Gemini Science Committee (GSC) Report
October 2009

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Membership and Conflicts of Interest

Timothy C. Beers, Michigan State University (None)
Scott Croom, University of Sydney (None)
Rene Doyon, University of Montreal (GPI)
John Lacy, University of Texas (None)
Paulina Lira, University of Chile (None)
Ross J. Mclure, University of Edinburgh (None)
Christopher C. Packham, University of Florida (Flamingos 2, T-ReCS)
Caty Pilachowski, Indiana University (None)
Suzie Ramsey, ESO (None, attending by Phone)
Henry G. Roe, Lowell Observatory (None)
Laerte Sodre, University of Sao Paolo (None)
Alan Stockton, University of Hawaii (GLAO, NICI, NIRI)
Chris Willott, Hertzberg Institute of Astrophysics (GLAO, GMOS, Flamingos 2, Altair, GPI)
1.1 Attending from OpsWG
Ilona Soechting, Oxford University (None)

1.2 Attending from Gemini
Gustavo Arriagada
Dennis Crabtree
Stephen Goodsell
Inger Jorgensen
Scot Kleinman
Manual Lazo
Nancy Levenson
Bernadette Rodgers
Doug Simons
Andrew Stephens
Eric Tollestrup

1.3 Additional Attendees for Instrument Discussion (10/14)
Wako Aoki, NAOJ
Colin Aspin, University of Hawaii
Robert Blum, NOAO
Masa Hayashi, Subaru Telescope
Tom Matheson, NOAO
Richard McDermid, Gemini
Andrew McWilliam, Carnegie Observatories
Richard Meyers, University of Durham (by phone)
Simon O’Toole, Anglo Australia Observatory
Nathan Smith, UC Berkeley
Verne Smith, NOAO
Naruhisa Takato, Subaru Telescope
Hiroshi Terada, Subaru Telescope

2 Matters Arising

Director Simons reported on the present state of affairs at the Gemini Observatory, reviewed recent resolutions from the Gemini Board, and outlined the topics which he hopes the GSC will address in this report, and going forward over the course of the next year.

The three main areas are:
1. Advice on current priorities to be included during the upcoming planning process
2. Further development and refinement of the Long Range Plan (LRP)
3. Plans for next generation Gemini Instruments

These topics have been considered in detail in the report below. Current copies of the relevant documents are included in appendices.
3 Scientific Productivity

Nancy Levenson summarized contributions to science results from members of the partnership over the course of the past year, supplemented by short (1-2 slide) presentations from individual GSC representatives. Included in these summaries were:

- First images of planetary “family”: *Marois et al. 2008 Science*
  - Two planets discovered with Gemini NIRI/ALTAIR
  - Third planet found with Keck and confirmed in Gemini data

- Weather on Titan: *Schaller et al. 2009 Nature*
  - Monitoring cloud activity on IRTF triggered ToO with NIRI/ALTAIR
  - Instigated clouds that may account for surface features below unstable convective regions

- Most distant observed galaxy (z=8.2), host of GRB 090423: *Tanvir et al. 2009 Nature*
  - Photometric redshift from NIRI ToO observations

- First generation of star formation in z=4.9 galaxy: *Swinbank et al. 2009 MNRAS*
  - NIFS observations of lensed galaxy
  - High star formation rate; low mass in stars (compared with dynamical mass)

  - 29h GNIRS/GS observation confirms lack of star formation and large mass

- No $^6$Li in exoplanet host stars (bHROS/GS): *Ghezzi et al. 2009 ApJ*
  - $^6$Li/$^7$Li < 0.02-0.0; less than 0.25 -0.70 M$_{Jup}$ metal-rich material accreted

- Finding new obscured SNe in luminous IR galaxies: *Kankare et al. 2008 ApJL*
  - Discovered with NIRI/ALTAIR; extinction affects estimates of star formation

The GSC is pleased with the exciting nature of the science highlights presented at the meeting, and urges the partnership to continue expanding its efforts to encourage this trend in the future.

