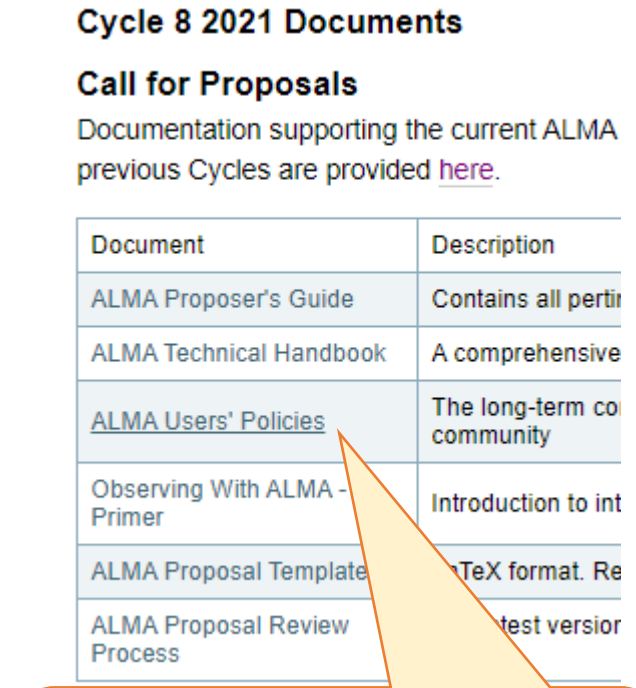
- Duplicate observations of the same location on the sky with similar observing parameters (frequency, angular resolution, coverage, and sensitivity) are not permitted unless scientifically justified. Detailed criteria of what constitutes a duplicated observation are specified in Appendix A of the Users' Policies.

- PIs are responsible for checking their proposed observations against both the ALMA Archive and the spreadsheet provided below to avoid duplicate observations.
- The proposal cover sheet contains a section where PIs can justify proposed duplicate observations.



Resubmissions

- Proposal teams that submit a Cycle 8 2021 proposal to observe some or all the Science Goals (SGs) of a currently active but unfinished project will have the relevant SGs identified as a "resubmission" by ALMA.
  - A SG is deemed a resubmission if it constitutes a duplication of an active SG following the rules specified in Appendix A of the Users' Policies and the PI of the relevant Cycle 7 project is listed as a PI, co-I or co-PI of the corresponding Cycle 8 proposal or the Cycle 8 PI is listed as an investigator on the Cycle 7 proposal.
- The relevant portion of the Cycle 8 2021 proposal will be cancelled if the observations are successfully completed in Cycle 7. Observations started in a previous cycle and accepted as a resubmission in Cycle 8 2021 will continue to be observed with the setup of the previous cycle.
- A Scientific Justification must be provided if the proposers request one or more additional epochs of observations in Cycle 8 2021 even if the Cycle 7 observations are completed.



