



GSMT Community Assessment Description

Executive Summary

The 2010 Decadal Survey (Astro2010) will need reliable and complete reports of TMT and GMT project status and estimated total life-cycle costs. Here, AURA/NOAO describes a community assessment process to enable such reports. These would complement a set of fully independent cost assessments Astro2010 will likely carry out. During this process, a single team of experts will assess each project independently but in the same specified areas using identical criteria. Meeting dates with top-level assessment charge, specified areas, and criteria have already been specified, so as to give the projects adequate time to prepare. A separate report for each project will be written. A direct comparison between the projects will not be made. Both reports will be delivered to the NOAO Director, who will in turn pass them on to the NSF and the appropriate Decadal Survey panels, with an appropriate description of the assessment process.

Motivations

A large aperture, segmented mirror, optical-IR ground-based telescope was given highest priority of all ground-based projects by the last Decadal Survey (DS2000). At the time, the generic concept was known as the Giant Segmented Mirror Telescope (GSMT). As a goal, DS2000 recommended a 50/50 private-public partnership. In this context, “public” means the US Federal government while “private” means a mixture of philanthropic individuals, non-governmental organizations, US state agencies, and international governmental agencies.

Since the DS2000, two US-led GSMT projects have emerged: the Giant Magellan Telescope (GMT) and the Thirty Meter Telescope (TMT). There is also an analogous European project led by ESO: the European Extremely Large Telescope (E-ELT). The National Science Foundation (NSF) has contributed directly and indirectly to the design and development phase of both US-led projects via AURA/NOAO.

In recent letters to AURA and the NSF, the GMT and TMT projects have reiterated their desire for continued and increased financial support from the US Federal government via the NSF during all project phases (construction, operations, post-construction development). The exact amounts in each category are open to discussion but a contribution of at least 25% of the total lifecycle costs of each project has been suggested. It is likely that each project will require a different mix.

The Astro2010 effort is currently underway. Initial meetings were held in December, and an outline of the structure and timeline for the panel is now available (http://www7.nationalacademies.org/bpa/Astro2010_Structure.html). The proposed activities are consistent with the Astro2010 time line.



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The funding agencies have asked that projects that have not yet entered construction phase be reviewed and re-prioritized by the Astro2010 committee. Hence, the concept, desirability, and priority of a GSMT will be re-evaluated.

Independently verified project status reports and total lifecycle cost estimates will be highly valued. The Beyond Einstein Program Assessment Committee (BEPAC) has been held up as an example to emulate. The Astro2010 panel expects to carry out its own fully independent cost estimates as well.

The NSF has made it clear that they will make no decision about GMT or TMT support until after the Astro2010 report is issued.

Community assessment of GSMT projects

Given the motivations above, AURA/NOAO has set up an independent panel of experts to provide an independent assessment of the US-led GSMT projects. This assessment process will focus on technical progress towards achieving science-driven technical requirements and construction readiness as well as the cost and schedule that would affect NSF investment and scientific return to the community at large.

AURA/NOAO will closely coordinate this assessment activity with the NSF to provide assurance of independence.

We believe that the information generated by this independent assessment panel will improve community and Astro2010 confidence in the feasibility, reality and readiness of TMT and GMT. In turn, such increased confidence will help maximize the likelihood that the Astro2010 panel will reaffirm the high priority given to GSMT by the DS2000 panel. In parallel, we believe an independent review will help two strong projects become even stronger by providing measured, balanced and neutral feedback.

General principles

General assessment principles include:

- Focus on current project progress towards initiation of major construction activity, technological risk mitigation and estimated total lifecycle costs.
- Focus on fact finding and validation. There will be no project comparison or down-select recommendations.
- Maintain assessment panel independence and impartiality. No panel members shall be associated directly with the AURA corporate office, AURA managed observatories, GMT, or TMT. However, AURA employees may provide support to the panel, especially in regard to logistics and organization. AURA employees may also participate as observers.
- Maintain an open process. Panel reports are likely to be read by a broad audience, so information designated by the projects as vendor proprietary should not be



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explicitly discussed or included in any panel working documents or reports, internal or external.

- Manage sensitive information appropriately. For a complete assessment, sensitive information (political, financial, commercial) may have to be presented and discussed. Such information shall not appear in any formal written reports.

Assessment process & time line

AURA/NOAO has created a draft charge for the assessment panel, which has been reviewed by the NSF and revised accordingly. Preliminary assessment topics are outlined below.

AURA/NOAO has recruited an assessment panel. GMT and TMT have been given a chance to recommend panel members.

The assessment panel consists of experts familiar with the management, execution and operation of large science projects, as well as technological issues associated with TMT and GMT. At least one panel member is a senior astronomer.

Panel members are individuals without a direct association with either project, AURA, or AURA-operated observatories. Panel membership will not be provided to prevent unnecessary interaction with panelists.

Each project will be required to deliver reports to the review panel several weeks before the assessment meetings. The required list of reports will be developed by the panel with support from AURA/NOAO. Each project will be invited to release documentation from previous reviews as well as any other documentation they feel would be helpful to the assessment panel.

The reviews will take place in Pasadena, California, during a 6-day period, in late April/early May. At the conclusion of each meeting, the assessment panel will present an informal, oral briefing to the project team senior management and appropriate observers from AURA/NOAO and the NSF. The final review reports will be delivered to the NOAO director and (separately) to the projects 4-5 weeks after the review period, at which time each project will have an opportunity to provide final comments and request revisions. After any revisions, the reports will be delivered to the NSF and appropriate Astro2010 sub-panel, probably by mid-July 2009. These reports and comments will not be widely circulated. For example, these documents will not be posted on the public Web. Nevertheless, it is expected that complete privacy will be difficult to impossible to maintain, so proprietary information or other sensitive material will not be included in the reports.



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Assessment topics & structure

This assessment shall focus on matters of requirements management, project management, cost, and schedule as well as system engineering and technical risk management.

Specific topics to be covered will be determined by the review panel, but will most likely include:

- Top-level observatory requirements and architecture
- System engineering process
- Design progress
- Technical risk mitigation
- Site preparation progress
- Project management process (including budget & schedule management)
- Business services process
- Staffing models (construction and operations phases)
- Operations concept, plan, and staffing/budget estimate
- Business model and windows for NSF contributions (construction, operations, and post-construction development)
- Total life-cycle cost estimate
 - Process, including inflation models and contingency planning
 - Total cost-to-completion estimate, broken down by Level-1 WBS elements (now-year and then-year)
 - Operations estimate (now-year)