

ALMA Community Day 2020



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Atacama Large Millimeter/submillimeter Array
Expanded Very Large Array



Today's Agenda

Morning – 9am to 12pm: News, Updates, and ALMA basics

- COVID-19 Updates
- Proposal Format
- New Changes and Capabilities in ALMA Cycle 8
- Proposing Better in Cycle 8
- ALMA Capabilities and Interferometry Primer
- NRAO Support

Afternoon – 1pm to ~4pm: Hands on Tutorials

- OT
- ALMA Archive
- Simulations in CASA
- Free time



(ALL THESE SLIDES WILL BE ONLINE)

Updates surrounding COVID-19

- Cycle 8 deadline postponed
 - NO EARLIER than May 19th, 2020 at 15:00 UT
10am (CST)
 - More information coming no later than April 21st
- On site science operations for Cycle 7 are currently suspended
 - Things are fluid
 - No decision has been made surrounding the extension of Cycle 7 or altering the array configuration schedule
- Data processing is ongoing
- NRAO is offering virtual face-to-face visits

(Things are fluid, this info may quickly be out of date!)

Proposing in Cycle 8

Where to start

- The Cycle 8 Call is Live - almascience.nrao.edu/
 - Create an ALMA account by registering at the Science Portal
- Download the Cycle 8 OT - almascience.nrao.edu/proposing/observing-tool
- Update your version of CASA (relevant for simulations) - casa.nrao.edu/
- Download the Cycle 8 LaTeX Template - almascience.nrao.edu/proposing/proposal-template
- Review the Proposer's Guide - almascience.nrao.edu/proposing/proposers-guide
- Other documentation
 - Call for Proposals, ALMA Primer, Technical Handbook (reference)

Proposing in Cycle 8

Timeline:

- Mar. 17 – Call for Proposals
- May 19th (at the earliest) – Proposal Deadline
 - 15:00 UT (10:00 am CST) NO JOKE!
- End July (tentative) – Results to PIs
- Sept. 9 (tentative) – Phase 2 submission
- Oct. 2020 (tentative) – Start of Cycle 8
- Oct. 2020 (tentative) – ACA Supplemental Call
- Sept. 2021 (tentative) – End of Cycle 8

Proposing in Cycle 8

Proposal Format:

- Proposal submitted through the OT
 - 4-pg Science Justification uploaded as a pdf to OT (6-pg Science Justification for Large Programs, >50 hr)
 - Instrument/Array setup defined in the OT through “Science Goals” (afternoon tutorial)
 - Technical Justification required for each Science Goal (text boxes within the OT)

Proposing in Cycle 8

Proposal Submission :

- Proposal submitted through the OT
 - ONLY THE PI CAN SUBMIT
 - Collaborative OT work is best done by emailing the saved OT proposal file
 - Proposal can be viewed by co-Is once submitted
 - Submit early, submit often
 - OT proposal validation can take a long time
 - Email spam (add co-Is near the end)
 - The OT checks font size now!
 - WILL NOT ALLOW YOU TO SUBMIT!!!

Proposing in Cycle 8

Array Configuration Schedule:

- Antenna configurations for the main 12-m array will use a new nomenclature in Cycle 8.
 - Configurations will be called C-1, C-2, and so on up to C-10, with C-1 having similar characteristics to the C43-1 configuration of Cycle 7, and likewise for the others.
 - Maximum baselines in Cycle 8 will be 8.5 km in configuration C-8.
- Configurations C-9 and C-10 with maximum baselines of 13.9 km and 16.2 km, respectively, will again be available in Cycle 9.
- NOTE: No PI observing takes place in Feb!
- The forward-looking configuration schedule (through Cycle 9) can be found at:

Start date	Configuration	Longest baseline	LST for best observing conditions
2020 October 1	C-8	8.5 km	~ 22h - 10h
2020 October 20	C-7	3.6 km	~ 23h - 11h
2020 November 10	C-6	2.5 km	~ 1h - 13h
2020 December 01	C-5	1.4 km	~ 2h - 14h
2020 December 20	C-4	0.78 km	~ 4h - 15h
2021 January 10	C-3	0.50 km	~ 5h - 17h
2021 February 1-28	No observations due to February Maintenance		
2021 March 1	C-1	0.16 km	~ 8h - 21h
2021 March 26	C-2	0.31 km	~ 9h - 23h
2021 April 20	C-3	0.50 km	~ 11h - 1h
2021 May 10	C-4	0.78 km	~ 13h - 3h
2021 May 31	C-5	1.4 km	~ 15h - 5h
2021 June 23	C-6	2.5 km	~ 16h - 6h
2021 July 28	C-5	1.4 km	~ 17h - 7h
2021 August 18	C-4	0.78 km	~ 19h - 8h
2021 September 10	C-3	0.5 km	~ 20h - 9h

almascience.nrao.edu/observing/observing-configuration-schedule/long-term-configuration-schedule

