The European ALMA Regional Centre (ARC): a model of users support

EU ALMA users’ support
Interface with the ALMA Observatory
Collaboration with the North American (NA) and East Asian (EA) ARCs

Paola Andreani, ESO
The ARCs and their relation to the JAO

ALMA Science Operations sites:
- Operations Support Facility (OSF)
- Array Operations Site (AOS)
- Santiago office

more in De Gregorio’s talk

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The Regional Centres are integrated parts of the ALMA Observatory.

Enhanced User Services

“Satellite” EU ARCs

ARCs provide user interface, archive, data analysis support, software tools, data delivery. Astronomers on duty.

Funded by the project

Funded by external agencies

Enhanced services essential to realise the full benefits of ALMA, provide advanced user support, algorithm development, student programs, public outreach, grants.

DSO provides:
- Array operations
- Scheduling of projects
- Execution of observations
- Data quality assurance and trend analysis
- Calibration plan maintenance
- Delivery of data to the archives
- Archive operations
- Pipeline operations

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Funded by the project
EU ARC = ESO + 7 Nodes

European ARC nodes

Nodes are not funded by ESO but by National Agencies

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The North American ARC is a partnership between the US, Canada (7.25%), and Taiwan.

The NAASC is a combination of the NA ARC and US funded Full Science Support.

One-stop shopping for NA-related astronomers:

- Proposals
- Observing scripts
- Data archive and reduction
EA-ARC non-core development:
• Joint archive of ALMA, Nobeyama 45m, (SMA?)
• Data base with quality parameters for existing telescope (45m, SMA) data
• Data filler to CASA (45m, SMA, NMA)
• Laboratory molecular line database (Toyama),
  – cross-identification with other-wavelength data
  – http://www.sci.u-toyama.ac.jp/phys/4ken/atlas/
• VO—collaboration with JVO group (NAOJ)

• Located in Mitaka (at NAOJ)
• Partnership with Taiwan and South Korea
Users’ support and interface with the Observatory

- **ESO member countries’ users support**
  - Support+Train users to best exploit ALMA capabilities
    - **Phase I**: science portal, helpdesk, users documents, emergency helpdesk 72hrs before submission, Community days
    - **Phase II**: preparation of project (scheduling blocks, SBs), contact scientists
  - **Data quality process**:  
    - assistance in Data Quality Assessment (stage 2)  
    - Collect feedback from PIs (QA3)  
    - PI data reduction help (tutorials in data reduction for PIs)
  - **Run archive + Data delivery**
  - **Leading scientists** for the Observing Tool, Archive, EU CASA development, and Pipeline
  - **Manage the EU ARC network** (f2f support, community outreach, training, quality assessment of data before delivery)

more in van Kampen’s, Randall’s, Stoehr’s talks and Petry’s poster
ALMA Observatory support

• **At the Operations Support Facility**
  – Support Commissioning (CSV) and Operations activities in Chile
  – CSV shifts and Astronomer on duty shifts
  – Support testing and requirements of SW systems:
    • subsystem scientists of ALMA-related SW projects
  – Assess data quality before delivery and feedback after data analysis

• **Proposal Review Process:**
  ▪ Technical assessment (Chile workshops)
  ▪ Technical secretaries
ARCHIVE: key role in the DATA FLOW

**Phase I**
JAO issues CfP
ARCs: user support + science portal

**Phase II**
ARCs: prepare SBs
Contact scientists: PIs

**Proposal Review Process:**
JAO + ARCs assistance

**Technical Feasibility**
JAO + ARCs

**Archive**

**Data delivery**
ARCs

**Data delivery**
ARCs

**Quality Assurance**
JAO + ARCs assistance

**Long Term Queue**
JAO

**Dynamical Scheduler:**
Short Term Queue
Astronomer on duty (JAO+ARCs)

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Role of the ARC nodes

- **Provide face to face support**
  - Proposal preparation
  - Contact scientists
  - SBs preparation together with PIs
  - Help in quality assessment
  - Data reduction
- **Participate in the ALMA helpdesk**
- **Participate in Commissioning**
- **Develop/suggest new SW and data reduction technique**
- **Community outreach and tutoring**
Expertise @ the EU ARC used in the helpdesk/face-to-face visits

