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

The STAC held its twenty-first meeting on 15-17 November 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 admirably forged ahead through continued uncertain times worldwide, making progress on a number of important projects and toward strategic goals. The STAC once again commends the Director and her team for its ability to innovate and adapt to these new and constantly changing realities. While much remains to be done and potential future delays on key projects are concerning, this should not detract from recognizing the Observatory's hard work and dedication at all levels.

21.1. The STAC congratulates the Observatory on its successes of the last six months, including (1) the F2/MOS commissioning, (2) the broad participation in the Gemini Virtual Science Meeting, (3) getting GeMS back on sky, (4) the M2 recoating, and (5) the completion of DRAGONS 3.0. Notable progress was also made in the areas of GNAO, GPP, and the dynamic scheduler. All these achievements will have a positive scientific impact in the future.

21.2. The STAC strongly supports the continued planning toward the in-person Gemini Science Meeting, to be held 26-29 July in Seoul. We look forward to a productive and exciting conference.

21.3. The STAC commends the Observatory for tracking proposer gender statistics as the NTACs implement dual-anonymous proposal review. It is very encouraging that the dual-anonymous process seems to be moving us in the direction of overall gender parity. We encourage the Observatory to investigate whether there are remaining biases at the intersection of gender and other factors such as race, career stage, etc. The STAC was also pleased to hear that the Observatory has found minimal effects of the Covid-19 pandemic on the scientific publication rate so far, but encourages the Observatory to continue to monitor this and to update the STAC regularly.

21.4. The STAC endorses the project priorities presented in the Development Report as follows: GNAO+GIRMOS, SCORPIO, GHOST, IGRINS-2, GPI-2, GLAO CoD, GNIRS Controller, GeMS Improvements, GNIRS IFU and GPOL, MAROON-X, IUP.

21.5. The STAC recommends the following science time fractions proposed by the Observatory for the upcoming semesters, specifically

1. Gemini North 2022B: **79.6%.** We recognize that there are two major engineering items in this case: the pending M1 coating, and the GPP XT1.

2. Gemini North 2022A: **95.0%**. Engineering changes include removing XT observing and adding the GNIRS Controller.
3. Gemini South 2022B: **77.2%.** The major engineering items here are: GHOST commissioning, M1 coating, GPP XT.
4. Gemini South 2022A: **95.4%.** The only engineering change here is removal of XT observing.

21.6. Members of the STAC generally reacted favorably to the proposal to take part in the Subaru Service Time program that appears in Appendix C of the Operations Report. We note that Hyper Suprime-Cam (HSC) on Subaru seems to be a queue mode instrument, so this will in theory enable access to all Subaru instruments by queue/service mode. We suggest that the Observatory should explore including HSC in the Subaru Service Time program, if at all possible.

21.7. The STAC read and discussed the proposal to allow greater flexibility in the distribution of Fast Turnaround time that appears in Appendix D of the Operations Report. We find this proposal reasonable, and in particular, helpful to partners with a smaller time allocation per semester.

21.8. The STAC appreciates that the Observatory has shared the GPI-2 CTT agreement draft with us for this meeting. We have made previous recommendations about the parameters of this arrangement both in our biannual reports to the Board and also in a memo that we provided to the Observatory and the Board in July of 2020, when negotiations with the instrument team began. We reiterate our two key recommendations, which have been consistent throughout:

1. The Observatory must work to ensure that the community has sufficient motivation, support, and access to the instrument and to science targets to realize the full scientific potential of the instrument and make it a benefit to the larger Gemini user community.
2. The STAC members are willing to be active participants in the definition of the CTT as well as the review and selection process for the LLP program.

Our limited opportunity to study and reflect on the draft document presented has led us to have some concern that these points will not be fully addressed. We encourage the Board to explore this further from their vantage point. We ask the Observatory to search for ways to more fully implement these suggestions moving forward, one of which could be to accept further feedback from the STAC once we have studied the proposed agreement in more detail.

21.9. The STAC was pleased to hear that SCORPIO remains on track to be completed prior to the beginning of operations by the Vera Rubin Observatory despite the recent delays. The STAC views this instrument as a critical component of Gemini's time-domain capabilities over the next decade. We encourage the Observatory to continue to place a high priority on the on-time delivery of this instrument. The STAC hopes that the Observatory is able to resolve the Request for Equitable Adjustment (REA) issues with SwRI in a timely manner and is looking forward to receiving updates prior to the next STAC meeting.

