ALMA Regional Centre nodes

The ARC node in Italy

Until the end of 2004 the Istituto di Radioastronomia (IRA) was one of the 7 institutes of the National Research Council (CNR) dedicated to astronomical or space research. As of 2005 these 7, together with the 12 observatories, are part of the National Institute for Astrophysics (INAF), which is now the coordinating organisation of all non-academic astronomical research in Italy.

IRA itself has its headquarters at Bologna, with sections in Medicina (near Bologna), Florence, Noto (Sicily), and Cagliari (Sardinia). The institute operates a 32-m antenna (for frequencies up to 22 GHz) and an interferometer (The Northern Cross; 408 MHz) at Medicina, and a 32-m antenna (up to 43 GHz) at Noto; it is constructing a 64-m radio telescope in Sardinia, which is projected to go up to 100 GHz. It has laboratories for receiver and backend development, mostly concentrated at Medicina.

The interface between ALMA and the user communities is formed by the ALMA Regional Centers (ARCs), currently being established in Europe, North America and East Asia. For European ALMA users, the European ARC is being set up as a cluster of nodes located throughout Europe, with the main centre at the ESO headquarters in Garching. Fundamental to ALMA's success are the enhanced services provided by the ARC nodes. We are introducing these nodes in this newsletter. In this issue, the nodes in Bologna and Manchester are featured.

IRA has a long tradition in (radio) interferometry, both for astronomical and geodetical research. In fact, its two 32-m antennas were specifically built to be part of the VLBI and EVN networks. The institute is involved in SKA and LOFAR, and is presently adapting the Northern Cross Interferometer to carry out tests for these projects. Considering this experience with interferometry, IRA was the natural choice for the establishment of the Italian ARC-node.

A particularly strong point of this node is its computer department, which for more than 25 years supports the national community in the use of AIPS and other radioastronomical packages. It has expertise in beowulf clusters and GRID-technology, the management of databases of catalogues (DIRA2), archives of astronomical images (AVO), and the handling of large data sets. Bologna is located close to one of the prime nodes of the Italian GARR-network; the planned installation of a 10 Gbit/sec fiber connection with GARR will be well-suited for an efficient transfer of ALMA data.

The working group involved in setting up the ARC-node presently consists of 6 staff members and two post-docs (Alessandra Rossetti and Francesco Fontani). Rossetti is the first postdoc specifically hired for ARC tasks. She has extensive experience with interferometry and the AIPS data reduction package, and is currently involved in tests of CASA, the ALMA data reduction software. A recent version of CASA has been installed at the Institute, where it is being used on existing VLA data (and in the near future also on data from the Plateau de Bure).

One of the tasks of the node is to foster interest in ALMA among the national astronomical community. We try to maintain contact with potential ALMA users by holding regular meetings and to identify areas of common interest that would benefit from
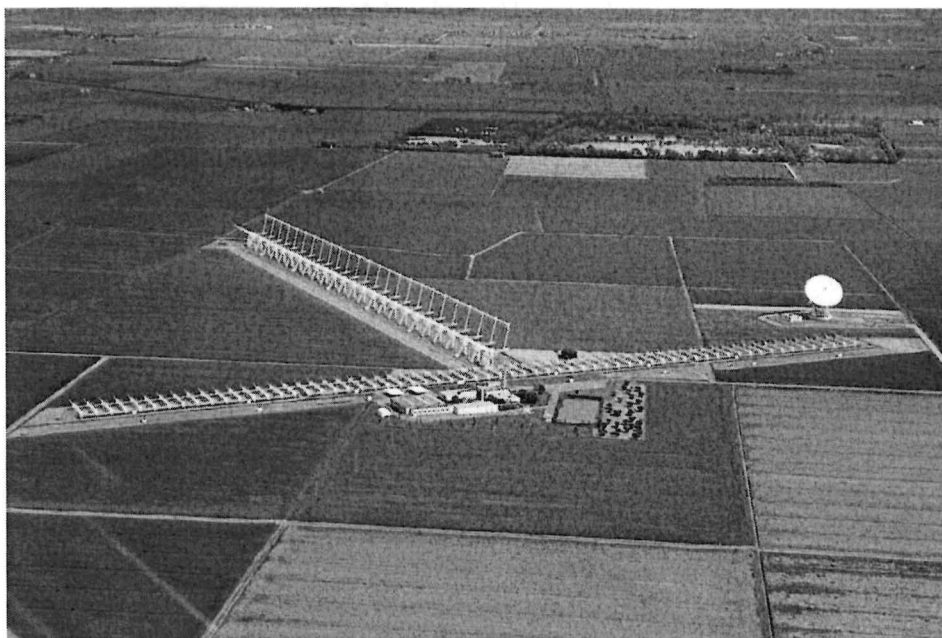
The Northern Cross interferometer and the 32-m antenna at Medicina.
photo credit: Roberto Ragazzoni - 2005

