

# User's Guide to the East Asian ALMA Regional Center (EA-ARC)

Japan (EA-ARC), Taiwan (EA-ARC node),  
and Korea (EA-ARC node).



[www.almascience.org](http://www.almascience.org)

## 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](http://www.almascience.org). Helpdesk tickets will be directed to the appropriate ALMA Regional Center at ESO, NAOJ or NRAO.

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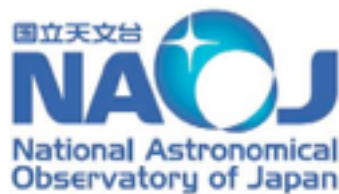
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## Contributors

East Asian ALMA Regional Center



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**User's Guide to the East Asian ALMA Regional Center (EA ARC)**

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## Scope

This document explains the role, structure, duties and function of the East Asian ALMA Regional Center based at NAOJ (National Astronomy Observatory of Japan) Chile Observatory, at the Mitaka Campus in Tokyo, Japan; the Taiwan node at the ASIAA, in Taipei; and the Korean node at KASI, in Daejeon.

## Web Resources

ALMA Science portal;

<http://almascience.nao.ac.jp>

ALMA Helpdesk:

<https://help.almascience.org>

EA-ARC Webpage:

<http://alma.mtk.nao.ac.jp/j/forresearchers/ea-arc/> (NAOJ, Japanese)

<http://alma.mtk.nao.ac.jp/e/forresearchers/ea-arc/> (NAOJ, English)

<http://alma.asiaa.sinica.edu.tw> (Taiwan Node, English)

[http://alma.asiaa.sinica.edu.tw/index\\_c.php](http://alma.asiaa.sinica.edu.tw/index_c.php) (Taiwan Node, Chinese)

<http://alma.kasi.re.kr> (Korean Node)

EA-ARC Tutorial & workshops information

<http://alma.mtk.nao.ac.jp/e/forresearchers/ea-arc/tutorials/>

Observing Tool (proposal preparation tool)

<https://almascience.nao.ac.jp/proposing/observing-tool>

CASA (Data reduction)

<http://casa.nrao.edu/>

## 1. ALMA and EA-ARC mission goals

The Atacama Large Millimeter/sub-millimeter Array (ALMA) is expected to be the leading observatory at millimeter and sub-millimeter wavelengths in the coming decades. ALMA is a global collaboration involving East Asia, Europe, North America and the host country Chile. ALMA will comprise at least 66 high precision antennas equipped with receiver and digital electronics system to observe the 30 GHz to 1 THz frequency range, and with angular resolutions as high as 5 milli-arcseconds. Using a fully dynamic scheduling system and innovative calibration strategies, the ALMA system will allow us to make the best use of the atmospheric conditions on the Chajnantor plateau, at 5000 m altitude in the Atacama desert.

The highest quality science produced with ALMA in the mm/submm bands will emerge through competitive access over the widest possible user community. A key requirement for ALMA operations is that comprehensive user support be available to the entire global astronomical community. This effort is coordinated via the ALMA Regional Centers (ARCs), supporting users at each stage to acquire ALMA data: from proposal and observation preparation, through to data reduction and data analysis, as well as data distribution and data archiving.

We have created the East Asian ARC (EA ARC), based at the National Astronomical Observatory of Japan (NAOJ) with the Taiwan and Korean nodes in Taipei and Deajeon, to help users fully exploit the capabilities of ALMA and maximize ALMA's scientific return. ALMA will appeal to a much broader range of astronomers than the conventional mm/submm community, and ALMA users of all levels and backgrounds are invited to take advantage of the assistance and expertise available at the EA-ARC.

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## 2. The East Asian ALMA Regional Center (EA-ARC)

The EA-ARC comprises a core office located at the NAOJ Mitaka campus in Japan, the Taiwan Node at the Academia Sinica Institute of Astronomy and Astrophysics (ASIAA) and the Korean node at the Korea Astronomy and Space Science Institute (KASI). The Japan, Taiwan and Korean offices are coordinated by close collaboration of their respective managers, and user supported services are distributed between them. Note that the Taiwanese ARC office operates in collaboration with both the EA-ARC and NA-ARC.

EA-ARC is coordinated from the NAOJ Mitaka campus, although the nodes in Taiwan and Korea have significant autonomy and are tailored to their respective populations and the services and facilities are largely consistent throughout the EA-ARC.