Proposing in Cycle 8

Logistic Changes in Cycle 8

- Dual-Anonymous Review
 - Do not identify the PI or any of the co-PIs or co-Is in any part of the proposal
 - Write in third person
 - Private (non-public) data or software should be referenced as a “private communication”
 - Do not include links to papers in preparation
 - Do not include acknowledgements or the source of any grant funding
 - Do not refer to data from ALMA or other observatories in an identifying fashion – use proposal IDs
 - Resubmissions should not list the PI or proposal ID

PIs are required to anonymize their proposals. PIs who do not anonymize their proposals in accordance with the guidelines may have their proposal rejected.

Proposing in Cycle 8

Logistic Changes in Cycle 8

Dual-Anonymous Examples

- Instead of: “In Smith et al. (2018), we demonstrated...”
proposers can write: “Smith et al. (2018) demonstrated...”
- Instead of: “Figure 1 shows the image from our Cycle 7 ALMA program (2019.1.02045.S, PI Smith).”
proposers can write: “Figure 1 shows the image from the Cycle 7 ALMA program 2019.1.02045.S.”
- Instead of: “This is a resubmission of our ongoing Cycle 7 program 2019.1.02045.S (PI: Smith). Half of our targets have been observed and we are resubmitting the proposal to obtain the remaining half.”
proposers can write: “This is a resubmission of our ongoing Cycle 7 program. Half of our targets have been observed and we are resubmitting the proposal to observe the remaining half.”

Proposing in Cycle 8

What's New?

Steady State ALMA

- 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)
- Baselines: Maximum baselines for the antenna configurations will vary from 0.16 km to 8.5 km. Configurations C-9 and C-10 will not be offered in Cycle 8. Maximum baselines of 3.6 km (C-7) for Bands 8, 9 and 10. Maximum baselines of 8.5 km for Bands 3 to 7
- Spectral line, continuum, and mosaic observations

Proposing in Cycle 8

What's New?

Steady State ALMA

- Polarization:
 - Single pointing, on-axis, full linear or circular polarization for continuum and full spectral resolution observations in Bands 3-7 on the 12-m Array
 - Linear polarization on-axis imaging in continuum and full spectral resolution modes at the level of 0.1% (3 sigma) fractional polarization with the very brightest calibrators, and 0.2% (3 sigma) level for a typical observation
 - Minimum detectable degree of circular polarization 1.8% of the peak flux for continuum and full spectral resolution spectral line observing
 - Mosaicking of continuum linear polarization observations in Bands 3 to 7 – THIS IS NEW

Proposing in Cycle 8

What's New?

Large Programs (started in Cycle 4)

- Any project >50 hours, or standalone ACA > 150 hours
- Limited observing modes
- Automatic 'A' grade
- +2 pages for Science Case
 - Data/Project Mgmt. Plans
 - Enhanced Data Products
- For best results – WORK WITH YOUR ARC FOR SUPPORT!!

Restrictions

- No polarization, bandwidth switching, Solar observations, VLBI observations, user-defined calibrations, or astrometric observations

Proposing in Cycle 8

What's New?

- Solar observations in Band 5
- VLBI observations of faint science targets (correlated flux density <500 mJy within an unresolved core on ALMA baselines up to 1 km).
- Pulsar observations using 12-m array as a single dish
- High-frequency observations (Bands 9 and 10) with the stand-alone 7-m Array
- Mosaicking of continuum linear polarization observations (Bands 3 to 7)
- Spectral scans with the 7-m Array
- All available observing modes are now “Standard” (no additional justification is required for any allowed mode)

Proposing in Cycle 8

What's New?

