

Report of Gemini's Science and Technology Advisory Committee (STAC), December 2024

The STAC held its twenty-seventh meeting on 9-10 Dec 2024, in a hybrid format (meeting in La Serena, Chile, and via Zoom).

STAC Membership

Craig Heinke, Chair	Damián Mast
Breann Sitariski, Deputy Chair	Rene Mendez
Ivana Damjanov	Jenny Patience
James De Buizer	Benjamin Shappee
Maria Drout	Gelys Trancho
Rebecca Larson	Jonelle Walsh
Jae-Joon Lee	Henri Michel Pierre Plana

Congratulations

27.0 The STAC congratulates Gemini on the successful SV for IGRINS-2, and on its coming availability to the community in shared risk mode for 2025A.

27.1 The STAC commends Gemini on resolving the REA with SwRI for SCORPIO and finalizing the time-and-materials contract with FRACTAL for integration and testing. We also extend our congratulations to the team for their diligent efforts in managing the schedule, maintaining vendor follow-ups, and making necessary adjustments. Additionally, we applaud the successful cryostat testing and the significant progress SCORPIO has achieved over the past few months.

27.2 The STAC congratulates Gemini on the success of the GNAO AOB preliminary design review.

27.3 The STAC thanks Rene Rutten for coming back again to serve as Interim Deputy Director, and thanks Diego Correa for his years of service, and wishes them both well.

27.4 The STAC congratulates Gemini on several major software improvements; integration of GHOST and IGRINS-2 software (allowing regular night-time GHOST observations, and successful IGRINS-2 SV); completion of the "Explore" facet of GPP; and initial versions of GOATS and Pygacq, which will enable easier target-of-opportunity observations.

27.5 The STAC thanks Craig Heinke and Maria Drout for their service on the STAC.

Recommendations/Endorsements

27.6 The STAC recommends prioritizing software development and increasing the available FTEs in SUSL. Software support is required for almost all projects in some capacity, and the understaffing issue creates bottlenecks and schedule slips across multiple programs. If Gemini cannot obtain new resources by hiring additional staff or from the broader NOIRLab staffing, they should prioritize completing projects vs. increasing efficiency in operations.

27.7 The STAC recommends that due to:

- (1) the high cost in time and resources of the current mode of GeMS,
- (2) the significant drop in interest from the community, and
- (3) the lack of resources to improve performance,

GeMS upgrades be placed in deep-freeze for the foreseeable future.

27.8 The STAC is hopeful that the schedule for SCORPIO will become more predictable in the coming year. The STAC is impressed with the marked improvement in the progress in the overall SCORPIO project and the transformation from a very at-risk program to a viable program with clearly defined milestones and work schedule.

27.9 The STAC supports the visit of Iqueye to Gemini-South, and hopes that it will be a productive visit.

27.10 Regarding GNAO, the STAC concurs with Gemini on pursuing the second option, which involves the GN AOB team making optical design adjustments now to facilitate a potential future upgrade to an MCAO system. This approach ensures the option for a future enhancement is safeguarded without requiring immediate implementation, while keeping cost and schedule impacts minimal.

27.11 The STAC notes the priorities in the science components of the strategic vision and encourages Gemini to consider engineering complexity and determine how implementing some priorities could positively impact science return (via sensitivity analysis, etc) in the era of the ELTs and the New Great Observatories. The STAC conveys its concern about the pace of progress, unclear process, and the limited details provided on the development of Gemini's Strategic Vision. The STAC requests a progress report that summarizes the outcome of the call for community reports and the criteria for the proposed priority list.

27.12 The STAC understands that the effects from the M2 mirror print-through on GPI-2 performance will be manageable, and that GPI-2 will attain useful results even before the new M2 mirror arrives. The STAC thus recommends that GPI-2 begin commissioning in 2025. Vibration analysis will continue to be an issue that the GPI-2 team must watch carefully.

27.13 The STAC notes the engineering time estimates provided by Gemini for 2025A. The STAC hopes that Gemini will limit the amount of time in engineering and shutdown, preserving as much science time as possible.