Denis Crabtree showed updated versions of the refereed paper productivity and impact indices of the Gemini Observatory as compared to other large telescopes (pertinent figures shown in Appendix A). The GSC felt that improvement in productivity has been continuing apace, and effective scientific use of the Gemini telescopes is clearly being made.
Current Status for Instruments and Telescope
Commissioning and Improvements and Priorities for
Gemini Planning

The GSC received a complete report on the status of the development and upgrades of Gemini instruments from Eric Tollestrup.

A thumbnail summary of this report follows:

NICI
NICI campaign (PI M. Liu) currently underway (see report from Rodgers below)
NICI available for general use as of 2009B
Upgrades in planning stage include dichroics to replace 50/50 mirror, additional filters, optimized spider, pupil, and focal plane masks (mostly) delivered, installation soon
A spare DM is in the procurement process

Flamingos-2
First light images have been obtained
Acceptance testing on telescope now underway / completion expected by end of 2009
Several problems remain – most serious being a failing detector array
Current plans are to go forward with a phased partial commissioning (imaging first, then spectroscopy) for users that would not be affected in a major way by the failing array
A temporary shutdown is planned for 2010, in order to replace failing array
A new Hawaii-2 array ordered, delivery expected by end of 2009

GNIRS
GNIRS repairs continue as a high priority, with considerable progress being made
New science array and additional engineering grade array purchased
Mechanism and MUX tests underway
OIWFS testing now complete
Optical and other assemblies aligned
Motors and sensors warm tested, shown to be functional
Vacuum testing complete, cold tests underway
The lens coating problems continue to be investigated – the current plan is to move forward with a mix of coated and uncoated optics, with the uncoated optics to be replaced with coated optics in the future
Acceptance testing is planned for February 2010
Anticipated that GNIRS will be on telescope by April 2010
Offered for general user in 2010B or possibly 2011A
GMOS-N

New Hamamatsu CCDs with substantially improved red response have been selected, and are now in process of having specifications verified
Contract issued to HIA for integration and testing
Expected delivery mid-2010, with installation and testing to follow immediately

GPI

Construction of GPI is now underway
Some problems remain with vendor for the MEMS
Installation and testing to start early 2010
Acceptance testing anticipated to be completed end of 2010

GeMS (MCAO)

Progress continues apace
Laser testing underway, delivery of Gemini laser still scheduled for late 2009
Canopus AO bench in process of being upgraded
Depending on delivery, other potential delays, targeting science commissioning in 2011A

The GSC is generally pleased with the overall effort on instrument development, and has highly ranked several of these projects for the Gemini planning effort in the coming year (see below). The primary concern is that real progress must be seen, in the form of making repaired, new, and upgraded instruments available to the user community as soon as possible.

Simons pointed out that the management of community expectations on progress with current instrument development and upgrades could probably be done better. This should be the subject of a future GSC telecom to flesh out plans.

Gemini> Progress has been substantial on several instrument development fronts and Gemini will communicate progress more frequently and through more channels in the future.

5 Operations Status and Report of the OpsWG

The GSC received an update on the current status of telescope operations from Dennis Crabtree. He reported that the queue is working well, though meeting the targeted goals of completed projects, in particular for Band 2 programs, remains challenging.

The exercise of rebalancing queue assignments in order to achieve proper partner shares, when integrated over several years, is basically working well. Discussions followed of what issues remain that might prevent optimal queue operation. Central among these appear to be the lack of queue planning software that would relieve the Gemini staff from having to manually manage crucial details (such as balancing of requested RA ranges with available time, and keeping track of partner time assigned to the queue), which consumes a lot of staff resources that could be better used in other ways. The GSC expressed a desire that the acquisition or development of this software be given a high priority in the coming year, as a well working, well optimized queue is at the heart of providing the community with an effective Gemini Observatory.
Gemini> The Observatory acknowledges the importance of this new software, the formation of which has always been prioritized in the broader context of a large range of software development activity at Gemini, including that needed to control new instrumentation that is also in high demand.

Discussions followed of ways in which users (especially students) could be better motivated to develop “ownership” of data acquired in queue mode, perhaps by travel to the telescope to actively participate in data taking along with telescope operators. It may be as simple as having the Gemini Observatory remind all successful queue observers that they are welcome to visit, in particular at times when “their” data is planned to be acquired, to the extent that is possible. The GSC encourages Gemini to pursue this approach.