- Supplemental Stand-Alone ACA Call (started in Cycle 7)
 - Massively undersubscribed
 - Proposal Deadline ~October 2020
 - Dual-Anonymous, distributed peer review
 - Review 10 proposal for every 1 you submit
 - Likely future of all ALMA review processes (Cycle 9 onward)

Proposing Better in Cycle 8

Proposal Writing Tips:

- Why ALMA? - Make sure ALMA is the best telescope to achieve your science goal and explicitly mention it.
- Why your targets? - Justify your target selection (this is always the weakest point in a proposal and the first thing reviewers use to take down your proposal).
- How?- Explain the need for the setup you chose (e.g.,. Band, angular and spectral resolution, SNR targeted (is it enough?), etc.) from a scientific perspective.
- Be Clear - Make figures and captions are self-explanatory and clear.
- Check the Archive - Do an archive search, show you have done your homework.
- DO NOT SQUEEZE TEXT! - This pisses off your reviewer and you don't want that.
- Be Concise - Keep in mind your reviewers have to read ~100 proposals so make yours easy to read and clear.

Proposing Better in Cycle 8

Don't Skimp on Your Request! (10 – 30 hr proposal are just fine!)

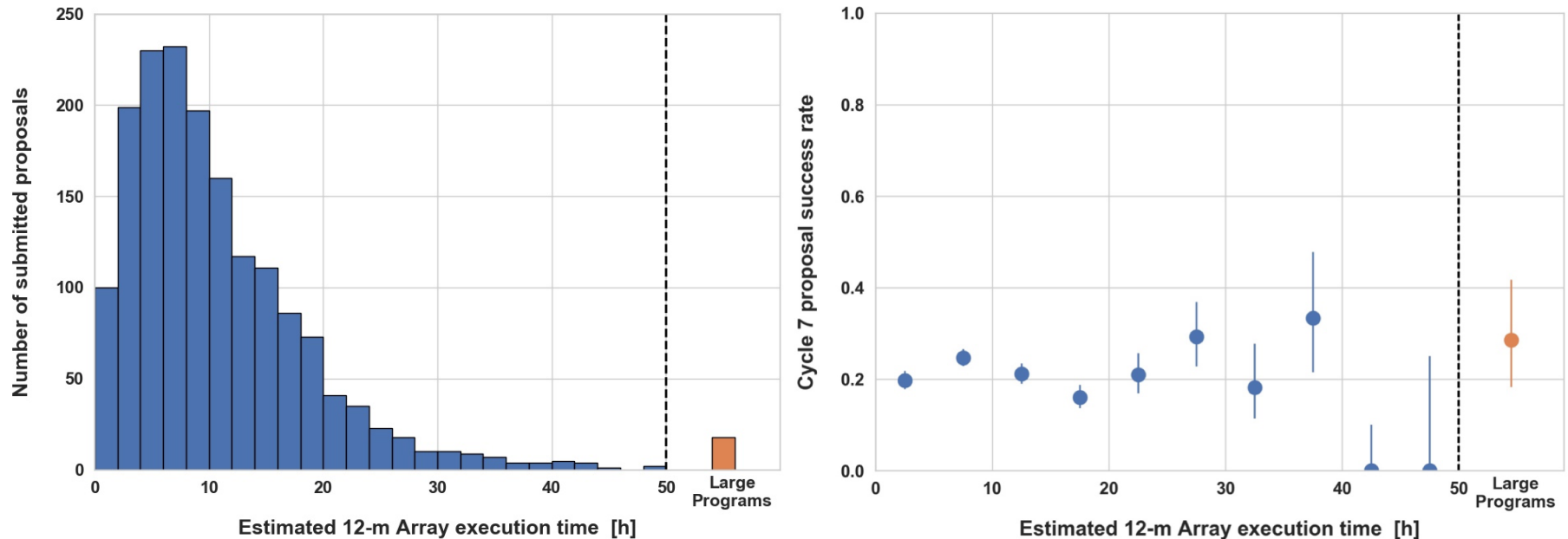
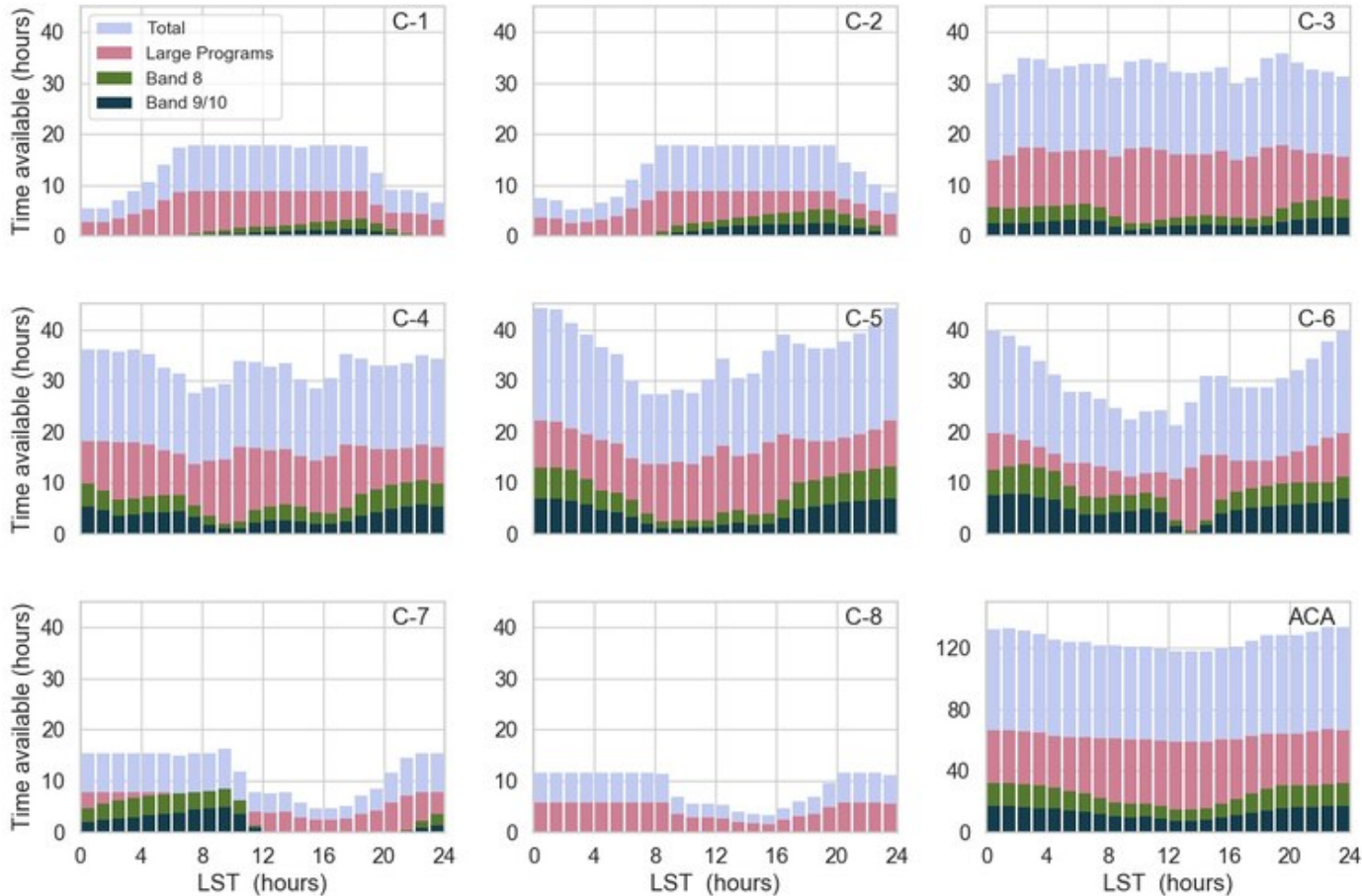


Figure 1: (Left) Number of proposals submitted as a function of the 12-m Array execution time in Cycle 7. (Right) The fraction of proposals (with 1-sigma confidence intervals) that are assigned priority Grade A or B as a function of the estimated 12-m Array time.

Proposing Better in Cycle 8

Managing Expectations and Taking Advantage of the ALMA Queue



Effective observing time available per configuration for executing PI projects. The time available for Large Programs is shown in pink and time for high-frequency observations in green and dark blue. The configuration schedule and, consequently, the total number of hours available per configuration may change in response to proposal pressure.

