Draft Minutes of the 80th meeting of the Scientific Technical Committee held at ESO, Garching, on 23 and 24 April, 2013.

The STC convened in the following composition:

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<td>J. Hron</td>
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<td>Members at Large:</td>
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23 APRIL 2013

1. **Opening of the Meeting and Adoption of the Agenda (STC-512)**
   The chair A. Marconi (Chair) welcomed the participants to the 80th STC meeting and asked all members to introduce themselves.

   No comments or additions were suggested for the agenda. The agenda (STC-512) was approved.

2. **Approval of the Minutes of the 79th STC Meeting (STC-511)**
   The Minutes of the 79th STC Meeting were approved without remarks.

3. **Report of the Director General**
   A. Marconi thanked the DIRECTOR GENERAL for the report.

   M. Steinmetz noted that the number of submitted observing proposals decreased from over 1000 proposals to less than 900 for the last call. The DIRECTOR GENERAL responded that that number did not include the ~500 proposals submitted through the call for proposals for ALMA and that the total number of ESO proposals had stabilized at around 900, still implying an oversubscription of a factor of about 4. B. Leibundgut commented that a large fraction of the community was involved in public surveys which could also explain the observed trend in the number of submitted proposals.

   A. Marconi asked whether there were some time constraints by the Brazilian Parliament to approve the ratification to join ESO by the end of the year. The DIRECTOR GENERAL responded that in the course of the last two months a lot of progress had been made in the ratification process. He added that the Brazilian government was aware of the importance of joining ESO, also with the understanding that Brazil would get a return not only in science but also industry. A. Marconi asked whether the ratification was expected to be approved by itself in the parliament or whether it depended on another bigger initiative. The DIRECTOR GENERAL answered that it was expected to be approved in the parliament by itself.

   A. Marconi asked whether there had been a change in the plan for E-ELT instrumentation since MIR, MOS and HIRES would start Phase B soon. The DIRECTOR GENERAL replied that from his point of view the METIS consortium should go ahead. He added that for the other two instruments, although there had been some re-structuring in the consortia, they had been raising significant funding in their Member States and ESO should not unnecessarily hold them back.

   A. Marconi enquired why instrument number 6 was included neither in the DIRECTOR GENERAL’s report nor in the long-term plan documentation. The DIRECTOR GENERAL responded that since the ESO 2013 budget had not been indexed for inflation by the Member States it had a reduced allocation of nearly 30 million Euros over the E-ELT construction period and therefore one of the instruments had to be shifted from the construction budget to the operations budget.

   H. Van Winckel asked why the plan for the Top Level Requirements (TLRs) for instruments 3, 4 and 5 had changed since it seemed that these requirements would only be formulated in one year from the time of the STC meeting by the Project Science Team (PST). M. Casali
replied that ESO would go ahead with the instruments as the TLRs were being developed without imposing any artificial time-scales. A. Marconi thought that was good so once the consortia were ready to start, they could do so without delays. The DIRECTOR GENERAL, however, remarked that in some cases two consortia might be ready to start with the procurement of the instrument at the same time but only one of the consortia would finally be selected. M. Casali insisted in that the current model foresaw avoiding any artificial delays.

4. **Long Term Perspectives**

4a. **Update on ESO's financial situation (P. Geeraert)**

A. Marconi thanked P. Geeraert for the report.

D. Queloz asked for clarification of the sentence stating that new Member States would help in the event that Brazil did not join ESO on a reasonable time-frame. P. Geeraert explained that new Member States would help even with Brazil joining to prevent ESO going cash negative by 175 million Euros in the period from 2019 to 2020. He added that it would not be possible to replace Brazil unless another big country decided to join ESO and emphasized that in order to start the E-ELT construction phase before the arrival of Brazil's contribution would require new Member States.

A.-M. Lagrange asked why the impact of the cost of loans was not negative. P. Geeraert responded that with the current interest rate the cost of loans was very low (the interest rate of the previous year was only 0.6%). He added that there was a high risk for the interest rates to rise during the construction period (2019/2020). Therefore, ESO would propose a plan to the Finance Committee to cover that potential increase.

A. Finoguenov enquired about the possible concerns of the Member States to take the loan. P. Geeraert answered that for some of them it was a problem to take up long-term loans but not all had the same definition of “long-term”. Therefore, ESO was trying to limit the length of such a loan to 5 years or less. He added that most of the Member States fell under the Maastricht rules and that they were required to keep their national debt below a certain threshold.

J. Hron asked about the situation of the indexation of the contributions. A. Marconi followed up on that question enquiring what assurance ESO had that the Member States continued to pay their contribution in time. P. Geeraert replied that there was no assurance. A. Marconi enquired whether there was any particular recommendation which the STC could include in their report to help coping with the situation. The DIRECTOR GENERAL explained that the funding of the E-ELT as approved by Council was based on extra contributions by the Member States, savings within the regular ESO budget and a major contribution by a new Member State. The funding scheme assumed a regular indexation for inflation of the ESO budget. Any statement from the STC providing their opinion about the difficult situation that the whole ESO programme would undergo if indexation were not followed by the Member States would be helpful. He added that the Member States had not agreed to officially index every year but to make a decision every year, which affected the 2013 budget, which was not indexed. P. Geeraert explained that the only commitment from the Member States was that there would be a year-by-year 2% increase on top of indexation. He added that the situation was even worse as the Member States had decided to index salaries while imposing no indexation on the ESO budget, implying an overall loss in purchasing power for ESO. A. Marconi asked whether the Council was the organism that would complain about that situation to the governments of the Member States. The DIRECTOR GENERAL answered affirmatively and added that the STC statement about indexation should be done
as soon as possible. He detailed that that situation had already been pointed out in the Committee of Council and would be followed-up in the next meetings.

