ALMA Regional Centre
Italian node

Beyond user support: our less visible activities

Jan Brand
INAF – Istituto di Radioastronomia
ALMA Regional Centre italiano
What does the ARC do? Not just active around a Call for Proposals!

We are part of a network:

ESO + 7 nodes [+ 1 COE]

Network has just been reviewed by external committee (14-15 Jan.)

http://www.alma.inaf.it
Host institute: INAF – Istituto di Radioastronomia (IRA), Bologna, Italy

ARC-node: 2 staff, 5 postdocs (1 Co-Fin with Dept. Astron. & Physics, UniBo)

+ Dedicated computer cluster, high-speed links

ARC node representative: Jan Brand (staff IRA; 0.25 FTE; planning, formation)

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>FTE</th>
<th>Expertise/task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marcella Massardi</td>
<td>Staff IRA</td>
<td>1.0</td>
<td>User support; formation</td>
</tr>
<tr>
<td>Viviana Casasola (until 31 Jan. 2015)</td>
<td>Post-doc</td>
<td>0.5</td>
<td>User support; formation</td>
</tr>
<tr>
<td>Arturo Mignano</td>
<td>Post-doc</td>
<td>0.5</td>
<td>User support; QA2; software; formation</td>
</tr>
<tr>
<td>Rosita Paladino</td>
<td>Post-doc (Co-fin)</td>
<td>0.5</td>
<td>User support; QA2; polarimetry; formation</td>
</tr>
<tr>
<td>Elisabetta Liuzzo</td>
<td>Post-doc</td>
<td>0.5</td>
<td>User support; QA2; mm-vlbi</td>
</tr>
<tr>
<td>Nuria Marcelino</td>
<td>Post-doc</td>
<td>0.5</td>
<td>Data reduction; EOC expert (Long Baseline; calibrator database)</td>
</tr>
<tr>
<td>Kazi Rygl (from 1 Feb. 2015, iALMA)</td>
<td>Post-doc</td>
<td>0.5</td>
<td>mm-vlbi</td>
</tr>
</tbody>
</table>

ARC node Expertise:

Polarimetry; (mm-)VLBI

Star formation (gal & extra-gal); astrochemistry; AGN; high-z universe
FUNDING

- Directly by INAF, on year-to-year basis; amount variable

Additional and external funding:

- Node participates in merit (‘premiale’) project “iALMA” (2014-2015 +?) [1 postdoc, 1 PhD]

- 1 postdoc co-financed by Dept. Physics & Astronomy, Univ. Bologna

- 2010-2013: post-doc on the ESO ALMA COFUND Fellowship program
What does the ARC do…

To help and inform the community?

- Organize Community Days / Proposal Preparation Days. (dal 2007)
  Different formats & contents (lectures on ALMA, on science; interferometric techniques; OT, simulator, tutorials; more focused on upcoming Cycle. At IRA, or via Videocon, or visiting institutes).

- Tutorials (CASA, OT. Stand-alone or as part of a School, e.g. ERIS)

- Seminars at institutes/observatories in Italy (scientific results + capacities new Cycle + opportunity for f2f help). [SISSA, Padova, Brera, Torino, Bologna, Roma, Napoli, Catania] Colloquia, pre-Early Science (Bologna, Firenze, Catania, Trieste)

- Workshops: Italian mm (2012, 2015)

- Face-to-face support + via Helpdesk, phone, e-mail.
  for proposal preparation, data reduction, archive mining

- A bi-monthly Newsletter

- An up-to-date web page: [http://www.alma.inaf.it](http://www.alma.inaf.it)
What does the ARC do…

**To train the community and the next generation?**

- **International Training School** (Astrochemistry with ALMA, 2011; Lucchin, 2015)
- **Supervise tesi di laurea** (at ARC or in collaboration); tesi di dottorato
- **Lectures** on radioastronomy and interferometry (Univ. Bologna, Catania)
  - Lectures on (sub)mm astronomy and ALMA (SISSA, Trieste)
  - Astrophysics Laboratory on interferometry, hands-on reduction ALMA data (Univ. Bologna, corso di Marano) from academic year 2013-14 onwards.

