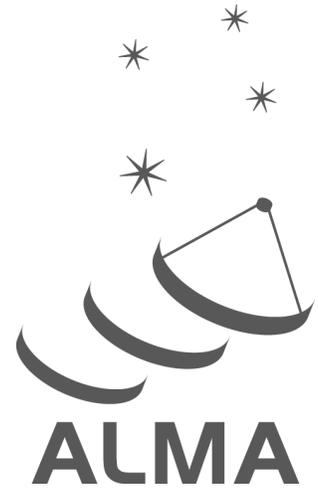


Phase 2 Quickstart Guide



www.almascience.org

ALMA, an international astronomy facility, is a partnership of ESO (representing its member states), NSF (USA) and NINS (Japan), together with NRC (Canada), MOST and ASIAA (Taiwan), and KASI (Republic of Korea), in cooperation with the Republic of Chile. The Joint ALMA Observatory is operated by ESO, AUI/NRAO and NAOJ.

User Support:

For further information or to comment on this document, please contact your regional Helpdesk through the ALMA User Portal at www.almascience.org. Helpdesk tickets will be directed to the appropriate ALMA Regional Center at ESO, NAOJ or NRAO.

Revision History:

Version	Date	Editors
1 (Cycle 4)	August 2016	Suzanna Randall
1 (Cycle 5)	July 2017	Suzanna Randall, Evanthia Hatziminaoglou
1 (Cycle 6)	July 2018	Evanthia Hatziminaoglou
1 (Cycle 7)	July 2019	Evanthia Hatziminaoglou

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In publications, please refer to this document as:
Phase 2 Quickstart Guide, ALMA Doc. 6.20

1 Scope

This document is intended to guide you as the PI of an approved ALMA observing proposal through the process of Phase 2 submission using the ALMA Observing Tool. From Cycle 5 onwards, PIs are simply submitting the Phase 2 Science Goals, and the observatory will be responsible for automatically generating the Scheduling Blocks for all approved projects with PI- or Phase 2 delegee-submitted Phase 2 Science Goals after the Phase 2 submission deadline.

2 Principles

As the PI, you are responsible for ensuring that your Phase 2 material is submitted before the advertised Phase 2 deadline. If the Phase 2 deadline is missed, no Scheduling Blocks will be generated for your project. This does not apply if there are official change requests (CRs; see Section 6) pending approval.

Shortly after receiving the notification letters, PIs of approved projects will be contacted by ALMA via a Helpdesk ticket. **Any necessary communication between the PI and ALMA concerning the approved project should proceed by replying to this Helpdesk ticket.** The only exception is for official change requests, which require an official CR ticket to be opened in the relevant Helpdesk department. The project Helpdesk ticket will be assigned to the Contact Scientist for your project, who will be happy to assist with any queries that may arise. However, **it is in no way mandatory to reply to the Helpdesk ticket if you are satisfied with your Phase 2 material and were able to submit it without issues.**

3 Submitting your Phase 2 Program in Three Easy Steps

Step 1: Retrieve your approved project from the archive

First make sure you have the latest version of the ALMA OT installed. This is achieved by closing any OT instance that may already be open and restarting. If you are using the Webstart version (which is strongly recommended), the OT will automatically update before it opens up. If you are using the tarball version, you will get a notification that the OT version you are using is out of date upon opening the OT. You will need to download the latest version of the OT from the ALMA Science Portal at <https://almascience.eso.org/proposing/observing-tool>. The new version of the OT will be displayed in the OT's title bar ("Cycle n (Phase2), where n is the number of the current cycle. The OT version used for the proposal submission will not work for Phase 2.

In the OT, open your project from the archive using *File -> Open Project -> From ALMA Archive* (see Fig. 1, top), or by selecting *Retrieve project from the ALMA Science Archive* in the pop-up window that appears when the OT is opened. You need to login with your ALMA Science Portal credentials to do this. You can find your project using the *All my projects* option¹, by entering your ALMA user ID, or by entering the project code if you have it at hand. If your project was approved, it will open up as a Phase 2 project in the *Program* tab (see Fig. 1, bottom), and the Phase 1 Science Goal(s) in the 'Proposal' tab will have been copied over into the Phase 2 observing program.