4b. **ESO Long Term Perspectives (Director General) (Cou-1486 conf.)**

The DIRECTOR GENERAL explained that the document set out a programme that fitted the 15 Member States funding which allowed ESO to go forward with the construction of the E-ELT. The document showed that the programme was doable in spite of some risks at the middle of the E-ELT construction period. He outlined that actions had been taken to alleviate the potential risks and asked for any recommendations to be included in the document.

A.-M. Lagrange asked for clarification about two issues. The first issue was related to the plan for La Silla Observatory up to 2020 and how ESO planned to continue attracting competitive science projects carried out by that observatory. Secondly, she asked for information about the community workshop to be held in the 2nd half of 2013. With regard to the first issue A. Kaufer replied that the La Silla Observatory would develop to open up to external science projects hoping for a strong engagement from the community. He explained that if the community response were not as strong as expected, ESO would have to evaluate La Silla's programme in 2020. A.-M. Lagrange asked about ESO’s strategy regarding the external projects. A. Kaufer answered that the strategy was first to attract these projects and, if the project involved the construction of a new instrument which was of interest for the wider ESO community, ESO could get engaged in the instrument project to make it available to the whole community. He added that the emphasis at that moment was put to ensure the long-term operations of the large telescopes as without them the small telescopes would suffer. The DIRECTOR GENERAL referred to the second issue as to the community workshop about the Paranal White Paper responding that the timing of the workshop was still open. He preferred to have the workshop once the E-ELT construction had begun.

A. Marconi stated that the reduction of the construction budget for the instrumentation of the E-ELT was not a good message adding that only 8% of the total budget was devoted to instrumentation. He was concerned that a large fraction of the initial observing time at the E-ELT would be given as guaranteed time observations, if instrumentation were financed to a large part through consortia. A. Russell clarified that the costs for instrument number 4 would not be shared by consortia and therefore would not affect the guaranteed time but that its costs had been allocated to the operations budget. A. Marconi countered that taking money away from the operations budget for building instrument number 4 would have an effect on e.g. instrument number 6. He stressed that it was particularly important to leave doors open for new Member States to participate in the construction of instrument number 6. A. Marconi detailed that instruments were the way in which the community could get involved with ESO, could contribute to ESO and shifting one instrument from the construction budget to the operations budget was not a favourable message to the community. The DIRECTOR GENERAL asked the STC members to talk to the delegates of their Member States in order to try to convince them to help relieve the financial situation of ESO.

E. Sadler asked for clarification of an item in the budget about “Technical Support R&D” since it seemed to be monotonically decreasing. A. Russell responded that the decrease was related to the completion of a number of development programmes related to framework funding. He added that the main technical support was associated with the needs of the operations of the telescopes, i.e. predominantly staff effort. A. Russell emphasized that that item also considered planning for future instrumentation to avoid obsolescence and that it always required a minimum budget level. E. Sadler agreed and remarked that, based on her experience, the R&D support helped to keep good technical staff and to drive exciting new instrumentation projects.
A. Finoguenov asked about the possible involvement by the EUCLID project for some ground-based support and how much money would be of interest to ESO. The DIRECTOR GENERAL responded that he was not sure whether ESA had explicitly requested support from EUCLID in the documentation. L. Pasquini clarified that in the 4MOST Phase A review recommendation it was requested to evaluate whether ESO could get support from space missions for which ESO provided ground-based support. The DIRECTOR GENERAL explained that there had been discussions in the past about joint activities between ESO and ESA but that the way it had actually worked was that ESO consulted the scientific community to obtain recommendations and find synergies. In a second step, specific projects were prepared to find external support and involvement from the community so that there was no funding exchange between ESO and ESA. A. Finoguenov detailed that there were rules for channelling national money from EUCLID so that it would be worth investigating these options. The DIRECTOR GENERAL responded that EUCLID were important for the future of astronomy, although he considered that direct exchange of funds between ESA and ESO was not the route to take at that moment unless there was an overwhelming argument and full support from the community.

5. **Directorate of Programmes**

5a. **Directorate of Programmes Introduction (A. Russell)**

A. Marconi thanked A. Russell for the report.

J. D. Monnier asked whether ESO was requesting support from the STC members for the PRIMA review. A. Russell replied that ESO had not formally set up the panel yet but that there would be external people in the review panel and that ESO would ask a member of the STC to be part of it. L. Pasquini added that thanks to J.-P. Berger and J. Woillez there were tighter links with the community through the GRAVITY and MATISSE teams. He would therefore expect participation from some of the members from those teams. A. Marconi concluded by saying that he absolutely appreciated the revision of the VLTI mid-term implementation plan as the decisions were clearly stated. It was a clear demonstration of the re-organization.