### 2.1. *The EA-ARC services.*

#### 1. *EA-ARC user and observatory support;*

EA-ARC staff in all regions includes scientific support staff, computer hardware and software support and archive maintenance, as well as education and outreach staff. The roles of the support staff are detailed in section 3.2. Information of the EA-ARC staff is maintained at:

<http://alma.mtk.nao.ac.jp/e/forresearchers/ea-arc/> (NAOJ)

<http://alma.asiaa.sinica.edu.tw> (Taiwan Node)

<http://alma.kasi.re.kr> (Korean Node)

#### 2. *Tutorials, Workshops and training;*

The EA-ARC holds ALMA early science workshops, user's meetings, regional 'Town meetings', and provides up to date information in conferences, workshops and astronomical society meetings. At these workshops, information on current and proposed capabilities is discussed, tutorials and hands-on sessions using the Observing Tool and CASA for proposal preparation and data reduction are also run. Feedback is specifically solicited from the user-

community to improve ALMA operations during these meetings, although feedback is welcome at any time.

A list of tutorial and workshop events is maintained at:

<http://alma.mtk.nao.ac.jp/e/forresearchers/ea-arc/tutorials/> (NAOJ)

[http://alma.asiaa.sinica.edu.tw/twarc\\_tutorials.php](http://alma.asiaa.sinica.edu.tw/twarc_tutorials.php) (ASIAA)

[http://alma.kasi.re.kr/Korea\\_ARC\\_Node\\_Events.html](http://alma.kasi.re.kr/Korea_ARC_Node_Events.html) (KASI)

### 3. *Face-to-face meeting;*

A small number visitors can be accommodated at NAOJ, ASIAA or KASI, for “Face to face” support and data processing assistance with EA-ARC support staff. Some funding is available for travel and accommodation (See also section 3.4). Requests for Face to face support should be submitted via the helpdesk system described in section 3.3.

## 2.2. *EA-ARC user support roles*

The EA-ARC offices in Japan, Taiwan and Korea are staffed by a number of active scientists and postdoctorate personnel, who together provide support for research scientists, at all stages of proposal preparation, as well as data processing. The EA-ARC staff have wide experience in mm/submm astronomy with particular expertise in interferometer mosaicking, combination of interferometric data and single dish data, polarimetry and advanced data analysis. The EA-ARC scientific staff, their research interests and support roles are introduced at:

<http://alma.mtk.nao.ac.jp/e/forresearchers/ea-arc/members.html>. (NAOJ)

[http://alma.asiaa.sinica.edu.tw/people\\_arc.php](http://alma.asiaa.sinica.edu.tw/people_arc.php) (ASIAA)

[http://alma.kasi.re.kr/people\\_staff.html](http://alma.kasi.re.kr/people_staff.html) (KASI)

Each ARC staff member has a unique set of task allocations, including primary leads in various ALMA subsystems, and *cognisant* roles in some aspect, which is a regional contact and representative. - e.g. the ‘Archive Cognizant lead’ will represent the EA-ARC within the ALMA-wide Archive working group, and contribute when cross-ALMA discussions and decisions are taking place. The core tasks of the EA-ARC scientific staff include;

*Contribute to the preparation and distribution of user documentation.*

As the ARC staff have a diverse expertise, it’s beneficial for all staff to contribute their specialisations and expertise to the development of user-documentation and user-support.

*Organize training material, tutorials, workshops, user’s meetings, and visitor support.*

As the ARCs have wide representation in many ALMA subsystems, the expertise is diverse and knowledge transfer from the cognizant leads to the user community, and within the ARC nodes themselves is an important function (please see sections 3.4 and 3.5 for more details).

*Respond to ALMA Helpdesk queries.*

EA-ARC Helpdesk Cognizant leads will determine how best to respond to incoming help desk tickets, and may choose to defer the response to a different ARC staff member, or even to a different ARC that might be in a better position to respond quickly, and usefully. A response is guaranteed within 48 working hours, and for this reason, users should ensure they use the help desk for queries to the ARCs, and not private email to the staff.

*Perform support duties to PIs on a personal level, as their 'contact scientist'.*

Each successful ALMA observing project will be assigned to an ARC Contact Scientist from amongst the EA-ARC staff, relevant to their node. Communication between the Contact Scientist and the PI should be made via the ARC Helpdesk. Contact Scientists will contact users *after* notification of the proposal submission outcome, primarily to discuss and finalize the observing process (called "phase 2"), and will remain through the observations until the end of the quality assurance process and final delivery of the data products to the user.

*Generate, verify, correct and describe to PIs, observing scheduling blocks ('Phase 2').*

Phase 2 refers to the process where the project proposal is converted into observing instructions. In previous cycles, this was accomplished by the Contact Scientists at the ARCs, but from Cycle 4 onwards, there will be an increasing obligation on the PIs to generate Phase 2 themselves (please see section 4.4 for more detail).