Step 2: Review and make any necessary edits to your project

Before submitting the Phase 2 Science Goals, you should carefully review all the information. This will be identical to what you submitted in Phase 1 and will usually not require any editing, unless the Phase 1 project

¹Using the *All my projects* option also shows you projects for which you are co-I or co-PI, however you can follow the workflow described in this document and submit SBs only for projects where you are the PI or Phase 2 delegee.

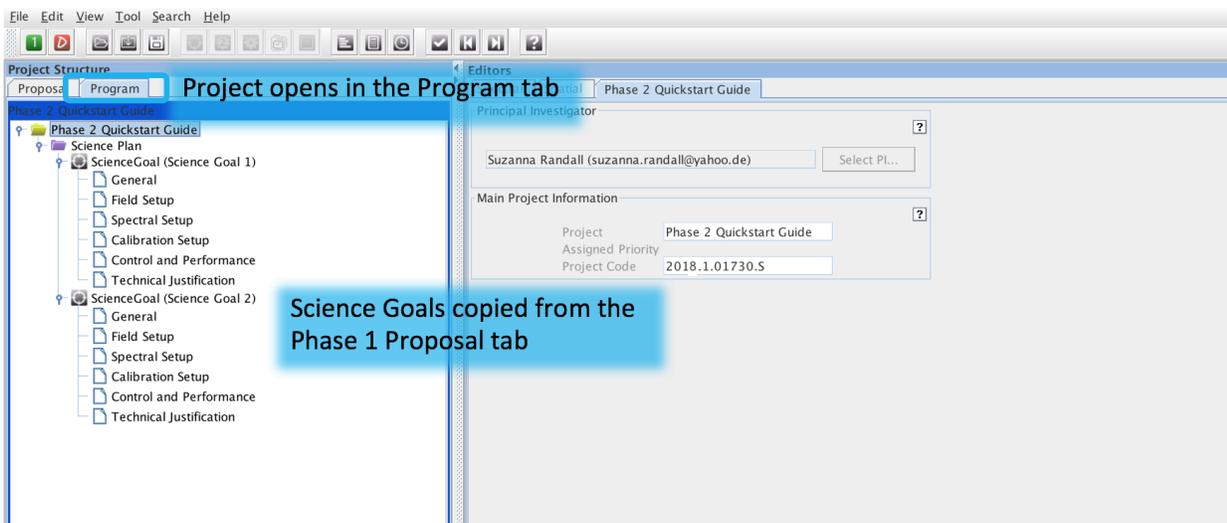
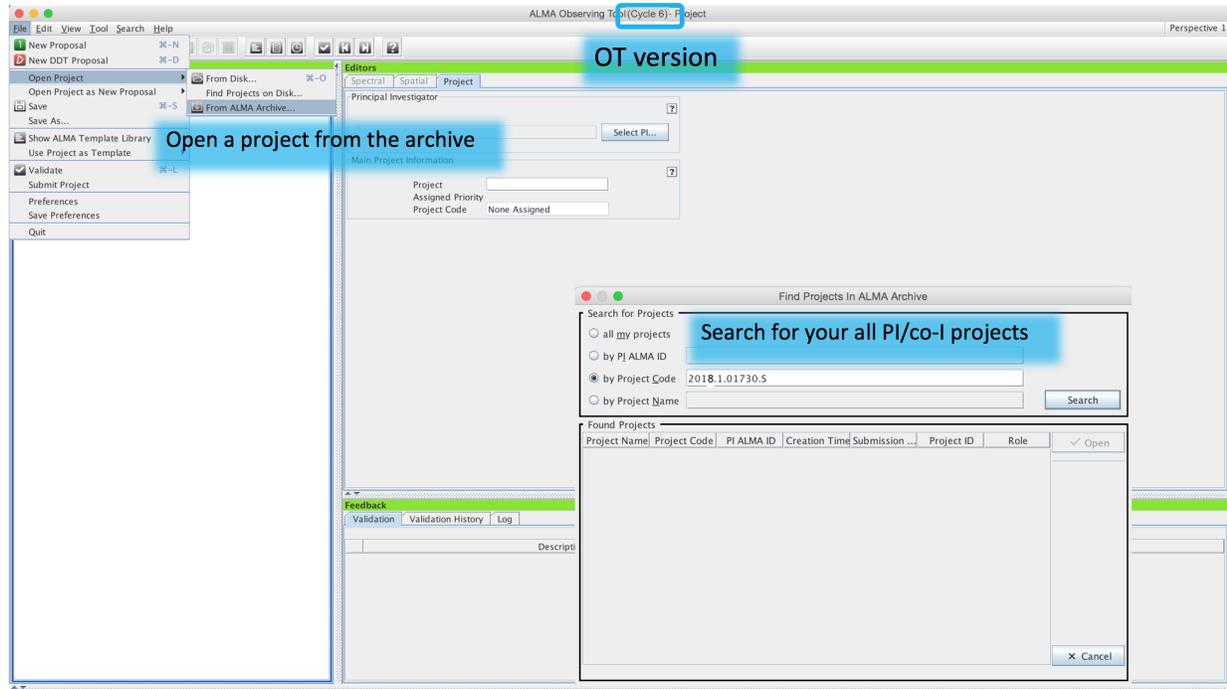


