EUROPEAN ORGANISATION FOR ASTRONOMICAL RESEARCH IN THE SOUTHERN HEMISPHERE

FOR INFORMATION

COUNCIL

119th Meeting
Garching, 9 and 10 December, 2010

SCIENTIFIC TECHNICAL COMMITTEE

74th Meeting
ESO, Garching, 19 and 20 October, 2010
SCIENTIFIC TECHNICAL COMMITTEE
74th Meeting
ESO, Garching, 19-20 October, 2010

Recommendations and Report from the 74th STC Meeting


Telecon: L. Bronfman.

1) ESO Budget 2011 and Forward Look 2012-2014 (FC-1827)

STC was asked for a recommendation on the ESO Budget 2011 and Forward Look 2012-2014 (FC-1827) draft document. Strictly speaking financial documents do not concern STC directly, but STC appreciated receiving the document for comments because funding priorities also define, at least indirectly, ESO’s science and technical priorities.

Unfortunately, the document was made available on October 15th, only four days prior to the meeting and over a weekend, which made it difficult to assess its scientific and technical implications. While STC understands that the writing of such a document is complex and that ESO is faced with many other issues, it feels that the regular slippage in the availability of this document in recent years has repeatedly prevented STC from considering the implications of the forward look in sufficient detail. In the present case, it is particularly worrisome, as budget cuts are being included in the programme in order to offset short term additional financial obligations (exchange rate, pension plan) or commitments (E-ELT delta phase B) and longer term new projects (E-ELT construction).

Regarding the scientific/technical priorities, influenced by this document, STC would like to make the following comments/recommendations:

a) The long-term budget plan reflects the high priority given to the E-ELT project. STC unanimously concurs that the expected science capabilities of the E-ELT, as presently planned, warrant such a high priority.

b) STC reaffirms that maintaining Paranal as a world-leading facility even with the ELT operating at Armazones is essential to
   • continue providing world-class facilities and services to the bulk of the ESO astronomical community
   • provide maximum flexibility for developing and exploiting new instrumental capabilities
   • ensure the health of instrumentation groups in the members states
   • ensure the integration of E-ELT into a state-of-the-art observatory
   • maximize the synergy between E-ELT and the VLT/VLTI/VISTA as well as with ALMA, SKA and future space based observatories (JWST, GAIA, EUCLID, PLATO, etc.)

c) STC would like to caution against any cuts that jeopardize the highly successful core programme of ESO on Paranal. STC believes that the upgrade of existing facilities and the development of new capabilities are an essential part of this core programme achievable at relatively modest cost. Hence, STC cannot support the cancellation of the upgrade programme but welcomes the statement in section 1.4.2: Selection and planning of new second generation instruments to be installed beyond 2016 will also be continued with guidance on priorities from the STC. The STC is looking forward
to the long-range new instrumentation plan scheduled for presentation at the April 2011 STC meeting.

d) When budget cuts outside of ESO’s core programme have been exhausted, STC is ready to examine and rank future plans for upgrades and new instrumentation to help balance the budgetary requirements with optimum science capabilities.

2) La Silla-Paranal Observatory

a) Recommendation on proposals for a wide-field multi-object spectrograph
Having repeatedly recommended that a call for a new wide-field MOS facility be issued, STC was particularly interested in hearing the report about the results from the recently issued Call for Letters of Intent for such an instrument. STC took note that a number of proposals (4/10) proposed an instrument that would be installed on non-ESO telescopes within the framework of different collaborations. In the down selection of the proposals, STC recommends that a large weight be given to those projects in which ESO is a major partner and/or for which significant observing time beyond GTO can be guaranteed to the ESO community.

b) Recommendation on VST Public Surveys and GTO Programmes
- To exploit the steadily narrowing window of opportunity relative to competing surveys, it is imperative that a commissioning plan for the VST telescope be worked out immediately. To have the expected large scientific impact, the public surveys must be underway before the end of 2011. Any additional delay would require a complete re-evaluation of the survey priorities. STC recommends that ESO and the VST team join efforts on a VST commissioning and post-commissioning plan to make sure the surveys start as soon as possible.
- Because carrying out the surveys is increasingly time critical, STC follows the recommendation of the LSP sub-committee and the PSP in recommending that all the available observing time for the first two years be used for Public Surveys and GTO programmes.

c) Comment of survey data delivery
Having prompted ESO to report on its capabilities in delivering the large data sets collected as a result of the new survey activities, STC welcomes the recently taken steps to ensure delivery of large data sets from new survey activities. STC is therefore reassured that ESO is in a position to deliver the survey data to the community.

