

The 2018 Visiting Committee Report

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ESO's activities are externally assessed every few years by a Visiting Committee composed of a panel of senior external experts who report their findings to the ESO Council and Director General. The assessment is based on an extensive set of presentations, reports and interviews with ESO staff conducted during visits to all ESO sites. Here we summarise the report and recommendations produced as a result of the latest Visiting Committee assessment, which took place at the end of 2018 and was presented to the ESO Council in June 2019.

The ESO Visiting Committee (VC) offers its external assessment of how ESO is complying with its mission to provide world-class facilities for astronomy and to foster astronomical collaborations. To this end, the VC considered the competitiveness of the research carried out by the ESO community and evaluated the calibre and range of ESO's observatory activities. The VC also looked at ESO's organisational health and readiness to reach its strategic goals, in particular the implementation of the Extremely Large Telescope (ELT) programme.

This report is based on the VC's two site visits — carried out between 22 and 26 October and 19 and 27 November 2018 in Garching and Chile, respectively — and extensive materials provided before and during these site visits. The report was informed by numerous direct interactions with ESO staff at all levels of the Organisation. All of the main recommendations reported here reflect consensus within the VC.

The VC came to the conclusion that, at present, not only is ESO fulfilling the essential elements of its mission superbly, but it is also a beacon of science in Europe and the world and a global leader in astronomy. Internally, ESO is a strong and largely healthy organisation, with strains and issues at a level that is to be expected for an endeavour of this ambition, complexity

and history. Looking to the future, the VC concluded that ESO is indeed set for a successful implementation of the ELT if the Organisation — and its Council — address a number of challenges, some of which are pointed out in this report.

ESO's strengths and excellence

The VC found ESO to be a world-class science organisation, truly exceptional in many respects. It has implemented and is operating a suite of observatories and instrumentation that is unrivalled in its combination of quality and breadth; the success of the Very Large Telescope Interferometer (VLTI) with the adaptive-optics-assisted, two-object, multiple beam-combiner GRAVITY is just one example. ESO's facilities enable its user community to carry out astrophysics on a par with other world-class facilities. The VC notes that Atacama Large Millimeter/submillimeter Array (ALMA) astrophysics carried out by the ESO community is truly outstanding at a global level.

The basic organisational structure within ESO is suited to its tasks, and it has a track record of adapting to new challenges. ESO can also draw on a deep pool of talent; the VC found a high level of staff dedication to its mission, and generally high employee motivation with a positive gradient.

The VC found that, in looking towards the future, ESO leadership appears to be striking a good balance between ambitious vision, dedication to excellence in its observatory facilities and moving towards healthy planning realism.

Optimising ESO's organisational structure

In light of these strengths, the VC paid particular attention to the question of whether ESO is ready to implement the ELT in the coming decade while continuing to maintain its cutting-edge strengths at the existing observatories (i.e., the La Silla Paranal Observatory) and sustaining its strong role in ALMA. It is the VC's view that ESO can accomplish this, as there are no obvious show-stoppers, and that it will succeed if a number of

challenges are successfully met. ESO is aware of those challenges, and some of them have been emphasised in the VC's recommendations.

ESO should continue to optimise its organisational health and efficiency by: strengthening both strategic planning of, and agility in, personnel recruitment and fostering in-house mobility; ameliorating both overbooking and project-multiplexing among individual staff members; ensuring that long-term planning security for ELT key expertise remains feasible within the matrix framework; and continuing to improve the communication flow, both upwards and downwards, within the Organisation.

ELT implementation

The VC was very impressed with the state of the ELT planning and implementation, as well as ESO's awareness of the complexity and enormity of this ambitious project. In light of the complexity, the VC recommends that ESO pay even closer attention to two aspects. First, a tightly integrated telescope-instrumentation-operations approach is key to the timely success of the ELT and an important aspect of mitigating budgetary and scheduling risks; these three aspects of the ELT must be tied together even more closely than in the case of the Very Large Telescope (VLT). Second, strong and coherent scientific leadership of the overall ELT effort must be in place throughout its implementation.

The VC also considered other aspects of ESO, such as its outreach strategy and the involvement in the Atacama Pathfinder EXperiment (APEX) and the Cherenkov Telescope Array (CTA).

