sion of these previews contains recalibrated positional (WCS) information with an accuracy ≤ 1 arcsec.

In addition to the main ESO archive query form, the archive also offers its users the possibility to query by instrument-specific parameters, via the so-called instrument-specific query forms. The latest one released was the CRIRES query form in October 2007. The APEX query form has been updated to be able to retrieve observing logs and CLASS files for the APEX-2A/FLASH data. Finally HAWK-I science verification data packages have been released.

For the latest information about the ESO archive, or to subscribe to the archive RSS feed, please see *http://archive.eso.org/.*

For any questions or comments on the ESO archive, please contact us at *archive@eso.org.*

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ALMA Science: the ESO-Garching Astronomers View

Leonardo Testi (ESO)

At the Garching Science Day 2007, proposals for observations with ALMA were presented. A comparison is presented with the ALMA Design Reference Science Plan. The comparison shows that ALMA can be exploited by the wider community for a variety of different science projects, many of which are beyond the expectations of the current community of millimetre astronomers.

ALMA has been designed and is being built to allow the astronomical community to achieve transformational science. To reach this ambitious goal, all ALMA components are scrutinised to ensure that they meet stringent scientific requirements. Together with the top-level science goals, the ALMA Design Reference Science Plan (DRSP)[1] has been created (see Hogerheijde 2006). The DRSP is a collection of science programmes that are used as reference for the scientific capabilities of the instrument. The DRSP has gone through a major revision (version 2.0) during 2007, in order to update its scientific content and to take into account the new ALMA capabilities made accessible through the East Asian contribution. Even though the DRSP contains a number of projects prepared by non-millimetre specialists, the bulk of it has been prepared by the millimetre community.

For the annual Science Day, held on 6 December 2007, the ESO Garching astronomers were invited to prepare potential programmes to be carried out with ALMA. Most of the science staff of ESO-Garching has profound experience in optical/infrared astronomy, therefore the Science Day was then a unique opportunity to receive input from a community base quite different from that of the DRSP, and possibly more similar to the future ALMA users.

The 147 programmes in the DRSP 2.0 and the 43 Science Day presentations were analysed in a homogeneous way to compare the distribution of programmes and the total requested time in the four ESO-OPC categories, with the addition of a new category for observations of the Sun, which will be possible with ALMA. The requests for observing time in each of the ALMA frequency bands were also compared.

The results of this analysis are shown as ring charts in Figure 1. In the DRSP, almost 60 % of the programmes are in four large scientific areas that are contained in the OPC-C category: Interstellar Medium, Star Formation, Circumstellar Matter and Solar System. Most of the remaining programmes target Galaxies (B) or Cosmology (A) with a minor fraction in Stellar Evolution (D) and Solar Physics (S).

The distribution of requested time reveals that the relatively few Cosmology programmes actually require a large investment of telescope time, while only a small fraction of time is needed to complete the Stellar Evolution and Solar Physics part of the programmes (less than 5 %).

The Science Day programmes offer a significantly different view, in that there is a much lower fraction of programmes in the C category and higher fractions in the other areas, especially the Stellar Evolution (D) and Solar Physics (S). This is also reflected in the fraction of requested time, where these latter two categories combined approach 10 % of the total time needed.

The analysis of the time requested in each of the ALMA receiver bands shows that the request for the highest frequency bands, B8 and B9, is similar (around 15 %). The lowest frequencies (B3 and B4) add up to about 25 % in the DRSP, but to almost 37 % in the Science Day programmes. The intermediate frequencies (B5, B6 and B7 – see Haupt and Rykaczewski 2007) are confirmed to be the workhorse of ALMA with 60 % in