Gemini> The Observatory has always welcomed visitors and particularly encourages those who can come for extended periods to interact with the science staff (e.g. Phase II and data reduction help), and remain available to participate in the execution of their observations in the queue.

Ilona Soechting presented recommendations from the OpsWG (see copy in Appendix B). The GSC generally endorses these resolutions, pending further discussions.

6 Update on NICI Campaign Progress

Bernadette Rodgers provided the GSC with an update on the current status of the NICI planet finding campaign (PI: Liu). The NICI campaign has been underway for two semesters thus far, receiving 12 nights in 2008B, and 24 nights in 2009A. The campaign is about to restart for 2009B.

The science team reports that they have been very satisfied with the quality of data obtained thus far. Some members of the science team have been very dissatisfied with the way that the team has been managed. Reports suggest that there is little or no communication between the full campaign team, and that there are serious hurdles to full involvement of the team members. The GSC is concerned about this apparent failure within the campaign team management, and would like to see these issues addressed quickly. We ask that a review of the NICI campaign be held at the earliest opportunity, which appears to be either December 2009 or January 2010. This should include both a scientific and management review. We request that the Board promptly respond to this review and a clear recommendation be made as to whether or not to continue with the campaign.

Gemini> The NICI campaign will be reviewed by the PFWG in early 2010, as previously planned. The Observatory looks to the PFWG to assess the scientific progress made to date in the survey and to make a recommendation about continuing the survey in 2010. The management concerns this project raises will inform the organization of future campaigns with new instruments.

7 Report on ALTAIR Performance

Dennis Crabtree presented slides from Julian Christou on the current performance of the ALTAIR module on Gemini-N, which summarized ongoing characterization of the vibration behavior that appears to be limiting optimal results. The report has identified clear resonant modes, but their source has not yet been tracked down.
A detailed discussion of ALTAIR performance with AOSWG chair Richard Meyers (by phone) followed on 10/14. Meyers presented the encouraging news that recent tests of ALTAIR with NIFS indicated substantially better performance than the competing AO IFU instrument on Keck (other than the size of the field of view). This discussion led to comments from the GSC concerning the desirability of a dedicated effort to establish if a cost-effective solution to question of increasing the usable ALTAIR field of view could be found. This is of sufficient interest to the GSC that a sub-committee will be formed in the near future to carry out a focused inspection of this question, possibly leading to a recommendation for a more developed feasibility study. Beers will solicit membership for this sub-committee from the GSC soon.

Gemini> The Observatory welcomes further study of the feasibility of increasing the patrol field of ALTAIR's tip/tilt sensor. It is clear that this is a limiting factor in the sky coverage of the system, which when optical conjugated to the ground layer yields a considerably smaller (~25" radius) patrol field than ALTAIR was nominally designed to provide. At the moment the Observatory expects modifications required to bring the guide field up to 2 arcmin (dia) would be large and probably shutdown access to ALTAIR for extended periods and this loss of access should be factored into any future upgrade plans. Likewise it is important to note that demand for ALTAIR, even in its current state is high, approaching the maximum reasonably allowed given dark sky constraints and the need to use other Gemini-N instruments optimally.

8 Enabling Large Programs with Gemini

The GSC was presented with a document developed by Dennis Crabtree detailing a plan in response to Gemini Board resolution 2009.A.4, calling for plans that foster large (or key) science programs with the Gemini Observatory. The present plan was discussed, and as it became clear that several elements might benefit from further GSC consideration (so that a GSC-approved plan might be presented at the November 2009 Gemini Board meeting), a sub-committee led by Henry Roe was established for this exercise. After offline consultation with a number of GSC members, a draft recommendation from the GSC was developed and circulated to the full GSC (see Appendix C).

Gemini> The Observatory thanks the GSC for working collaboratively and rapidly to develop a proposal to enable Large Programs at Gemini. While generally well received by the Board, several outstanding issues remain in the proposal, as articulated in Board resolution 2009.B.11. The Board is constituting a sub-committee with representation of the Board, GSC, and Observatory to resolve these remaining issues before adopting a new Large Program policy, requesting an initial report from the combined subcommittee by May 1, 2010.