3) ALMA
The STC would like to congratulate again the ESO ALMA project staff for their major achievements during the past six months. All areas are now clearly progressing steadily. Of particular importance is the assembly of a number of European antennas, the successful beginning of the commissioning and science verification (CSV) phase, and the continued on-time and above-spec delivery of the Band-7 and Band-9 front-end cartridges. The STC also notes the new team in place to work on the ALMA archive. Taken together, these events represent major steps towards a successful completion of the European ALMA deliverables.
a) **Recommendation on Early Science**

STC notes with some concern that despite the imminence of the Call for Proposals for Early Science, a number of requirements for issuing this call as previously recommended by STC have not yet been met. In particular, STC recommends that a calibration plan and the Early Science proposal implementation process be in place well before issuing the Call.

4) **E-ELT**

STC would like to congratulate wholeheartedly the entire E-ELT team for having put forward a credible proposal of this scope within schedule. The successful completion of the external review and the very positive statements expressed by the review panel in their preliminary report is a testimony to the skills and dedication with which the project operates. STC now awaits the conclusions of the 6-9 months duration delta phase B.

a) **Recommendation on Instrumentation plan**

In its recommendation on the E-ELT instrumentation plan, the STC stressed the importance of a high contrast planet imager and MOS capabilities for the E-ELT to reach its unique science goals. For this reason, STC endorses the recommendation by ESE that the project should explore ways of incorporating relevant XAO input during construction and that just waiting for SPHERE results is not advisable.

**Appendices**

1. **STC 74th Meeting Agenda** page 4
2. **Report from the 3 STC sub-committees**
   a. LSP sub-committee meeting, September 30, 2010 page 6
   b. ESAC sub-committee meeting, October 18, 2010 page 14
   c. ESE sub-committee meeting, September 30, 2010 page 26
# Appendix 1: STC 74th Meeting Agenda

## October 19

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Document</th>
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<tr>
<td>09:00</td>
<td>Closed session STC only</td>
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<tr>
<td>09:30</td>
<td>Closed session with DG</td>
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<tr>
<td>10:00</td>
<td>Welcome</td>
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<tr>
<td>10:05</td>
<td>1. Adoption of the Agenda</td>
<td>STC-474</td>
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<td>2. Approval of the Minutes of the 73rd (extraordinary) STC Meeting</td>
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<td>10:45</td>
<td><em>Coffee break</em></td>
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<td>11:00</td>
<td>4. ALMA</td>
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<td>4a. Project Status Report (W. Wild)</td>
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<td>11:20</td>
<td>4b. Discussion of ALMA Fact Sheets</td>
<td>STC-475D-ALMA</td>
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<td>11:35</td>
<td>4c. ALMA development proposals (L. Testi)</td>
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<td>11:50</td>
<td>4d. Report from ESAC (L. Tacconi)</td>
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<td>12:10</td>
<td>4e. Discussion</td>
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<td>12:40</td>
<td><em>Lunch</em></td>
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<td>13:30</td>
<td>5. Directorate of operations</td>
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<td>5a. Directorate of Operations Overview (A. Kaufer)</td>
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<td>13:50</td>
<td>5b. Update on survey data delivery (M. Romaniello)</td>
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<td>14:00</td>
<td>5c. Discussion of Directorate of Operations Fact Sheets</td>
<td>STC-475A-DOO</td>
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<td>14:20</td>
<td>6. Directorate for Science</td>
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<td>6a. Directorate for Science Overview (B. Leibundgut)</td>
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<td>14:40</td>
<td>6b. Discussion of Directorate for Science Fact Sheets</td>
<td>STC-475C-DSC</td>
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<td>14:50</td>
<td>6c. Report from the La Silla Paranal Subpanel (Y. Mellier)</td>
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<td>Also available: LSP STC Summary presentation</td>
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<td>15:15</td>
<td>6d. Discussion</td>
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<td>15:45</td>
<td><em>Coffee break</em></td>
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<td>16:00</td>
<td>7. ESO Budget 2011</td>
<td>FC-1827</td>
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<td>16:15</td>
<td>7a. ESO Budget [*]</td>
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<td>17:00</td>
<td>Closed session</td>
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20 October

6. Directorate for Science (cont.)

09:00 6e. Report on the OPC Working Group (B. Leibundgut)
09:15 6f. Spectroscopic Surveys (B. Leibundgut)
09:30 6g. Report on the VST workshop (J. Melnick)

