GEMINI OBSERVATORY

Office of the Director
Gemini Observatory: Teaching Humanity about the Universe

Northern Operations Center
670 N. A′ohoku Place
Hilo, Hawai′i 96720

Phone: (808) 974-2514
Fax: (808) 974-2599
Email:dsimons@gemini.edu

To: Simon Morris – GSC Chair
From: Doug Simons
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Subj: Response to 2007 GSC Report

Introduction

In accord with the new GSC Terms of Reference, through this letter I would like to summarize the Observatory's response to the recent GSC report stemming from the October 2007 GSC meeting held in La Serena, Chile. First though I would like to thank all of the GSC members for their support of Gemini by participating in this important committee. The Gemini Directorate and Board both rely deeply on the guidance the GSC provides on matters of scientific priorities and direction and I look forward to working closely with the GSC in the future.

Future Priorities

As expressed during the past GSC meeting, the Observatory now uses a comprehensive task definition and prioritization process to allocate precious resources on a regular basis. This process culminates each year during the 3rd quarter with a planning retreat in either Chile or Hawaii (the venue for our next retreat). We invite the GSC to send at least 2 representatives to this retreat to (1) make sure the GSC has direct input to the Observatory plan and (2) give the GSC visibility into our entire planning process. My responses below are substantially derived from the details of our 2008 Observatory plan which is comprised of band 1 (2008 tasks), band 2 (2009 tasks unless sufficient resources are identified earlier in 2008), and band 3 (2010-2012 tasks). I anticipate posting a letter to our community on Gemini's web site in early 2008 to briefly explain the need for and methods behind our planning process, a high-level summary of the tasks we plan to pursue in 2008, and an explanation of why we cannot pursue many desired tasks due simply to resource limitations. In any event I believe the 2008 Observatory plan is responsive to the GSC's recommendations, as I explain in some detail below.

Red CCDs for GMOS – There has been a long standing (5+ yr) need to upgrade the GMOS CCDs and for most of that time the principal action the Observatory took to address this need was to pursue new devices via the UH led Phase 4 MIT/LL CCD consortium. That effort has regrettably not produced devices that meet our needs, hence the Observatory has been looking elsewhere to find competitive red-sensitive CCDs. To date the best option we have been able to identify are the LBL CCDs (per Joe Jensen's report to the GSC). Accordingly a band 1 task has been defined within the Observatory plan by our development program team to establish procurement details, hardware and software requirements, funding needs, and labor demands required to actually implement this upgrade. This task is currently programmed to be completed by mid 2008. To be clear, no commitment has been made yet to perform this upgrade but the Observatory does commit to develop a detailed project plan from which we can determine exactly how and when to insert this important project into our overall observatory plans. I would also like to emphasize that, based upon past experience, retrofitting new CCDs in GMOS is a major undertaking and will likely require assembling a laboratory test system to fully characterize the

new CCD mosaic before it is installed into either GMOS to ensure that all the new hardware and software needed to run LBL devices in GMOS function correctly before we shutdown a key instrument for a lengthy period of time to perform that actual upgrade.

ALTAIR/LGS – A number of options to improve the performance of the ALTAIR/LGS system were discussed during the last GSC meeting and are listed in the GSC's report. The Observatory regards its AO systems at both sites as key elements in its long-term commitment to provide the Gemini community with state-of-the-art research tools. We have made *significant* investments over the past decade in our AO systems and will continue to pursue such technologies aggressively in the future, consistent with the design philosophy of Gemini as a high-resolution facility. Between launching the ALTAIR/LGS system, pursuing various upgrades for that system, and building MCAO, I have placed as a high priority getting the Gemini-N laser AO system operating reliably and efficiently in its baseline configuration on the expectation that getting ALTAIR/LGS fully operational is a prerequisite for getting a much more complex MCAO system operational. This approach is consistent with past AOSWG recommendations. We have therefore defined a band 1 engineering task to address a "punch list" of improvements identified by our AO sci-op's team that will streamline the operation of ALTAIR/LGS on the sky. Once these improvements have been made to our baseline system we will look seriously into making upgrades on ALTAIR/LGS in the context of our observatory plans and consistent with the GSC's recommendations. Among these I place as highest priority expanding the sky coverage for the system as I suspect the biggest science gains would be realized by enabling more science targets in the sky. Secondary to that would be to improve the delivered strehl, which would benefit NIRI based observations but have limited impact with NIFS.

MICHELLE – Several band 1 tasks have been identified within our Observatory plan to bolster our MIR capabilities. These include (1) a task to address image elongation noticed while chopping, which is believed to be due to synchronization problems between M2 and the PWFS used to derive guide signals, (2) a task to significantly upgrade MIR performance by increasing the chop throw and support off-chip chopping, (3) a major project to replace the M2 control system hardware and software in an effort to increase its reliability and maintainability, and (4) installation of a water vapor monitor at Gemini-S to facilitate better execution of MIR programs. These 4 projects all reflect the Observatory's commitment to providing our community with the best ground-based MIR platform in astronomy. A decision to provide dual beam guided chopping will await further analysis of sky coverage possible with this mode and will likely be assessed against other competing projects during the next planning retreat.