future ALMA observations. In addition to the general user-support services that the ARC-nodes will provide, each node is also requested to specify certain areas of expertise, possibly unique to that particular node. Although each node is open to visitors from all ESO member states, the areas of expertise should preferably coincide with the main interests of the national community which is likely to make most use of an ARC-node. Following this general principle, the Bologna ARC has identified the following areas of expertise: 1. Data handling/ GRID technology; 2. Mosaicing; 3. Coordinating surveys/key-projects (creating and maintaining catalogues etc.) ;4. polarimetry.

Developments at the Italian ARC-node can be followed on our web page (http://www.ira.inaf.it/alma/alma.html).

(contributed by Jan Brand)

The ARC node in the UK

Plans for the creation of the UK's ARC node are well underway. The University of Manchester is leading a consortium of UK groups including Cambridge, Oxford and Edinburgh, to develop a centre of expertise in ALMA data reduction and user support. The core of the support will be based in a new building housing the Manchester Astrophysics group, and will call on specialist support from the other experts in Cambridge, Edinburgh and Oxford. The request for funding of the UK ARC is currently being reviewed by STFC, and if this is successful, it is hoped that funding for the first staff will begin in late 2008.

The UK ARC node will provide direct user support to the community for all aspects of using ALMA. It will provide training, documentation and one-to-one support. This will include feasibility studies for large and small projects, help with the submission of proposals and the scheduling of observations. Following observations, data analysis for standard and non-standard projects, quality assurance feedback and data interpretation will be provided. Specialised simulation software will be developed for optimizing experiment design and evaluating image quality and data re-
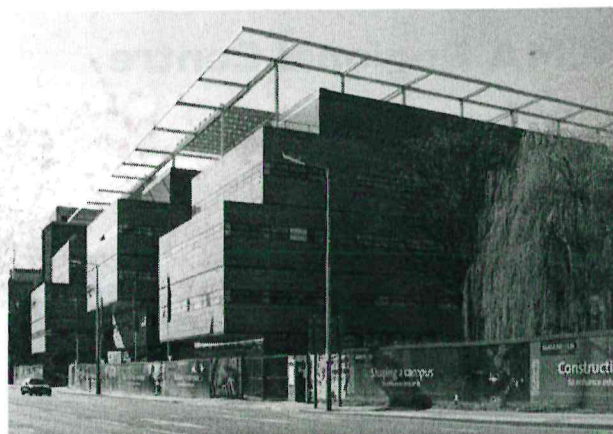
The new Turing building which will house the ALMA UK ARC node is situated on the central campus of Manchester University, viewed here from Upper Brook Street in June 2007 with Manchester city centre behind the camera.

duction techniques for large and complex projects will be developed in response to specific needs.

Overall, the UK has an outstanding reputation in sub-millimeter science and in radio interferometery. ALMA will be a new and complex instrument to use, even for those with sub-millimeter experience and the majority of users will benefit from face-to-face support provided by a dedicated team at a central support facility. In particular, this team will bring essential experience in high-resolution radio interferometry, developed over many years of experience with MERLIN, VLBI and VLA. It will complement the existing UK expertise in single-dish sub-mm astronomy and that in additional areas supported by other European ARC support units.

The UK ARC node will be centrally located in the UK at the University of Manchester and conveniently placed for all national and international transport links. A dedicated suite of offices and workstations will be provided in the new Turing building which houses the Jodrell Bank Centre for Astrophysics (combining the University's Astronomy and Astrophysics group, the e-MERLIN/ VLBI National Facility and part of the Jodrell Bank Ob-

Some of the key personnel in the UK ARC application (alphabetically left to right): Dr Alan Bridger [ALMA software support, UK ATC ROE], Dr. Gary Fuller [ALMA archive development, Manchester], Prof. Simon Garrington [Director e-MERLIN],   Dr Tom Muxlow [e-MERLIN/ALMA user support], Prof. Steve Rawlings [ALMA simulation tool, Oxford], Dr. John Richer [ALMA UK project scientist, Cambridge]