5b. **Instrumentation Programme (M. Casali)**

A. Marconi thanked M. Casali for the report.

H. Van Winckel asked about VISIR and whether it was not possible to install an internal chopper as a solution to solve the efficiency problem of the instrument. M. Casali replied that there was little internal space and that they would look at the possibility of installing an external chopper instead. A. Marconi asked for clarification whether those problems were for the specific detector in particular or for that kind of detectors. M. Casali answered that it was an intrinsic problem of the detector type and added that all previous detectors which had been investigated all presented the same noise problem.

A.-M. Lagrange asked two questions. The first one was related to the AO (Adaptive Optics) for the E-ELT and the risks associated to the very complex MCAO (Multi-Conjugate Adaptive Optics) and the LTAO (Laser Tomography Adaptive Optics) projects. She enquired whether it would be better to have simpler SCAO (Single Conjugate Adaptive Optics) systems, at least for first light, than the complex ones that had not been demonstrated to work on sky yet. Her second question was about the plans for the large-size deformable mirrors suppliers which did not seem to be very reliable at that moment. M. Casali responded that regarding the single conjugate AO, ESO’s plan at that moment was that all first three instruments would have the SCAO systems as the scientific performance for the case of very bright stars.
on axis was expected to be much better. He added that regarding the other AO systems he did not find anything particularly risky besides the normal start of instrument development projects, although the organization of the MCAO consortium or the realization of the LTAO should be taken care of. M. Casali noted that he found the deformable mirror development to be the main risk. A.-M. Lagrange enquired whether the different options described in the document were compatible with the time-frame of the instruments. M. Casali responded that there was no major problem for the instruments but that they would have to wait for the AO modules. He added that he was more concerned about the deformable mirror development problem and that several possibilities were being explored in parallel at that moment, investigating existing technologies for the deformable mirror within the MCAO system. He concluded by saying that the next step would be cleared later on in the year. A. Marconi asked whether all three instruments would have a single conjugated AO module. M. Casali replied affirmatively and explained that whether every instrument would have its own or whether there would be a joint module for the three instruments (as e.g. the MCAO system) was still being discussed. A. Marconi thought that was a significant change from the original plan. M. Casali explained that there were two reasons for that: one was the science capabilities of the single conjugate AO and the second one was risk mitigation.

J. D. Monnier followed up on the question by A. Marconi regarding the VISIR detectors and asked whether other AQUARIUS devices that ESO had in hand or from other observatories could be tested to find if all detectors had the same magnitude or time effects that affected the sensitivity of the detectors. M. Casali replied that they had tested 5 out of 6 detectors and that all of them showed the same problem. He added that they would meet with the supplier in the following week to see whether they would provide help.

E. Sadler expressed her concern about the Laser Tomography AO (LTAO) system since the expertise had to be built up and the funding situation was already tight. She enquired whether that instrumentation was needed for the first light of the E-ELT or whether it would be too risky. M. Casali replied that ESO had to evaluate the self-imposed constraints from the Top Level Requirements (TLRs) and see whether they could compromise these constraints (e.g. on emissivity) and find a solution. E. Sadler enquired whether there was an alternative plan. M. Casali answered that there were several alternative solutions: i) to re-arrange the design to see whether a working LTAO system could be fit; ii) to create a more flexible new design at the expense of compromising the emissivity; and iii) to share a MCAO module between two first-light instruments.

5c. Discussion of Directorate of Programmes Fact Sheets (STC-513B-DOP)
No questions or comments were raised.

5d. VLT Instrumentation Roadmap (L. Pasquini) (STC-514)
A. Marconi thanked L. Pasquini for the report.

G. Wright enquired about how realistic the plan for the VLT instrumentation was. L. Pasquini explained that SPHERE and MUSE should go to the telescopes in 2013. He was only concerned about possible major delays as to PRIMA which took away a lot of time/effort and funding and which would impact other instrumentation.

A. Finoguenov asked why the 4-m class telescopes had been included in the future instrumentation if 4MOST had not been approved yet. L. Pasquini clarified that he had meant the 4-m class telescopes for La Silla. A. Finoguenov enquired whether the reason for selecting 4MOST was that it could fit the telescope. L. Pasquini explained that the
consortium had demonstrated that VISTA was more effective for 4MOST than the NTT. With regard to the La Silla 4m telescopes he pointed out two aspects: i) HARPS or the 3.6 m telescope would be more in use and successful in the following 10 years; and ii) ESO did not want to specify that the NTT was dedicated to one particular scientific programme.

H. Van Winckel enquired whether the NTT could still be operated with the help from the community. L. Pasquini explained that in principle there was no a priori restriction but that it would depend on the project proposal and on the interest from the ESO community.

5e. **Paranal White Paper (R. Gilmozzi) (STC-515)**

A. Marconi thanked R. Gilmozzi for the report.

E. Sadler asked whether ESO had thought about the possibility that the two current big surveys (VISTA and VST) might lead to spectroscopic follow-up studies. R. Gilmozzi answered that part of the wide multi-object spectrograph projects reported by L. Pasquini were tightly linked to the VISTA survey. E. Sadler pointed out that a natural result of the surveys would also be the discovery of very rare objects which the team might want to study in detail. R. Gilmozzi agreed.

