EUROPEAN SOUTHERN OBSERVATORY
ORGANISATION EUROPEENNE POUR DES RECHERCHES ASTRONOMIQUES
DANS L’HEMISPHERE AUSTRAL

SCIENTIFIC TECHNICAL COMMITTEE

58th Meeting
ESO, Garching, October 26 & 27, 2004

MINUTES
Minutes of the 58th meeting of the Scientific Technical Committee, held at ESO, Garching, on October 26 and 27, 2004.

The STC convened in the following composition:

Chairman: J.-L. Puget (France)
Members: J.-M. Vreux (Belgium), D. Minniti (Chile), H. Kjeldsen (Denmark), I. Tuominen (Finland), R. Bacon (France), A. Eckart (Germany), T. Henning (Germany), A. Cimatti (Italy), R. Gratton (Italy), P. Garcia (Portugal), N. Piskunov (Sweden), S. Lilly (Switzerland), K. Kuijken (The Netherlands), A. van Ardenne (The Netherlands), R. Hills (UK), P. Roche (UK)
Guest: R. Genzel, MPE (agenda item 8)

On behalf of the ESO Executive: C. Cesarsky (Director General)

J. Alves J. Melnick
M. Basbiler G. Monnet
D. Baade A. Moorwood
J. Beckers F. Paresce
F. Comeron L. Pasquini
J. Credland P. Quinn
P. Dierickx A. Renzini
S. D’Odorico D. Silva
R. Fosbury J. Spyromilio
R. Gilmozzi G.H. Tan
A. Glindemann T. Wilson
B. Leibundgut

Minutes: M. Zwaan
26 October 2004, Day 1

1. **Opening of the meeting and adoption of the agenda (STC-359)**

   The Chairman welcomed the new STC member T. Tuominen (Finland). J.-L. Puget introduced an extra agenda item: “20 micron upgrade to MIDI”, after item 9. The agenda was adopted with this change.

2. **Minutes of the 57th STC meeting (STC-358)**

   The minutes were approved without changes.

3. **Report of the Director General**

   After the report by the Director General, J.-L. Puget added that the present version of the report by the Council Strategy Planning Working Group should be distributed to the STC members.

   S. Lilly asked about how ESO press releases on scientific results are chosen. There are concerns in the community that some of the press releases appear to be premature. C. Cesarsky and B. Leibundgut replied that press releases are very carefully chosen after rigorous evaluation by a group of scientists. It is essential for ESO to do press releases of high profile results, it would harm ESO if they were too conservative with the selection of press releases, which in a few, rare cases may imply a reasonable risk to be taken.

4. **Discussion of Fact Sheets (STC-360A-E)**

   P. Garcia asked if it is true that no exposure time calculator exists for FEROS. J. Melnick replied that it is being constructed at this moment.

   J.-L. Puget is worried about the support and maintenance by European companies after delivery of equipment. R. Gilmozzi replied that this is a great concern, specifically for the power station, spare parts for mirror support, and the adaptor rotator. Repair and delivery of parts often takes more than a year.

   R. Bacon inquired about the ‘AO friendly weather’ statistics. R. Gilmozzi replied that the critical parameter is tau_0, which is measured continuously, every night. ‘AO friendly’ is generally defined as tau_0 larger than 3 ms.

   H. Kjeldsen asked about the implementation of the Iodine cell inside the HARPS adapter and its effect on the availability of the self-calibration mode. J. Melnick replied that there might be a problem with the temperature control of the Iodine cell, which is presently being investigated.

   N. Piskunov noted that it is important that bad pixel masks of CCDs are produced for all instruments.

   A. van Ardenne asked about the stability of delay lines for VLTI. G. Monnet responded that the delay lines are measured continuously. There are misalignments of approximately 100 micron, which is not a problem for the first level of VLTI operation. The solutions are being investigated as part of the system review. Eventually, it might be necessary to realign the rails every six months.
P. Roche asked whether the chopping problem is unique to NACO, or also exists for other instruments. J. Spyromilio replied that the problem lies in the instability of the field selector of NAOS.