**Courses**

- Support post-doc fellowships
- Co-proposers accepted **premiale project iALMA** (see session on Day2).
  - Includes WP ‘ARC node development’ (mm-VLBI => postdoc: Rygl) and WP ‘Advanced Training’ (=> 3 PhD’s: Bologna [Galluzzi], Firenze [Bianchi], Catania [Urso])
i ALMA objectives over 4 years:

To construct a solid infrastructure at INAF to support Italian involvement in ALMA. This includes:

- Develop receivers for ALMA Band 2-3 to study complex and pre-biotic molecules in disks and probe the high-z universe;
- Strengthen the ALMA science activities in Italy combining observations and innovative laboratory experiments on ices;
- Train a new generation of researchers in Italy [6 PhD positions];
- Support and expand the ARC node in Bologna;
- Develop outreach activities for ALMA at INAF;
- Investigate in Italy the possibility of ‘green energy’ production for ALMA
What does the ARC do…

To learn and improve ourselves AND help the ALMA project?

- Monthly EU ARC telecons; yearly f2f meeting ACC; yearly “All Hands” meeting with all EU ARC personnel: 2014 Grenoble (Bologna organized in 2012)
- Writing/editing documentation on network and network activities
- Writing/editing technical Handbook/Manuals for OT
- Contact Scientist duties
- QA2 (Quality Assessment; after receiving special training)
- Software testing (new versions of CASA, OT)
- Development of software tools
- SV (Science Verification) data reduction; participation in specialist groups (e.g., imaging)
What does the ARC do…

To learn and improve ourselves AND help the ALMA project?

(continued)

- Participating in CSV/EOC [Commissioning & Science Verification]:
  - polarimetry (calibrator database: source list, data reduction, integration reduction script in pipeline, writing CASAguide)
  - long baseline campaign

- Organize specialist workshops for ALMA & ARC(-nodes) community:
  polarimetry with ALMA (2013)
  mm-VLBI with ALMA (2015; also partly open to outside-ARC)
  These initiatives also serve to get in on ground floor with these projects

- Participants in ALMA Upgrade proposal ESO-GMVA (Ros et al.) on inclusion of phased array ALMA in global VLBI network.
  Involved in WP2.4 (disk logistics, correlation, archiving) and WP2.6 (user support)

- Exchange programs (between nodes, between nodes and JAO)
EU ARC contributions

• Contribution to EOC polarization activities continued thereafter at the Italian node
  (Marcelino, Paladino, Mignano, Massardi. A PhD position to work on polarization was assigned on iALMA project funding)

• we contributed with a **source list of candidate polarisation calibrators** based on the AT20G survey

• we are **reducing test datasets**
  - calibrator observations in the framework of the ALMA calibrator campaigns
  - 24hr runs on selected sources in Band 3, 6, 7

• we are integrating the polarimetric reduction scripts within the existing **data reduction pipelines**

• we wrote the **CASAguide for polarimetric observations of 3C286**
EU ARC contributions

- Contribution to EOC polarization activities continued thereafter at the Italian node
  (Marcelino, Paladino, Mignano, Massardi).
  A PhD position to work on polarization was assigned on iALMA project funding.

- We contributed with a source of data.

- We are reducing test datasets:
  - Calibrator observer plan.
  - 24hr runs on science targets.

- We are integrating the polarization.

- We wrote the CASAguide for polarization.