Duplication criteria can be found in the "Users Policies" document

https://almascience.nao.ac.jp/documents-and-tools/cycle-8-documents

Proposal format

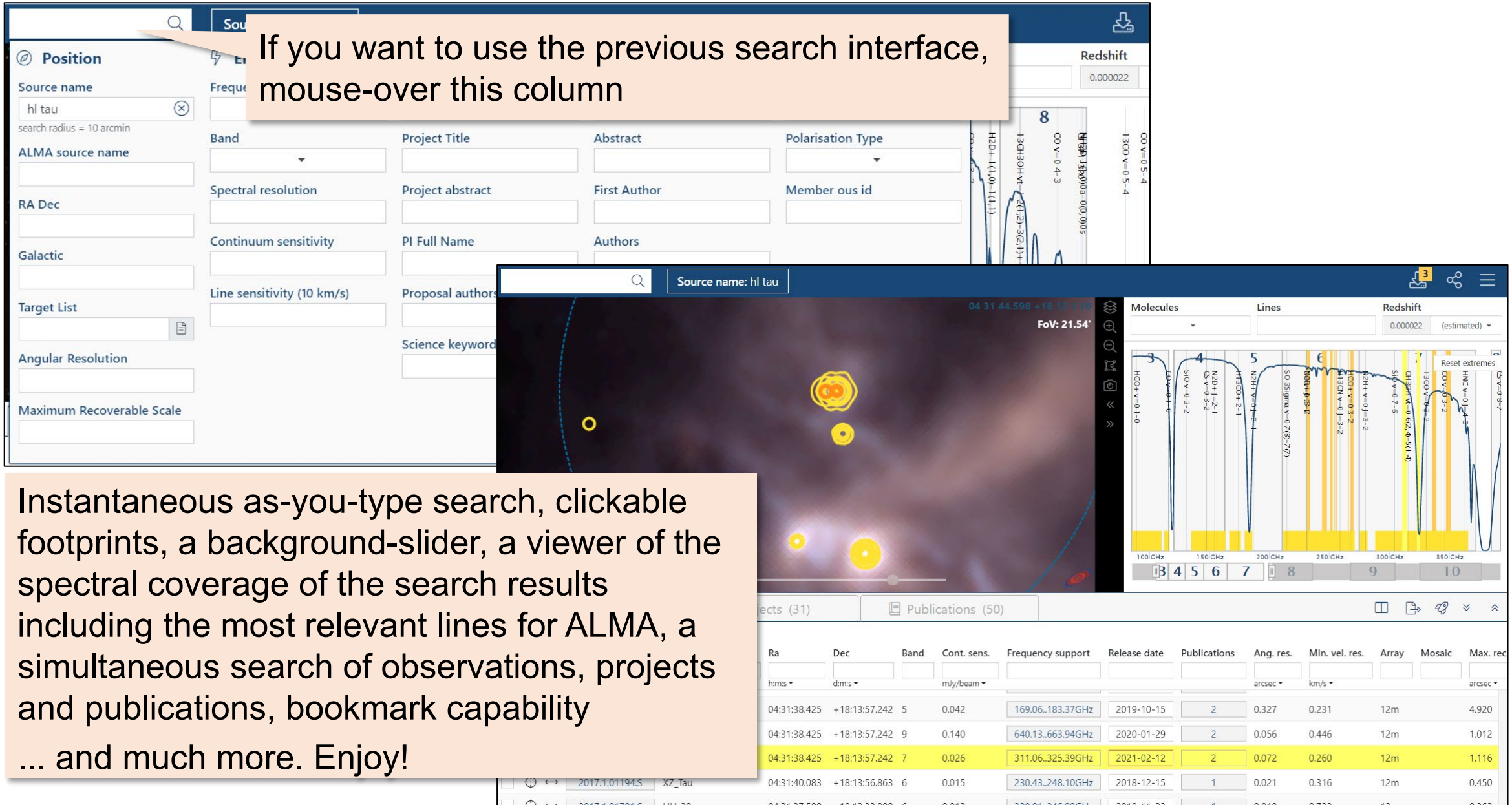
- Page limits
  - Total length: 4 pages for Regular, ToO, mm-VLBI and DDT proposals, 6 pages for Large Programmes (A4 or US Letter format)
- Font size: no smaller than 12 points including figure captions, tables and references
- Latex template is in the Science Portal and users can use it.

Other notes

- **No Phase 2 deadline** for PIs
  - Please carefully check that your observing setting at Phase 1 (proposal submission) is correct.
- TP-alone can be proposed with the combination of the 7-m Array
  - The OT currently does not permit users to request only the TP Array. However, if a user has existing 7-m Array data through their own program or through archival data, but now realizes that TP Array data are needed to obtain short spacings, they can submit a proposal requesting both the 7-m Array and TP Array. The proposal should indicate that only the TP Array is needed and that the 7-m Array should be descoped if the proposal is accepted. This option is available only if the 7-m Array data have already been obtained.
- Polarization with ACA stand-alone
  - This mode will have a cap in the total hours, but please do not hesitate to propose. Users over-reacted about this kind of “cap” before. Please do not hesitate to propose just because of the cap.
- Source coordinates (update of the Users Policies)
  - Please do not intentionally hide the true coordinates.