[1] See *http://www.strw.leidenuniv.nl/~alma/drsp.shtml.*

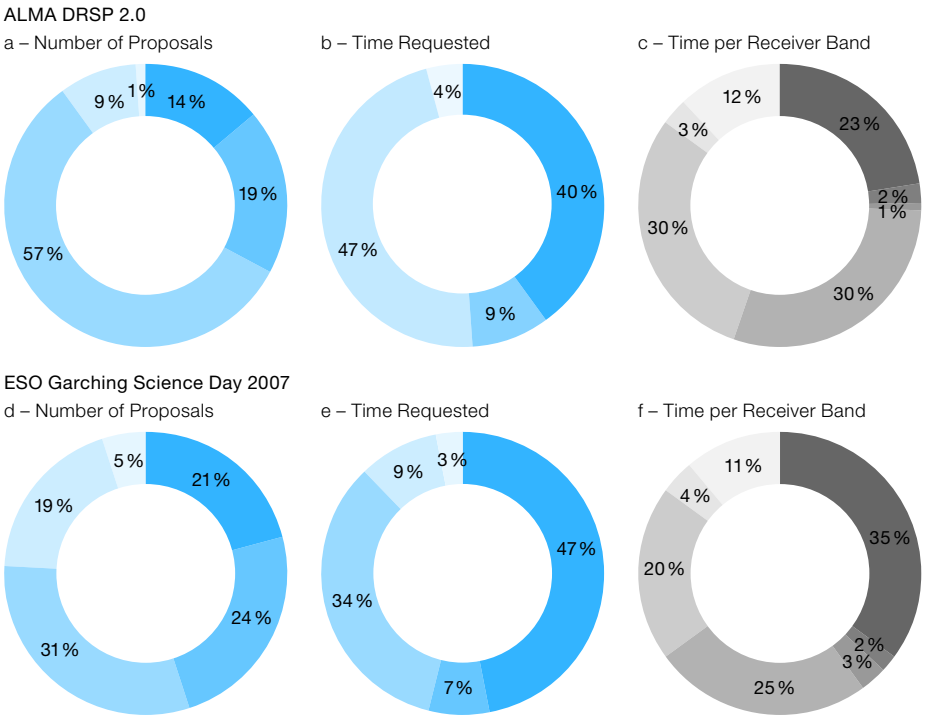

Figure 1: Ring charts show the distributions of the number of proposals and total time requested in the various ESO-OPC categories (A-Cosmology; B-Galaxies and Galactic Nuclei; C-Interstellar Medium, Star Formation and Planetary Systems; D-Stellar Evolution, with the addition of S-Solar Physics), and the distribution of the requested time for the various ALMA frequency bands (see Haupt and Rykaczewski 2007). The top diagrams relate to the ALMA DRSP 2.0 while the bottom ones derive from the ESO Garching Science Day 2007 presentations.

Key to a, b, d, e: OPC Categories A B C D S

Key to c, f: ALMA Receiver Bands B3 B4 B5 B6 B7 B8 B9

the DRSP and almost 50 % in the Science Day programmes.

While the differences between the DRSP and the ESO Science Day programmes may, in part, reflect the large fraction of scientists among the ESO staff interested in stars, galaxies and cosmology, it is important to point out that several ALMA applications in these areas, that are not covered in the DRSP 2.0, were presented. These new programmes will be incorporated in the next revision of the DRSP. The Science Day is thus a strong and positive indication that astronomers coming from outside the traditional millimetre community want to use the unique ALMA potential to attack problems that are completely out of reach with current millimetre instruments.

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News from the ALMA Test Facility

Todd Hunter (NRAO), **Robert Laing** (ESO)

A major milestone was achieved at the ALMA Test Facility (ATF) on 19 January 2008 when the first interferometric spectrum of an astronomical source was obtained. The spectrum, shown right, was of the hot molecular core of the Orion Nebula. The two ALMA prototype antennas at the ATF were used, along with evaluation front-end receivers and production back-end equipment controlled by a combination of ALMA software and ad hoc scripts and procedures. This milestone follows the ability of obtaining stable dynamical fringes on bright quasars, which was achieved in the second half of 2007. The baseline length at ATF is 35 metres and the spectral resolution used is 7.8 MHz (24 km/s) which is one of the low-resolution configurations of the correlator.