NICI – The Observatory remains committed to completing NICI commissioning with the goal of starting the NICI planet-search campaign in 2008A. Tests conducted to date using the new UH provided DM have been extremely encouraging. Progress in general with NICI though has been slower than preferred due to problems with NICI's thermal electronics enclosures, cryo-coolers, and array controllers, all of which are being addressed. The next key step in NICI commissioning is to exercise the high-level S/W used to coordinate NICI's control system with the telescope's to yield streamlined science operations. A go/no-go decision to start the NICI campaign will be made after consultation with the Planet Finding Working Group (PFWG), which is scheduled to be formed in early 2008. I will seek guidance from this group (a sub-group of the GSC) once we have sufficient on-sky commissioning data to realistically evaluate NICI's performance and assess that in the context of what will likely be needed to achieve the goals of this major campaign.

FLAMINGOS-2 – The Observatory is awaiting the arrival of this highly anticipated instrument from the University of Florida. We have assigned to band 1 priority the task of acceptance testing FLAMINGOS-2 at Gemini-S (which includes on-telescope tests), pending the successful completion of pre-ship AT for this instrument. Science commissioning of FLAMINGOS-2 has been assigned band 2 status. A decision

about promoting this key step to band 1 status awaits completion of all acceptance testing. The Observatory concurs with the GSC that this instrument should be extremely popular with the community but given delivery challenges are only committing at this point enough band 1 resources to ensure we complete acceptance testing in 2008.

MCAO – This project has been partitioned into 4 phases, the first 2 of which have been assigned band 1 status and take the project through full integration of all subsystems on the telescope. Like FLAMINGOS-2, this would leave us in the position to start on-sky commissioning but we are not committing the commissioning resources at this time, pending completion of these precursor tasks. Once science commissioning begins we will rely on GSAOI exclusively. Commissioning MCAO with FLAMINGOS-2 will be treated as a secondary (but still important) priority to getting the baseline MCAO system working with a state-of-the-art imager like GSAOI. If we have a resource conflict between commissioning MCAO and FLAMINGOS-2, then the priority will be given to FLAMINGOS-2 on the expectation it will be simpler to commission (therefore much faster) and the demand from the community so strong that this up-front investment will be well worth it.

GNIRS – This was assigned mission critical band 1 ranking among Gemini engineering's 2008 program. GNIRS was the most popular NIR instrument offered to our community and we anticipate it regaining that status once it is repaired and commissioned again at Gemini-N. To ensure resource availability GNIRS was moved already to the HBF lab, where we have an extensive lab facility, including a flexure rig and clean room, to accommodate the GNIRS repairs. At this time, given the extent of the damage to GNIRS, we expect to have this instrument on Gemini-N in early 2009.

Aspen Program – The Observatory provided the Board for approval during its November 2007 meeting all the contracts needed to proceed immediately with both WFMOS studies and the construction phase of PRVS. Regrettably, the news of the UK's intentions to withdraw from Gemini set back the approval process. The Observatory is nonetheless working closely with the Executive Agency and Board to expedite the start of the WFMOS studies (the highest priority element of the Aspen program) and we remain hopeful that they will be started in early 2008.

Low over subscriptions at Gemini-S – The Observatory shares the GSC's concerns about the relatively low over subscription rates at Gemini-S. The reasons for this are no doubt complex and involve everything from partner interests in specific N/S targets to instrumentation available at each telescope. We nonetheless expect that with the release of NICI, FLAMINGOS-2, GSAOI, and MCAO, there will be a large demand for time at Gemini-S, so view this as a temporary and manageable situation. In the mean time, we agree that it would be helpful if the NGO's would raise the awareness of their communities about the availability of time at Gemini-S.

Data Reduction – The Observatory is launching a major project called DataFlow which we expect will simplify and streamline data reduction for our community. This project just successfully passed its CoDR this month and we anticipate significant progress with developing its various components during 2008 and 2009. Incorporated in DataFlow is the migration of our IRAF data processing modules to PyRAF – a more modern and flexible processing environment that Gemini is developing in collaboration with STScI. We therefore believe we have sophisticated improvements to our data reduction tools identified which will greatly help our community process Gemini data.

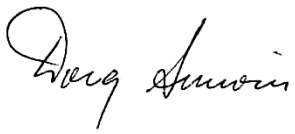
Web pages – The Observatory recognizes that our web pages substantially represent our "front door" to our highly distributed community and therefore must be well organized and up to date to properly inform and support our community. Accordingly we have been investing considerably in-house to overhaul our web pages. Since the GSC meeting the first major product of this effort has been released. Guests to

www.gemini.edu will now find completely new and improved web pages describing Gemini's instrumentation. More such improvements are anticipated in the future.

LRP – As expressed during the October 2007 GSC meeting, for a range of reasons Gemini needs to develop its long range plans. Once adopted these plans will be integrated into our near (1 yr) and mid-range (5 yr) plans to ensure reasonable continuity in the allocation of resources to various tasks designed to support long range objectives. The LRP envisioned will include science, engineering, development, and administrative components since all of these divisions within Gemini must function together to meet the scientific aspirations of our community. An initial draft needs to be ready by Q3 2008 for review by the next Gemini Visiting Committee. From there we will make adjustments and further flesh-out the plan before incorporating it into our next 5 yr budget proposal (2010). I look forward to working closely with the GSC to develop the science component of our LRP.

There are a number of other issues identified in the GSC report that I felt were minor compared to those identified above. If clarification is needed by the GSC on any topic raised in the GSC report I encourage members to contact me directly and I will be happy to provide a response.

Aloha,



Dr. Douglas A. Simons
Director
Gemini Observatory