Figure 1: Top: Opening a project from the archive. Bottom: An accepted project will appear in the Program tab in Phase 2.

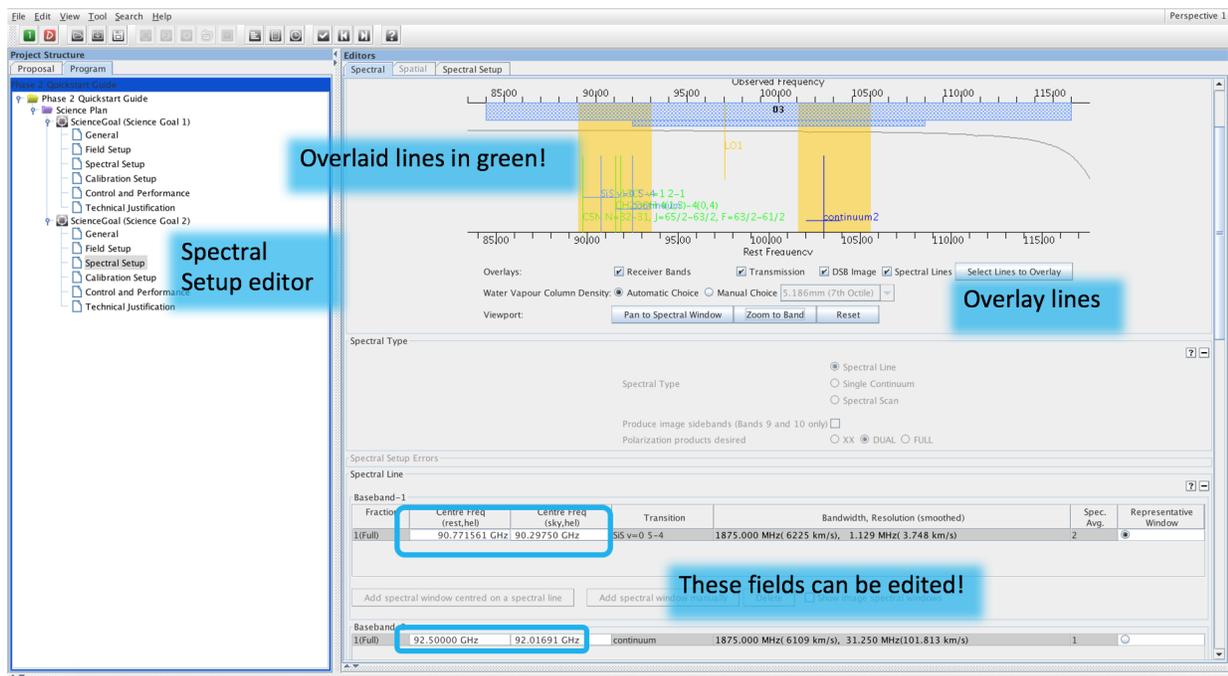
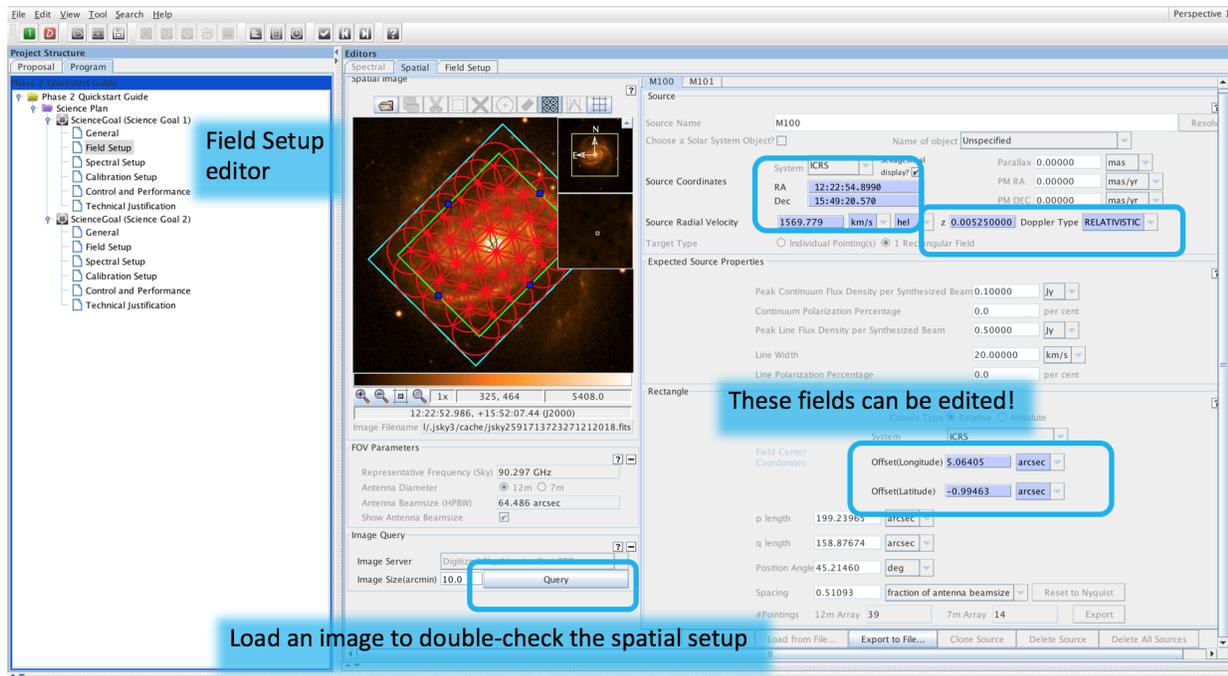