ALMA Science Archive

https://almascience.nao.ac.jp/asax/



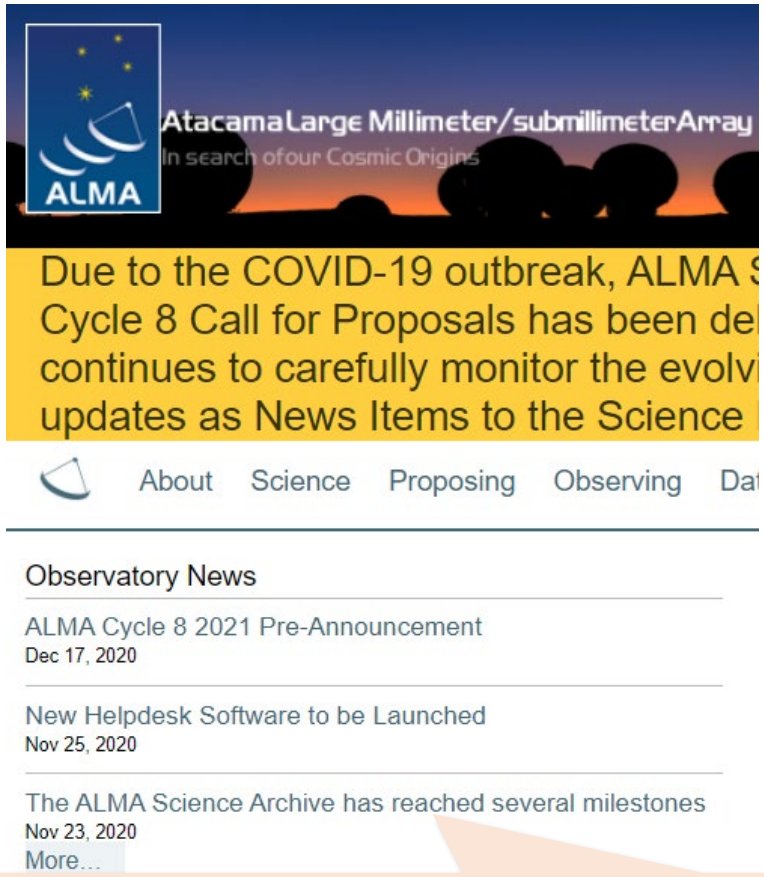
Instantaneous as-you-type search, clickable footprints, a background-slider, a viewer of the spectral coverage of the search results including the most relevant lines for ALMA, a simultaneous search of observations, projects and publications, bookmark capability

... and much more. Enjoy!

Archive updates

More than 1PB of data has now accumulated in the Archive

- **Improved downloads with the new ALMA Request Handler backend**
- **All FITS files are now accessible individually**: For all data from Cycle 1 onwards, all FITS files and README files can now be accessed file-by-file without needing to download huge tar files.
- **SV data can be searched for**
- **Virtual Observatory services available**
- **Improved astroquery**
- **Updated README files and QA reports**
- **ARI-L products available**



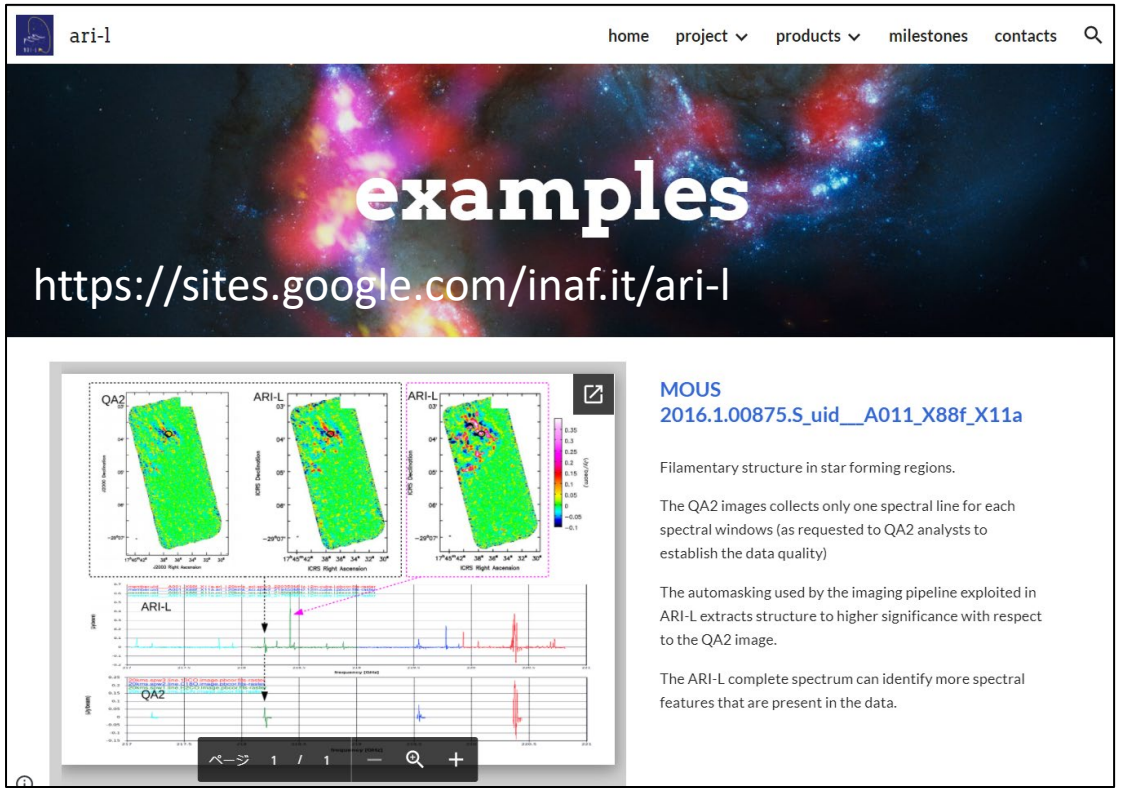
You can check details in the news in the Science Portal: https://almascience.nao.ac.jp/