H. Kjeldsen wondered why only 37% of the La Silla observers fill out the end of mission report. J. Melnick replied that the system is still recovering from a major problem with the remedy reporting system.

A. Cimatti inquired about the throughputs of NACO and the VIMOS IFU compared to the expected values. J. Spyromilio answered that these numbers are known but he does not have them at hand. S. D’Odorico added that during the commissioning of the instrument the throughput of the IFU mode of VIMOS was measured at ~55% of the MOS mode. The losses in the IFU module are higher than the original prediction by the Consortium, but still comparable or better than those of other fibre-based IFUs.

D. Minniti asked whether it will be possible to apply for time on REM. J. Melnick responded that REM is a telescope dedicated to follow up GRB alerts. The data will be available to the community. In between GRB alerts it might be possible to carry out alternative programs. This is up to the consortium and interested parties should contact directly the consortium.

A. van Ardenne asked if the increase in the number of proposals in P75 is due to the larger number of instruments becoming available. J. Alves answered positively. A. van Ardenne asked if this increase implies a larger load on the Paranal staff. R. Gilmozzi replied that the number of staff is still growing and is expected to stabilize in two to three years.

N. Piskunov expressed his concerns about the status of the adaptive secondary mirror and the dependence of several future instruments on this. G. Monnet replied that retrofitting an adaptive secondary to an existing telescope is difficult, especially for the VLT given its interferometric mode. However, the expected time scale is still appropriate. Cost is an essential component in the feasibility study. In response to P. Garcia’s question whether the adaptive secondary is contained within the Long Range Plan, C. Cesarsky replied that development of the adaptive secondary is possibly a high-risk development. It needs to be carefully assessed, but is currently in the Long Range Plan. A. Eckart asked whether there is any communication with the LBT team about the development of adaptive secondaries. G. Monnet replied that the feasibility studies for the MMT, LBT and the VLT are conducted by basically the same groups of people and considerable progress is being made.

P. Roche inquired why VISIR does not approach background-limited performance. A. Moorwood replies that ESO staff are experimenting with a new method of detector readout, which consists of a dynamic change of the integration time. This improves the situation to the performance reaching a factor three above background in imaging mode. For spectroscopy the situation is worse.

P. Garcia asked about the status of the image slicer changes for MUSE. A. Moorwood replied that a new approach is being investigated which should be cheaper, more compact and deliver improved performance compared with the Phase A concept. The basic schedule for MUSE has not changed since Phase A. L. Pasquini added that a first prototype of the image slicer will be produced soon.
P. Garcia asked whether there is sufficient funding available for KMOS, X-Shooter and MUSE within the Long Range Plan. J.-L. Puget noted that the LRP documents are not yet available. A. Moorwood added that for all three instruments the budgets are close to the original allocations.

5. Report on the scientific usage of NACO, FLAMES, and VIMOS

J.-L. Puget noted that the discussion on the results from the OPC/STC Working Group on the balance between Large Programs, Normal Observing and Guaranteed Time and optimizing the scientific return from ESO cannot take place at present. C. Cesarsky added that the Visiting Committee (VC) recommended that there should be no national representation in scientific committees. Furthermore, the VC advised that the Council Strategy Planning Working Group should continue their work. This working group will take over the work initiated by the OPC/STC Working Group.

C. Cesarsky suggested that the STC membership remains intact for the next six months.

P. Garcia noted that it cannot be concluded that the expertise in several committees is not high enough due to the constraints of national representation. Moreover, the opinion of the VC was that the problem lies mostly in coordination (Cf. ESO/Cou-974, page 4, 5th paragraph). Finally, failure to comply with national representation will result in a loss of contact with the community.