A. Finoguenov enquired about the risk management and the quicker delivery of instruments to Paranal in the future. He also asked about the phases within the R&D plan that ESO wanted to speed up. R. Gilmozzi responded that the longest period in the life time of an instrument was the time between “thinking it up” and the time when the instrument was finally approved due to the high level of bureaucracy, committee meetings, reviews, etc. By accepting risks as in the case of fast instrumentation (in a similar approach to the one of visitor instruments), one could compress that process to 1-2 years. M. Casali added that there were several approaches that could be followed in order to speed up the process and that did not involve increasing the risk such as resourcing or borrowing ideas from industry.

5f. **VLTI Implementation Plan Update (J.-P. Berger) (STC-516)**

A. Marconi thanked J.-P. Berger for the report.

H. Van Winckel enquired how the discussion about PRIMA at the end of the year would affect MATISSE. J.-P. Berger explained that PRIMA had faced all the difficulties of the facility such as how to control polarization and that all the lessons learned from PRIMA would be applied to MATISSE and GRAVITY.

D. Queloz first asked about ESO’s plan in the event that the vibration problem at the UTs could not be solved and thus the UTs could not be used for interferometry. He had a second question about why the matrix structure did not work for the VLTI and why it was expected to work for the E-ELT. J.-P. Berger replied to the first question regarding vibration on the UTs explaining that ESO’s strategy at that moment was the identification of the vibration sources and their mitigation. He added that ESO was seriously considering having an active vibration control system which had successfully worked at Keck. A. Russell took over the second question about the matrix detailing the background of the recent VLTI re-organization into different projects. He emphasized that the goals of the re-organization were to retain the skills of the original VLTI core team (e.g. developing new lasers in the future, ability to do active optics, ultra-high contrast and ultra-high resolution imaging) and to make sure that new instrumentation would be delivered on time to both VLTI and E-ELT. A. Marconi remarked that ESO should ensure there were transfer checks for these projects in both the “columns and rows” of the matrix as the VLTI was itself a single project. A. Russell replied
that there were five work packages co-ordinating all together within the same big project of
the VLTI which was the reason for hiring J.-P. Berger and J. Woillez.

A. Marconi asked for clarification about the sentence “maintaining the VLTI as a trans-
directorate project”. A. Russell replied that several issues at the VLTI could not be solved by
one single project team and that intimate working relationships with the people at Paranal
and with the data management side and the interaction with the community on the data
products were required.

A.-M. Lagrange asked about the need to revise the VLTI operations model. What was
expected from the community and how was ESO planning to proceed? J.-P. Berger
explained that ESO would first ask the consortia what the requirements/ demands were for
the operations model and would then inject their knowledge, likely moving towards a less
flexible operations model similar to that of other interferometric facilities. A proposal would
be presented to the consortia/ community. A.-M. Lagrange enquired whether there was a
risk to “freeze” the configuration of the telescope operations model depending on the
science cases proposed by the community, preventing other science from being done at the
VLTI. J.-P. Berger agreed that that risk indeed existed and that ESO would have a clearer
answer about the operations model once the requirements/ demands from the community
had been evaluated.

J. D. Monnier asked whether the goal to improve the data products to make them more
accessible to the community was planned for the second generation instrumentation only or
whether there would be a major effort at all levels in ESO. J.-P. Berger responded that the
continuous support of the pipelines after PAC was not included in the contracts but that an
operation model that included the delivery of high-quality calibrated data products should be
contemplated. R. L. Akeson asked for clarification on whether GRAVITY would provide the
pipeline. J.-P. Berger replied that their pipeline would go all the way to the end products and
was supposed to be provided to ESO.

J. Hron enquired for how long MIDI would be kept. J.-P. Berger clarified that although MIDI
had been a successful instrument, it would have to be removed from the telescope to make
space for MATISSE. A. Marconi remarked that MIDI + the fringe sensor unit were more
sensitive than MATISSE. J.-P. Berger agreed replying that the sensitivity of both instruments
was similar. He added that the main limitation for the sensitivity was the background (i.e.
MATISSE combines the measurements from more telescopes). A. Marconi enquired
whether MIDI was as sensitive as it could be. J.-P. Berger agreed that MIDI had probably
reached the sensitivity limit. J. D. Monnier mentioned that the impact the problems with the
VISIR detectors might have on the sensitivity had not been explored. J.-P. Berger took note
of that point.

A. Marconi enquired about the status of the MAMMUT project for active vibration control
developed by Jena. J.-P. Berger explained that MAMMUT was not meant to be used in
operations but that it would be used as active vibration control.

A. Marconi asked whether PIONIER could only work with the ATs. J.-P. Berger clarified that
PIONIER worked with the UTs and that PIONIER was less sensitive to the vibrations.

5h. Report on the Phase A Reviews of 4MOST and MOONS (L. Pasquini) (STC-517)
A. Marconi thanked L. Pasquini for the report.

J. D. Monnier asked whether there had been a detailed look at the cost estimate from
MOONS. L. Pasquini explained that there had been a lot of discussion about the costs for
both instruments as these costs had been underestimated (e.g. the detector cost for MOONS and 4MOST and the optics cost for 4MOST). He added that after these changes no major deviations were expected.

