Draft Minutes of the 66th meeting of the Scientific Technical Committee, held at ESO, Garching, on April 18 & 19, 2007.

The STC convened in the following composition:

**Chairman:**  
L. Tacconi (Germany)

**Members:**  
J. Blommaert (Belgium)  
H. Kjeldsen (Denmark)  
L. Haikala (Finland)  
J.-G. Cuby (France)  
Y. Mellier (France)  
D. Minniti (Chile)  
T. Herbst (Germany)  
R. Gratton (Italy)  
L. Testi (Italy)  
J. Afonso (Portugal)  
G. Olofsson (Sweden)  
W. Benz (Switzerland)  
H. van Langevelde (The Netherlands)  
R. Hills (UK)  
P. Roche (UK)

**Observer:**  
A. Herrero (Spain)

**Guest:**  
D. Enard (Only on April 19)

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

P. Andreani  
M. Basbilir  
G. Chiozzi  
M. Cullum  
S. D’Odorico  
R. Gilmozzi  
N. Hubin  
A. Kaufer  
A. Longinotti (Day 1)  
J. Melnick  
A. Moorwood  
P. Padovani (Day 2)  
F. Primas  
A. Richichi  
H. Rykaczewski  
S. Stanghellini  
R. Tamai

**Minutes:**  
S. Mieske
18 APRIL 2007

1. **Opening of the meeting and adoption of the agenda (STC-425)**

The meeting was opened by the chair L. Tacconi.

L. Haikala was welcomed as new Finnish STC member. A. Herrero was welcomed as Spanish observer.

It was announced that 2 current STC members would leave the STC to take on a position at ESO:

- L. Testi will move to ESO as the European ALMA project scientist, and as such abstain from the closed session.
- R. Hills will become ALMA project scientist at the JAO in Chile.

The two members were thanked for their work at the STC.

The dates for the first 2008 meeting were fixed: April 16-17th.

The agenda was adopted.

2. **Approval of the minutes of the 64th and 65th (extraordinary) STC Meetings (STC-416/424)**

The minutes of the 64th and 65th (extraordinary) STC meetings were approved.

3. **Discussion of the Fact Sheets**

**STC-426A-INS:**

J. Blommaert inquired about the remanence problem with the AMBER detector. A. Moorwood stated that this effect was of the order of 30%, and that the consortium had agreed to replace the detector.

R. Gratton inquired about CRIRES high precision radial velocity measurement and flat-fields. A. Moorwood replied that the radial velocity precision was about 70 m/s, meeting the first level goal. The flat fields are accurate to better than ~1%.

T. Herbst requested information on high-speed low-noise detectors, referring to both Calico and others. A. Moorwood described some problematic aspects of Calico. He also elaborated on the general difficulties of fast infrared detectors, stating that the corresponding call for tenders received poor response.

L. Tacconi inquired about the Barr filters for OmegaCam. A. Moorwood replied that they were not a critical concern given that most programmes can be carried out with the currently existing filters.
D. Minniti inquired about the possibility of burst- or fast-photometry-mode with HAWK-I. A. Moorwood replied that this is in principle possible, but that the speed is limited by the large array size.

P. Roche and R. Hills asked about the problem of getting 1k MIR detector arrays. A. Moorwood detailed the problems of obtaining such detectors from industry (e.g. Raytheon) at appropriate costs. The DIRECTOR GENERAL added that a French company had gone to larger format arrays and should be contacted.

**STC-412B-LSP:**

H. Kjeldsen inquired on the status of the iodine cell for HARPS. A. Kaufer replied that it was decided to not follow this further since it endangers the fiber mode. He mentioned the possibility of UVES.

T. Herbst asked whether instrument noise was affected by RFI. A. Kaufer replied that most noise parameters are not related to RFI.

T. Herbst encouraged highlighting more the recent MCAO achievement with the MAD demonstrator instrument. The DIRECTOR GENERAL replied that this would be changed on the ESO web page.

L. Tacconi asked for an up-date regarding the ISAAC intervention. A. Kaufer replied that the intervention was deferred to a possible slot in October, given that ISAAC has worked without problems and that there are manpower commitments for HAWK-I.