Proposing Better in Cycle 8

Managing Expectations and Taking Advantage of the ALMA Queue

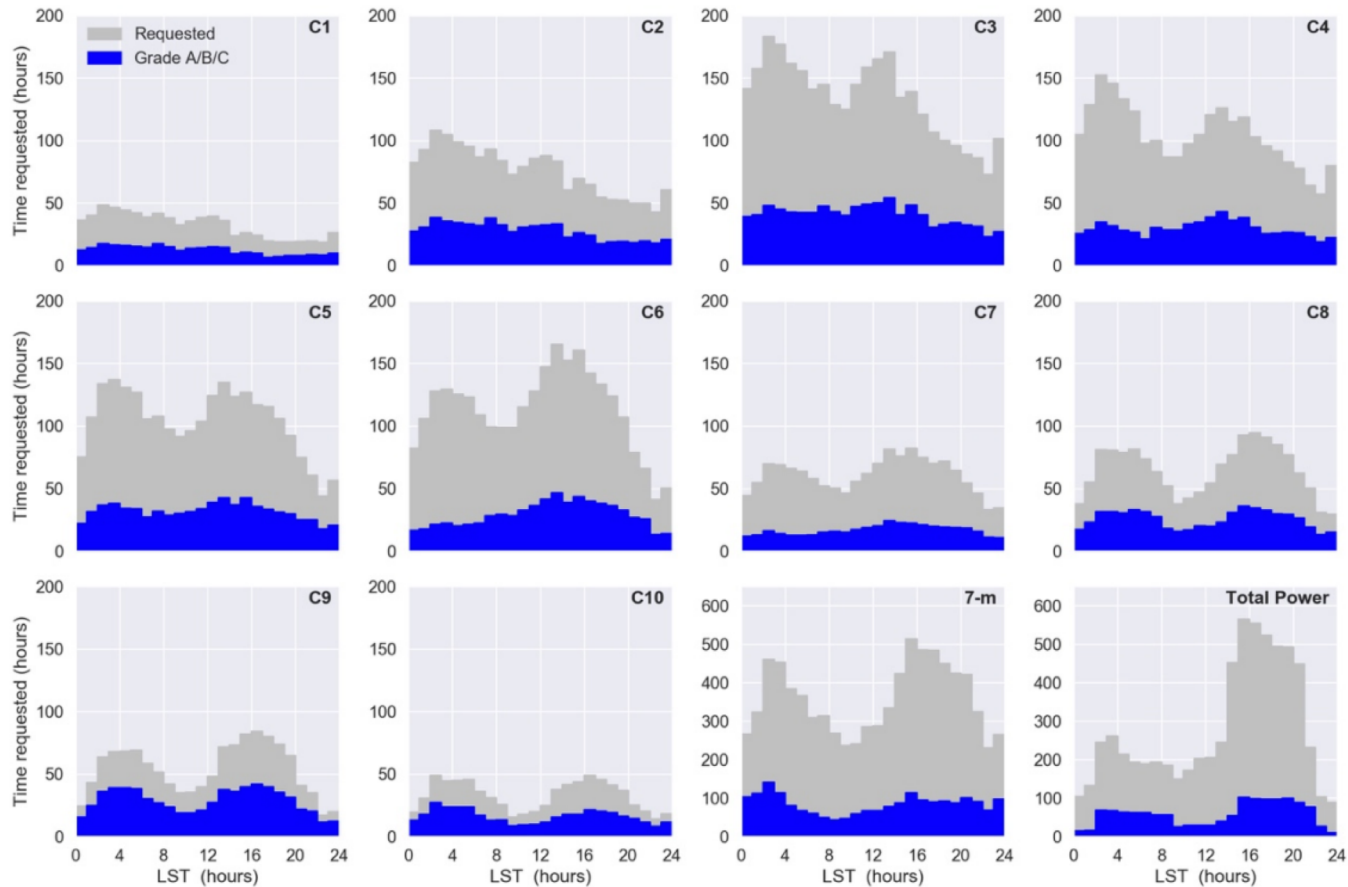
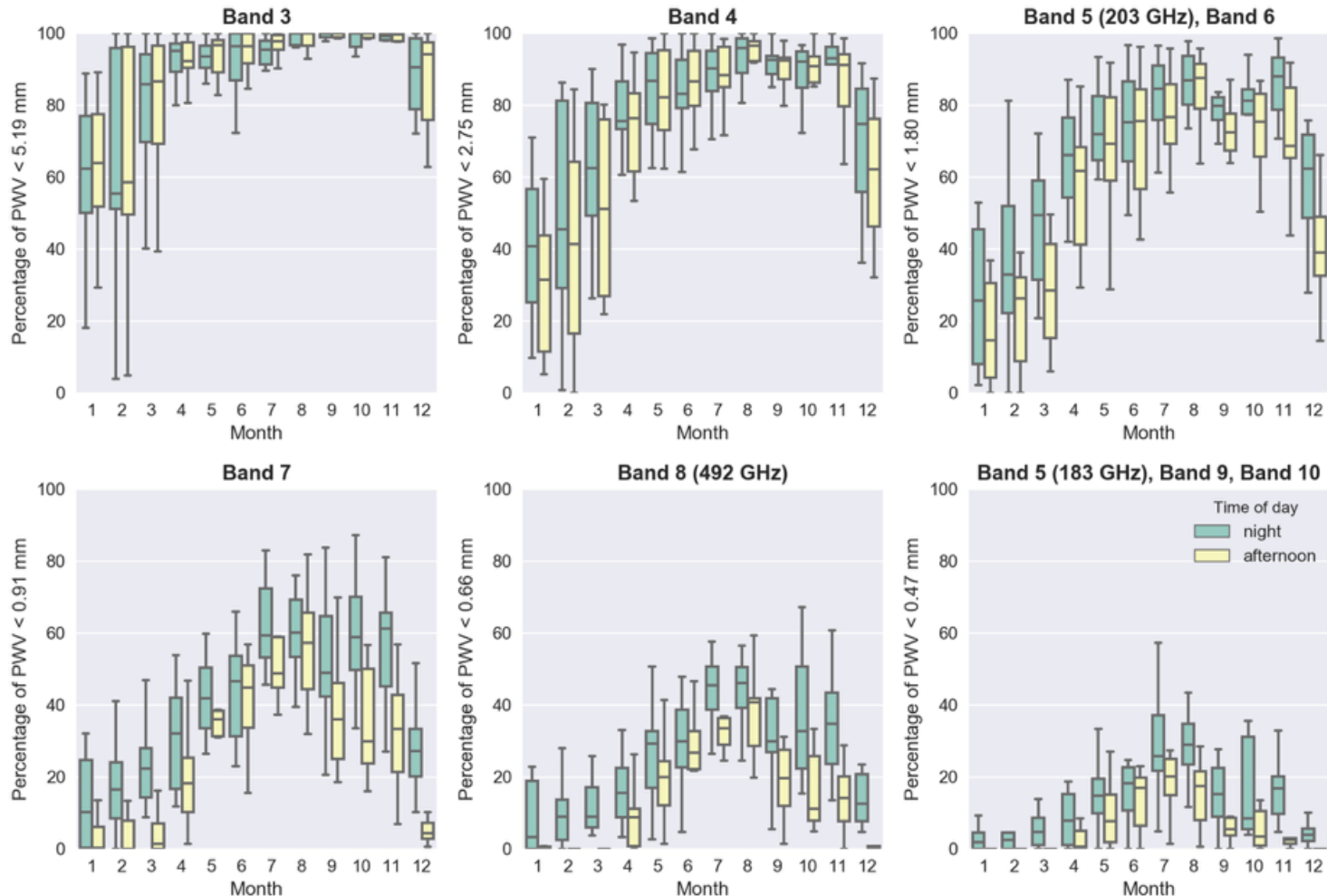


