

## **Gemini Observatory Response to November 2011 STAC Report**

Gemini thanks the newly-formed STAC for their efforts to address the wide range of issues that affect the Observatory's scientific success. Gemini responses to the actions and recommendations are provided here.

### **Action 1.1: GHOS**

The STAC intends to closely monitor progress and appoints Nathan Smith to lead the Instrument Science Team for GHOS (& GRACES). Several additional non-STAC IST members will be appointed in the near future.

Gemini> Scot Kleinman, GHOS project manager, will forward monthly project report to Nathan Smith and keep him aware of the dates for the CoDR, to be in May or June 2012.

### **Recommendation 1.2: GHOS**

The STAC strongly endorses having an external independent cost analysis at the time of the further down-select.

Gemini> The AOC-G, as the management advisory body, had raised this issue in conversations with the Observatory. The Development Division will seek an external cost analysis once the three proposals are received.

### **Action 1.3: GRACES**

The STAC intends to closely monitor progress and appoints Nathan Smith to lead the Instrument Science Team for GRACES (& GHOS). Several additional non-STAC IST members will be appointed in the near future.

Gemini> Eric Tollestrup, GRACES project manager, will forward monthly project report to Nathan Smith and keep him aware of the dates for the CDR, to be around June 2012.

### **Recommendation 1.4: GRACES**

The STAC strongly endorses moving forward with this project as a near-term high priority and consulting with the IST concerning on-sky commissioning plans.

Gemini> The contract with CFHT was approved by NSF on Dec 14th. GRACES is continuing to move forward with the signing of a contract with CFHT on December 22, 2011, and the subsequent signing of a sub-contract between CFHT and HIA for the major hardware components required to connect Gemini-N to ESPaDOnS. Gemini and CFHT have also begun developing the software to support Stage 1 of GRACES. The hardware and software components are expected to be completed in October 2012, with integration, testing, commissioning occurring by the end of 2012. Community use, scheduled in blocks of order 5 nights at a time, could start in early 2013. Performance of the system will be monitored through the first semester of use, to determine whether to move forward to Stage 2 (in which the capability becomes much closer to a full facility instrument).

### **Recommendation 1.5: GMOS CCD**

The STAC recommends pushing ahead full speed with the development work for the Hamamatsu devices, including achieving the desired low read-noise. The STAC recommends this first Hamamatsu focal plane be installed in GMOS-S as soon as possible, ideally in the middle of 2012 during southern winter to attempt to minimize lost observing time and bring this capability online as soon as possible. With lesser urgency GMOS-N would then be upgraded from the new E2V chips to a second focal plane of Hamamatsu arrays, likely containing a similar mix of Hamamatsu chips to maximize sensitivity in both the blue and red.

Gemini> Given the need to conduct GNIRS repairs in 2012B, we have postponed the GMOS shutdown for the CCD installation until November 2012. We will work with the STAC and Operations Working Group to decide by the end of February between scheduling GMOS-S or GMOS-N first, contingent on:

- F2 MOS availability during 2012B
- Understanding of cost, risk and schedule of shipping GMOS-S dewar to Gemini North

#### **Action 1.6: GMOS CCD**

The STAC is keen to follow progress on this project closely and appoints Tom Matheson as the point of contact for the GMOS CCD project and requests the observatory forward the monthly project reports to him and keep him informed of developments and decisions that need to be made concerning timeline and order of GMOS CCD upgrades.

Gemini> Scot Kleinman, GMOS-CCD project manager, will forward monthly project reports to Tom Matheson.

#### **Recommendation 1.7: next instrument priority**

The STAC endorses the proposed observatory timeline of presenting a ‘strawman’ instrument concept at the January 2012 AAS meeting, soliciting science white papers in January 2012 for review in March, leading to a final instrument recommendation from the STAC in April to be forwarded to the Board for approval at its May 2012 meeting.

Gemini> The solicitation for science white papers has been issued, with a deadline of March 15, 2012.

We note that this or any other specific instrument must fit within a comprehensive long-range plan. Such a plan should focus on the overall science needs and capabilities, especially recognizing the operational limit of 4 instruments and AO at each site. Gemini is in general concerned the new recommendation has moved drastically away from the previous recommendation by the GSC (to pursue GLAO and a new, appropriate IR imager for Gemini North). The development of white papers is an important step to engage the community more broadly and to assess their support for this change.