Figure 2: Edits allowed in Phase 2 in the field and spectral setup editors

submitted had mistakes. The most common mistakes occur for the target coordinates, proper motions and source velocity/reference frames (in particular if the sources were resolved from SIMBAD), as well as the spectral setup. **Please check these values very carefully - it is your responsibility to make sure they are correct!** You may want to get a co-I to double-check your work; in order to do this they can simply download the .aot file from the ALMA archive.

If necessary, you can make the following corrections to the Phase 2 Science Goal:

- you can shift the position of any pointing up to a limit of 0.5 times the primary beam size shown in the *Spatial* tab in the Field Setup editor (see Fig. 2)
- you can change the central frequency on sky of any spectral window up to a limit of 20% of its bandwidth
- you can edit the list of rest frequencies defined in Phase 1 using the *Define Rest Frequencies* button in the *Spectral Setup* editor

You can make these adjustments by using the following fields in the OT (see also Fig. 2):

- Source Coordinate RA and Dec
- Source radial velocity, redshift, Doppler type
- Pointing Offset RA and Dec
- Spectral window centre frequency



Editable fields typically have a lilac background while non-editable fields typically have a white background. The exception is spectral setup baseband tables that have not been selected, which appear white but are editable when selected.

Any changes made to these fields are cumulative, e.g. a $+2''$ change in the field centre coordinate RA and a $+1''$ change in the Offset RA will result in a $+3''$ overall change in pointing position. Similarly, changing the source radial velocity by -10 km/s and shifting a spectral window central frequency by -5 km/s will result in an overall change of -15 km/s. The limits quoted above apply to the **total** change in pointing position and/or spectral window frequency with respect to the approved Phase 1 Science Goal.



There is no 'reset' button for the editable Phase 2 Science Goal fields. If you want to revert to the original values after experimental editing, you will have to copy them over from the Phase 1 Science Goal viewable from the Proposal tab. Those values cannot be edited. Alternatively, you can re-retrieve the last version of the project submitted from the archive.

If you need to make any changes beyond those allowed by the OT, you should seek advice from your Contact Scientist (see Section 6). The same goes for projects with special requirements (see Section 5).