E. Sadler made two comments. She mentioned that there was very good experience with the operational mode proposed for 4MOST (with the 30% of fibers going to the community) in Australia. The second comment was related to the fact that a multi-object near-IR spectrograph on a 4 m telescope might not be sensitive enough. L. Pasquini commented that ESO would have to see how the 30% of community fibres would be allocated and how that fitted into the ESO operations model. He added that the community would have to adapt the target to exposure times and fields selected by the survey. L. Pasquini confirmed that an IR spectrograph concept on VISTA had been considered earlier in the process but was deemed not competitive enough compared to MOONS on the VLT.

S. Vennes asked whether blue-visual capabilities for MOONS were excluded by the design. L. Pasquini responded affirmatively. S. Vennes enquired what ESO gained by delaying 4MOST for one year. L. Pasquini replied that there were some concerns about the high cost of the project (up to 18 million Euros) and that the ESO resources would not allow an earlier start. He detailed that one year would give the team time to set up and consolidate the consortium and to find the additional funding. L. Pasquini added that if the team did not find the funding, ESO could not do it.

D. Queloz commented that 4MOST was a very expensive project for the community and ESO and that the management part of the project was weak. Furthermore, he asked whether, if the STC recommended it, how far ESO would control the costs. Following the same line of thought A. Marconi remarked that 4MOST was the most expensive instrument proposed up to then. L. Pasquini explained that that project was larger than other instruments but that the ESO investment at that moment was not large. He added that the main problem was to decide who managed the risk. L. Pasquini pointed out that the outcome of the project would be a 5-year public survey with an instrument which was 70% financed with non-ESO funds. A. Marconi enquired why the STC could not wait until the following year to provide a positive recommendation when the consortium had solved all issues and had raised more funds. L. Pasquini responded that with a positive recommendation for 4MOST the consortium would be given the chance to sort out the pending points of the project on solid ground. A. Marconi countered that he did not want to bind ESO prematurely.

With regard to both instruments MOONS and 4MOST, A. Moitinho asked whether there was any concern about the timely procurement of all the actuators for the fibre positioners by the companies. L. Pasquini answered that the teams had already contacted the companies and that both had a quotation.

Trying to answer A. Marconi’s concerns M. Casali remarked that a positive recommendation by the STC allowed ESO to start the negotiation of the contract. A. Marconi asked whether the STC could give a conditional recommendation subject to successful contractual negotiations which M. Casali answered affirmatively.

D. Queloz asked for clarification on whether there were sufficient guarantees that 4MOST was a feasible project given the risk that the project might become more expensive than proposed. L. Pasquini countered that all ESO instrument projects had been within the approved budget and added that ESO did not ask to start both projects simultaneously.

E. Sadler stressed that the STC had pushed very hard for the Call for Proposals for these instruments. J. D. Monnier asked whether the Call for Proposals was made specifically for VISTA and whether the positive recommendation for 4MOST would exclude other concepts.
A. Russell replied that during that process ESO did not ask the community whether they preferred to use VISTA for continuing IR surveys or to put something new on the telescope. M. Casali commented that ESO had followed the STC recommendation about looking for a multi-object IR spectrograph. D. Queloz countered that the STC had made recommendations for one instrument but ESO was at that moment asking to recommend two instruments, one out of which was gigantic and very expensive, at the same time that ESO faced the construction of the E-ELT and its instrumentation. A. Russell responded that everything was planned to fit within the budget and that ESO would start one instrument every year. A. Marconi followed A. Russell’s comment and asked whether, if the STC did not approve 4MOST, ESO would not have a project to be started in 2014. L. Pasquini responded affirmatively stating that, if the STC did not provide a positive recommendation, there were still two years to think of something else although not at the same level as 4MOST. A. Marconi pointed out that in that case ESO would lose one year in its development programme which L. Pasquini confirmed.

H. Van Winckel asked about the exchangeability of the instrument and whether it was still a requirement which L. Pasquini confirmed.

5i. **HARPS Maintenance & Fiber-Link Upgrade (L. Pasquini) (STC-518)**
A. Marconi thanked L. Pasquini for the report.

H. Van Winckel enquired whether the fibre was without the optical scrambler. L. Pasquini answered that ESO would keep the optical scrambler. He pointed out that ESO had asked Geneva for no intervention of the vessel, i.e. it would stay closed.

5j. **CRIRES Upgrade Proposal (L. Pasquini) (STC-519)**
A. Marconi thanked L. Pasquini for the report.

H. Van Winckel noted the marginal increase in sensitivity. L. Pasquini countered that the increase in sensitivity was good since the cross-disperser was highly efficient.

A. Marconi enquired whether NACO would replace CRIRES during its upgrade or whether NACO would be decommissioned. A. Kaufer commented that he would cover that question in his presentation.

5k. **Report from the La Silla Paranal Subpanel (A.-M. Lagrange)**
A. Marconi thanked A.-M. Lagrange for the report.

L. Pasquini commented that ESO aimed at providing the PRIMA technical results before the next STC meeting. He added that a feasibility study of VISIR’s external chopper would require starting a small project impacting other projects. A.-M. Lagrange explained that the STC was asking ESO to consider that solution by evaluating several items for their feasibility, duration, etc. A. Marconi suggested that ESO could try simpler solutions first and if they did not work, ESO might consider the option of the external chopper. A.-M. Lagrange pointed out that the STC was recommending a feasibility study.

