



June 15, 2007

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Dear Colleagues --

This note will (a) bring you up to date on the status of the Giant Segmented Mirror Telescope Science Working Group (GSMT SWG) and its new roles following the NSF Senior Review: and (b) determine your availability for a telecon to help us plan SWG activities over the next year.

Apropos (b), please let Laurie Phillips (NOAO's Giant Segmented Mirror Telescope Project Office; lphillips@noao.edu) know as soon as possible whether you would be able to participate in a telecon at noon PDT (3pm EDT; 9am Hawaii) on either Monday, Tuesday or Wednesday, 25-27 June. We expect the telecon to last 1 hour, and to invest that hour in making the membership aware of the NSF's new expectations for the SWG, the key tasks facing us, and the approximate schedule of activities. We will also try to answer what we are certain will be a range of questions, given the significant changes in the scope of the SWG's work and its roles with respect to the Foundation and the community. Laurie will provide a call in number, along with gentle reminders re the time and agenda for the meeting by mid next week.

Apropos the status of the SWG, as you can imagine, the report issued by the NSF's Senior Review Panel, as well as subsequent discussions with AURA and the two US Projects (TMT and GMT) has had a significant impact on the status of GSMT and the role of the SWG in the future. Among the most salient changes are:

- (1) that AURA was asked by NSF to withdraw without prejudice from its partnership with TMT and focus on working with the GSMT SWG and the community to advance the goals of both projects. (See [Steps Towards a National GSMT Program Final.pdf](#))
- (2) that the GSMT SWG will assume an even more important role in the future. In particular, it has been charged to:
  - Serve as a strong advocate for a GSMT (a) in the community; (b) in meetings with key advisory groups such as AAAC and CAA; and (c) with the new decadal survey committee. The NSF has made it clear that the GSMT, and perhaps other major projects given high priority in the 2000 survey will be re-examined by the 2010 panel. The GSMT SWG has a critical role to play in providing the decadal survey committee with the information needed to make an informed decision regarding the importance of a GSMT for US astronomy. To be fully effective, the SWG will need to develop mechanisms for

engaging the broader community in discussions regarding the GSMT and in building strong and vocal support for the major investment that will be needed in order to ensure full public access to a GSMT.

- Develop a Design Reference Mission that captures the full range of science programs that can be carried out by extremely large telescopes of sizes ranging from 20-40m. The DRM will build on the work already carried out by the SWG in its first reports, ["Frontier Science Enabled by a Giant Segmented Mirror Telescope"](#) and ["A Giant Segmented Mirror Telescope: Synergy with the James Webb Space Telescope"](#), and its current work in developing an understanding of scientific performance as a function of aperture, and will incorporate as well the science cases that are being developed by GMT and TMT. Particular emphasis will be placed on complementing the large science programs that have been well developed by the SWG and the projects with extensive examples of smaller, "PI class" projects that take advantage of the unique combination of angular resolution and sensitivity afforded by a GSMT. To provide a reference of the level of input required for the DRM, we are attaching with this letter two examples of contributions made during the early stages of preparing the JWST DRM.
- Use the DRM to develop a reasonable estimate of the time likely to be required by members of the US community not directly involved with either GMT or TMT so that the NSF can develop a quantitatively-based assessment of an appropriate level of public investment in GMT, TMT or both.
- Use the DRM to develop an understanding of the suite of instrument and adaptive optics capabilities required to carry out the full range of scientific programs enabled by a GSMT. This analysis will provide the NSF with the information needed to assess whether a program analogous to TSIP (in which public funds for instruments/new capabilities evoke public time on facilities capitalized by private funds) can be used as one path toward public access to a GSMT.
- Use the DRM to develop an understanding of the operations modes (classical observing, queue observing, interrupt-driven/TOO observing) needed, and to assess the importance of funding a publicly accessible, NVO-compliant archive. Again, this analysis will provide the NSF information critical to assessing the importance of a public investment in operating funds and funds for a broadly accessible, well-documented, reliable archive.
- Develop a full understanding of how the US system of public and private telescopes needs to evolve so that the full complement of capabilities (O/IR and possibly others) needed to exploit a GSMT is available, and scheduled as part of simple and straightforward process. This assessment will help guide the NSF in adjusting its investments in the system, ensuring that all members of the community have the tools needed to prepare programs requiring the GSMT by carrying out necessary pathfinder observations or surveys, and to follow up GSMT observations by means of more intensive or extensive observations on other facilities.

In discussions with the NSF, it became clear that the Foundation wishes the SWG not only to take on the broader roles summarized above, but to ensure that its membership be representative of all segments of the US community. As a consequence, the Foundation and AURA have agreed that the

SWG membership will evolve over the next several months, so that in equilibrium, it contains equal representation from the TMT and GMT communities, as well as much larger representation from the US community. Going forward with this balance of constituencies will add to the SWG's credibility as it begins to carry out its new responsibilities.

Our plan is to (a) appoint new members of the SWG in accordance with the requests of the NSF; (b) to hold a joint meeting between the new members and currently serving members of the SWG in the second half of October or the very beginning of November in service of a smooth 'hand off' of responsibilities; and (c) to ask some currently serving members of the SWG to rotate off the committee following that meeting. By meeting at this time, our next planned face-to-face meeting will also be able to take advantage of discussions currently underway by TMT and GMT, who together are attempting to define common scientific missions. The SWG's efforts will take into account whatever consensus is developed by the two projects, in addition to input from the larger community.

The SWG has accomplished much to date -- in particular, laying the groundwork for the support that NSF has begun to provide for the TMT and GMT Design and Development Phases. We should be proud of those accomplishments, but realize that much needs to be done if we are to realize the goal of providing broad community access to a GSMT (TMT, GMT or both) by the middle of the next decade.

We look forward to talking with you in a few weeks and to rededicating ourselves to achieving our shared vision.

Sincerely,

Rolf Kudritzki

Steve Strom

RK/SS

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attachments