8. Directorate of Programmes

10:00 8a. Directorate of Programmes Overview (A. Russell)
10:30 8b. Discussion of Directorate of Programmes Fact Sheets STC-475B-DOP

10:45 Coffee break

11:00 8c. Update on VIMOS upgrade (M. Casali)
11:15 8d. Wide-field spectrograph letters of interest (M. Casali)
11:30 8e. Discussion

12:00 Lunch

9. E-ELT

13:00 9a. Report from the Programme Office (R. Gilmozzi)
13:20 9b. E-ELT external review (A. Russell) E-TRE-ESO-100-0800

13:40 9c. Report from the ESE Subpanel (T. Herbst)
14:00 9d. Discussion

14:30 Closed session

16:30 Meeting with DG and Directors

17:15 End of meeting
Report of the La Silla-Paranal (LSP) sub-panel

September 30 2010 sub-committee

Present:

LSP sub-panel: B. Cotton, J. Fynbo, A. Marconi, Y. Mellier (Chair), G. Perrin, M. Prouza, R. Ragazzoni;


I. General comment

No major concerns or important progress were reported during the meeting. The sub-committee understood that the LSP meeting held during a transition period. ESO reported very good progress in almost all points discussed, but the important milestones are still to come, within the next weeks or months. So, for many items presented in this report technical points are already detailed in the previous LSP report and are not listed again.

Note that the LSP agenda was set up far in advance in order to be in phase with the STC agenda, according to the rules that were proposed during the last LSP meeting.

II. VIMOS

VIMOS was added to the LSP agenda because some problems were reported by a VIMOS user during the last weeks preceding the LSP meeting. Some early science data obtained, validated and transferred to the PI with the upgraded-VIMOS (after re-commissioning) turned out to be totally out of specifications. The data clearly demonstrate that the instrument was not ready for science observations (misalignment of zero-order, defocusing towards the edges). It is not clear yet why the instrument received green light for science observation and whether the pending technical problems were clearly and timely reported through the internal ESO communication chain.

ESO said they are very well aware of the problems and are working on them (instrument and internal communication). Recent communications (post-LSP) with the PI show that the
instrument is now working very well. However, the LSP sub-committee wonders why the problems were not immediately detected on the telescope. If the VIMOS Quality Control tools cannot detect some obvious problems, then it may be a serious issue for the operation of ESO Public Spectroscopic Surveys. The panel suggests that the team in charge of VIMOS talk to the ESO team in charge on the ESO Public Imaging Surveys. From the presentations we had from this team, it seems that many of the QA tools and web-based monitoring tools could be used for surveys with VIMOS.

III. AOF

The LSP sub-committee was very happy with the progress reported on all sub-systems of the AOF, namely GRAAL, GALACSI, DSM, ASSIST, 4LGSF, SPARTA, NGC and the UT Upgrade. For many of them, the panel has seen pictures and reports on on-going activities on the manufacturing, or the assembly and tests and integration of major hardware pieces. For the others, contracts are in good shape. No apparent problems have been identified, so far. The commissioning plan, with only 2 month downtime for DSM, looks realistic and the synergy with SPHERE is a good strategy. For the VLT Upgrade the FDR is planned by mid-2011. To date, the end of commissioning is December 2014, with the GLAO Hawk-I operation starting by mid-2014 and the GALACSI-MUSE in operation by the end of 2014.

The LSP sub-panel encourages the team to go ahead in order to have the AOF ready on time and to prepare the E-ELT. The LSP committee is however aware that critical reviews are still to come and we will have better views after the review on December.

IV. New High Performance AOF Instrument (post-NACO)

The comprehensive review of all options under study at ESO to replace NACO was very clear and helpful. The LSP sub-panel understands that a broad range of technical solutions and observing modes have been explored, some still being at a very early stage. Both narrow fields (20-40 arc-second FOV) and wide fields (1-2 arc-minutes) instruments are investigated; namely SPIFFICAO, GALACSI-CAM, HP-IRLOS or Hybrid-MCAO. All these options have been presented to the Panel as well as interesting summary tables with the relevant parameters.