- High-frequency observing
- Wide-field and high-dynamic-range imaging
- Molecular spectroscopy, catalogues, models
- Polarimetry
- Astrometry
- Multi-frequency synthesis
- Array combination imaging
- Solar physics

Helpdesk triage at the 3 ARCs (ESO, NA and EA)
Tickets dispatched to “experts” at all ends

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ESO ARC and the ARC nodes preparing the community for cycle 0

EU ARC retreat
March 2011

December 2010
Nordic ARC-node workshop

May 2011
Nordic ALMA Proposal Workshop

February 2011
German ALMA Early Science Community Day

April 2011
Early Science workshop

ALMA community days April 2011

December 2010
UK ARC Community Days

June 2011
Preparing for ALMA

May 2011
Leeds Early Science workshop

November 2010
Observing with ALMA - Early Science

May 2011
ALMA proposal/OT tutorial workshop

June 2011
Training School Astrochemistry with ALMA
ESO ARC and nodes events in preparation for cycle 1

2 April 2012
ALMA evolved stars workshop

7-8 June 2012
Cycle 1 and CASA workshop

2-3 April 2012
Italian mm-astronomy meeting

25-26 June 2012
ALMA Cycle 1 Community Days

27-30 March 2012
ALMA session at NAM

28-29 February 2012
ALMA winter school

5-6 June 2012
Cycle 1 workshop

24-28 November 2012
mm-interferometry school

15-17 February 2012
ARC Retreat

5-6 June 2012
Cycle 1 workshop

25-26 June 2012
ALMA Cycle 1 Community Days

7-8 June 2012
Cycle 1 and CASA workshop

2-3 April 2012
Italian mm-astronomy meeting

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2013 EU ARC events and preparation of cycle 2

29-31 May 2013
Nordic Science with ALMA

28-31 January 2013
Astrochemistry in the ALMA era

24-29 June 2013
CESRA 2013 Meeting with ALMA
session,

19-20 March 2013
Science with ALMA band 11

14-17 January 2013
Solar ALMA workshop

21-22 February 2013
Cycle 1 PI CASA tutorial

EU ARC RETREAT
June 10-12

Sept 2-3 2013
UK Community days

Sept 8-13
European Radio
Interferometry school

Nov 5-6 2013
German Community days

Sept 13-20 2013
IRAM single dish school

IRAM 30m School
Guide to the European ARC

Guide to the European ALMA Regional Centre

Available from:
http://www.eso.org/sci/facilities/alma/arc/
http://almascience.eso.org/document-and-tools

Version: 19 November 2010
Authors: European ARC and ARC nodes, edited by Martín Zwaan

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Limited but successful experience

• Alma is still in the Early Science phase
  – ALMA went through cycle 0 (completed)
  – ALMA started cycle 1 which is by far not complete

• As far as we can tell this model has been successful so far
  – EU submitted proposals have the largest share
  – Users’ feedback is very positive
  – European share in number of ALMA science papers larger than other regions
  – high quality of the ALMA science output
Lessons learned

• Why is this model successful? (so far!)

- Closeness to the users
- Users recognise the expertise of the people at the nodes
- a large fraction of the active community not just consumers, but actively integrated into the project (increase motivation, esteem of the project and make them as “ambassadors”)
- ALMA has been well advertised through well organised Community events
- Shared information/operations model:
  - Frequent meetings/common events
  - Frequent (monthly) telecons
Challenges and improvements

• Communication
  Information flow is critical: if interrupted this set-up breaks down

• Share the same/similar expertise and knowledge
• More direct exchange between ARC node staff/ESO ARC/JAO
  Not easy to delegate work on a daily basis

• Big challenge:
  – How to keep a distributed network integrated?