Step 3: Submit your Phase 2 Program

In order to complete the Phase 2 process it is recommended that you validate prior to submission (see Fig. 3). You must then submit the project with the Phase 2 Science Goals to the ALMA archive. To submit and complete the Phase 2 process, simply select *File -> Submit Project* and follow the pop-up instructions (Fig. 4). You can re-submit as many times as necessary before the Phase 2 deadline. Note that projects with validation errors (Fig. 5) will not submit, however this should not normally happen for approved projects, unless the corrections made were too large.

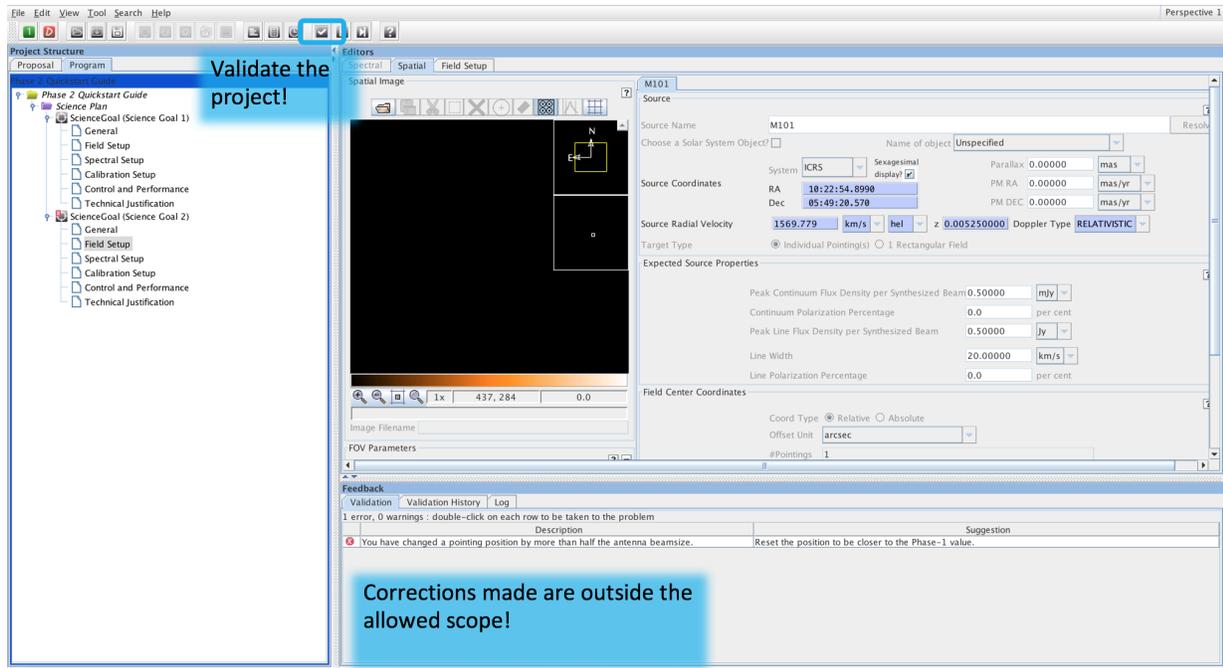


Figure 3: Validating your Phase 2 project. Any validation errors will prevent you from submitting.



It is your responsibility to ensure the Phase 2 products for your approved project are submitted to the archive before the Phase 2 deadline. Scheduling Blocks will not be generated for projects where the Phase 2 material has not been submitted. **Submission of Phase 2 products by PIs or delegates will not be possible after the deadline!**



Any Science Goals that were de-scoped will be ignored for SB generation, i.e. SBs will not be generated for such Science Goals. This is handled automatically by the software, and human intervention is not necessary. De-scoped Science Goals are clearly marked as such in the OT.