The LSP panel realises that the guidelines for the selection process of any of these options have to be defined. Important parameters likely technical complexity, manpower, cost, timeliness, programmatic, and main science drivers must be taken into account (in particular the galactic center). Trade off and selection of best options must however primarily preserve the top level science requirements that motivated the STC to recommend a post-
NACO instrument. It is not clear, for example, that a MOS capability is needed, is technically feasible (if cold masks are needed, for instance) and should be explored further. Likewise, one may wonder if building a second GALACSI structure is the right way to go, considering the risks, as well as the scientific needs and the programmatic constrains for MUSE. The LSP proposes that a science team be set up as soon as possible in order to work closely with the post-NACO instrument team and set clear scientific boundary conditions. It also suggests that ESO draw clear rules and a planning for the selection process of the design for the post-NACO instrument.

V. VST and VST Public Surveys

The Panel had detailed report on the VST Public Surveys and GTO programs Review meeting that held at ESO on September 28 and 29, and a summary of the PSP recommendations and suggestions. It endorses the recommendations and suggestions made by the Public Survey Panel. The LSP sub-committee noticed that the commissioning plan provides a date for the beginning of the VST Public Surveys that is still a bit vague (after end of July 2011). Given the narrow window that remains for VST to be competitive, the LSP regrets that more precise dates were not provided for the commissioning. The LSP suggest that VST team provides a clear plan for the commissioning and post-commissioning (SV, dry runs) phases for the next STC meeting (October 19-20, 2010). Further, in order to avoid extra-delays, the Panel suggests that the OmegaCam camera be on the telescope as soon as possible.

VI. VISTA and VISTA Public Surveys

The LSP sub-committee was very impressed by the summary report on VISTA and the ongoing VISTA public surveys. After the summary given on the Phase 2 (survey monitoring tools) and Phase 3 (survey data delivery) data management steps and on the current status of VISTA surveys, the Panel feels that the whole process is well under control by ESO. The QA and survey monitoring tools developed at ESO are working well and fill all needs.

The production rate of each VISTA Public Survey obtained by ESO after less than one year of operation (and only 6 months of official survey operation) is impressive. The concerns expressed by the panel on this issue during the last meeting are dissipated, in view of the statistics on the completeness shown by ESO (99% for UltraVISTA, 95% for VHS, 70% for VIDEO, 47% for VVV, 67% for VIKING and VMC for 98%) and the explanations of the rather low efficiency for VIKING, VIDEO and VVV). The LSP panel congratulates the teams in charge of the operation of the VISTA telescope, the surveys and of the data management for their impressive work and readiness level.
As the data release will be discussed with the PIs in November, the LSP panel suggests that ESO warns the Public Survey teams that the data production and the content of all data products should be fully described. Explanatory documents should be part of the release. The panels suggests that the ESO refers to recommendation 6 of the VST review for the documentation VISTA survey products, in particular the following point: “In addition, the PSP encourages the detailed documentation of the algorithms and the processes so that these pipelines can be fully understood and maintained in the future”.

VII. PRIMA

The follow up of PRIMA activities by the LSP sub-committee is continuing. As in the previous meeting, important progresses have been made in many sub-systems (Differential Delay lines, Fringe Sensor Units, Stars Separators for the ATs, PRIMA end-to-end metrology, Control Software). The on-going PRIMA commissioning plan follows the priority set by the LSP, with the highest priority for beginning micro-arcsecond astrometry programs, followed by faint object science for AMBER and MIDI and then the phase reference imaging with AMBER and MIDI. The LSP sub-committee is happy with the report and is waiting with great interest for the upcoming astrometric commissioning, in November 2010. It hopes that the PRIMA team will be soon in position to move on to the second step, toward faint object science (see also the summary of the VLTI community meeting in the last item).

VIII. PIONIER

PIONIER are progressing very well and seems almost ready and on schedule. The collaboration between Grenoble and Paranal is excellent. The LSP sub-panel is now just waiting for the first image of stars. As reported in the previous report, commissioning runs planned in November and December and first science runs are planned in December 2010. The LSP sub-committee re-iterates its satisfaction to see that everything goes smoothly with PIONIER.

IX. VLTI infrastructure

The LSP sub-panel noticed that over the last 6 months, all activities on VLTI infrastructures progressed well and are still progressing, on all major fronts on the infrastructure and the instruments (in addition to PRIMA) thanks to a 3 months period of technical time:
- vibrations on UTs (vibrations);
- upgrade of ATs (network upgrade, coating of M2 and M3, AT operations);
- operation of the 4 ATs that can now be used for imaging;
- MIDI (image drift), and AMBER (co-alignment with VLTI, Calibration Alignment Units, operations, Reflective Memory Network RECorder);

At the time of the LSP meeting, the technical activities were still in progress, it was not possible to have conclusions for all of them, but the activities follow the plan set by the VLTI technical team. The LSP sub-committee is however happy with the progress report made during the meeting. As the STC expects an updated plan for VLTI by Spring 2011, a short progress report was sufficient for this meeting. The Panel looks forward the future plan in order to have also a timescale for achievement of all systems and sub-systems relevant for the VLTI infrastructure.