### 2.3. *EA-ARC Observatory support roles*

Assist Joint ALMA Observatory (JAO) in the Proposal Review Process.

ARC staff can serve as Technical secretaries, or as Technical Assessors only. They are not permitted to contribute to scientific assessment during review of proposals.

*Serve as Astronomers-on-Duty (AoD) for on-site observations monitoring.*

ARC staff serve as astronomers-on-duty at the Operations Support Facility in Chile, for a total of 8 weeks, shared within the ARC. This is a core responsibility for all Executives. The ARC staff are therefore up to date in the operations of ALMA, and develop a continuing face-to-face communication between the ARCs, and JAO.

Undertake data reduction, data quality assurance (QA) and enable distribution of data to PIs.

ALMA is developing an automatic data reduction pipeline, given the extreme diversity of ALMA projects, the development requires significant staff and time resources before it can be completed. Projects which cannot easily be processed using the existing pipeline must be examined on a case-by-case basis, and processed manually. The processing includes a quality-check before being uploaded to the ALMA data archive for collection by the PIs.

### 2.4. *EA Users: Japanese, Taiwanese and Korean regions.*

EA users supported principally by EA-ARC staff are all those carrying out research based in any Japanese, Taiwanese or Korean Research Institutions or Universities. However, Taiwan-based researchers can select via the ALMA science portal, that their principal support be based in *either* the East-Asian, or North-American ARCs, to which their observing time will be allocated. Further information about the Taiwan office can be found at: <http://alma.asiaa.sinica.edu.tw>

### 3. User Communication, Information, news and help

#### 3.1. *The ALMA Science Portal.*

The science portal serves as a nexus for all ALMA-related matters;

- Proposal information - building and submitting your proposals
- Archive access - a data repository and portal for delivered and archived data
- ALMA proposal-development and data-reduction tools
- Documentation on policy and operation, as well as operation of ALMA software and tools.
- Access to the Project tracker, to monitor the progress of observations, and importantly,
- Helpdesk; for users' FAQs and questions/help requests.

The East Asia ALMA science portal website can be found at: <http://almascience.nao.ac.jp/>

#### 3.2. *East Asia ARC and Node information*

Regional East Asia ARC information page contains similar information to the science portal site, but has a strong emphasis towards regional information: tutorials, meetings, local staff, etc.

<http://alma.mtk.nao.ac.jp/j/forresearchers/ea-arc/index.html> (Japanese)

<http://alma.mtk.nao.ac.jp/e/forresearchers/ea-arc/index.html> (English)

<http://alma.asiaa.sinica.edu.tw> hosts information for the Taiwan node.

<http://alma.kasi.re.kr> hosts information for the Korean node.

#### 3.3. *The ALMA Helpdesk*

The ALMA Helpdesk is the primary means for communication between users and ALMA. Interaction is via a "ticketing system", which automatically tracks user-submissions (called "tickets") and related communications across the entire global community. Access to the helpdesk is via the science portal, thus users are required to first register with ALMA before access to the helpdesk system: <https://help.almascience.org>.

The fastest process for users needing further information is to first consult the knowledge base information repository (available in both Japanese and English; users in Korea and Taiwan should refer to the local node for language-specific help) - if the information therein is not suitable, then the users should feel free to detail the specifics of their query in a dedicated helpdesk ticket.

Helpdesk tickets will be automatically redirected to the user's respective ARC in the first instance, i.e. queries from East Asian users will be addressed by the East Asian ARC staff. Such tickets are "triaged"; assessed for the most rapid and timely response path; either by local ARC staff ("user support specialists" - USS), or redistributed back to the global helpdesk for the attention of other international experts.

In general, users should not contact the Operations staff directly (i.e. by private email); helpdesk-submitted tickets are triaged to on-hand staff (ensuring rapid response); further, operations staff are not able to personally allocate time resources to communicate with the users directly; and finally, maintaining a single, managed helpdesk resource provides an efficient database on user issues and solutions, ultimately helping ALMA staff provide a more efficient service for the user.

Users can generally expect a response within 2 business days. Tickets submitted within a few days prior to the proposal deadline will be accessed by the international helpdesk pool to facilitate the most rapid response. The EA-ARC will support EA users in both English and Japanese, however to receive a prompt response within a few days of the deadline, we encourage users to use English, as doing so will enable any available ARC staff from anywhere in the world provide a speedy reply.



Once the ticket has been satisfactorily answered, EA-ARC staff will mark the ticket as 'Resolved', and if the user is satisfied with the response they should mark the ticket as 'Closed'.