A very last, final sanity check is recommended to ensure that:

- the spectral window central frequencies, redshifts, and target coordinates, velocities, reference frames and offsets are correct in all your Science Goals
- you have taken the necessary action if your project requires any special considerations (see Section 5)
- you have submitted the project to the archive

4 Phase 2 submission delegation

PIs can elect to delegate the Phase 2 process to a colleague of their choice. This person must have previously registered in the ALMA Science Portal. As PI, you then add them as a Phase 2 delegate in your ALMA user

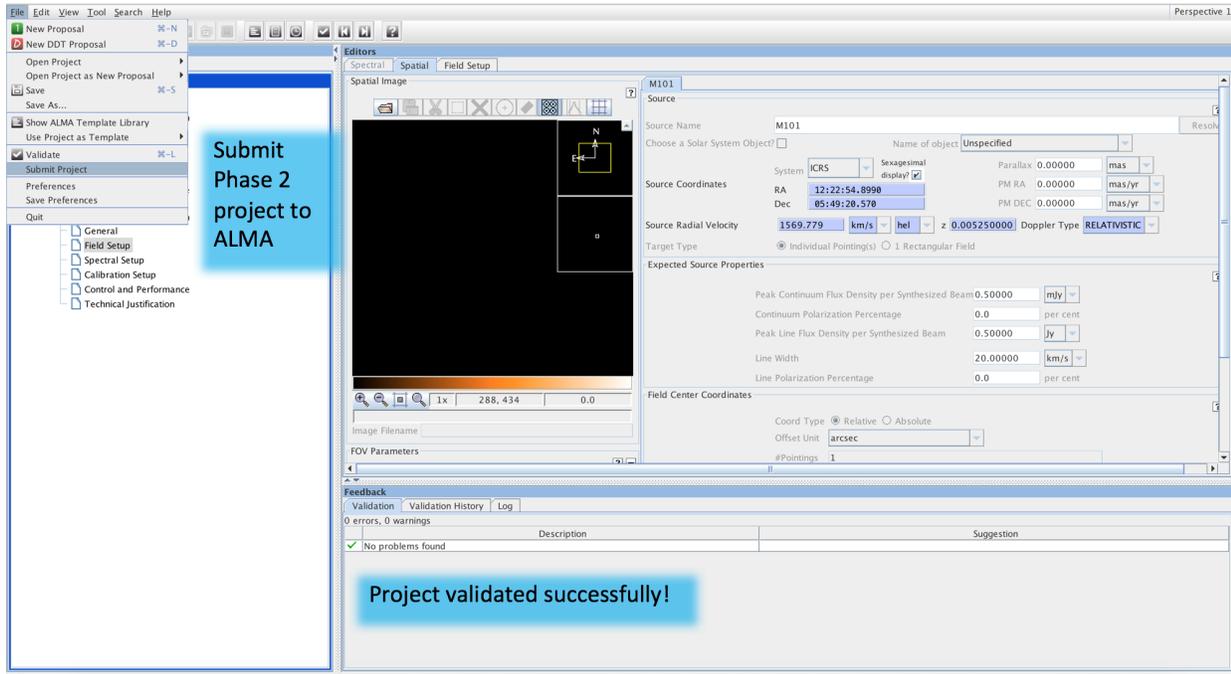


Figure 4: Submitting your Phase 2 program

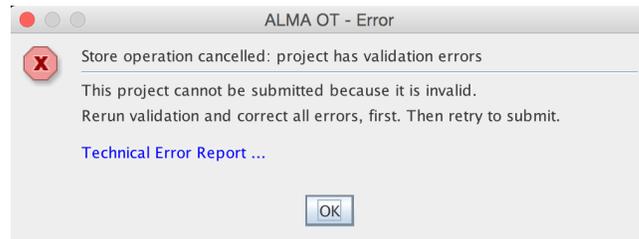


Figure 5: Attempted submission of a project containing validation errors.

profile accessible when logged into the ALMA Science Portal (see Fig. 6). Simply go to the *Project Delegation* tab, hit *Add delegee*, select the project you want to delegate and start typing the last name of the delegee into the field (see Fig. 7). From the pull-down menu you can chose the type of delegation (PHASE2, ToO Triggering or DATA). The latter option allows the delegee to access your data from the ALMA Science archive while it is still in proprietary time. To add the same person as delegee both for Phase 2 and for data download, you will need to follow the *Add delegee* process twice, as the Phase 2 delegation concerns only the Phase 2 submission process and does not grant data access later on in the process. The same applies to any other combination of delegations.