The Panel recommends that the team does not spend too much time in deploying many modes for AMBER and just focuses on the most scientifically compelling, according to the AMBER community.

Several points were discussed during the VLTI community meeting that held one day after the LSP meeting) that were summarized by A. Marconi and G. Perrin who both attended the meeting:

- The community expressed the desire to have a resource analysis: what are the problems to be solved? What are the priorities? What are the available resources? Having this information could help defining priorities, leaving aside problems for which the requested resources might be too large. This should be addressed by the midterm plan we requested as STC.

- It has been suggested that there is a problem because there is no plan for increasing magnitude limits before 2nd generation instruments, in the meantime Keck is observing and improving his sensitivity, not only on LR but also on MR should find ways to improve on existing instruments. There are three ways to improve:
  
  o keep reducing vibrations to bring VLTI to specs
  o implement on-axis/off-axis fringe tracking with PRIMA but not only for astrometry
  o accept a shared risk mode in which the magnitude for AMBER is 9-10 instead of 7 the current limit for AMBER proposals
It has been asked for possibility to have risk in service mode: i.e. accept a service mode observation in "shared risk"; if it does not succeed then it's like in visitor mode, the time is lost. Service mode for interferometry does not necessarily need to be an observation which is guaranteed to succeed (this would allow to attempt observations of targets fainter than limiting magnitude).

A. Vibrations:

. Numbers which have been presented refer only to M1-M3 (accelerometers), but real numbers are probably much worse. No direct measurements of the overall values were obtained because of little technical time available (and bad weather). The vibration fight is a continuous effort: each time some instrument is changed, vibrations have to be remeasured and new sources of vibrations must be found.
. Possibility to improve AMBER data quality and accuracy of measurements with RMNREC
. Request from GRAVITY to finish VLTI infrastructure, reduce vibrations, get the third star separator, and need for support on software. GRAVICY would like less than 200 nm rms; MATISSE 300 nm (40% loss of contrast) or better 180 nm (only 5% loss)

B. Ongoing/future projects:

. MAMMUT project: laser metrology to measure UT vibrations if tests successful then we can understand whether this method can be used to suppress vibrations MAMMUT testing in Paranal in 2011 Q1. No budget foreseen for paranalisation and duplication.
. NAOMI: optimistically 1st system foreseen for end 2013 in Paranal
. 2nd generation fringe tracker: feasibility studies from Grenoble, NOVA & TNO, ONERA idea is not to start design ESO 2GFT before 2012 (wait for new and better detectors) project of about 3 years (would come in 2015-2016, one year after gravity?). In the meantime, FINITO could be upgraded with better detectors (SELEX) to increase the sensitivity of AMBER on-axis with 3 telescopes and bridge the gap with 2GFT.
. The star separator will have priority over 2nd gen fringe tracker

C. Possible actions:

. J. Melnick has collected action items and priority wishes. Iterations will take place between ESO and the community to define priorities given the load of staff available resources. The list of action items includes
. Implement software by Jaffe for MIDI,
. On axis FT with FSU for MIDI,
. Service mode with risk; category of "risky" proposals with technical improvements, should be evaluated by OPC and Paranal people to see if feasible,
. Implement self coherence mode as standard,
. Improve IRIS / FINITO detector; priority to put new detector in FINITO,
. ESO conference on VLTI results, synergies with ALMA / JWST, etc...
La Silla–Paranal STC sub-panel (LSP)
Draft Agenda
September 30, 2010 - Council Room

09:00  Welcome and adoption of the Agenda (Y. Mellier)
09:10  AOF status report (N. Hubin)
09:40  New AO instrument for the AOF (replacement of NACO; M. Casali)
10:10  Discussion

10:30  Coffee Break

11:00  Status report of Public Surveys with VISTA (M. Arnaboldi)
11:30  Recommendations from the VST Surveys review (Y. Mellier)
12:00  Discussion

12:30  Lunch

13:30  Status report of VLTI infrastructure (A. Merand)
14:00  PRIMA Commissioning (F. Delplancke)
14:30  PIONIER (P. Haguenauer)