9 Priorities for 2009 Gemini Planning

The GSC devoted a considerable amount of time in order to identify and rank the relative instrument development priorities for Gemini planning for the coming year. It was felt that, unlike in previous years, it was not necessary to merge lists for Gemini-N and Gemini-S, so parallel lists were developed. The following priorities were delivered to Doug Simons in time for inclusion in the Gemini Planning Retreat which followed the GSC meeting (10/15-10/16).

Gemini-N 2009 Instrumentation Priorities from the GSC

1. GNIRS Repairs
2. GMOS-N CCD Upgrade
3. NIRI / GNIRS detector controller replacements
4. ALTAIR -- Error budget analysis leading to action plan to improve strehl and FWHM
5. ALTAIR LGS -- Investigate LGS operation without tip/tilt star
6. ALTAIR – Conduct feasibility study for increase in field of view
7. GNIRS and GMOS-N -- blind offset improvements
8. MICHELLE -- Investigate feasibility and impact, with a view to implementation of dual beam chopping/guiding (improving IQ and a 22% boost in S/N)
9. MICHELLE
   a. Chop throw to 30”
   b. Spectropolarimetry

Gemini> The Observatory agrees with the priorities recommended by the GSC and has factored these into the 2010 Observatory plan. Completion of GNIRS repairs and commissioning of this key facility in 2010 remains the top priority for development activity at Gemini-N. We also anticipate completing the upgrade of the GMOS-N CCD mosaic with fully depleted red sensitive devices.

Gemini-S 2009 Instrumentation Priorities from the GSC

1. FLAMINGOS-2
   a. Commissioning
   b. Science Verification, as soon as possible with maximal availability to the community
2. MCAO
   a. System Verification
   b. GSAOI
   c. FLAMINGOS-2
3. GMOS-S – CCD upgrades
4. GMOS-S -- blind offset improvement
5. NICI -- Upgrades
6. T-ReCS – leveraging from Michelle improvements (above)
   a. Dual beam chopping/guiding
   b. Increase chop throw to 30”

Gemini> The Observatory agrees with the priority recommendations of the GSC and has factored these into the draft 2010 Observatory plan. Bringing FLAMINGOS-2 on-line remains the highest priority for Gemini-S development activity. MCAO work will also proceed, albeit at sub-optimal FTE levels due to resource limitations.
**10 Long Range Plan**

The GSC has been working with the Gemini Directorate over the past two years to develop a draft Scientific Long Range Plan. Of course, this has also been a time over which discussions concerning the nature of future instrumentation, possibilities of changes in the partnership, and the role of Gemini in the context of next-generation telescopes have been raised. As a result, the GSC has been continuing discussions of the existing LRP, with a view toward producing a more complete, forward looking, and partnership-driven document.

It is the hope and expectation of the GSC to finish these discussions over the course of the next few months, in time for a report to be delivered at the May 2010 board meeting. To accomplish this, Beers plans to solicit members of the GSC to form a sub-committee to draft a new version of the LRP, which will serve to (hopefully) converge the rest of the GSC toward the final plan.

The current version of the LRP is provided in the Appendix. It is clearly out of date, but is provided here just to inform the GSC of its present form.

*Gemini*> Per the November 2010 Board meeting, in which the time scale for developing a recommendation on future instruments has been accelerated by ~6 months, the LRP will have to be completed by May 2010 if it is to be usefully factored into Board/Observatory deliberations during the May 2010 Board meeting.

**11 Frequency of GSC Meetings**

Members of the GSC expressed a desire for more frequent face-to-face meetings, rather than the single (northern) fall meeting per year format. This is an especially fast-moving period for Gemini, and it was felt that more effective communication with the Director and Board could be achieved with the addition of a second meeting per year, timed so as to precede the Board meeting in the (northern) spring. Plans for a meeting prior to the May Gemini Board meeting should begin soon.

*Gemini*> The Observatory is open to a range of mechanisms to increase the level of communication between Gemini, the GSC, and our community. This could include more frequent telecons and/or face-to-face meetings, within the constraints of budget/schedule that make such meetings feasible.