B. Leibundgut presented the statistics on the scientific return from the new VLT instruments: VIMOS, NACO and FLAMES and illustrated some of the highlights from each instrument.

P. Roche asked for clarification on the ratio of allocated to requested nights. Does it imply that the OPC reduces the number of nights allocated per program? B. Leibundgut replies that the OPC is requested not to reduce programs unless there is a good reason.

R. Bacon noted that the late delivery of data reduction pipelines for spectroscopy can delay publications, compared to imaging programs. D. Silva added that reduction pipelines for SINFONI and VISIR are very advanced and should be available at the same time that the instruments are released to the users.

K. Kuijiken asked if users respond to the email they receive one year after their observations, which solicits information on the status of the data. B. Leibundgut replied that papers are often not finished one year after the data were taken. ESO staff check all refereed publications and maintain a database of those that are based on ESO facilities.

R. Hills was worried about the number of publications based on VIMOS data. B. Leibundgut clarified that many programs that were allocated time were not carried out because the instrument was not properly working. A. Renzini added that VIMOS was offline from August to December 2003. The present VIMOS publications are based on data taken before then, indicating that the process from data taking to a refereed publication takes almost two years.

J.-L. Puget noted that Large Programs are an efficient method of producing science. However, the number of LPs approved for the current Period was low.

P. Roche asked whether the two proposed visitor instruments have been approved. C. Cesarsky and R. Gilmozzi noted that both have gone through detailed review processes, especially concentrating on interfacing. In the case of CIRPASS, only two nights were approved by OPC,
so alternatives using deployed instruments are being offered to the proposers. ULTRACAM underwent the review process and is going to be installed at the VLT as a visitor instrument. DAZZLE has just started the review process.

S. Lilly noted that the statistics collected on the scientific use of NACO, FLAMES and VIMOS are not sufficient to draw conclusions on the efficiency of these instruments.

T. Maccacaro was asked to comment on the small number of LPs selected at the last OPC meeting. He explained the current complicated procedure of selecting LPs and noted that the OPC preferred that the LPs would go directly to the panels and then discussed by the OPC on Thursday. The OPC believes that generally the scientific output of the LPs is high. B. Leibundgut clarified that a major difference between LPs and normal programs is that the former are not ranked. S. Lilly emphasized the importance of treating LPs and normal programs separately and reserving a fixed amount of time for LPs. Presently, up to 30% of the total scheduled time can be spent on LPs.

6. **Report from the Council Strategic Planning Working Group**

J.-L. Puget summarized the report and presented the recommendations.

N. Piskunov expressed his concern about giving up national representation in committees. Funding agencies of small countries might object if they are not equally represented. P. Garcia stressed the importance of circulating the documents of the working group to the STC members.

7. **Report from the VLTI Implementation Committee**

F. Paresce briefly reported on the 30 refereed papers that are based on VLTI observations. Unfortunately, due to VLTI technical problems, the Science Demonstration (SD) and GTO runs in June were not as successful as anticipated. AMBER is presently being tested, there are still a number of technical problems to be solved. Overall, the SD program has been successful. For Period 75, 35 new proposals have been received. G. Monnet added that the performance of MACAO is improving. A. van Ardenne noted that the number of refereed papers per year based on VLTI instruments is similar to that of other VLT instruments.

C. Cesarsky proposed a new scheme for the VLTI Implementation Committee, similar to the ALMA European Science Advisory Committee. But it was decided to also keep this on hold for six months.

A. Glindemann reported on problems with the delay lines. Some of the problems with the low contrast of AMBER have been solved. MIDI will be used for the SD time. IRIS will be used to remove tip-tilt that is introduced by turbulence in the tunnel. Commissioning of AT1 went very well, the image quality is excellent after fixing a problem with the air conditioner.