Archive updates: ARI-L

Additional Representative Images for Legacy (ARI-L)

- EU (Italian)-led, development project, bringing the reduction level of ALMA data from Cycles 2-4 close to that of what is processed with the ALMA Imaging Pipeline in more recent Cycles.
- More than 74000 ARI-L FITS files are available for download.

A uniform set of full data cubes and continuum images covering at least 70% of the data from Cycles 2-4.
⇔ More limited QA2-generated products which cover only a small fraction (< 10%) of the observed data for those cycles.



Archive updates: ARI-L

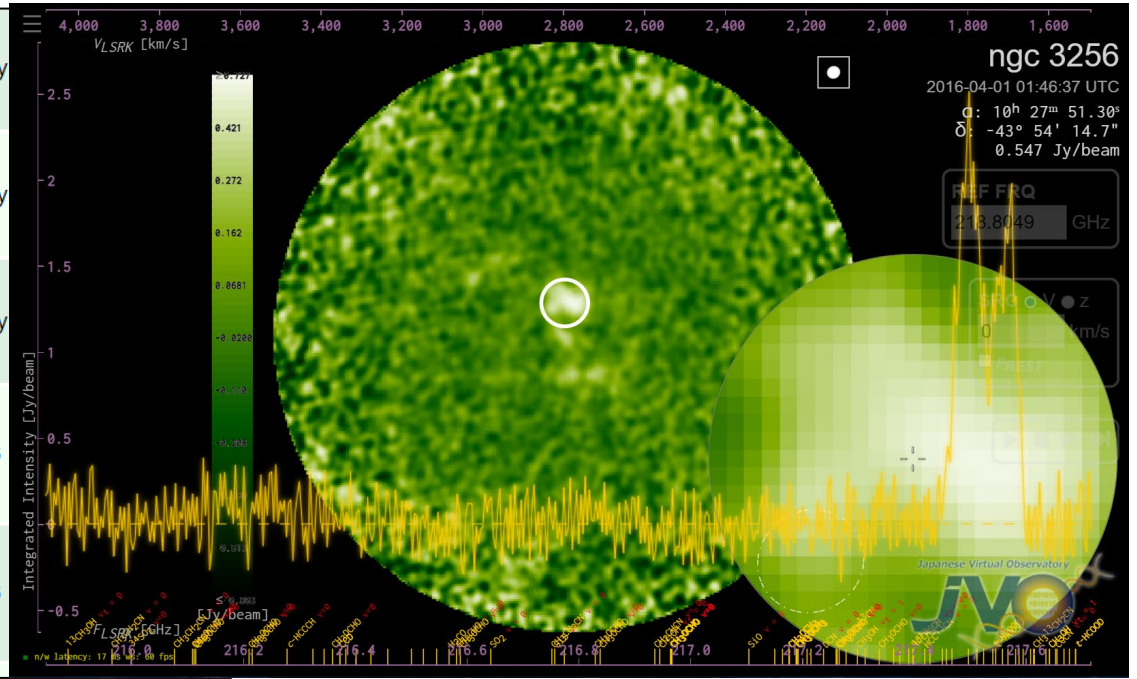
ALMA Science Archive

In the Request Handler page, you will see “external” with the package name “ari_l”.