A. Herrero inquired on how high the maintenance level for VIMOS was. A. Kaufer answered that it was still somewhat higher than for other instruments, at ~5%, but is slowly decreasing due to continuing efforts of stabilizing the instrument.

P. Roche inquired about the problem with the coating for the APEX secondary. A. Kaufer replied that the problem was probably environment related but is under study by MPIfR together with VERTEX.

J.-G. Cuby inquired whether the daily workload for aligning AMBER was still very high. A. Kaufer pointed out that there was no breakthrough yet, and that this issue is still on the punch list for AMBER. He added that the misalignment from day-to-day is small, but that over 1-2 weeks they are more critical.

L. Tacconi asked about the problems with AO+Sinfoni regarding the tip-tilt star acquisition under too good conditions. R. Gilmozzi replied that this was due to a problem with the STRAP, and that a new head is being designed to overcome the problem.

**STC-412D-SCO:**

L. Tacconi inquired whether the duty work of the new fellows on the mountain works out fine. A. Kaufer confirmed this.
**STC-412E-DMO:**

T. Herbst inquired on the policy regarding the fact that the VO was a European funded effort with worldwide accessibility. The DIRECTOR GENERAL answered that up to now no critical comments regarding this issue had arrived from other bodies such as Council.

H. Kjeldsen thanked ESO for making the re-processed HARPS data available. He also inquired about the status of ARC node funding. P. Andreani replied that each ARC node is asking for funding at their national agency, and that Radio-Net and FP 7 proposals are ongoing.

H. van Langevelde asked about the status of CASA testing. P. Andreani stressed that this is an ongoing effort both at Socorro and at ESO, including both a fellow and a student.

**STC-412G-TSD:**

T. Herbst asked about an update on the wind-safety issues of the thin shells. N. Hubin replied that work on this is proceeding well, and that there will be a mechanical protection.

**STC-412H-VISAS:**

L. Tacconi inquired why the over-subscription in P79 was lower than P78. The DIRECTOR GENERAL replied that this was an even-odd effect, due to different night length in summer vs. winter.

**STC-412J-STC Action items:**

None.

L. Tacconi as chair of STC thanked ESO for providing the fact sheets.

4. **Report of the Director General**

During her report, the DIRECTOR GENERAL specifically noted that the LGS performance without tip-tilt star gives very satisfactory results.

H. Kjeldsen asked whether the planetarium show for ALMA could be exported to other places. The DIRECTOR GENERAL replied that agreements with several other planetaria have been achieved.

J. Blommaert asked about the timeline for ARTEMIS. The DIRECTOR GENERAL pointed out that this was still under discussion, emphasizing that time for testing is still necessary.
5. ALMA


After H. Rykaczewski’s report, H. van Langevelde asked whether the actual correlator hardware was used for the first fringes. H. Rykaczewski replied that the prototype correlator had been used for that. He also elaborated on the assembly state of front-end cryostats and cartridges, and mentioned contract placement details.

R. Hills asked whether the delay of band 7 to September due to change requests would cause an overall delay. H. Rykaczewski replied that an effort is being made to maintain continuity. The DIRECTOR GENERAL added that the band 7 issue is of external responsibility, but that it needs to be followed thoroughly. R. Hills added that the band 7 issue is not critical, but rather a matter of trade-off.

H. Rykaczewski summarized the status of further small and major contracts, following an inquiry of R. Hills.

W. Benz asked for more information on possible Vertex prototype problems. H. Rykaczewski replied that the problems were due to astigmatism, and that the problems were investigated to avoid them in the mass production.

5b. ALMA Operations (P. Andreani)

After P. Andreani’s presentation, H. van Langevelde asked whether there would be direct ESO support for CASA users. P. Andreani replied that this should be mainly done by ARC nodes. ESO will be able to provide only e-mail support.

H. van Langevelde inquired about the Internet-connectivities between the ALMA site and Europe. P. Andreani replied that the connection was slower than to the US. T. Herbst inquired about the nature of the connection between ALMA OSF and Santiago. It was pointed out that this was a combination of fibre and microwave.

The DIRECTOR GENERAL stressed that a Chilean ARC is under discussion.

