Report of Gemini's Science and Technology Advisory Committee (STAC) May 2020

The STAC held its eighteenth meeting on 11-13 May 2020 by videoconference.

STAC Membership

Elliott Horch, Chair	Jae-Joon Lee
Ryan Chornock	Damián Mast
Mark Chun	Marcelo Mora
Ryan Foley	Henri Plana
Craig Heinke	Lisa Poyneer
Robert Hynes	Eric Steinbring
Jeyhan Kartaltepe	Marsha Wolf

Since the last set of Gemini governance meetings, the COVID-19 crisis has presented a wide set of challenges to the Observatory, to the astronomical community at large, and of course many aspects of life well beyond. The STAC congratulates Gemini on navigating these challenges with agility and considerable skill, and for protecting Observatory assets while still making significant progress on a range of important projects. The STAC encourages the Observatory to continue seeking creative ways of safely re-opening facilities while at the same time informing the user community of their progress to the extent possible, so observers can adequately prepare themselves to maximize science outcome when operations resume.

18.1 The STAC is grateful for the level of detail that the Observatory provided both in the reports prior to the meeting, in their presentations during the meeting (despite the abbreviated meeting format), and in detailed documentation shared earlier this year, such as the Observatory response to the GNAO CoDR. The ability to study the major ongoing projects at this level greatly aids the STAC in providing more granular recommendations to the Board.

18.2 The STAC congratulates the Observatory on three successful recent developments with regard to the current instrumentation projects. First, the commissioning of the NGS2 wavefront sensor in the South for GeMS. The STAC expects that the improved speed and sensitivity will result in a greater science return in the coming semesters. Likewise, the delivery of GHOST to La Serena before the COVID-19 crisis took hold is a significant accomplishment. Finally, the STAC were extremely pleased to see first light data from the MAROON-X commissioning; the performance at this stage is very encouraging. The STAC thanks both the instrument team and the Observatory for this welcome and excellent news.

18.3 The STAC endorses the project priorities presented in the development report as follows: GNAO, SCORPIO, GHOST, GSAOI/GNAO, IGRINS-2, GIRMOS, GPI2, GLAO/ASM Feasibility, GNIRS Controller, IUP, DM0.

18.4 The STAC endorses the following science time fractions proposed by the Observatory for the upcoming semesters, specifically:

2021A: 96% for the South and 96% for the North.
2020B: 83% for the South and 85% for the North.

(The latter includes slight revision from the recommendation in the last STAC report in order to accommodate the commissioning of GHOST.)

18.5 Given the current situation and information available at present, the STAC finds the tentative plan to hold the next Gemini Science Meeting in Seoul during the first half of August 2021 (prior

to the IAU Meeting) a reasonable approach. It is important for the Gemini user community to have the opportunity to see the latest scientific results from Gemini, updates on instrumentation projects, and to participate in the discussion of Gemini's strategic plans for the coming decade. The STAC recognizes that further changes to the plan, including consideration of an online format, may be needed if the COVID-19 crisis continues.

18.6 The STAC was pleased to review recent progress on the long-term instrument plan. The STAC recognizes that there is a need for the Observatory to maintain some flexibility moving forward and likewise the STAC may make further recommendations as the plan is executed, but concrete statements that can be made at present are that (1) the current plan of furloughing instruments in the North appears generally workable, subject to user demand, (2) NIFS is a good candidate for moving to the South to alleviate some pressure in the North, (3) the use of IGRINS in the South over the next several semesters is a strong argument in favor of the deployment of IGRINS-2 in the North although deployment in the South could also have scientific merit, and (4) making the user community aware of the long-term instrument plan (and any updates) well in advance will be key to its success.

18.7 With further regard to the long-term instrument plan, the STAC recommends that the port-sharing arrangement for GPI2 and MAROON-X from 2022 through 2027 be carefully synchronized with the scientific needs of the projects undertaken with those instruments. An example is that measurement of proper motions observed with GPI2 may need observations separated over several years, thus a 2-year furlough in 2026-2027 would appear feasible, but only if GPI2 returns to the telescope in 2028.

18.8 In terms of the expected scientific return, the STAC views the GPI2 proposal for guaranteed time as a reasonable starting point for further discussions with Gemini, subject to the requirements of the Observatory. The STAC notes that community interest was not broad during GPI's southern run, and suggests that Gemini find ways to increase community engagement with GPI2.

18.9 The STAC congratulates the observatory on its progress in developing the TDA roadmap. In particular, the software development components (e.g., DRAGONS and the dynamic scheduler) will provide long-term scientific benefits to the observatory for TDA and MMA.

18.10 The STAC is cautiously supportive of the unified AEON TAC model proposed by the Observatory, but has three recommendations as we move forward. The first is that it is imperative that the TAC have sufficiently deep and broad expertise to adequately and fairly evaluate a potentially wide range of scientific cases. Second, there was some concern that the model must protect the scientific interests of the smaller partners in Gemini if they choose to contribute some fraction of their time to the AEON proposal framework (in order to avoid the past negative experiences with the LLP process). Finally, the STAC encourages the observatory to carefully consider the proposed exchange rate of telescope time to ensure the Gemini community is adequately compensated for the unique capabilities of Gemini (both instrumentation and aperture) relative to 1-meter class facilities.

18.11 The STAC encourages the observatory to formulate a plan for communication, education, and outreach to the community to support the AEON model for proposals in order to encourage the broadest possible community of proposers beyond the small initial group of users who are already familiar with TOM toolkits.

18.12 The STAC thanks the Observatory for the statistics on publications derived from archival data at Gemini. This work is having an increasing positive impact on the scientific output of the

Observatory, which the STAC views as a sign of the vitality and reach of the Observatory within the astronomical community.

18.13 The STAC congratulates the GNAO team on their continued technical progress and detailed replan. Understanding the interfaces and dependencies among the four major subsystems will be a priority for project execution, and the STAC looks forward to an ongoing conversation with the Observatory on this topic.

18.14 The STAC commends the team for the science flow-down to the top-level requirements. The STAC encourages the GNAO team to continue to engage the science team and to document and trace the technical requirements to their science cases. The STAC would welcome the opportunity to continue working with the Observatory to review the science case flow down for GNAO and provide more detail on which science capabilities (e.g. GSAOI, GIRMOS, etc) they require.

18.15 The STAC is encouraged by the significant progress on the GNAO RTC and AOB sub-contracts. The significantly higher cost than expected for AOB indicates the importance of continued attention to technical management and making tradeoffs between science return, cost and schedule. The STAC looks forward to hearing the result of discussions with NSF regarding additional funding and extension of overall project schedule, as appropriate. The STAC recommends that the Observatory develop a contingency plan in the event that the additional external funding is below project needs.

18.16 The STAC continues to view GNAO as the top development priority. The STAC also supports GIRMOS being developed into a long-term facility instrument behind it, including for imaging. Having GSAOI as a temporary imager could mitigate risk of schedule mismatch, and early communication with users on that timeline along with strong technical management which minimizes the duration of the interim period will be key to the best scientific productivity at GNAO first light, and prior to full GIRMOS commissioning.

STAC Points of Contact:
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Visiting Instruments: Elliott Horch
Default for other issues: Chair

Future STAC Meetings:
The 2020B meeting will be held November 9-10, 2020, with the location to be determined at a later date.