

Report of Gemini's Science and Technology Advisory Committee (STAC), May 2021

The STAC held its twentieth meeting on 10-12 May 2021 by videoconference.

STAC Membership

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

Since the last set of Gemini governance meetings, the Observatory has continued to operate at a high level despite the COVID-19 situation, and has once again made substantial progress toward important Observatory goals. The STAC recognizes the skill of the leadership team and the effort of the Gemini staff at large in restarting operations in the South and operating both telescopes in the current environment since the middle of last semester. The Observatory saw a number of personnel changes over the last few months; the STAC would like to congratulate Dr. John Blakeslee in his new role with NOIRLab, Dr. René Rutten on his return to the Canary Islands, and Ms. Terry Lee on her retirement. We thank them for the many ways they have made the work of the STAC easier and more effective during their time at Gemini. Finally, the STAC welcomes Dr. Janice Lee as the new Gemini Chief Scientist and Dr. Stephen Goodsell in his new position as GNAO Project Director.

20.1. The STAC thanks the Observatory for the information provided in the current instrument report, as well as plans for the future. In particular, the STAC was pleased to see the detailed major breakage analysis of existing instruments. In the context of the long-range instrument plan, we encourage the Observatory to prioritize the maintenance and upgrading of the GMOS instruments as they enter their third decades of service. GMOS remains the most heavily requested instrument in both hemispheres for most or all partners and the instruments are expected to continue to serve the needs of the Gemini user community well into the future. An extended downtime for one of them would adversely affect the largest single fraction of the Gemini community. The STAC looks forward to further updates detailing the possibilities for (maintenance and) upgrading both GMOS instruments and is ready to provide input and assistance if needed.

20.2 The STAC endorses the project priorities presented in the development report as follows: GNAO+GIRMOS, SCORPIO, GHOST, IGRINS-2, GPI-2, GLAO/ASM feasibility, GNIRS Controller, GeMS Improvements, GPOL, IUP.

20.3 From the scientific point of view, the STAC endorses the IDF spending priorities for FY2021-2028 listed in Section 3.1 of the Director's Report. These are: (1) Current IDF commitments (facility instruments, upgrades, project support), (2) GNAO overrun, (3) GIRMOS imaging capability, (4) SCORPIO overrun, (5) Instrument upgrades, (6) Visiting instrument support/MAROON-X conversion, (7) Gen5#4, (8) GLAO/ASM Conceptual Design.

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

2022A: 95% for the South and 96% for the North.

2021B: 83% for the South and 90% for the North.

(The latter is a slightly modified value from our last report.)

20.5. The STAC congratulates the GNAO team on the progress in the past six months in: repositioning the project for GLAO/LTAO and preparing for the June 2021 Review, setting up a competitive procurement process for the AOB, strengthening the project's oversight and organization, and for achieving key milestones with the RTC and LGSF. The STAC encourages the GNAO team to continue to work closely with the GIRMOS team to ensure GIRMOS maintains scope and schedule. Projected overruns of GNAO remain a concern, as they can compromise the overall breadth and timeliness of the Observatory's future capabilities and therefore the science return.

20.6. The STAC continues to see SCORPIO as a key element in Gemini's near-term future, and strongly prefers that SCORPIO be completed without descopes if at all possible. SCORPIO will play a major part in helping the Observatory to fulfill its scientific strategic plan with regard to time domain astronomy. We are confident that the Observatory is taking the right steps at present to bring a fully-capable SCORPIO to the telescope. However, to provide adequate feedback and recommendations, the STAC encourages regular updates on any developments during the next several critical months.

20.7. The STAC was encouraged to learn that implementation of the AEON TAC process is being started and will be in place by 2022B. We have been pleased in our involvement in the project to date and look forward to a more detailed description of the process at the next set of governance meetings in November so that we can give final feedback before the formation of the relevant TACs.

20.8. The STAC supports the idea of a workshop to engage the user community and study the science cases for the ASM. We note that, although there could be competition for time between the ASM and GNAO, the ASM provides gains in a number of areas (for example, wide field, thermal IR, and efficiency gains for existing instruments), and we encourage the Observatory to explore all aspects of the science case.

20.9. The STAC was very happy to see the plans taking shape for a virtual Gemini meeting to be held this summer, and for the in-person meeting to be held in Korea in 2022. The former will keep the user community engaged while travel is difficult, and provides a key opportunity for the Observatory to communicate its latest thinking on the long-range instrument plans and scientific possibilities. We anticipate that the latter will still play a greater role in the dissemination of scientific results. Beyond the immediate plans for this year, the STAC sees considerable value in continuing virtual meetings. Due to its flexible queue scheduling and fast turnaround observations, Gemini is well suited to opportunistic observations that may fall outside of the scope of longer-term funded projects. A virtual meeting, especially with minimal registration costs, provides an ideal venue to publicize results from such programs.

20.10. The STAC applauds the Observatory's efforts to gather data on the gender statistics of proposals and the impact of COVID on the Observatory's workforce. These data will be essential to evaluate the effectiveness of dual anonymous peer review (as already adopted by one partner). The STAC firmly believes that working toward and achieving gender equity, and recognizing the work-life balance

requirements of the workforce, will lead directly to the best possible science done with the Gemini telescopes.

20.11. The STAC is encouraged by the progress that the Observatory has made toward integrating activities into the NOIRLab umbrella. We are particularly interested in further developments to streamline and support data reduction by the user community and the Observatory's role in building an online community for collaborative observations. We note that at present the Gemini Archive is seeing much more use than in the past. We encourage the Observatory to make more higher-level reductions available in more instrument modes.

20.12. Due to the importance of high-quality data products in the near future, we are enthusiastic about the potential of DRAGONS. Nonetheless, we also suggest that the wider adoption of DRAGONS at other facilities will greatly benefit DRAGONS itself, where the documentation, the modular design and implementation, and the interoperability with other efforts are the major keys. Making software development expertise available to the community to assist in building their data analysis environments should be supported, and could be a useful addition to plans for a NOIRLab data center, particularly for those interested in porting DRAGONS to other instruments and/or telescopes.

20.13. The STAC was pleased to hear the outline of the 5-year plan to be proposed to the NSF by NOIRLab at the end of this calendar year, both from the NOIRLab Director's and Gemini Director's viewpoints. We recognize that much of the discussion at this early stage in the process is aspirational, and the coming months will be key to making these concepts more concrete. Members of the STAC have ideas in this regard and are ready to help with that process before our next meeting, if called upon. The goals of the Technology Development Center are very good, but care must be taken not to adversely affect the success of instrument developers who currently take advantage of funding mechanisms such as NSF's ATI and MRI programs in the US, or similar programs for other partners. Finally, we note that there is an important opportunity with regard to the Community Science and Data Center to feed information stored there back into Gemini and other observatories in the NOIRLab system in order to make their nightly operations more automated and efficient.

STAC Points of Contact:

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Visiting Instruments: Elliott Horch

Default for other issues: Chair

Future STAC Meetings:

The 2021B meeting will be held November 15-16, 2021, with the format to be determined at a later date.