Typical costs for GIROS (an instrument like X-Shooter) are in the range of \$15M.

#### **Action 1.8: Flamingos-2**

The STAC intends to closely monitor progress and appoints Karl Glazebrook as point of contact for F2 and requests the observatory forward the monthly project reports to him and keep him informed of developments and decisions that need to be made moving toward SV.

Gemini> The current development project is now complete and closed; Karl Glazebrook has received the final project report. In parallel with the transition into Operations, a set of essential improvements will be required to minimize downtime in the queue. These will be carried out as a defined project before the end of 2012.

**Recommendation 1.9: Flamingos-2**

Recognizing that first impressions of instruments are very important, the STAC encourages the observatory consult with the STAC on the decision of when & how to proceed with the two calls for F2 SV proposals.

Gemini> Percy Gomez, FLAMINGOS-2 instrument scientist, has been working with Karl Glazebrook to develop plans for SV. Gemini will provide technical assessment of the proposals and identify a draft program that fulfills the SV requirements. Karl will lead the STAC sub-committee that will provide the scientific assessment of the program.

**Action 1.10: GeMS**

The STAC intends to closely monitor progress and provisionally appoints Tim Davidge as the point of contact for GeMS and requests the observatory forward the monthly project reports to him and keep him informed of developments and decisions that need to be made moving toward SV.

Gemini> Gustavo Arriagada, GeMS project manager, will forward monthly project reports to the STAC-appointed person.

**Recommendation 1.11: GeMS**

Recognizing that first impressions of instruments are very important, the STAC encourages the observatory consult with the STAC on the decision of when & how to proceed with the call for SV proposals.

Gemini> Benoit Neichel, GeMS instrument scientist, and Rodrigo Carrasco, GSAOI instrument scientist, will be the points of contact from Gemini.

**Recommendation 1.12: GNIRS**

The STAC endorses the Observatory's suggested approach to GNIRS repairs and upgrades, as detailed in the document "GNIRS upgrades summary" dated 1-November-2011. The STAC strongly encourages that the repairs be organized so as to minimize the downtime of this highly subscribed instrument and endorses the observatory suggestion to coordinate GNIRS servicing with the annual northern shutdown.

Gemini> The expected shutdown duration for implementing most of the upgrades mentioned (except IQ and OIWFS) is 4 months. Some current problems with mechanisms may be signs of

more fundamental issues. Thus, to reduce potential long-term damage to GNIRS and to avoid an unplanned emergency shutdown, we will start GNIRS servicing in July 2012.

**Recommendation 1.13: Altair**

The STAC recommends that the observatory, via the Gemini web page, NGOs, and STAC, be sure to publicize the availability and performance of this new PWFS T/T mode as soon as possible.

Gemini> Julian Christou, project manager for this new facility, will lead commissioning in January and February. We anticipate having this mode available for regular use 2012B.

**Recommendation 1.14: Altair**

The STAC endorses the observatory's proposed upgrades as described in "Altair Upgrades Summary" (1-Nov-2011) and welcomes the expected improvements in performance and reliability.

Gemini> The Development Division will plan the work through 2012B.

**Action 1.15: Altair**

The STAC appoints Henry Roe as the point of contact for Altair and its upgrade project and requests the observatory forward the monthly project reports to him and keep him informed of developments and decisions that need to be made concerning timeline and order of Altair upgrades.

Gemini> As above, the Development Division will plan the work through 2012A. We will forward project reports to Henry Roe, which will begin when the project enters the execution phase.

**Recommendation 1.16: GLAO and future of AO at GN**

Given the evolving funding situation and importance of developing instrumentation plans within the current and coming budget realities, the STAC recommends the observatory explore additional, less expensive, options for future AO on Gemini North. These might include a significant upgrade of Altair to allow a wider patrol field and significantly fainter guidestars or an Altair-2 focused on narrow-field higher-strehl operations. Other creative options seem likely to exist. The STAC requests that the observatory pursue additional options for the future of AO at Gemini North so that the STAC can begin to consider them and discuss them with the community at the User's meeting in July.