JVO (http://jvo.nao.ac.jp/portal/alma/archive.do)

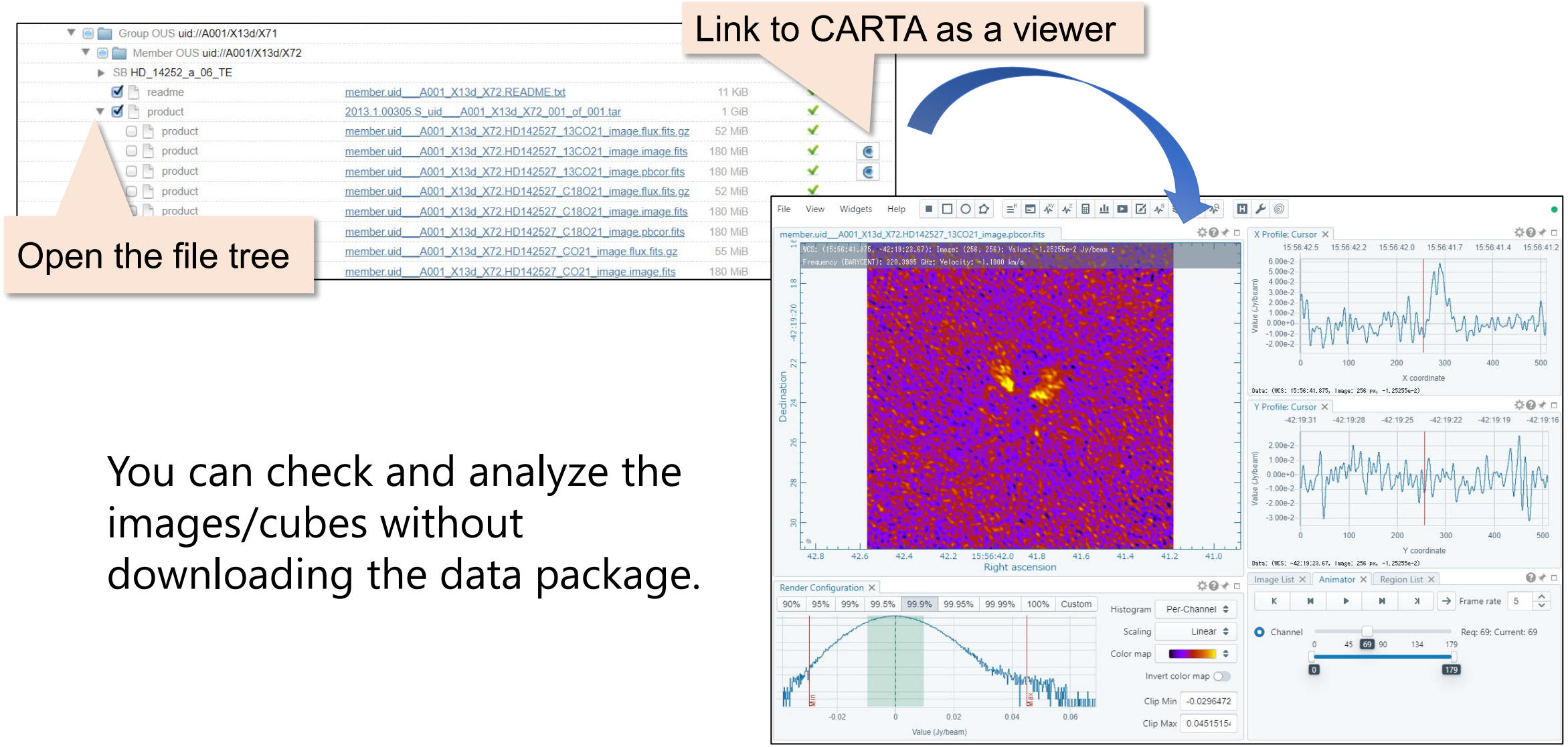
In the search results page, it says “ARI-L”

.T i		Download WebQLv4 VO Search	ALMA official	The properties of compact-object mergers detected by LIGO and VIRGO	Stars and stellar evolution	AT2019osy
.T i		Download WebQLv4 VO Search	ALMA official	The properties of compact-object mergers detected by LIGO and VIRGO	Stars and stellar evolution	AT2019osy
.S i		Download WebQLv4 VO Search	ARI-L	Chemistry in the Brightest Luminous-Infrared Merger	Galaxy evolution	ngc_3256
.S i		Download WebQLv4 VO Search	ARI-L	Chemistry in the Brightest Luminous-Infrared Merger	Galaxy evolution	ngc_3256



Archive updates: link to CARTA

ALMA Science Archive in the Request Handler page



You can check and analyze the images/cubes without downloading the data package.