ALMA User Support in Europe: historic perspective and forward look

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ALMA Regional Centre

EASC/DOO
ALMA: a distributed project at all scales

- 66 antennas – three sub-
- AOS(@5000 m) + OSF(@
- Three executives (EU, NA
- Users from all over the world, supported by three ALMA Regional Centres (ARCs)
- EU ARC: ARC at ESO + :

Users Committee meeting, 26-27 April 2018
ALMA: science for everyone

- 100% service observing with dynamic scheduling
- e2e data flow system
- Science quality calibrations and informative imaging delivered to users
- Raw data, processed data and calibration recipes in archive
- Friendly and widespread User Support through the ARCs
The ALMA user community

Registered ALMA users

<table>
<thead>
<tr>
<th>Cycle 0</th>
<th>Cycle 1</th>
<th>Cycle 2</th>
<th>Cycle 3</th>
<th>Cycle 4</th>
<th>Cycle 5</th>
<th>Cycle 6</th>
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<td></td>
<td></td>
<td>8472</td>
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</tbody>
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8472 (19 Apr 2018; 12h00 CEST)
ALMA in numbers (proposals)

HOURS

PROPOSALS
ALMA in numbers (data)

Calibration

Number of MOUs

<table>
<thead>
<tr>
<th>Cycle</th>
<th>ESO manual</th>
<th>ESO pipeline</th>
<th>Nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>125</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
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<td>10</td>
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<tr>
<td>5</td>
<td>0</td>
<td>25</td>
<td>5</td>
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Imaging

Number of MOUs

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70% done by the nodes

Users Committee meeting, 26-27 April 2018
Conceived as an experiment

Distributed user support favoured by community in 2002 ALMA community day

STC and Council approved Call for Statements of Interest, issued in 2004

Six institutes replied with national funding agencies support

Memorandum of Understanding (MoU) was signed in 2008

Czech node joined in 2009

Portuguese Centre of Expertise created in 2014

New MoU signed in December 2017
## Workforce

<table>
<thead>
<tr>
<th>Where?</th>
<th>People</th>
<th>FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESO</td>
<td>18 (+4 fellows)</td>
<td>10.5 (+archive +admin)</td>
</tr>
<tr>
<td>EU ARC nodes</td>
<td>~62</td>
<td>~26 (includes IT)</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>~36</td>
</tr>
</tbody>
</table>

- ~Half permanent – half on temporary contracts (nodes)
- Anything from 0.1 to 1.0 FTE per person
- Minimum variations from one year to the next
Workforce

Users Committee meeting, 26-27 April 2018
Management and reporting

Management: ARC Coordinating Committee (ACC):
- Representatives from each node, CoE and ESO
- Two people at ESO tasked with coordination of network

Reporting to / informing:
- The European Science Advisory Committee (ESAC) - subcommittee of the STC
- Joint ALMA Observatory (JAO), ALMA Management Team (AMT), integrated Science Operations Team (iSOpT)
Make ALMA accessible to European astronomers and optimise scientific return by:

- Providing optimal user support to European community
- Strengthening European ALMA community
- Broadening access to ALMA science

Contribute to ‘making ALMA work’ by:

- Providing expert assistance towards ALMA commissioning and optimisation
- Providing tools to users and the observatory
EU ARC network concepts

- Contracts
  - There are no contractual obligations between ESO or ALMA and the ARC nodes
  - Collaboration is based on trust and Memorandum of Understanding

- Finance
  - ESO does not provide financial support for the ARC nodes
  - ARC nodes seek their own funding

- Observing time
  - ARC nodes do not benefit from guaranteed time on ALMA
The role of ESO: core tasks

- Phase 1 operations
  - Call for proposals, user documentation etc

- Phase 2 preparation
  - SB validation, update, generation for non-standard modes

- Data delivery

- Archive operations
  - ESO hosts a complete synchronised copy of the ALMA archive

- Science portal

- Helpdesk

- Quality Assurance (QA2)
The role of the nodes: f2f support & enhanced functions

- Provide face-to-face user support: **core** task, delegated to the nodes
  - Proposal preparation, data reduction, archive research
  - Available to users of **all** levels, from novices to experts, from students to senior staff
  - Funding via RadioNet networking activity Mobility or ARC Users (MARCU).

- Contact scientists for observing projects

- New software and data reduction techniques

- Scientific community development and public outreach

- QA2 – observatory (**core**) task, now regularly shared among the JAO, the ARCs and the nodes

Users Committee meeting, 26-27 April 2018
Challenges

- Distance (from ESO, from JAO, from ALMA)
- Communications & information flow (towards all directions)
- Diversity (structure, composition, funding, mandates)
- Funding (schemes, horizon, requirements)
- Mandates (different for the different local communities)
- The human factor
Overall assessment (2011 – 2018)

- Network a success for ESO, the nodes and the ESO community
- ESO considers this model for future facilities
- ESAC/STC reports praise the network continuously and consistently
- Very positive ARC external review in 2015
- ALMA user support questionnaire: ARC network received highest scores
- Feedback from users after face-to-face visits always positive
Forward look (~2025):
The nodes’ view

- Network wishing to be a major actor in shaping ALMA
- Wish & will to continue under the same model (with the support of funding agencies)
- ESO’s endorsement: necessary for funding and credibility
- ESO’s coordinating role: appreciated and required
- Direct lines to JAO
- Autonomy in defining user support procedures
Forward look (~2025): ESO’s view

- ESO committed to keep supporting the ARC network for as long as there is need and interest
- Character of QA2 will change
- Emphasis should be given to archive research, date mining, delivery of science ready data products
- Evolution toward more general support centres supported by ESO
- Collaboration with ARC nodes on development strongly encouraged
Forward look (~2025): Users’ view

- Purpose of this session
- From users feedback:
  - Support of the nodes very much appreciated
  - Continuation of the current model
  - Support for archival research
- More direct contact with ESO staff
Forward look (~2025): User support

- Continued user support:
  - Data reduction, additional analysis
  - Archival research, demand expected to rise
  - Data combination, advanced reduction techniques
  - Towards more science-oriented support

- Remote help

- Online tutorials
Forward look (~2025):
Evolution of the network

- Evolution towards general support centres (mm / sub-mm / radio), also offering combined support, e.g. ALMA+APEX; ALMA+VLBI; ALMA+SKA; …
- Some level of involvement in QA2
- Development of tools and software for the community
- Enhance autonomy of the network, moving towards an independent organisation of tasks to better cater for the EU and local communities
Final remarks

- European ARC network has been providing support since ALMA Cycle 0
  > 70 community events
  > 200 face-to-face visits recorded in the Helpdesk
  > 1000 proposals supported
  > 2000 MOUSs calibrated/imaged and delivered

- ESO, nodes and users keen on continuing under the current scheme for the foreseeable future

- Flexibility essential from all parts in order to continue making this work