**12 Plans for Future Instrumentation Development**

The GSC has been having extensive discussions over the past year on the topic of future instrumentation for the Gemini Observatory. These discussions led to an (originally) prioritized list of suggested instrumentation, developed during the course of multiple telecons. Beers presented this list, looking for additional discussion, and ultimately to a GSC vote on it. Here is the list as presented:
1) Optical High-Res (R > 15000)
2) IR High-Res (R > 15000)
3) X-Shooter type (Multi-wavelength spectrograph)
4) Planned replacement of aging instrument(s)
5) OH Suppressing Imager/spectrograph
6) GLAO development

It became clear that members of the GSC did not feel prepared to carry out such a vote, so discussion ensued concerning how best to go forward. This discussion benefited from the contributions of a number of non-Gemini attendees, who were asked for their own perspectives on this question.

Members of the GSC attempted to solicit information from their constituencies, but not all partners felt they were able to sample a sufficiently large fraction of their users to be confident of their national priorities. So, it remains that a final GSC recommendation will have to be postponed until this goal can be met.

During the course of this discussion, a summary slide of the US ALTAIR report, assembled by Verne Smith, was shown. That slide is reproduced here:

**U.S. Desired Capabilities (rank-ordered): Distilling ALTAIR to one slide**

*What instrument capabilities will be important for your research in the long term? Fill in the gaps with new instruments or time trades, plus consider upgrades.*

(sum of $1^{st} + 2^{nd} + 3^{rd}$ priorities)

- Optical/ Multi-object spec. (R<15,000) 102 GMOS
- Optical/ Wide-field imaging 88 GMOS
- Optical/ Single-object spec. (R>15,000) 81 GMOS
- Optical/ Single-object spec. (R<15,000) 60 NIRI (LGS), GSAOI + F2 (MCAO)
- Optical/ Multi-object spec. (R>15,000) 59 FLAMINGOS2
- NIR/ Single-object spec. (R>15,000) 58 NIRI, GSAOI, FLAMINGOS2
- NIR/ Diffraction-limited imaging 53 GNIRS, NRI, FLAMINGOS2
- NIR/ Multi-object spec. (R<15,000) 49 GMOS
- NIR/ Seeing-limited imaging 42 NIFS
- NIR/ Single-object spec. (R<15,000) 41 NICI, GPI
- Optical/ IFU imaging and spec. 37 TReCS, MICHELLE
- NIR/ IFU imaging and spec. 32
- NIR/ Multi-object spec. (R>15,000) 32
- NIR/ High-contrast diffraction limited imaging 30
- MIR/ Single-object spec. (R<15,000) 20
- MIR/ High-contrast diffraction limited imaging 16
The GSC was sufficiently impressed with this approach to assessment of the desires of the community that it was decided that similar information needs to be obtained from the rest of the partnership as soon as possible, ideally in time for the town hall meeting to take place at the January AAS meeting in the US, and partnership meetings that will follow. This will be obtained by circulating a subset of the questions from the ALTAIR survey sent to the US, so that the entire partnership has the opportunity to summarize their own information. Clearly, this must be done quickly.

Gemini> The Observatory encourages the GSC to conduct such a community poll, based upon a subset of the already established ALTAIR questions. The results of such a poll will feed critically into the March 2010 Board retreat.

Simons reported that plans are progressing for holding a Gemini Instrumentation Meeting, to be held in August 2010, in San Diego, CA. By then, all partnership information will have been gathered, and interpreted (at least by the GSC), and it is expected that a final set of recommended new instrumentation will be approved at this meeting.

Gemini> Regrettfully, we will no longer be pursuing a community wide future science/instrumentation workshop. This activity, like the preceding community outreach efforts, were all designed to inform a report on future instruments that would be submitted to the November 2010 Board meeting, consistent with the start up of funds derived from the recently submitted 2011-2015 funding proposal Gemini made to the NSF. The likely withdrawal of the UK from the Gemini Partnership at the end of 2012 has fundamentally changed these plans. Per the November 2009 Board meeting, the GSC is charged to derive through community polls an assessment of what next-gen instruments should be built and advise the Director and Board on community next-gen instrument desires for the March 2010 Board retreat. Given this accelerated schedule, it will not be possible for the Observatory's senior staff to interact with the community through their respective annual community astronomy meetings, hence the need to cancel plans for an August 2010 international meeting.