5c. Report from ESAC (L. Testi)

After L. Testi’s presentation, H. van Langevelde emphasized his opinion that building up a molecular spectral database is beyond the mission of ESO.

The DIRECTOR GENERAL summarized her concerns regarding the possible divergence of the three different front-end integration centers. R. Hills pointed out that the idea of having three different centers is questionable, but has to be lived with. Efforts shall be made for close collaboration among the different involved parties regarding the integration.

H. van Langevelde asked whether the integration functionality would at some time become available in Chile. R. Hills replied that the most logical thing will be to transfer this to the observatory after ~5 years. The DIRECTOR GENERAL confirmed this.
G. Olofsson stressed that the integration centers will also be required in the long run for 2nd generation receiver developments. R. Hills replied that the resources needed for integrating new receiver systems would not be as high as for the first integration. The DIRECTOR GENERAL remarked that in the future an integration center in Chile may be able to deal with this.

W. Benz inquired how the hiring of Local Staff is going on. H. Rykaczewski answered that contracting is done by AUI, with ESO being integrated in the candidate selection.

6. **E-ELT**
   6a. **Report from the Programme Office (R. Gilmozzi)**

After R. Gilmozzi’s presentation, T. Herbst inquired whether there were prospects for 5 arcminutes GLAO imaging. R. Gilmozzi replied that the 2 arcminute GLAO results from MAD are not fully understood yet, so no meaningful statement can be made yet regarding the 5 arcminutes GLAO. N. Hubin added that the Cn² profile would be investigated to study its effect on the AO performance.


After D. Enard’s report, A. Herrero asked whether the La Palma was not included in the monitoring plans because the site was sufficiently well characterized. D. Enard confirmed this.

T. Herbst stressed that the site selection is becoming a matter of urgency given that negotiations with a possible host country should start by the end of 2007.

H. Kjeldsen expressed a concern that the site characteristics measured on-site during a short time scale may not represent the long time characteristics. J. Spyromilio replied that - compared to site prospecting for the current suite of telescopes - now better characterizations without very long on-site measurements are possible.

L. Tacconi asked whether other WGs are still active. T. Herbst and D. Enard replied that the other WGs are currently 'on-call'.

6c. **Report from the Telescope Project Office (J. Spyromilio)**

After J. Spyromilio’s presentation, W. Benz expressed his concern that the ELT development should not compromise quality over speed. J. Spyromilio replied that there was no intention to compromise quality but that the requirement that the telescope be timely was also a consideration in the pace of work.


After S. D’Odorico’s presentation, A. Herrero suggested to make more public calls for studying possibilities of a MOS instrument right from the beginning of the E-ELT. S. D’Odorico detailed the technical issues associated with such a possibility. A. Moorwood added that exceptional sources
potentially found by Spitzer/JWST should have a low space density, and that this may lower the necessity to have MOS capabilities right at the beginning. A. Herrero replied that despite these uncertainties it would be worthwhile to study a simple MOS slit instrument which could operate from the start of operation of the telescope. S. D’Odorico pointed out that if there is a group interested in this type of instrument both scientifically and on the technical side, they could reply to the Call for Proposals on “new” instrument concepts which will be issued in 4Q. To launch such a study is not so urgent because it does not require the study of complicated AO systems.

L. Tacconi asked which instrument would likely be the first one on the E-ELT. S. D’Odorico replied that this will be decided at the end of the E-ELT Phase B. The first instruments could be a camera and a simple spectrograph taking advantage of the GLAO correction from the telescope AO mirror.

P. Roche expressed his concern about sufficient free resources for instrument development, given the involvement of several consortia in 2nd Generation VLT instruments. S. D’Odorico confirmed that this was a concern, but that for 4 proposed instruments corresponding teams are already set-up.

P. Roche stressed that the choice of a pre-determined group to develop an instrument may not necessarily reflect the science priorities for the E-ELT. A. Moorwood pointed out that the competition between TMT and E-ELT is also between instruments, and that the E-ELT may well be first in some science areas, despite the later anticipated first light.

T. Herbst stated that a large response to instrument calls does not equal the readiness for commitment to build the instruments. The DIRECTOR GENERAL pointed out that the matters of instrument procurement will and need to be discussed at a high level soon, e.g. with Committee of Council. She added that a constructive dialogue with the TMT consortia would also be desirable.