21.10 The STAC congratulates the GNAO team on their successful June review, their follow-on work in response to those recommendations, and issuance of the AOB RFP. We are pleased to see the addition of Dr. Stephen Smee to the team and welcome him to Gemini. With a new project manager and the award of the AOB contract in the next six months, this will place the project in a strong position.

21.11. We suggest monthly contact between the Observatory and the incoming STAC Chair and Deputy Chair to keep abreast of key issues, mostly Development and Operations (which often change on

timescales shorter than the 6 months between meetings). They will use this information to bring other STAC members into the loop on issues relevant to their contact instruments. These meetings can be small with Scot Kleinman and Andy Adamson as the current primary points of contact, and other Gemini staff brought in as appropriate. This will help to complete a seamless transition from the outgoing STAC Chair, and facilitate better communications between the STAC and the Observatory moving forward.

21.12. The STAC is pleased with the progress made on AEON and the proposed timeline. More details on the AEON implementation, rather than the proposal process, would be beneficial for feedback before rollout in 2022B. We encourage the Observatory to facilitate AEON use through workshops, conference talks or webinars to introduce the new tool to users. We encourage communication with and feedback from the STAC through the ToO points of contact.

21.13 The STAC is looking forward to hearing a presentation about the Observatory's plan for the late-2022 GPP XT call in its next meeting, including details about how the Observatory is planning to widely advertise the call and educate the user base about the capabilities of the GPP system. In particular, the STAC notes the potential overlap of the initial phase of XT and scheduler testing with LIGO/Virgo run O4, and expects significant interest from the MMA community.

21.14: The STAC looks forward to the offering of F2 MOS mode, and hopes the Observatory will make substantial commissioning data available to support the community when this mode is made generally available (presumably for FT time).

21.15. The STAC endorses the 5-year proposal and overguidance being prepared for NSF's consideration.

21.16. We commend the Observatory on the development of DRAGONS so far, which meets a crucial need of user support for the future. We urge the Observatory to move DRAGONS software development forward faster than the current planned timeline, given the increasing obsolescence of IRAF and the barrier this may present to new users. We were pleased to hear that in the meantime, the Observatory is taking steps to provide a cloud-based or virtual machine solution which provides an IRAF portal that is urgently needed. The STAC is concerned that the limited number of instrument modes planned to be supported by DRAGONS in the next few years will limit the scientific productivity of observations in other modes, particularly complex modes of operation such as IFU data. Based on these concerns, we request that the Observatory provide a progress report on DRAGONS development at the next STAC meeting so that we can better understand the existing obstacles to providing data reduction pipelines for the remaining facility instruments.

21.17. The STAC agrees that, given the current situation and the lack of hours that can be allocated to new LLP programs next year, the cancellation of the LLP call for 2022 is a reasonable course of action. We recognize that LLPs require substantial preparation, and thus encourage the Observatory to give as much advance notice as possible before cancelling expected LLP calls. We hope and expect that the call for new LLPs would resume in 2023.

21.18. The STAC finds the very good alignment of the U.S. Decadal Survey and Gemini's Scientific Strategic Plan to be generally very encouraging for Gemini's future. However, as the Observatory moves forward within NOIRLab, it is important to keep in mind that the goals of the Gemini partner communities may not always align with those of NOIRLab overall. The STAC encourages the Observatory to more strongly advocate for and protect the unique science done by all Gemini partners in its role within NOIRLab.

STAC Points of Contact:
ALTAIR & GNAO: Eric Steinbring
F2: Rob Hynes
GeMS: Eric Steinbring
GHOST: Henri Plana
GMOS: Marcelo Mora
GNIRS: Jeyhan Kartaltepe
GRACES: Ashley Villar
GPI-2: Mark Chun
IGRINS2: Jae-Joon Lee
Instrument Upgrade Program: Damián Mast
NIRI: Ryan Chornock
ToOs & AEON: Craig Heinke, Ryan Chornock, Ashley Villar
SCORPIO: Ryan Foley
Visiting Instruments: Chair, until new STAC members are named
GIRMOS: Chair, until new STAC members are named
Default for other issues: Chair

Future STAC Meetings:
The dates for the 2022A meeting have not been finalized as of this writing. Pending Board approval, this meeting will likely be held either May 23-25 or June 6-8, 2022, with the format to be determined at a later date.