Considerable discussion followed concerning whether the mechanisms by which Gemini obtains new instrumentation should be revised. This resulted in the following thoughts, assembled by Chris Packham, which seemed to resonate with the rest of the GSC. As noted below, there is a call for the formation of a small working group to develop specific proposals along these lines, which Beers will seek to populate shortly.

Instrument Development Comments

With the completion of the Aspen process represented uniquely by GPI, as mandated by the Gemini Board, the observatory is starting a new instrument procurement process. Previous instruments were procured through the Abingdon (1997), Aspen (2003) and the current process is envisioned to culminate in the “A+” (2010). There has been widespread discussion in the Gemini partnership about the current status of the instrument suite at Gemini, and perhaps the key area of guidance that the current GSC could provide to the Observatory is that of instrument upgrades and/or replacements.

It seems prudent to investigate in a parallel track (so as not to interfere or slow the current procurement process) the optimal way to procure instruments for the Gemini observatory. One
could question if revisiting the Gemini instrument suite once every 6 years is a rapid enough process, especially if the funding profile for Gemini’s instruments is now evolving toward a continuous (steady) funding stream. As part of the transformation from construction to steady state operations, a transformation of the instrumentation program to an ongoing effort, distinct from the “first light” and “second generation” instruments, and that the upgrade of existing instruments could be folded into an ongoing process along with a steady stream of new instruments. Other ideas/concepts to explore could include a yearly design set of money available to the partners as a way to propagate ideas up to the GSC/Observatory. These are just ideas, and many more could be garnered from instrument builders and GSC members.

A working group formed to include Observatory, GSC and instrument builders could be a useful vehicle to investigate the optimal and most responsive manner of instrument procurement for Gemini.

Gemini> The Observatory is open to exploring alternative methods of informing the process used to define next-generation instruments. To date this has substantially been driven by the natural 5 yr rhythm of Gemini’s funding cycle. In practice, instruments have not been delivered in “bunches” as development time scales, design and fabrication efficiencies, and a myriad of other programmatic factors tend to conspire to scatter the delivery times of instruments as part of an overall program. Constraints on cash flow and the ability of Gemini’s funding agencies to make firm commitments on Gemini’s instrument program on a steady basis will factor critically into the cadence with which new instruments are started. Nonetheless, we welcome from the GSC serious consideration of the instrument development program on shorter timescales. We encourage adopting a broad perspective that considers the complete instrument suite and the perspectives of the partner scientific communities.

13 APPENDICES

APPENDIX A – Productivity Figures from Dennis Crabtree

APPENDIX B – Resolution from OpsWG Report

APPENDIX C – GSC Report on “Enabling Large Programs” at Gemini
APPENDIX A: Refereed Paper Production and Impact  
(assembled by D. Crabtree)

Impact is defined as the ratio of the citations of a paper to the median # of citations for AJ papers of the same year.
APPENDIX B: Resolutions from OpsWG Report

Resolution Item 17.1 – For classical programs, the Phase I technical reviews must encompass the backup program including backup targets and observing conditions. For programs switched to classical at a later point, a valid backup program must be established before the ITAC.

Some proposals that ask for queue sometimes get classical time (in the US). They do not have a backup program. Discussed if PIs could come up with a backup program after the ITAC meeting. It is also fine NOT to have a backup program, as long as they understand that they will lose the time if the conditions are not right. Must be noted that US is the only partner with considerable classical time (26%).

Resolution Item 17.2 – Introduction of a word limit of suggested 900 words for all partners enforceable at submission point for all proposals. This resolution will come into force after ITAC approval.

Resolution Item 17.3 - Future OpsWg meetings will take place at the observatory with alternating site in February for a face-to-face meeting and both sites video-linked in August. [cost saving measure]

Resolution Item 17.4 - The software tools that define observations are essential for Gemini's continuing success. The OpsWG urges Gemini to allocate appropriate resources to (1) maintain the existing operational software tools (PIT, OT), and (2) to develop next generation of software that will enable the implementation of the "guaranteed data model".