ALMA long baseline progress

- ALMA Long Baseline Campaign Sep 5 - Nov 30, 2014
- Tested up to 15 km baselines, mostly B3, B6, B7
- Infrastructure (pads, engineering etc.) going well
- Improved technical performance as needed
  - More accurate position determination incl. pressure term
  - Delay server calculations and efficiency improved
- Fringes, phase closure, image quality shows ALMA works consistently as expected (or better!)
  - WVR crucial, allows ~minute-scale cycle times
  - Develop/document optimised techniques for observing
- Need phase reference source within few degrees
  - Weak calibrator survey (QSO, stars, asteroids...)
  - Self-calibration often possible
What does the ARC do…

**To learn and improve ourselves AND help the ALMA project?**

(continued)

- Participating in CSV/EOC [Commissioning & Science Verification]:
  - polarimetry (calibrator database: source list, data reduction, reduction script integration in pipeline, writing CASAguide)
  - long baseline campaign

- Organize specialist workshops for ALMA & ARC(-nodes) community:
  - polarimetry with ALMA (2013)
  - mm-VLBI with ALMA (2015; also partly open to outside-ARC)
  These initiatives also serve to get in on ground floor with these projects

- Participants in ALMA Upgrade proposal ESO-GMVA (Ros et al.) on inclusion of phased array ALMA in global VLBI network.
  Involved in WP2.4 (disk logistics, correlation, archiving) and WP2.6 (user support)

- Exchange programs (between nodes, between nodes and JAO)
What does the ARC do…

For the public? Outreach.

- Contribute to Radioastronomy Visitors Centre, Medicina
- Participated in “Origins 2013” for the European Researchers night (live stream)
- Collaborate with INAF media (interviews, news items)
- Articles in popular press; talks
Early Science Cycles 0 – 2. Some statistics I

ARC researchers:

- are involved as PI or Co-I on 94 ALMA proposals, of which 18 are accepted (19%)
- are (co-) authors on 7 refereed ALMA papers
- supported ca. 150 proposals (est. 5 hrs average /proposal, 0.5 – 16 hrs range)
- reached a few 100 astronomers (seminars, tutorials, f2f)
- had 18 f2f visits at the ARC (15 proposal preparation, 3 data reduction)

Please visit our web pages: http://www.alma.inaf.it
Italian researchers:

Over 3 Cycles:

- Submitted 119 proposal with Italian PI
  - total submitted: 3435 (3.5%)
  - EU-submitted: 1448 (8.2%)

- Accepted: 17 proposals with Italian PI (14.3% of those submitted)
  - total accepted: 961 (1.8%)
  - EU-accepted: 312 (5.4%)
Early Science Cycles 0 – 2. Some statistics III

Italian researchers:

- **Cycle 0**
  - 919 submitted (EU: 399; Italy: 36 PIs)
  - 161 accepted (highest prio + fillers; EU: 49)
  - Unique Italian PI's: 3+1 [2.5% of all accepted; 8.2% of EU accepted props]
  - Unique Italian Col's: 17

- **Cycle 1**
  - 1133 submitted (EU: 487; Italy: 36 PIs (30 unique PIs))
  - 288 accepted (highest prio + fillers; EU: 87)
  - Unique Italian PI's: 2+0 [0.7% of all; 2.3% of EU accepted props]
  - Unique Italian Col's: 31

- **Cycle 2**
  - 1383 submitted (EU: 562; Italy: 47 PIs (43 unique PIs))
  - 512 accepted (highest prio + fillers; EU: 176)
  - Unique Italian PI's: 5+6 [2.2% of all; 6.3% of EU accepted props]
  - Unique Italian Col's: 67
Next appointment: proposal preparation day for Cycle 3
9 April 2015


Preliminary Program

10:00 - 12:30 Morning session
- ALMA Cycle 3 capabilities
- ALMA OT (with interactive sessions)
- FAQs in the proposal preparation
- Other ALMA tools (OST, CASA simulators)

13:30 - 18:00 Afternoon session
- F2F support to participants
We would appreciate getting feedback from the community

Please speak up now, contact one of us during the meeting, or send us a mail later.

Please visit our web pages: http://www.alma.inaf.it