J. Spyromilio stressed that already at the beginning of operations; the TMT is planning to be able to do the same science as the E-ELT, e.g. MCAO.

A. Moorwood and S. D’Odorico pointed out that the STC is asked to make a recommendation on the instrument study plan as presented in STC-430. ESO will keep the STC informed on the future progress of the studies and will consult the STC again when decisions have to be taken, e.g. on the choice of the new instrument concepts to be studied.

6e. Report from the Operation Project Office (F. Comeron)

F. Comeron presented his report from the Operations Project Office.

7. La Silla-Paranal Observatory (STC-427)
7a. Future plans for La Silla (A. Kaufer) (STC-428/429)

After A. Kaufer’s presentation, P. Roche inquired which instrument had the highest science productivity. A. Kaufer and B. Leibundgut stated that this was HARPS. P. Roche pointed out that because of its importance, HARPS should be made available to the whole ESO community. A. Kaufer
and the DIRECTOR GENERAL replied that the impact might be lowered by distributing the time among too many different parties.

J. Afonso inquired whether a change of the presented La Silla operational model was envisaged if it was chosen as ELT site. A. Kaufer replied that La Silla even as it is today could not support the construction of an ELT.

J. Afonso expressed his opinion that the presented plan for La Silla does not appear to be in the spirit of what ESO provides now. He stressed that the member countries pay to ESO with the aim that their communities get broad access to the telescopes. The DIRECTOR GENERAL noted that changing the La Silla model would also allow new opportunities for large consortia.

W. Benz expressed his concern that shifting to large groups would buy out smaller communities from La Silla, giving as example the Swiss community. J. Melnick pointed out that after contacting M. Mayor he was assured that there would be enough groups to support a 3.6m telescope fully dedicated to HARPS. A. Kaufer added that already now, there are groups paying for the usage of La Silla telescope (like the 2.2-m telescope), and that they pay more than what is envisaged for HARPS.

W. Benz added that the number of nights per object would increase as the planet masses go down. The DIRECTOR GENERAL replied that the current pressure factor on the 3.6m telescope was rather low.

G. Olofsson expressed his opinion that the current way of running La Silla is better than the minimal way proposed now.

D. Minniti inquired how the Chilean proposals would get handled under the new envisaged model. The DIRECTOR GENERAL replied that this has not been discussed in detail, but that the 10% Chilean share will be maintained.

A. Herrero inquired whether any retired instrument from La Silla might come back. A. Kaufer replied that SOFI and FEROS might stay as visitor instrument.

R. Gratton expressed his concerns about unequal treatment between national and ESO telescopes in terms of financing.

J. Blommaert pointed out that it would be helpful to have some more information on the science produced by single instruments. J. Melnick replied that the data was available and that he would distribute it to the STC members as soon as possible. A. Kaufer added that one has to balance the demand vs. maintenance cost.

T. Herbst noted that WFI was important since it represents a bridge towards the VST. He also inquired about the cost associated with a complete shutdown of La Silla. The DIRECTOR GENERAL replied that there was no agreement to return the mountain in its original state, but that in any case the aim was to maintain La Silla. She added that the operational model of La Silla would most likely move towards a mixed financial model, in which ESO still takes part of the costs.
J.-G. Cuby inquired about the specific choice of the year 2012 for the full start of the new operational model. A. Kaufer and the DIRECTOR GENERAL replied that this time-scale fits to the beginning of the ELT construction and to the age structure of the La Silla staff.

L. Haikala expressed his opinion of preferring La Silla operations in the way they are done now. He inquired how much science will be lost if the operational model is changed. A. Kaufer replied that a HARPS-like instrument cannot be done on Paranal, while other instrument capabilities can be matched at the VLT. He did not believe that there would be a substantial loss of scientific area coverage when changing the La Silla operational model. L. Haikala added that the over-subscription would tend to increase, given the closing down of small telescopes and the increase of the community.

R. Hills remarked that one needs to demonstrate that one is moving to new things and that sacrifices are being made in favour of the E-ELT. He expressed his concern that it may be difficult to keep good staff at the observatory. A. Kaufer replied that the staff is involved in discussions already, and that it indeed will not be an easy task.