Gemini> Gemini will explore a range of options for future AO development, with the AO workshop in Victoria June 18-19 and the Gemini Science and Users' Meeting in San Francisco July 17-20 key venues for community discussion. Given the long timescales for development, the desired direction should be established soon. Henry Roe from the STAC is involved in planning for both of these events and can encourage useful feedback for the STAC. The workshop will address both GLAO and other possibilities, with an aim to develop scientific support for the various options, which will be discussed further at the Science meeting.

The Observatory and the STAC have an obligation to generate ideas and strategies that will keep Gemini at the forefront of science a decade from now and later. While we must be realistic and work within limited budgets, we should not neglect to cultivate the creativity that will ultimately produce more powerful tools for community science use. A decade ago, MCAO was a risky and ambitious endeavor, and the community is now poised to reap its benefits. One further consideration for the Observatory and the STAC is to maintain a strong AO support team, both to continue to utilize existing systems effectively and to have expertise to develop new ones for the future. We can fulfill these goals by pursuing viable and interesting AO program.

**Action 1.17: GLAO and future of AO at GN**

The STAC appoints Henry Roe as PoC for AO on Gemini North.

Gemini> The Observatory will keep Henry Roe informed of AO considerations for Gemini North. The former AO Science Working Group had provided useful and detailed analysis of AO questions. We recommend that the STAC consider reviving this working group to bring additional expertise to the Committee, ideally in advance of the June workshop to facilitate their participation.

**Recommendation 1.18: A&G-2**

The STAC endorses the plan to move forward with replacement A&G units, however recommends moving forward with identical (non-GLAO capable) units in North & South.

Gemini> The core requirements and effort for the replacement A&Gs will focus on the non-GLAO capable design. The results of feasibility studies to assess the design of a dichroic compatible for GLAO and to repackage GCAL as part of the A&G stack of modules will be completed in early 2012 but will not be part of the core requirements.

**Recommendation 1.19: Detector controllers**

The STAC endorses the proposed approach in the document “Detector Controller project” (4-November-2011) of investigating the several controllers available for purchase. The STAC requests a progress report on this project at future STAC meetings.

Gemini> This project aimed at replacing the GNIRS controller within the next 18 months will be planned starting in 2012 Q2. Real work will start after the first Hamamatsu CCD installation (given personnel conflicts). If NIRI is refurbished, it would be a logical second implementation of the controller.

**Recommendation 1.20: F2T2**

The STAC endorses the concept of exploring how the tunable filter could be incorporated into Canopus and then be used by either F2 or GSAOI. The STAC requests a progress report on this project at future meetings in 2012 so that it can make an informed recommendation in 2012 about whether/how to proceed with installation in 2013.

Gemini> We will provide more information about the technical feasibility (working with University of Toronto) and practicality (given expenses and effort at the Observatory) for the April 2012 STAC meeting.

**Recommendation 1.21: NIRI**

The STAC requests a report for its April meeting on what resources would be needed to upgrade NIRI and continue its life as an imager beyond the end of 2012. In the meantime the STAC appoints Henry Roe as point of contact for NIRI and request the observatory keeps him informed of NIRI developments and decisions.

Gemini> Eric Tollestrup will lead this effort and will provide information for the April meeting.

**Prioritized list of projects**

1. F2 commissioning
2. GeMS commissioning
3. Hamamatsu -> GMOS-S (presuming no technical difficulties with going South first)
4. GPI
5. GHOS
6. GRACES
7. Develop options for keeping NIRI alive for imaging
8. A&G replacement
9. Next instrument (post-GHOS)
10. GNIRS repairs
11. Altair upgrades as proposed
12. Investigate next-gen mid-priced AO for GN
13. Detector controllers
14. Hamamatsu -> GMOS-N
15. Further investigate F2T2 -> Canopus bench

Gemini> Overall, we will work in alignment with these priorities. We note that there will be some temporary reordering; e.g., GRACES will have priority over GHOS during the implementation phase (2012Q3-Q4). We look forward to a more extensive discussion in April to distinguish between timeline and priority, and to identify short-term priorities to resolve cases of resource conflicts and long-term goals for the Observatory.