14:45  Closed session

16:30  Meeting with ESO staff

17:00  End of meeting
Report from ESAC

ESAC Meeting, 18 October
ASAC Meeting 13-14 October in Santiago at new ALMA Headquarters, with visit to ALMA site

ESAC Membership:  Jose Afonso, Frederic Gueth, Lauri Haikala, Michiel Hogerheijde, Rob Ivison, Roberto Maiolino, Jesus Martin-Pintado, Raphael Moreno, Elaine Sadler, Linda Tacconi

European ASAC Membership:  Frederic Gueth (ASAC Chair), Rob Ivison, Michiel Hogerheijde, Jesus Martin-Pintado, Linda Tacconi

Jes Jorgensen replaces Roberto Maiolino in ESAC in 2011
ESAC Meeting on October 18

• Immediately after ASAC meeting, and CSV and ORR reviews in Santiago

• List of Topics:
  1) Project update
  2) ASAC Summary – 4 main charges from ALMA Board
  3) Commissioning and Science Verification, and Operations Readiness Review summaries
  4) EC funding/projects
  5) ALMA development plan
  6) APEX status
Main ASAC Charge

Charge 1: The principal item for this meeting is the readiness of the Project to start Early Science and the content and timing of the Call for Proposals. Key issues include:

- the status and reliability of the infrastructure,
- hardware and software (including both the real-time aspects and the suite of software for supporting observations) and of the calibration systems and methods;
- the completeness of AIV, CSV and SystemVerification tasks;
- the preparedness of the user support system, as well as the expectations and needs of the user community.

The ASAC will have reports from the CSV Status Review and the Science Operations Readiness Review. In addition, reports on the status of construction and of the observatory infrastructure will be presented, along with details of current limitations and developments which relate to the question of which capabilities should be offered at which stage. Further considerations are whether or not the burden of supporting Early Science will delay the completion of the full construction program and, conversely, whether exposure, at this stage, to the problems of providing a service to users will help or hinder the project in achieving its final goals. The ASAC should provide commentary on these topics and make recommendations on how to proceed with the Call for Proposals.
Early Science Requirements - Reminder

From CSV Implementation Plan

2.3.1 Minimum Requirements

The ASAC has recommended that Early Science should not start until the following conditions can be fulfilled and the Board has approved this plan:

- At least sixteen 12m antennas fully commissioned with at least 3 receiver bands available on all antennas.
- Synthesis mapping of single fields.
- Sufficient antenna stations to provide a range of configurations covering the shortest spacings and out to at least 250 m.
- A basic set of spectral modes as previously selected by ASAC.
- Calibration of all the above to a level comparable with existing millimeter-wave arrays – requires hot/ambient loads and WVRs.
- Software to support users’ applications, the preparation and execution of observations and off-line data reduction.
Impressive progress since last face-to-face meeting. ESAC Congratulates the Project for all the hard work and milestones reached.

AEM antenna progress leads to “cautious optimism” – much happening up at the OSF integration site (ASAC tour of AEM).

European FE’s (Bands 7 and 9) continue to be in good shape.

Input to ESAC discussion:
• CSV (Commissioning and Science Verification) review October 7-8. ESAC represented by Jesus Martin-Pintado
• ORR (Operations Readiness Review) October 11-12. ESAC represented by Frederic Gueth.
• ASAC recommendations
Readiness for Early Science

Main Discussion Points and Concerns of ESAC for Early Science:

• Communication within the Project – AIV to CSV team, CSV to SciOps, Project to ARCS (lateral communication) and from Management downward (vertical communication) needs to be improved.

• Mixed messages/dates/timelines sent out to community on Early Science.

• Archive – awkward/difficult access to information (European deliverable). New team in place to remedy problems – confident that main functionalities will be offered soon (queries, etc.).
Readiness for Early Science III – ESAC Perspective

• Recommends identifying soon (immediately after Board) a unified schedule for ES across the project.

• Whenever the Call is released, it must be extremely clear on 1) what capabilities will be offered, 2) what the rules of the game will be – “best effort basis”, 3) what the minimum amount of observing time will be, 4) how much interaction the users will need with their data, etc.

• ESAC prefers one Call for Proposals per set of capabilities

• Prefers scheme with smaller number of high quality, well thought out proposals, rather than hundreds of small requests.

• Prefers quality of ES data over quantity – better to have fewer projects completed well, than many projects of lower quality.
Charge 2: Issuing the Call for Suggestions for Science Verifications targets has been postponed several times. It is now proposed to do this as soon as possible after the reviews and the ASAC meeting, in order to take advantage of the improved perspective that will have been gained. The ASAC should advise on the content of that call.