H. Kjeldsen advocated a detailed evaluation of the scientific consequences for changing the La Silla operational model, also in the context of the ASTRONET roadmap to the use of 2-4m telescopes in the future.

B. Leibundgut pointed out that the community prefers large blocks of time at the La Silla telescopes, which can also lead to a gain in scientific impact.

J. Melnick and the DIRECTOR GENERAL emphasized that STC for now is only asked to vote on the science operations and instrumentation plan proposed for the next few semesters until 2009.

L. Tacconi added that it is important to show that efforts for saving money are being made.

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8. **VLTI**

8a. **Second generation instruments Phase-A studies: mid-term review (A. Richichi)**

After A. Richichi’s presentation, A. Moorwood remarked that there would be presentations for all 2nd Generation VLTI instruments at the VLT workshop in October 2007. He also pointed out that it is important to get STC members for the Phase A review meetings.

A. Richichi stated that currently, mixing UTs and ATs is not possible, following an inquiry from J. Afonso. He also stressed that this may cause a problem for VSI.

W. Benz inquired how many FTEs are missing for VLTI. A. Moorwood and R. Gilmozzi replied that the issue is not only FTE but also skills. They detailed some of the internal personnel movements between different departments, and explained how the staff situation and instrument evolution is considered in the MRIP.
8b. **Report by the chair of the VLTI sub-panel (P. Roche)**

After P. Roche’s presentation, R. Hills asked whether the Keck Interferometer team really solved the vibration problems to a much better level than presently at the VLTI. F. Delplancke explained that Keck solved the problems with dedicated accelerometers and laser metrology to measure the vibrations of all mirrors in the optical train. She pointed out that the record for fringe tracking at Keck was 10th magnitude, compared to 6th magnitude for the VLT with the ATs and ~7th magnitude with the UTs.

R. Hills noted that a decision should be taken as to whether imaging or precision measurements are the VLTI priorities, stressing that precision measurements may be the way to go.

T. Herbst added that for Keck, 7 FTEs over 3 years were necessary to reduce the vibrations. F. Delplancke explained how PRIMET would help to reduce vibrations.

F. Delplancke noted that the Keck Interferometer is considered a 'black belt' instrument, requiring heavy on-site support by specialised staff. In contrast, the VLTI operations rather have a more user-friendly approach.

H. van Langevelde inquired whether the conservative VLTI magnitude limits also apply to GTO time. A. Richichi replied that these conservative limits are for service mode, where a guaranteed outcome shall be provided. For visitor mode the limits can be 1-2 magnitudes deeper. He added that the VLTI is the most successful Interferometer in terms of publications. The DIRECTOR GENERAL and A. Richichi stressed that the VLTI is generally considered as a leading Interferometer by the American side.

The DIRECTOR GENERAL inquired whether the instrument teams might provide manpower to help resolving faster the problems of VLTI. J. Melnick replied that such an offer has been made by the instrument team.

A. Kaufer summarized the observatory efforts going on regarding VLTI. He stressed that the VLTI had top priority at the moment, and that a large number of skilled engineers is already available. He also pointed out that the recommendations issued by the ITF were followed through and achieved. He furthermore stressed that the community interest in the VLTI has risen a lot after AMBER was made available at the ATs.

J. Spyromilio commented on the historical development of VLTI. He pointed out that the major problems of VLTI had been understood and that the implementation of that knowledge was ongoing. He warned about wanting to rush forward too fast. He concurred with A. Kaufer that there were many skilled engineers available on the mountain, noting that additional help from the consortia would also be welcome. He emphasized that a choice had to be made between a 'black-belt' VLTI with fainter limiting magnitudes, and a VLTI that lives with the other instruments on the mountain. T. Herbst noted that the Keck observatory was not shut down during the vibration suppression campaign.

P. Roche pointed out that the development of 2nd generation instruments is questionable given the current state of VLTI. He added that also PRIMA is questionable.
A. Moorwood stated that for the Phase A studies, ESO will require detailed answers from the consortia on the requirements for VLTI. The DIRECTOR GENERAL recalled the Council resolution of 2004, where the VLTI was not given the highest priority.