In order to retrieve projects delegated to them from the archive, delegees should search by Project Code (delegated projects will not appear under *All my projects* unless the delegee is also a co-I.) The delegee can then download the project from the OT and view, edit and submit it. Delegees have the same privileges as the PI during the Phase 2 process. They can make any changes the PI is allowed to make and can submit the Phase 2 material to the archive as many times as they wish before the Phase 2 deadline. After the Phase 2 deadline neither PIs nor delegees may submit.

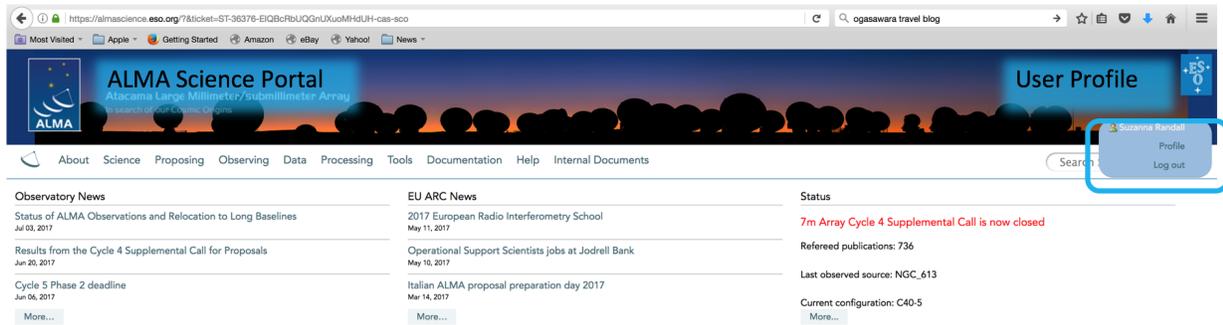


Figure 6: Finding your profile information on the ALMA Science Portal

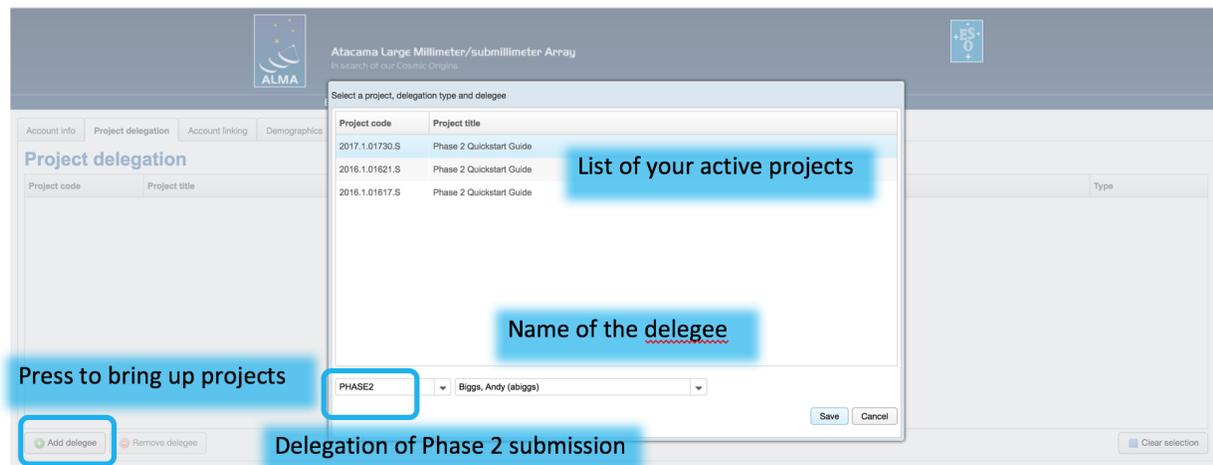


Figure 7: Assigning a Phase 2 delegee for your project

5 Observing modes that require special consideration

- Projects containing **Total Power (single dish)** observations: all Total Power single dish observations require an OFF position to be specified at Phase 2. This should correspond to a region in the sky where no emission is expected at the frequency of observation down to the sensitivity requested.

From Cycle 7 on an offset for each science target will be chosen by ALMA based on the following criteria:

- Extragalactic objects in all bands: an offset of 10' from the target in horizontal coordinates
- Galactic objects (Band 3 - 6): a fixed position in ALMA off-position catalogue within 5 degrees from the target
- Galactic objects (Band 7 and 8): a fixed position in ALMA off-position catalogue within 3 degrees from the target

PIs can request to use their preferred reference position before the Phase 2 deadline on their Helpdesk project ticket.