Gemini presented a dire picture of software situation, and that it cannot support P1 and OT upgrades, let alone GAP development. The OpsWG discussed it at length, noting that Gemini should not pursue development work if operational software is jeopardized.

Resolution Item 17.5 – When drawing plans for Future Instruments the operational impact including full distribution of observing conditions, instrument swaps, etc. should be explored in detail and taken into account.

Discussed new instruments proposed by the GSC (spectrographs all, with range of wavelengths, focusing on high spectral resolution). Agreement that should look at instruments that can be used in poorish conditions. Better alignment with operations when ranking the instruments.

Resolution Item 17.6 - Future Instruments should deliver data reduction software compatible with the Gemini Software Package as part of basic requirement.
Resolution Item 17.7 - The OpsWG expresses its support for the large program initiative. Up to 10% time fraction dedicated to the program at its starting point would be in line with large programs approved and executed at Gemini in the past.

Dennis Crabtree suggested that 30% of time to come off of the top to do large programs. There would be a large program TAC (possibly ITAC members). Selling point is that there is a large number of joint proposals already. Issues: balance between telescopes, RA holes vs peaks? Number of nights available: notionally 10%. Let NTACs see proposals for comment (but not ranking). Will also be discussed by ITAC and the GSC.

Resolution Item 17.8 - OpsWG agrees to implement a 7 day observatory and NGO respond time to phase II activations. Starting point is 10 days before the P2 deadline. The information provided to PIs should indicate this commitment.

Resolution Item 17.9 - Observatory should attempt to cover any queue under-subscription through, in the first instance, reactivation of programs not completed in previous semesters (starting with band 1) followed by adding time to current programs. Those steps can be undertaken without consultation for large partners (US, UK, CA) only. Regression to ITAC failed programs is not being viewed favorably. If multiple programs fulfill the selection criteria, any selection should be based on the current partner time imbalances.

Resolution Item 17.10 – The OpsWG recommends that ITAC allocates rollover status to all band 1 LGS programs.
APPENDIX C: GSC Version of Report on Enabling Large Programs

Board Resolution 2009.A.4. A plurality of the Board, the Gemini Science Committee (GSC), and the Third Gemini Visiting Committee desire large, as well as key, programs to be accommodated within the current multi-TAC system.

The Board instructs the Observatory, in consultation with the Operations Working Group, the GSC, and the National Gemini Offices (NGOs) to develop a plan to foster large/key programs. The plan should be delivered to the Board in time for consideration at the November 2009 Board meeting, and be ready to be implemented for the proposal call following that Board meeting.

At its recent Hilo October 2009 meeting the GSC was presented with “Enabling Large Programs at Gemini” (Dennis Crabtree, 23 September 2009). In discussions the GSC was strongly supportive of the concept. Given Board Resolution 2009.A.4 (repeated above), time is of the essence to work with Gemini management on a proposal that can be presented to the Board next month. “Enabling Large Programs at Gemini” provides a strong basis for the proposal, however additional issues were raised in the GSC meeting and further offline discussions.

Issues needing to be addressed:

Project team management plans & assuring access to necessary resources

The NICI campaign is a current example of a large project where an early and clear definition of the management plan would have proved beneficial. Large Program proposals need to have a “Management Plan” section including a plan for data reduction, analysis, and publicly accessible archiving. The role of each collaborator in the project should be described. We note that NOAO survey proposals are required to have such a section and these are critically evaluated during the TAC process.

Many Large Programs will require access to resources outside of Gemini’s control, e.g. smaller telescope time for target selection. In some cases programs may require significant computing resources or additional access to instrument capabilities not offered by Gemini. Proposers should be required to identify these additional necessary resources and how access to those resources will be secured and assured.

Large Program Criteria

The “Definition of a Large Program” needs to be further developed. The GSC discussed and generally agreed that the minimum size of a Large Program should be
greater than the suggested 100 hours spread over 2-3 years. A minimum size of 200 hours is suggested as the appropriate benchmark.

Additional ideas that should be included:

1. The purpose of Large Programs is to enable scientific programs requiring large, statistically complete, and homogeneous data.
2. Datasets that enable significant additional archival research are highly encouraged.