9. Survey telescopes

9a. VST Status Report (J. Spyromilio)

After J. Spyromilio’s presentation, Y. Mellier summarized his view of the problem. The most optimistic date for first light is mid 2008. The project on INAF side has mostly very young engineers, but no one with a clear overview of the project. VST cannot succeed without huge help.

L. Tacconi inquired whether there was a backup-plan.

The DIRECTOR GENERAL stressed that INAF first needs help from the inside. She expressed her confidence that the Italians can overcome the problems. ESO can help, but it needs to be exactly defined in what. A current complication is the recent resignation of the INAF president. She stated that taking over the telescope would require long negotiations. She noted that plans within ESO had been made regarding participation in the installation of the telescope in Paranal, but that those could not apply until the more severe fundamental problems with VST were solved.

J. -G. Cuby noted that the VST situation is significantly worse than six months ago. He asked whether the community should be informed that VST might never happen. Y. Mellier noted that dropping VST would force ESO to think about other wide-field imaging facilities. He added that if VST were dropped, there would be no wide-field optical survey capability at ESO until at least 2011. He noted that VST coming in beginning 2009 would still be a competitive telescope, and that in this case 100% of the time should go to public surveys to recover at least partially some of the lost time.

The DIRECTOR GENERAL stated that a starting date for VST within 2008 is very optimistic. She reiterated that negotiations for taking over VST would probably be very long, and that taking over VST would come at the expense of other projects. She emphasized that if the VST gets too late (end of 2009), it may get cancelled.

L. Tacconi inquired whether there will be a CfP in 2008 for VST, and whether the STC is required to give recommendations. The DIRECTOR GENERAL and J. Spyromilio answered that these matters have to await consultation with the highest levels of INAF.

G. Olofsson asked whether it was feasible to have VST ready within a year. J. Spyromilio stated that it needs more engineering work to have a clearer time-scale.

W. Benz inquired whether an ESO take-over was an option for INAF. The DIRECTOR GENERAL replied that up to now this was not an option. She added that VST had high priorities for the previous INAF president, replying to an inquiry of H. Kjeldsen.
9b. **VISTA Status Report (M. Cullum)**

After M. Cullum’s report, G. Olofsson inquired whether the internal optics of the camera had been tested. M. Cullum confirmed this, stating that they had been accepted by the VISTA consortium 6-9 months ago.

9c. **LSST (Y. Mellier) (STC-431)**

After his presentation, Y. Mellier pointed out why a large area coverage of 20000 square degrees was needed, following an inquiry of T. Herbst.

B. Leibundgut noted that the LSST situation is somewhat unclear, referring to 2 issues: first, the preferred mode of European participation in LSST; second, the funding situation.

Y. Mellier inquired on the technical feasibility for a wide-field imager on the VLT. J. Spyromilio answered that the VLT telescope design would not allow a wide-field capability comparable to Subaru. A. Moorwood added that the low dome clearance at the VLT limits the wide-field capability.

L. Tacconi noted that a proper review on the possibilities of ESO’s participation in LSST would be required before making decisions.

The DIRECTOR GENERAL noted that the Visiting Committee showed itself doubtful whether ESO would be able to afford simultaneously VLT, ALMA and ELT operations. A possible LSST participation has to be seen in this context. She added that using existing VLT resources in exchange for LSST/SuprimeCam participation might be reasonable.

Y. Mellier summarized that in the past, several approaches for increasing ESO wide-field capabilities had gotten negative feedback. He asked whether one should give up this aim or rather continue to lobby this possibility. The DIRECTOR GENERAL replied that a participation in SuprimeCam might be possible, and perhaps also wide-field imaging studies with the NTT and VLT.

G. Olofsson inquired whether the magnitude limit of LSST implied confusion limitation, which Y. Mellier denied.

T. Herbst noted that the full depth of LSST would be reached after 5 years, opening up a possibility for synergy with the ELT.

Wrapping up the discussion, the DIRECTOR GENERAL said that it would be useful if STC formally asked ESO to study wide-field imaging capabilities on both NTT and VLT.

10. **Scientific Highlights from ESO telescopes (J. Melnick)**

J. Melnick presented science highlights from the last semester.