A. Marconi enquired whether the public survey mode in which 4MOST would operate was for all observations, not only for 30% of the fibres which L. Pasquini confirmed. He explained that all data were revised yearly with the scientific data products. A. Marconi asked for clarification on whether it would be like giving the 4MOST consortium GTO for 70% of the
fibres but that it would have to provide all data products. L. Pasquini confirmed that statement and indicated that the consortium would have to provide the data products yearly. A.-M. Lagrange enquired whether the 4MOST survey was GTO. L. Pasquini replied that it was not as the three surveys would have to be approved by ESO. A.-M. Lagrange asked whether there was any proprietary time. L. Pasquini answered that he was only aware of the yearly release of the data. A.-M. Lagrange enquired whether the people from the consortium could publish the data before the data release which L. Pasquini confirmed. He added that the ESO community would receive the three full surveys completed with all scientific data products. A. Marconi asked whether it would be fair to say that it would be like the Sloan Digital Sky Survey (SDSS), and M. Steinmetz pointed out that the difference between 4MOST and SDSS was that in 4MOST the raw data would be public immediately. He added that the reduced data would be available only after one year. M. Steinmetz further explained that the primary scheduling time of the surveys would drop below 70% due to the many constraints needed to carry out the observations. A. Marconi remarked that that was a rather unconventional GTO with a high return to the community and wondered whether ESO had considered that possibility for other future instruments. L. Pasquini replied that it was the survey nature of the instrument what made it very suitable for that kind of GTO. It would probably be less convenient for other more conventional instruments. The DIRECTOR GENERAL stressed that 4MOST was still a proposal and that up to then there was no recommendation. J. Melnick noted that the team would get to pick the targets. A. Marconi asked whether there would be a panel evaluating the value of the survey. L. Pasquini answered that the recommendations to the team were that the target selection criteria should be publicly known and that one should think about how the community could participate in the selection of the targets.

J. D. Monnier asked whether ESO planned a major discussion with the community about the changes in the internal structure of Paranal and future instrumentation or whether all these issues would be discussed internally. L. Pasquini expressed his personal opinion on that matter stating that ESO could carry on as proposed for the following years. He stressed that for the long-term (i.e. when the E-ELT would be fully operational) a change might be needed in the way ESO obtained input from the community. The DIRECTOR GENERAL stated that the system had worked very well in the last years although, if there were an evolution, ESO would be open to new ways on getting ideas and recommendations from the community.

6. **E-ELT**

6a. **Status (A. McPherson)**

A. Marconi thanked A. McPherson for the report. No questions were raised.

6b. **Report on science activities (J. Spyromilio)**

J. Spyromilio reported on the successful workshop on the E-ELT instrumentation organized by S. Ramsay and mentioned that the conclusions would be captured in an internal E-ELT document to keep track of what had been said. A.-M. Lagrange and I. Hook would collect the thoughts in the context of the HIRES and MOS instruments. J. Spyromilio explained that over the following year ESO was planning to run three thematic workshops on stellar populations, exoplanets and solar system objects with the E-ELT which had been triggered by discussions with the community. He added that the TLRs for the first-light instruments 1 and 2 had already been released and that within the Project Science Office ESO was preparing the TLRs for instruments 3, 4 and 5 in order to be able to provide the information to the STC in April 2014. If the STC agreed on the requirements, ESO could start procuring designs for instruments 3, 4 and 5 on a parallel track. J. Spyromilio detailed that he had started a general and open discussion about the E-ELT operations model. This was
expected to take place within the regular science activities and workshops planned by ESO for the coming years.

6c. Discussion

H. Van Winckel enquired whether the formulation of the TLRs for the E-ELT instruments was done based on the Science Requirements. J. Spyromilio explained that for MOS and HIRES there were community White Papers from the end of Phase A. He added that ESO usually tied the requirements to a particular science case, although that did not exclude other science cases that could be done with those requirements. J. Spyromilio stressed that the community was deeply involved in that process. A. Moitinho enquired whether the STC was supposed to read the White Papers. J. Spyromilio responded that the White Papers were not ESO papers but documents written by the community to define their interests on the different science cases. A. Moitinho remarked that since the TLRs were the result of the White Papers, ESO should perhaps make them available to the STC. J. Spyromilio countered that the TLRs were not the result of the White Papers but that the PST took these documents into consideration (together with the output from Phase A with its proposed science cases) in order to establish the final TLR document. A. Moitinho thought it would be useful for the STC, if ESO made all that information available in some way or another. J. Spyromilio answered that that would not be a problem.

A. Moitinho was of the opinion that it would have been good to have a couple of slides from J. Spyromilio’s presentation that the STC could have had as a future reference. For the record, J. Spyromilio enquired to have his report be included in the minutes.

Recommendations from the LSP subpanel for the E-ELT (A.-M. Lagrange)

In her presentation, A.-M. Lagrange itemized several points to be discussed. The first one was related to the consistency between the TLRs and the science cases for CAM and IFU and whether the TLRs would fulfil the science cases that had been proposed. The second point considered the issue about how the LSP subpanel or STC could be better informed or involved in a timely manner about the progress of the several instruments (e.g. to have access to all documents). The third point enquired about the priority for instrument number 3. The final point was related to the global adaptive optics strategy for the first two instruments on the E-ELT, in particular for MCAO and LTAO and concerns about their feasibility.