Summary of recommendations

Articulating the current ESO strategy

ESO has successfully implemented most of the strategic vision that was laid out in 2004. The VC recommends that the ESO Council and the Director General develop and formally document ESO's strategic vision for the next decade. The VC strongly supports ESO's overriding

focus on the implementation of the ELT while maintaining current strengths. The VC therefore acknowledges and supports the conclusion that any responsible articulation of the current strategy may leave little or no room for the implementation of any other major new programmes in the near future.

Ensuring the budget envelope for ESO's mission

The VC appreciates ESO's current rigour and realism in determining the resources needed for the implementation of the ELT. It is the VC's view that, as an organisation, ESO is robust and efficient enough to successfully implement the ELT within the currently forecast resource need, which strains the contribution envelope of the Member States. The VC strongly encourages the ESO Council to push for the provision of the required (forecast) budget, as this will indeed ensure ESO's global leadership in astronomy for decades to come.

Optimising ESO's organisational health and efficiency

The VC found ESO to be a strong, healthy and efficient organisation overall, with highly talented and motivated staff. The organisational strains that will inevitably result from ESO's ambitious plans will require continued and strengthened effort towards organisational optimisation.

Specific recommendations follow:

- The VC recommends that ESO continue to address or mitigate both the historic and the inevitable political differences in its staff arrangements, such as aspects of the 50/50–80/20 science/duty contracts for scientists, or aspects of the international/local staff categories among technical and scientific staff in Chile.
- The optimisation of the matrix structure at ESO Garching, which has gained widespread acceptance, must continue by: eliminating or reducing oversubscription of staff resources; addressing the extensive project fragmentation

experienced by some staff; and finding ways to assure long-term planning security for key ELT expertise within the matrix framework.

Strategic and efficient recruitment

Among aspects of organisational efficiency, extensive near-term recruitment of highly qualified personnel will be key to ESO's mission success in the coming years. The VC recommends that ESO review all aspects and all actors involved in efficiently and successfully bringing in new talent; this is to ensure that recruitment is both proactive and strategic, as well as efficient and rapid in practice. The VC also recommends that ESO continue to improve the effectiveness of in-house career mobility and development.

A close telescope-instrumentation-operations approach for the ELT

In light of the ELT's complexity, the VC recommends that ESO pay close attention to a very tightly integrated telescope-instrumentation-operations approach. In the VC's view, this is key to the timely success of the ELT and is an important aspect of mitigating budgetary and scheduling risks. Specifically, the VC recommends that the ELT Programme deepen its connections with both the external instrument teams and the future LPO operations team, in a spirit of close collaboration.

Overall science leadership for the ELT

The VC recommends that ESO ensure strong science leadership of the overall ELT effort as it will be critical to the ELT's long-term scientific success and impact. Such leadership is key to fully considering the needs of the telescope, the instruments, the AO and the operations from the viewpoint of the ELT's overall scientific utility; it will also ensure that appropriate trade-offs are made between performance and capability on the one hand, and budget, schedule and risk on the other.

On CTA implementation

The VC concurs with ESO that CTA is an exciting scientific prospect in collaboration with a strong consortium. The VC is also concerned that unforeseen efforts related to CTA on ESO's part could distract from the implementation of the ELT and strongly recommends that ESO's prioritisation, role and effort in CTA do not grow beyond what is currently planned.

On the future of APEX

APEX is currently working well and producing good science. The VC recommends that ESO examine critically whether APEX will remain scientifically indispensable for its user community as ALMA matures, beyond the current contractual arrangement.

On education and outreach strategy

The VC recommends that ESO clarify and strengthen its vision, and implementation, of its education and outreach effort, with a closer integration and coordination of these activities in Europe and Chile. In Garching, the VC sees a serious risk that the tremendous potential of ESO's Supernova will not be realised, given its current lean level of staffing. The VC was unconvinced that augmenting the current operations model merely by external fundraising alone would lead to an education and outreach effort that lives up to ESO's vision.

Note

^a The Visiting Committee 2018 was composed of Masimo Altarelli, Rebecca Bernstein (Vice-Chair), Sofia Feltzing, Robert Kennicutt, Anne-Marie Lagrange, Hilton Lewis, Elena Pian, Hans-Walter Rix (Chair) and Patrick Roche.