8. **PRIMA Reference Mission Report by the VLTI Implementation Committee (STC-362)**

R. Genzel presented the PRIMA Reference Mission Report. He explained the concept of imaging interferometry and discussed the science goals. The STC complimented him on the report.
S. Lilly inquired how interferometers will compete with filled aperture instruments. R. Genzel replied that the power of filled aperture instruments lies mostly in the light collecting power, that of interferometers in high spatial resolution.

In response to a question by P. Garcia, R. Gilmozzi said that the mirror segment phasing may be a limiting factor in reaching the ultimate spatial resolution with OWL.

A. Cimatti asked how many extragalactic objects can be observed with VLTI. R. Genzel answered that the angle within which a bright reference star must be observed is approximately 1 arcmin, meaning that several tens of objects are observable with PRIMA.

N. Piskunov asked what fraction of the time a 4-element interferometer would be fully functional. T. Henning replied that like AO systems, interferometers will be routinely operated in a few years time. T. Henning added that lessons should be taken from VLTI on how to make a complex system work.

P. Roche asked what the optimal number of elements is for an imaging interferometer. R. Genzel and A. Glinde replied that an exact answer cannot be given, but probably 6-8 elements is optimal.

R. Hills wondered if simulations have been done to test the efficiency of PRIMA. R. Genzel replied that there is presently no man power available for these detailed simulations.

9. **VLT-VLTI Science Operation Policy (STC-361)**

A. Renzini presented the updated VLT/VLTI Science Operation Policy document.

S. Lilly commented that there could be a scheme in which a GTO team applies for a long term status of their project. A. Renzini replied that GTO teams feel that funding agencies would prefer that the time for GTO projects is guaranteed, and that the project is not reviewed along the way. S. Lilly asked whether the “30% limit for LPs” refers to a reserved amount of time for LPs, or a cap on the amount of time for LPs. J.-L. Puget said that it would be most useful to have a guideline average percentage instead of a strict maximum or minimum percentage.

A. van Ardenne asked whether the present proposal for GTO projects will result in less creative projects. A. Renzini that this is not the intention: the GTO projects allow a good characterization of the instruments and the allow science to be done at an early stage. The only concern in the community is that GTO teams may monopolize a scientific field, creating a situation similar to that in particle physics where science is done within large teams. In response to a question by R. Hills, A. Renzini noted that one GTO night is worth approximately 50,000 Euro per UT. T. Henning added that teams would be less inclined to build instruments if they are not allocated GTO time, but have to have their projects approved by the OPC.

K. Kuijken asked whether the goal of notifying applicants on time allocation at least three months before the beginning of the semester is achieved. A. Renzini replied that this is the goal but is presently not achieved for those observations to be carried out at the beginning of a semester.

K. Kuijken asked if it is an ESO policy to provide a pipeline for visitor mode observations. D. Silva replied that the pipelines are running on the mountain.
P. Roche raised the issue of the four second generation instruments each being allocated 150 GTO nights, putting too high a pressure on the available time. A. Moorwood replied that it can be contained within the 10% cap if it is spread out over about 5 years.

J. Vreux asked for a clarification on the 2-month time scale for AT relocations. A. Renzini replied that every six months a list of baselines that will be available for the next Period will be released.

9B. Extra agenda item: 20 micron upgrade to MIDI

T. Henning noted that the 20micron option has always been envisioned for MIDI. The problems in the upgrade lie mostly in operations, not so much in technical difficulties. T. Henning stressed that the decision on performing the upgrade should be made now, otherwise the money will not be available. P. Roche asked whether calibration at 20 micron will be a problem. T. Henning replied that the problem is essentially the same as at 10 micron, but there are far fewer calibrators available.

A. van Ardenne and T. Henning were asked to leave the room.

G. Monnet reminded the STC of the procedure that should be taken for upgrades. He added that the 20 micron upgrade will have a significant impact on VLT operation, 10 micron MIDI will be unavailable for one Period. Also other instruments will be delayed by the 20 micron upgrade. The 20 micron option could be regarded as a second generation program, instead of an upgrade. R. Gilmozzi added that the load on Paranal staff is already very high with many incoming subsystems.