J. Spyromilio responded that CAM and IFU had already been approved which was the reason why ESO did not ask the STC for recommendations. Regarding the priority for instruments 3, 4 and 5 he outlined that these instruments were identified and that there was not any scientific priority between the three instruments, unless the STC changed its previous recommendation. He added that although instruments 3, 4 and 5 were first generation instruments, ESO had not been told to follow a particular sequence to deploy them. M. Casali commented that ESO was trying to remove artificial delays in the start of the instruments. He added that instruments 4 and 5 already had proposals out and that it was just a matter of whatever was going to be ready first would start first. A.-M. Lagrange asked for further clarification on that process. J. Spyromilio pointed out that instruments 4 and 5 would not be delayed, if instrument 3 were not ready before them. The DIRECTOR GENERAL remarked that instruments 1 and 2 were clear and that they would go ahead. He added that for instrument 3 there was an identified consortium. Instruments 4 and 5 had to go through a down-select as part of the process to get these instruments defined. Once that was ready, they would go ahead.
J. Spyromilio added that ESO had a science case to put SCAO in the system, although it was still unclear how it would be done. A.-M. Lagrange went back to the cases of CAM and IFU and pointed out that when science cases were dropped off or seriously compromised by the final TLRs of the instruments, the STC should be notified. J. Spyromilio provided some background on the topic and explained that the contrast ratio that the IFU instrument would reach had not been changed with respect to the original proposal/concept (i.e. HARMONY). A. Marconi emphasized that the reason why the STC requested an extra subcommittee was to have enough time for discussions and for a full evaluation of the documents.

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7. **ALMA**
   7a. **Programme Status Report (W. Wild)**
   7b. **Discussion of ALMA Fact Sheets (STC-513D-ALMA)**

A. Marconi thanked W. Wild for the report.

R. Ivison asked whether W. Wild could comment on the likelihood that long-baseline observations in Cycle 1 would be undertaken. W. Wild responded that there was much work in progress at that moment and that it was limited by the number of antenna pads. He added that the problem was that some of the pads were not correctly wired (which is a North American deliverable) and that it might have to be re-done. P. Andreani commented that there were six antennas on the longest baselines (about 1 km) that had recently been achieved but that the image capabilities were still limited. W. Wild noted that even though there were antennas at 1 km-long baseline stations, they were not forming the originally planned configuration. R. Ivison asked when the community would be informed about that issue. P. Andreani answered that the community had already been informed about the slowdown. She added that they would make sure with their North American colleagues that the information flow was going to continue. R. Ivison asked whether the information sent included the issue of the risk of the long-baseline observations. P. Andreani responded that only information about the slowdown was mentioned although they were planning to soon make more information available on the ALMA Science Portal.

A. Marconi asked about the date for the next Call for Proposals. P. Andreani replied that the question would be dealt with in her presentation.

7c. **Early Science Operations (P. Andreani)**

A. Marconi thanked P. Andreani for the report.

E. Sadler commented that it made little sense to start Cycle 2 when Cycle 1 had barely begun and enquired whether the STC could make any recommendation on that point which P. Andreani confirmed.

A.-M. Lagrange wanted to know whether the situation of the observatory would be better if there were more commissioning time. P. Andreani replied that that was the reason why ALMA was not doing science observations at that moment. A.-M. Lagrange enquired how long it would take to be operational again, if every problem were fixed smoothly. P. Andreani responded that, from her point of view, the main problem was efficiency, i.e. there was little co-ordination between engineers, scientists and software engineers which lowered the global efficiency of the observatory. W. Wild provided an example and explained that
software engineers only worked during daytime due to contractual issues. L. Testi added that there had been a long discussion at ESAC about the CSV (Commissioning and Science Verification) plan and that the CSV plan mainly depended on the current availability of staff and resources at the observatory.

L. Bronfman wanted to know whether P. Andreani’s talk would be made available to the STC. P. Andreani and A. Marconi replied that it was already available on the webpage.

7d. **ALMA Development Studies (L. Testi) (STC-520)**

A. Marconi thanked L. Testi for the report.

A.-M. Lagrange enquired whether the Call for Studies needed to be simultaneous with the other regions, if ESO wanted to co-ordinate the work. L. Testi replied that the agreement in ALMA was that every region would follow its own rules and procedures. He added that what they co-ordinated was the timing, i.e. when the Call for Studies would take place and that they were encouraging multi-region studies with multi-region teams. A. Marconi remarked that ESO might want to co-ordinate with the other regions in order to avoid duplicated studies. L. Testi answered that it depended on whether it was a project or a particular item. He provided an example. For the THz-receivers where research and development were still very high, there were several competing studies involved in the development of different technologies. A. Marconi asked whether ALMA would go for construction for two similar projects doing the same thing but in different regions. L. Testi replied that would not be possible as the final approval would be done at the ALMA Board. W. Wild commented that the ALMA Development Steering Committee dealt with that kind of situations where the three executives came together and discussed whether there were multiple interests or conflict of interests and advise the ALMA Director on the matter. Up to then it had worked very well.