- Projects containing **time constraints**: please check the time constraints specified at Phase 1 very carefully, and if applicable contact your Contact Scientist to add further possible time slots or supplementary information. Only time constraints specified in the relevant fields in the OT will be considered by default; any additional scheduling information (including anything mentioned in the scientific or technical justification of your proposal) needs to be brought to the attention of your Contact Scientist during the Phase 2 process.

- Science Goals that use the narrowest spectral windows offered, and/or have **expected lines very close to the spectral window edge**. Due to technical restrictions on the exact placement of the spectral windows, the desired (i.e. that specified in the Science Goal) and the actual spectral window frequency observed may differ by up to ~ 20 MHz. If you are hoping to observe spectral lines within a few tens of MHz of the spectral window edge, please contact your Contact Scientist for help.
- **VLBI** projects: these projects follow the normal workflow. They will be assigned to a VLBI expert, and you will be contacted if any further action is required from your side after SB submission.
- Projects that contain **Solar observations**: these projects follow the normal workflow, however the SBs are submitted with the understanding that the ephemeris provided is preliminary and will be updated shortly before the Solar campaign. If you are the PI of an accepted project containing Solar observations you will be contacted before the start of the Solar campaign with instructions on how to provide the final ephemeris files.
- **ToO** (target of opportunity) projects: ToO projects follow the normal workflow, i.e. you need to generate and submit the SBs by the Phase 2 deadline as for any other project. The triggering of observations will then be done via the Helpdesk by the PI or a selected delegee (feel free to ask your Contact Scientist for help).
- **Re-submissions**: ALMA will check all approved Cycle 7 projects against approved (ABC rank) Cycle 6 projects (as well as carry-overs from previous cycles) and identify any SBs that are re-submissions. If the Cycle 6 SB has already been started (if at least one Execution Block has passed QA0), the observations from the previous cycle will normally be carried over to Cycle 7 and the corresponding re-submitted Cycle 7 SB will be cancelled. If the Cycle 6 SB observations have not yet been started the Cycle 7 observations will proceed as normal. As a PI you should normally not need to worry about this in Phase 2. Your Contact Scientist will contact you after the Phase 2 deadline if any clarifications are needed.
- Projects with **astrometric requirements** beyond those advertised in the Call for Proposals: make sure to contact your Contact Scientist to discuss the possibility of implementing calibration strategies beyond the standard calibration offered by ALMA.

6 Change requests

If you require any edits to the Phase 2 Science Goals that are beyond the scope of the corrections allowed, you should first get in touch with your Contact Scientist via the project Helpdesk ticket. Your Contact Scientist will advise you on whether or not to submit an official CR ticket to the Helpdesk. **Only PIs can submit CRs - not their Phase 2 delegees**. If a CR is submitted and, subsequently, approved by the ALMA Director, an ALMA staff member will make the necessary edits and update the Phase 2 Science Goals for you. You will be informed by your Contact Scientist once the new Science Goals are ready to be reviewed. You will need to approve such projects via the Helpdesk before they can be added to the observing queue.



If you have submitted an official change request, and you have received no feedback by the Phase 2 deadline there is no cause for panic. Any project for which an official change request is still pending at the time of the deadline will have the Phase 2 products submitted by ALMA staff, regardless of whether the change request is eventually approved or not. You will be contacted once this has happened and be asked to approve any resulting updates to your project via the Helpdesk.



The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership of the European Organization for Astronomical Research in the Southern Hemisphere (ESO), the U.S. National Science Foundation (NSF) and the National Institutes of Natural Sciences (NINS) of Japan in cooperation with the Republic of Chile. ALMA is funded by ESO on behalf of its Member States, by NSF in cooperation with the National Research Council of Canada (NRC) and the National Science Council of Taiwan (NSC) and by NINS in cooperation with the Academia Sinica (AS) in Taiwan and the Korea Astronomy and Space Science Institute (KASI).

ALMA construction and operations are led by ESO on behalf of its Member States; by the National Radio Astronomy Observatory (NRAO), managed by Associated Universities, Inc. (AUI), on behalf of North America; and by the National Astronomical Observatory of Japan (NAOJ) on behalf of East Asia. The Joint ALMA Observatory (JAO) provides the unified leadership and management of the construction, commissioning and operation of ALMA.