C. Cesarsky clarified that the Project Development Advisory (PDA) Committee has assessed the project. This is a normal procedure for upgrades. It is important that there is general agreement on the outcome of the PDA.

A. van Ardenne and T. Henning were invited back into the room.

J. L. Puget asked for comments on the proposed third star separator. C. Cesarsky added that are already offers for a fourth star separator.

G. Monnet noted that procuring a third and fourth star separator will have an impact on second generation instrument planning and the development time frame.

T. Henning noted that the decision on the third star separator should be made on the basis of the available documents. There is no need to wait for the results of the VLTI instrumentation workshop in April 2005.

10. Technical report on ALMA (STC-360D)

J. Credland presented a status report on ALMA, discussed antenna procurement, front-end development and new tasks.

P. Roche asked for a brief statement on the overall status of ALMA. J. Credland said that the project is under control, but slightly delayed.

T. Wilson reported on activities related to European ALMA Scientific Advisory Committee. He reported on the ALMA community day, ALMA regional centers and the charges given by the ALMA board.

R. Hills noted that reducing the number of antennas from 64 to 50 will cause a decrease in speed by a factor of 1.6. However, all receivers perform better than the specifications. T. Henning added that further reduction of the number of antennas will result in ALMA not being able to reach the Level 1 science requirements.

N. Piskunov and S. Lilly asked whether the agreement with Japan is flexible, such that they could provide additional antennas. C. Cesarsky replied that this is unlikely.

C. Cesarsky noted that unlike in Europe, in the US the funds for ALMA construction and operation are well separated.
27 October 2004, Day 2

12. **Report on APEX**

J. Melnick presented a status report on APEX. The project is now 1.5 years behind schedule. It is estimated that the instrument will be in routine operation in the second quarter of 2005.

In response to a question by R. Hills, J. Melnick said that the APEX antenna has not been formally accepted.

J.-L. Puget asked whether it would be possible to extend the wavelength coverage of the 200 micron array to 350 micron. J. Melnick said that this would be very interesting.

P. Roche asked how many instruments APEX can support. J. Melnick replied that all three facility instruments will be operated remotely.

A. van Ardenne asked if there are lessons to be learned for ALMA. J. Melnick replied that 1) measurements of opacities at the Chajnantor site indicate that frequent observations in the THz bands are possible and 2) construction work at this site is possible but prone to delay because of snow fall. Furthermore, the present two containers are not air tight and lose their oxygen. Two additional air tight containers are expected to arrive at the site soon.

C. Cesarsky added that discussion with the APEX partners on procedures for large surveys are ongoing. There should be a call for ideas for science verification programs.

Regarding the new facility instruments, J.-L. Puget added that the step from single element detectors to arrays is very important.

13. **Opening ESO Archive Facility (STC-363)**

P. Quinn explained that the current proposal is to open the ESO archive to the international community on 1 April 2005.

P. Roche asked whether opening of the archive will increase the load on the staff significantly. P. Quinn replies that the staff load will increase in the near future because of the VST, VISTA and ALMA coming on line. The increased load from opening the archive is small compared to this.

P. Garcia asked what the size of the ESO archive is compared to other science archives. P. Quinn replies that for astronomical standards the ESO archive is large, but high energy physics data bases are 100 times larger. However, the expected problems related to data distributing are the same.

A. Eckart inquired whether it is known in detail how the ESO archive data flow within Europe. P. Quinn responded that these statistics can be found on the ESO Archive home-page.

H. Kjeldsen asked whether other observatories also open their archives. P. Quinn replied that most data from large telescopes are made public because many of their funding agencies require that.

J.-L. Puget asked what the role of ST-ECF will be in the near future. P. Quinn explained that ST-ECF will continue their present tasks until 2006, after which new core tasks will be defined. One of these core tasks will relate to archives and VO technology.
A. Renzini noted that the VLT-VLTI science operation document will have to be correspondingly modified if the proposal to open the archive will be accepted.