R. Ivison asked why Band 2 had been singled-out in the Call. L. Testi answered that he did not think Band 2 had been singled-out. He explained that it was mentioned in the presentation as a possible example because he was expecting the team to put in a proposal.

G. Wright enquired whether, given the difficulties of the observatory, the Call for Studies diluted the observatory commissioning effort. L. Testi replied that there was no overlap between the people involved in the commissioning and the teams replying to the Call for Studies. W. Wild added that they were basically different communities as the technical development was done by instrument builders, while the Commissioning and Science Verification activity was carried out by expert scientists. He emphasized that there was maybe some overlap but that it was very minor. L. Testi commented that it might have an effect on the calibration method, algorithm and observing modes as he knew of a group that was interested in the Call and that was actively involved in the CSV but that for the people involved in developing the science case it was usually not labour intensive. E. Schmid stressed that there were high expectations on the correlator software development team in North America from the ALMA phasing project where they wanted to have two engineers working full time for the Call for Studies, representing a possible risk for the performance of the team.

7e. **APEX Extension (A. Kaufer) (STC-521)**

A. Marconi thanked A. Kaufer for the report.
J. D. Monnier asked whether there was any discussion about the change in the model of the APEX observatory to make operations less expensive given that ALMA presented competing capabilities. A. Kaufer responded that the issue had recently been evaluated by an external review board and the general assessment was that current operations were as cheap as they could be for 4000 hours observing time per year. He concluded by saying that he did not think there was any way to save money except de-scoping.

7f. Report from ESAC (R. Ivison)  
7g. Discussion  
A. Marconi thanked R. Ivison for the report.

J. D. Monnier asked why APEX was such a unique facility and continued arguing that there used to be other facilities similar to APEX that other communities had shut them down. He wondered why APEX should remain open. R. Ivison responded that the community needed a facility with continuing wide-field capabilities in sub-millimetre astronomy and the fact that facilities such as Spitzer, Herschel or the JCMT were not going to be there justified his comment.

A.-M. Lagrange enquired about the cost of APEX for ESO per year. A. Kaufer replied that the cost to ESO for the period 2016/2017 would be 700,000 Euros per year. A.-M. Lagrange asked for clarification about the PI instruments and whether only PIs could apply for observing time with those instruments. R. Ivison replied that there were some rare situations in which science had become ring-fenced by the PI. He added that, although it had not been an issue up to then, it should be solved in a formal sense to make sure it would never become an issue. A.-M. Lagrange asked what kind of calendar R. Ivison would recommend for APEX. R. Ivison answered that the sensible time-scale would be the extension to 2017. A. Kaufer added that the concerns expressed about the access to PI instrument was the reason that the external review requested the 2015 milestone to determine the way forward at that time.

A. Marconi asked whether there were any items related to ALMA that needed to be discussed. The DIRECTOR GENERAL thanked R. Ivison for the helpful summary of the ESAC meeting and stated that he would make sure the summary was sent to P. Cox who would be involved in the development of the long-term plan of the observatory.

8. Directorate of Operations  
8a. Directorate of Operations Overview (A. Kaufer)  
8b. Discussion of Directorate of Operations Fact Sheets (STC-513A-DOO)  
8c. Discussion  
A. Marconi thanked A. Kaufer for the report.

E. Sadler had a question related to the data release of the VISTA and VST public surveys and whether the VIKING data were being released after the problems reported at the last STC. A. Kaufer responded affirmatively that the release for the data products had been followed and that the next data release would be at a later stage that year. A. Marconi enquired about the technique tachoastrometry with UVES. L. Pasquini replied that it was measurement of the difference in radial velocity on a double star by rotating the slit in four positions. That provided angular resolution below the diffraction limit. A. Marconi asked whether it was similar to spectroastometry. L. Pasquini answered that they were not similar but that in tachoastrometry only radial velocities were measured and that there was no information about the spatial distribution of the spectra.
9. **Directorate for Science**  
9a. **Directorate for Science Overview (B. Leibundgut)**  
9b. **Discussion of Directorate for Science Fact Sheets (STC-513C-DSC)**  
9c. **Discussion**

A. Marconi thanked B. Leibundgut for the report.

A.-M. Lagrange commented that the document mentioned a decrease in the number of Fellows for 2013 due to the financial situation. She added that it was important to keep the momentum for postdocs as they represented the future of astronomy. B. Leibundgut agreed to that statement. He thanked A.-M. Lagrange for her support regarding that matter. The DIRECTOR GENERAL also agreed with A.-M. Lagrange and added that the STC could help ESO by requesting indexation to the Member State delegates. A.-M. Lagrange responded that they were doing that. B. Leibundgut noted that two young researchers had decided to join ESO with individual Marie Curie grants. He added that there was no plan to replace the Fellowship programme by external funding but that thanks to the COFUND funding and Marie Curie People programme ESO had been able to keep the scientific interaction.

A. Finoguenov commented that the documents stated that the ESO Press Release Office lost staff. B. Leibundgut explained that someone moved from the ESO Public Outreach Department to Internal Communications. He continued that due to the financial situation, he was not allowed to create a new position and an internal solution was being worked out but that it would take time.

B. Leibundgut pointed out that the next April STC Meeting would take place on 8 and 9 April 2014. The sub-committees would take place on 7 April 2014.

A. Marconi thanked all the speakers from the morning session.