Figure 7. Distribution of estimated execution time for all submitted **Cycle 7 proposals (gray)** and proposals assigned Grade A, B, or C (blue).

Proposing Better in Cycle 8

Managing Expectations and Taking Advantage of the ALMA Queue

Box and whisker plots of the percentage of time that the precipitable water vapor (PWV) is less than the thresholds adopted for the various ALMA bands versus the month of the year. The PWV measurements were obtained by the APEX weather stations between 2007 and 2017.



Proposing Better in Cycle 8

Chose Observable Targets

Start date	Configuration	Longest baseline	LST for best observing conditions
2020 October 1	C-8	8.5 km	~ 22h - 10h
2020 October 20	C-7	3.6 km	~ 23h - 11h
2020 November 10	C-6	2.5 km	~ 1h - 13h
2020 December 01	C-5	1.4 km	~ 2h - 14h
2020 December 20	C-4	0.78 km	~ 4h - 15h
2021 January 10	C-3	0.50 km	~ 5h - 17h
2021 February 1-28	No observations due to February Maintenance		
2021 March 1	C-1	0.16 km	~ 8h - 21h
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2021 May 10	C-4	0.78 km	~ 13h - 3h
2021 May 31	C-5	1.4 km	~ 15h - 5h
2021 June 23	C-6	2.5 km	~ 16h - 6h
2021 July 28	C-5	1.4 km	~ 17h - 7h
2021 August 18	C-4	0.78 km	~ 19h - 8h
2021 September 10	C-3	0.5 km	~ 20h - 9h

Pay attention to the best LST, particularly for high-frequency and high-angular-resolution observations.