• ESAC does not favor an Open Call for Suggestions, and finds that such a call leads to unnecessary overheads. (Note: ESAC and ASAC disagree on this!)

• CSV team, in consultation with ARCs, could arrive at sensible/complete target choices.

• Suggests that this phase be called “Science Demonstration” instead of Science Verification.

• Although SV (or SD) data will be public, ESAC/ASAC recommend that CSV team lead the first “ALMA is Working” data paper.
ALMA Proposal Review Process

Charge 3: The document Principles of ALMA Proposal Review Process has been approved by the Board. ASAC should review progress on the implementation of these principles and provide comments to the Board.

• ESAC pleased that “The Principles of the ALMA Proposal Review Process” has been approved by the Board.

• Implementation of the process is still in early stage of discussion – worrisome, given there will soon be a Call for Proposals for Early Science.

• Implementation of Early Science review process could (and maybe should?) be different from Full Operations proposals.

• Workload and time requirements on reviewers needs to be at forefront – need top people for the ARP!. ESAC suggestions – fewer readers per proposal, 2 page maximum proposal limit, triaging of low ranked proposals...
On the Road to the Full Array…

Charge 4: Although the immediate question of readiness for Early Science will be dominant at this meeting, the ASAC should nonetheless also pay attention to the broader picture of the progress of the Project towards Full Operation and for its further development, and bring any concerns to the notice of the Board, particularly in the areas of scientific commissioning, software development and implementation and user support.

• ESAC agrees completely with ASAC view that top priority for Project should be the path to Full ALMA Operation, over increasing Early Science time.

• The European deliverables to the project, in particular, the Archive and AEM antennas, need to be in place on time and be performing optimally for the full exploitation of ALMA science.
See Leonardo’s presentation – evaluation underway.

ESAC wishes to participate/be kept informed of the selection process.
APEX Update

• LABOCA 2 installation proceeding well – ESAC recommends keeping LABOCA 1 on standby as backup if possible, in case of installation problems.
• Pleased to hear about PI instrument z-Spec commissioning first results.
• Pleased that new SFHI backend will soon be available.

• ESAC endorsement: The current and planned suite of instrumentation on APEX, such as LABOCA 2, and PI instruments such as Artemis, z-Spec, and Zeus will provide the ESO community access to a unique set of sub-millimeter capabilities. With these capabilities ESAC strongly believes that APEX will continue to be in high demand after ALMA inauguration, and supports the proposed extension to at least end 2015.
European ELT Science and Engineering (ESE) Committee Report
October 2010

ESE Participants

Joris Blommaert, Raffaele Gratton, Roland Gredel, Tom Herbst (chair), Isobel Hook (via videocon), Josef Hron, Gerard Lemaitre, Göran Olofsson, José Miguel Rodríguez-Espinosa (via telephone), Didier Queloz, Florian Kerber (secretary)

David Crampton, Marijn Franx, and Gerard Rousset could not attend, but they provided feedback on the proposal in advance of the meeting. Colin Cunningham apologized that he could not attend.

ESO Participants

Fernando Comeron, Philippe Dierickx, Roberto Gilmozzi, Markus Kissler-Patig, Suzanne Ramsay, Adrian Russell, Jason Spyromilio, Roberto Tamai

The meeting took place at ESO on 30 September 2010 and followed the attached agenda. Note that the agenda refers to discussion areas only. In most of these areas, the ESE deliberations addressed both the original proposal and the initial feedback from the external review panel.

The ESE report follows, beginning with some general remarks, followed by more specific comments, which appear in the approximate chronological order of the presentations and discussion.

General Remarks

The ESE unanimously agreed that the E-ELT Project Office has produced what appears to be a credible design for a scientifically interesting 42m telescope, an achievement for which the team deserves hearty congratulations.

The recently completed External Review process has been a success. The referees represent world-class expertise across a range of disciplines essential for a successful proposal. And, although only the initial reactions of the panel were available at the time of the ESE meeting, the external review committee appears to have identified important strengths and challenges of the design. The ESE anticipates that their final recommendations will be of enormous value in judging the E-ELT.

The ESE appreciated access to the proposal documents well in advance of the meeting. As a general remark, the panel suggests that the proposal documents would be strengthened by individual executive summaries.