C. Cesarsky added that REM data will be made available to the ESO community immediately after the observations.

14. **Report on Planet Finders 1 and 2**

G. Monnet briefly reported on the Planet Finder Status. No discussion followed Monnet’s presentation.

15. **Report on OPTICON Activities**

G. Monnet reported on OPTICON, FP6 Contracts and JRA highlights.

P. Garcia asked whether there are currently preparatory activities for FP7. G. Monnet replied that the rules for FP7 are being defined in order to make the process more efficient.

A. van Ardenne added that ESO has been successful in FP6, but ALMA is currently on the FP6 reserve list. If successful, how is the ALMA FP6 program going to be coordinated with ESO internal ALMA activities? C. Cesarsky replied that the FP6 money is connected to the development of band 5 and to software related to early science.

16. **Status of OWL/ELT Activities**

R. Gilmozzi presented a report on the OWL conceptual design status.

R. Bacon asked whether a fixed gravity position for instruments is possible. R. Gilmozzi replied that this is not included in the present design, but some instruments might require it. This will be analyzed in the next design iteration.

T. Henning inquired about Spain’s contribution to OWL. C. Cesarsky said that the discussions on the specifics of their contribution are ongoing.

P. Garcia asked whether instruments are expected to work at the diffraction limit. G. Monnet replied that two sets of instruments are envisioned: one set will work at the diffraction limit, the other set consists mainly of spectrographic instruments, which will sample at five times the diffraction limit.

R. Hills asked what the total emissivity of the instrument will be at 2.5 micron. R. Gilmozzi replied that studies are still being done. The answer will depend on what types of coating of the mirror are used.

R. Hills asked whether external reviews of the design studies are being planned. R. Gilmozzi replied that a conceptual design report is planned for autumn 2005. After that an external review is planned, the results of which should be available before the Council meeting in December 2005.

N. Piskunov inquires whether there are site studies ongoing. R. Gilmozzi replied positively and added that in the current schedule the decision on the site needs to be taken in 2008.
A. van Ardenne asked whether there are plans for cooperating globally. R. Gilmozzi said that after the design review, the cooperation is expected to increase. Additional funding will be applied for through an FP7 proposal. An OPTICON working group is working on a Science Case booklet.

S. D’Odorico briefly reported on seven concept studies for OWL instruments launched in collaboration with institutes in the community to complement and provide feedback to the design study of the telescope.

G. Monnet noted that it is foreseen that OWL will be a ‘growing telescope’, which means that it can be used for observations during the period when the segmented mirror is being assembled.

R. Gratton asked whether OWL can be used for observations at daytime. R. Hills noted that the atmospheric problems will probably be too great. Obviously, guide stars are not available at daytime.

R. Bacon expressed skepticism on the ‘growing telescope’ concept. G. Monnet replied that it is a realistic concept for a telescope consisting of mass produced parts. J. Spyromilio added that using the telescope during the construction phase is essential for an optimal understanding of the telescope.

P. Roche inquired about the status of large telescope projects in the US. R. Gilmozzi replied that three design studies in the US/Canada (CELT, GSMT, VLOT) have merged into one project, which has received a donation of 35 million dollar. Another concept (GMT) is also under development. The TMT conceptual design phase schedule is very aggressive, with plans to start construction in 2008.

17. **Scientific Highlights**

B. Leibundgut demonstrated the ESO publication data base and presented some recent outstanding results obtained at ESO Telescopes. No discussion followed his presentation.

18. **Any other business**

Dates for the next meeting were set to April 14 and 15, 2005, and October 17 and 18, 2005. An extraordinary STC meeting on the Long Range Plan was planned for December 3, 2004.

[For the STC resolutions/recommendations of the 58th meeting see document ESO/STC-365]