The TACC will grade your proposal on scientific merit, not on whether your science will actually be observed. (e.g., Band 10 observations will not happen during the day!)

Proposing Better in Cycle 8

Know your configurations!

Config	Lmax		Band 3	Band 4	Band 5	Band 6	Band 7	Band 8	Band 9	Band 10
	Lmin		100 GHz	150 GHz	185 GHz	230 GHz	345 GHz	460 GHz	650 GHz	870 GHz
7-m	45 m	AR	12.5''	8.4''	6.8''	5.5''	3.6''	2.7''	1.9''	1.4''
	9 m	MRS	66.7''	44.5''	36.1''	29.0''	19.3''	14.5''	10.3''	7.7''
C-1	161 m	AR	3.4''	2.3''	1.8''	1.5''	1.0''	0.74''	0.52''	0.39''
	15 m	MRS	28.5''	19.0''	15.4''	12.4''	8.3''	6.2''	4.4''	3.3''
C-2	314 m	AR	2.3''	1.5''	1.2''	1.0''	0.67''	0.50''	0.35''	0.26''
	15 m	MRS	22.6''	15.0''	12.2''	9.8''	6.5''	4.9''	3.5''	2.6''
C-3	500 m	AR	1.4''	0.94''	0.77''	0.62''	0.41''	0.31''	0.22''	0.16''
	15 m	MRS	16.2''	10.8''	8.7''	7.0''	4.7''	3.5''	2.5''	1.9''
C-4	784 m	AR	0.92''	0.61''	0.50''	0.40''	0.27''	0.20''	0.14''	0.11''
	15 m	MRS	11.2''	7.5''	6.1''	4.9''	3.3''	2.4''	1.7''	1.3''
C-5	1.4 km	AR	0.54''	0.36''	0.30''	0.24''	0.16''	0.12''	0.084''	0.063''
	15 m	MRS	6.7''	4.5''	3.6''	2.9''	1.9''	1.5''	1.0''	0.77''
C-6	2.5 km	AR	0.31''	0.20''	0.17''	0.13''	0.089''	0.067''	0.047''	0.035''
	15 m	MRS	4.1''	2.7''	2.2''	1.8''	1.2''	0.89''	0.63''	0.47''
C-7	3.6 km	AR	0.21''	0.14''	0.11''	0.092''	0.061''	0.046''	0.033''	0.024''
	64 m	MRS	2.6''	1.7''	1.4''	1.1''	0.75''	0.56''	0.40''	0.30''
C-8	8.5 km	AR	0.096''	0.064''	0.052''	0.042''	0.028''	N/A	N/A	N/A
	110 m	MRS	1.4''	0.95''	0.77''	0.62''	0.41''			

Cycle 8 – 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 2020.

Cycle 8 – A Successful Proposal!

- Proposals are given a grade of A, B, or C
 - Grade A proposals guaranteed to be completed, will carry over to next cycle if not completed
 - All accepted proposals have a high completion percentage (Cycle 6)
 - Grade A – 57% complete, 40% partial (Cycle carry over)
 - Grade B – 51% complete, 49% partial
 - Grade C – 29% complete, 48% partial
 - Accepted Large Programs receive A grades
 - Supplemental ACA Stand Alone programs are all grade C (but massively undersubscribed)

Cycle 8 – A Successful Proposal!

- Phase II (Creating and Queuing Scheduling Blocks)
 - PIs review their scheduling blocks by Sept. 9, 2020!
 - PIs review their scheduling blocks by Sept. 9, 2020!!
 - PIs review their scheduling blocks by Sept. 9, 2020!!!
 - If you don't submit your SGs, your proposal will be downgraded!
 - 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>

Questions?



How about a 15 minute break?

- Fill up your water
- Warm up that coffee
- Get a snack
- Check your email
- Wash your hands
- Stretch your legs
- Pet your dog/cat
- Text a loved one