27.14 The STAC notes the FY24B Gemini Portfolio Report. The STAC is concerned by the multiple projects with resources “lacking”, or in “shortage”. The STAC hopes that Gemini will reallocate resources from projects that finish to other high-priority projects, avoiding starting new projects where possible.

27.15 The STAC recommends IT improvements including the recent system changes and upgrades following the cyber incident be assigned as an official project (to add to the 23 projects presented in the report) with required deliverables, reports, timelines, and communication of updates to both the STAC and the Board.

27.16 The STAC appreciates the opportunity from Gemini to give feedback on the Rocky Worlds Gemini DD proposal. We suggest that the incoming Director consider the following points in making a decision:

- We recommend that the Director’s Office study the integration times needed in order to complete this program to concretely understand how much of the DD time this would consume, and the impact this would have on community-submitted targets and programs already working their way through the normal TAC process.
- If the Director’s Office is looking for recommendations from the STAC for the use of under-utilized/unutilized DD time, we recommend considering bringing back the Staff-TAC in some form, where the Gemini staff are able to apply for science time internally. This was done in the past and had a positive impact on morale, expertise, and productivity among the crew.

27.17 The STAC agrees with Gemini’s recommendation to include a STAC member in the M2 Servicing review. The STAC recommends sharing the associated document with Breann Sitarski and that she be included in the review.

27.18 The STAC notes the Science Statistics report. The STAC noticed that GHOST and GeMS/GSAOI are missing from the pie charts of facility instrument usage, and would like to see them included next time.

27.19 The STAC recommends the following ranked priority ordering for instrumentation projects:

Green: SCORPIO, GNAO/GIRMOS, IGRINS-2, GPI-2.

These are the **top priorities** for Gemini.

Yellow: MAROON-X Facility Transition, GHOST PRV.

These are areas where Gemini should only support external groups to make progress, and should only use internal resources if those cannot be applied to the top priority projects.

Orange: GLASS. We endorse using limited resources to complete this proposal for additional funding. If additional funding does not become available, this project should be placed on hold/deep freeze.

Red: GPOL, GeMS improvements, IGRINS/MAROON-X shared port, GLASS CoDP
These projects should be placed on hold/deep freeze at this time.

27.20 The STAC recommends that Gemini provide a comprehensive breakdown of projects, clearly detailing the kind of resources required (e.g., Operations, Software, etc.).

To assess project completion or understand the priorities within the Gemini Portfolio, a comprehensive Master Project Plan (MPP) should be utilized, integrating resources from different observatory groups such as Operations, SUSD, and contractors, and providing combined time-scales.

The STAC believes that prioritizing Gemini's initiatives should be based on resource types, with individual priority lists presented for each resource. However, the current information provided to the STAC does not support this level of analysis.

STAC Points of Contact:

ALTAIR: Jennifer Patience, Jonelle Walsh

DRAGONS: Damián Mast, Gelys Trancho,

GNAO: Gelys Trancho, Jonelle Walsh

F2: Ivana Damjanov

GeMS/GSAOI: Gelys Trancho, Breann Sitarski

GHOST: Jae-Joon Lee

GIRMOS: Gelys Trancho

GMOS: Breann Sitarski, Ivana Damjanov

GNIRS: Damián Mast, James De Buizer

GPI-2: Breann Sitarski

IGRINS2: Jennifer Patience, Rebecca Larson

Instrument Upgrade Program: Damián Mast

NIRI: Damián Mast

ToOs & AEON:

SCORPIO: James De Buizer

Visiting Instruments: Rene Mendez (Zorro+Iqueye)

GPMO: Breann Sitarski, Gelys Trancho

Strategic Scientific Plan: Ivana Damjanov, Breann Sitarski

Default for other issues: Chair

Future STAC Meeting:

The dates for the 2025A meeting are planned, pending Board approval, to be in May 2025, in a hybrid format and in Hilo, Hawaii.

