

## 1 Science IPT

### 1.1 Status

During the July-Sept. period, Science IPT has provided review panel members and observer expertise for the Local Oscillator PDR, the computing CDR2 and the Science Software Requirements face-to-face meeting. The Science IPT initiated a new version of the ALMA Scientific Specifications and Requirements (ALMA-90.00.00.00-001-A-SPE), whose status is pending.

### 1.2 Scientific Advisory Committees



**Figure 1** The ASAC ponders ALMA tradeoffs in terms of science.

The Science IPT facilitated the meeting of the ALMA Scientific Advisory Committee which met at the NRAO in Charlottesville, VA on 2004 Sept 27-28. The Science IPT provided support to the ASAC as it responded to 5 Charges from the Board. The ASAC response has been transmitted to the Board for the 2004 Nov meeting in Santiago. The Science IPT/EU has provided support to the European Science Advisory Committee for its meeting 2004 September 23 in Garching. Advice on ALMA Regional Centers and Early Operations was provided to the project based on the input of the community via these committees.

### 1.3 Milestones

The Table gives the status of Level 2 milestones due during the current quarter and the next quarter.

Milestone	Level	Title	Date	Status
9825	2	Science aspects of operations plan complete	2004-Sept 20	Draft I1 submitted
9830	2	Plan for early science configurations complete	2004-Jun-30	Completed 2004 Sept In Document Approval Queue
9835	2	Report WVR strategy / implementation / operations	2004-Sep-30	Revised 2004 Oct.

Milestone 9835 in its original form depended upon tests of the WVR at the ATF. In the currently understood schedule, that has slipped to mid 2005. Given the weather patterns at the ATF it is unlikely that WVR field testing can now be completed before winter 2005/6. As reported in June 2003, the baseline at the ATF is likely to be too short for atmospheric phase correction demonstrations; the field testing is mainly to demonstrate operation of the instrument.

### 1.4 Calibration

As planned, the Calibration Group is now functioning under the leadership of Jeff Mangum. The Calibration Plan has been presented to Science Advisory committees; feedback from those committees and from the project is being incorporated into the Plan. A feasibility study is under way for the multiple load amplitude calibration device described in ALMA Memo No. 461. Meanwhile, measurements of a simpler, fallback amplitude calibration device utilizing a semi-transparent vane are underway in Madrid. Plans are being developed to perform astronomical tests of a semitransparent vane amplitude calibration device at the ATF in 2004-5. A feasibility study for a system to measure absolute flux is in its final stages at the BIMA Interferometer under the guidance of W. J. Welch. Holdaway, Stirling, Richer and Hills are working to produce a grid of atmospheric models with which to model WVR performance in a study to determine the most effective way to combine fast switching and WVR correction of atmospheric phase perturbation.

Authors of projects in the *Design Reference Science Plan* have been polled to provide details of the calibration needs, particularly the amplitude accuracy, for their projects.

The responses are to be found at

[http://www.strw.leidenuniv.nl/~alma/drsp\\_calib\\_responses.html](http://www.strw.leidenuniv.nl/~alma/drsp_calib_responses.html). This is also the subject of Charge 3 to the ASAC.

## **1.5 Commissioning and Science Verification**

A revised version of the Commissioning and Science Verification Plan was presented at the ALMA Community Day week in Garching, on 24 Sept. and to the ASAC on 27 Sept. A CSV team has been formed, comprised of Laing, Emerson, Chandler, Lucas, Mangum, Shepherd, Wilson, Wootten, Saito, Morita and Kawabe. In discussions with the PMCS team, a plan for this phase of ALMA has been laid out in detail.

## **1.6 Configuration, Antennas**

The inner array pad locations are approved, outer pad locations have been in the document approval queue for over a year, the antenna movement plan is in the document approval request queue, and the Early Science configurations also await document approval. The plan for calibration of ALMA baselines, a complex process for an array in which several elements move every few days, is now submitted for approval

## **1.7 Site Characterization**

Monitoring of site conditions continues, with monthly posting of data to the ALMA/NA website. Particular focus has turned to atmospheric characterization data needed during operation of the array, with monthly telecons devoted toward definition of the instrumentation needed. The preliminary document is available in the Science IPT documents area of ALMAEDM and has been provided to members of other IPTs for comment.

## **1.7 Science Requirements**

The Science Requirements document was discussed with the Project Engineer, resulting in clarification of wording in the document. Approval of the revised version is expected very soon.

## **1.8 Organization, interaction with other IPTs**

The Science IPT has worked closely with the Front End and Back End IPTs to ensure that effective designs are produced. Science IPT members regularly attend telecons of the Software System Requirements team; Brian Glendenning of the Computing IPT regularly attends meetings of the Science IPT/NA and Robert Lucas of the SSR regularly attends Science IPT and ASAC meetings.

## **1.9 Meetings, Outreach and Public Education**

The major event of the quarter has been the ALMA Community Day, held at the ESO Garching 2004 Sept 24. This was sponsored by ESO and RADIONET. Members of the ESAC actively participated in the organization of the Workshop and many were able to attend. The ESAC acts as a conduit between ESO, JAO and the European ALMA Science Community. There will be a website with the collected presentations, and a short report of the meeting in the ESO Messenger. Among the topics discussed were 'Science

Samplers' a current account of software support for ALMA, the Operations Plan the Commissioning and Science Verification Plan, and plans for the ALMA Regional Center for Europe.

Wootten represented ALMA at [Cores, Disks, Jets & Outflows in Low & High Mass Star Forming Environments: Observations, Theory and Simulations](#), a meeting held July 12-16, 2004 in Banff, Alberta, Canada. There will be an ALMA Town Meeting at 1:00 pm on 2005 January 11 (Tuesday) during the 205<sup>th</sup> AAS Meeting held in San Diego, CA. Planning of that meeting began during July. Wootten worked with van den Bout and Hibbard on defining the North American ALMA Science Center, delineating web content to introduce it to the community.

ALMA newsletters for North America and Europe have been released.