### 3.4. *Support for travel to Mitaka and the nodes.*

For users needing or wishing to attend the ARC or nodes to discuss or re-attempt the processing of their observations, with nearby ARC/node staff support can make use of travel and accommodation provided by the ARC and Nodes. In general, support to the ARC and nodes is supported at a domestic level only.

The NAOJ campus hosts a dedicated networked visitor's work room with rapid access to ALMA archives and to ALMA data reduction software support. Working disk space is also provided for raw and processed data, as laptop use may be impractical, considering the ~100 GB sizes of ALMA data files. Users are able to request face-to-face support via a helpdesk inquiry (see section 3.3).

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## 4. EA-ARC roles in proposal preparation, observations & data processing

### 4.1. *Call for Proposal*

A Call for Proposal (CfP) will be issued for each scheduling period. The EA ARC is responsible for distributing the CfP among the East Asian user community, along with any supporting material and software tools. The CfP will inform the community about the available capabilities and provide necessary information for the submission of proposals. The EA ARC staff identify areas of work prior to the call, update webpages, and issue announcements. The EA-ARC contributes to the various stages in the entire process, "phase 1" and "phase 2", data processing and delivery in the following ways.

### 4.2. *"Phase 1": Proposal preparation.*

Phase 1 comprises simply proposal preparation and submission. Submitted proposals must be prepared with the Observing Tool (OT) (requiring registration in the Science Portal), and *must* include a scientific and technical justifications, targets and spectral settings, sensitivity and integration time estimation, atmospheric conditions requirements (e.g. transparency and atmospheric conditions).

### 4.3. *Proposal assessment*

ARC involvement of the proposal assessment is actually minimal, and restricted to assisting of "technical assessment" (see stage 2 below) and other proposal handling duties. The proposal assessment process is briefly described here for the benefit of the EA-ARC constituent.

1. First-cut triage: As upwards of one thousand proposals are again expected for cycle 4 observations, a first-cut "triage" of submitted proposals is undertaken (projects can be triaged out from further review, only after the agreement of the three Scientific Assessors (see the 'panel review' bullet point below).
2. Technical assessment: Where appropriate, remaining proposals will be assessed for 'technical feasibility' by ARC and JAO staff. The technical assessment occurs over approximately a week and assesses the practicality of the proposal from a technical aspect, the scientific content of the proposal is not considered in depth (see also section 4.4).
3. Panel review: Proposals submitted to any category is reviewed by one of two or three *panels*, comprising approximately ten field-experts and a "technical secretary" who is present only to answer technical questions from the review panel and take panel votes. Each proposal is reviewed in detail by three panel members (one "primary science assessor" and also two "secondary science assessors"), for discussion by the panel during the panel meeting. The

outcome of the proposal review panels is a single rank-ordered list of the proposals allocated to that panel.

4. Committee review and rank merging: The final stage of proposal assessment and ranking is the responsibility of a proposal review committee, comprised of the chair and deputy chairpersons of each proposal review panel. The outcome of the proposal review committee is a single, rank-ordered list of proposals, formed from merging the panel lists including all Executive regions.

#### 4.4. *“Phase 2”: Preparation for observations*

The “Phase 2” stage is the conversion of the project requirements into observational parameters (e.g. frequency tunings, calibration schemes, etc.) In previous Cycles, this was performed by ARC staff, but from Cycle 4 onwards, this will be done in some cases, by the PI. Minor changes to the observations can be implemented easily during phase 2, however larger changes (modifying targets/frequencies, large position changes, etc.) require first the approval of the Change Request Standing Committee, and a helpdesk ticket should be submitted outlining the changes and including a complete justification. Requests for significant changes may cause long delays in completion of phase 2 and delays in the SB’s being committed to the observing queue.

#### 4.5. *Data reduction & data software and archive support.*

During and after observations are complete, JAO and the ARCs execute a series of quality assurance (QA) checks. As ALMA matures, we expect an ever-greater quantity of data (but not all, and not entirely) will be processed using the automated ‘*pipeline*’ processing. Remaining data will continue to be processed manually, using processing scripts. The complete data-product package (containing raw data, processed data, calibration tables, scripts, QA reports, logs, and data products) will be made available to the PI from the EA ARC archive through password-protected, web-based data distribution.

PIs can continue to request assistance or information from their contact scientist via the helpdesk system after data delivery by email, or a direct Face-to-face meeting request can be made, again via the helpdesk (see section 3.2). Where appropriate, the EA-ARC may collaborate or support the development of modified pipeline versions and advanced simulation tools.



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.