Finally, the ESE noted that the September 2010 meeting was nominally the last get together of this body. At the meeting, ESO personnel noted that ESE’s mandate extends through the end of Phase B, which is defined by a positive or negative decision by Council. It is unclear at this point whether such a decision will take place in December 2010, but STC should begin deliberating the issue of engineering and scientific feedback during a possible construction phase. Independent of the outcome of impending events, the ESE would like to express its best wishes to the E-ELT Team and thank them for their collaboration over the last several years.
Telescope Construction Proposal

In light of multiple, nonzero probability risks, we agree with the external review panel that the overall program schedule is too aggressive. We support the Project Office’s intention to re-work the schedule in the coming months.

The XAO science case is of prime importance, and may have serious influence on decisions in the construction phase. The project should explore ways of incorporating relevant input during construction. It is not advisable to just wait for SPHERE results.

The ESE welcomes the honest evaluation of telescope emissivity under realistic conditions, and supports the Project Scientist in his intent to re-evaluate the science cases in light of the higher anticipated thermal background. Such an analysis may force a re-evaluation of mirror cleaning and/or protection strategies. Similarly, ESE supports ongoing efforts, including accelerometer strategies, to address the impact of M2 on SCAO performance.

E-ELT Science Case

ESE encourages the Project Scientist to include a summary table in the science case document. This table should show which science cases are covered by which instrument capability (especially highlighting the first light capability). This would help in gaining an overview and in rationalizing instrument calls.

The ESE welcomes consideration of solar system science in the Top Level Requirements. Refining tracking demands may reduce complexity and cost.

The ESE notes that STC has increased the priority of ELT-MIR. Section 5.4.1 (page 66) of the instrumentation plan document states:

“Within the pool of capabilities, the ELT Mid Infrared Instrument already has a preferred status and will be strongly considered as the third instrument to be delivered to the telescope. The reasoning behind this is presented in Section 5.4.2 below.”

ESE encourages STC to review these sections to ensure that they do not overstate its views.

Instrumentation Plan

ESE welcomes the plan for significant instrument investment in the operations phase. Completing the initial instruments seems reasonable within the cost frame proposed.

ESE notes that, while the overall instrumentation budget is in alignment with expectations, the budgets for the individual instruments in section 8.2 of the instrument plan are 20-40% lower than those derived from the Phase A studies (ELT-MIR is an exception). The external review committee noted this as well. Maximum scientific productivity of the telescope will require careful examination of the overall size and balance of these budgets in light of the science case. The SWG or its follow-on seems the ideal body to help with such an examination, (ESE recognizes that the SWG has been insulated from cost issues to date, but a reduced budget may involve rationalizing and descoping the instrument suite, an activity well within their purview)

ESE supports the instrument schedule, with two high impact facilities available soon after first light, and subsequent capability coming along with a two-year cadence. Such a strategy has the inevitable challenge of sustaining instrument team momentum over many years of inactivity. While we see no clear remedial action at present, ESO should maintain an
overview of the European situation going forward, and take whatever steps are possible to ensure a smooth restart of activity. Technology development in the community is an obvious option.

**Operations and System Engineering**

The Project presented a convincing model for operations. The ESE appreciates the advantages and savings of shared operations with Paranal. The Hawaii experience indicates that commuting for day crews should be manageable.

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**Agenda – ESE Meeting 30 September 2010**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>09:00</td>
<td>Welcome and logistics (Gilmozzi, Herbst)</td>
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<tr>
<td>09:15</td>
<td>Telescope Construction Proposal - Spyromilio</td>
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<td>09:30</td>
<td>Discussion</td>
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<td>11:00</td>
<td>Coffee</td>
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<td>11:15</td>
<td>E-ELT Science Case – Kissler-Patig</td>
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<td>11:30</td>
<td>Discussion</td>
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<td>12:15</td>
<td>Instrumentation Plan - Casali</td>
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<td>12:30</td>
<td>Lunch</td>
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<td>13:15</td>
<td>Discussion</td>
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<td>14:00</td>
<td>E-ELT Operations Plan - Tamai</td>
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<td>14:15</td>
<td>Discussion</td>
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<td>14:45</td>
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<td>15:00</td>
<td>E-ELT Systems Engineering - Tamai</td>
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<td>15:15</td>
<td>Discussion</td>
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<td>15:45</td>
<td>Open Items and Discussion</td>
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<tr>
<td>16:15</td>
<td>Closed Session and draft recommendations</td>
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<tr>
<td>17:30</td>
<td>Adjourn</td>
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