Fraction of Time

The GSC recommends an initial maximum of 15% of the total Band 1 and Band 2 time available from those partners choosing opt-in status. This fraction can be reviewed annually by the GSC (for net impact on science), the OWG (operations), etc. and changes recommended. All partners are encouraged to participate to maximize the community involvement and scientific return. For the Large Program effort to succeed there needs to be strong community support and a healthy oversubscription rate of highly rated proposals. We recommend this initial 15% percentage with the hope that there will be strong justification for increasing the percentage in future years. However, the LPTAC should not consider increases as guaranteed and should plan annual allocations accordingly, i.e. the full 15% should not be allocated in the first year. We note that a 15% fraction of observing time is equivalent to several million dollars of observing time per year and therefore a conservative approach in the first year is prudent to ensure long-term success.

Workload of Gemini Staff

We believe there is a pent-up demand in the Gemini communities for survey type programs, and we wish to ensure the maximum exposure and scientific return for the valuable investment of observatory resources/time. Presumably observatory staff astronomers will be heavily involved in supporting teams as they prepare proposals, providing technical reviews during the selection process, supporting the Large Program TAC (LPTAC), and supporting the Phase 2 preparations of successful teams. However, an FTE estimate was not provided during the GSC meeting nor at the follow-on retreat so the impact of this extra workload is unclear. Additionally, there is a question of how to manage the potential conflict of interest if observatory staff astronomers are supporting Large Program proposal preparation while preparing their own Large Program proposals. We would like to hear from the observatory on these important aspects before commenting further.

We encourage the observatory to find ways to draw on outside resources from the NGOs and the national TACs as much as possible. Because of the high value of the resources involved, much care and attention must be paid to the LPTAC and program administration processes.
Priority Band of Large Programs

Large Programs should have equal priority with standard programs, which requires that Large Program time be divided between Band 1 and Band 2. It is a likely recipe for frustration if a Large Program is assigned time only in Band 2. Therefore, the GSC recommends that each approved Large Program receive part of its time in Band 1 and the remainder in Band 2. There are some Large Programs that would best be implemented in Band 3, e.g., those that could be used as efficient “queue fillers”. Guidance can presumably be obtained from the proposing authors if they feel their program would be among these. There must be safeguards in place that Large Programs are not allowed to squeeze out normal programs from highly subscribed months or RA ranges.

The requested RA distribution in a Large Program proposal should be evaluated by the LPTAC for its impact on other programs.

Time allocated to a Large Program should not rollover from one semester to the next. However, if extenuating circumstances can be demonstrated the LPTAC should be willing to consider a request to extend a Large Program beyond the initially requested semesters. Extemuating circumstances could include the unavailability of requested instruments due to breakdowns or poorer-than-average weather over several semesters.

Timeline

As presented at the GSC meeting there would be an annual call for proposals issued each year in early August, with a proposal deadline of mid-September. A large program could then start in the following A semester.

GSC recommendations:

- Prepare an initial announcement regarding Large Programs to be released in December 2009 (in time for the Jan. 2010 AAS and other national Gemini town halls through the spring). This should include as many fleshed out details as possible. Such a roll-out with plenty of lead time before the first call for proposals is important for giving teams time to organize and building community support for Large Programs.
For this first year, prepare a Draft Call for Proposals that is released ASAP, perhaps even as part of the December announcement. This would give teams more time to organize and prepare strong proposals.

In subsequent years release a Draft Call for Proposals as early as possible, preferably by May 1. Any major tweaking of the proposal requirements/process should be announced in this draft, with the goal of only minor revisions to instrument availability etc. in the Call for Proposals.

Letters of Intent serve a useful purpose, giving the observatory lead time to adjust the composition of the LPTAC and seek commitments from outside reviewers who are unaffiliated with pending Large Program proposals. We recommend that the Observatory require Letters of Intent with a deadline of ~6 weeks ahead of the proposal deadline (Aug. 1?). These letters should include the following information, although it is understood that all of this information in the LoI is preliminary and may change in the submitted proposal.

- Project Title
- PI with full contact information
- Co-I’s with contact information
- A description of the broad scientific goals of the program in sufficient detail to aid in identifying knowledgeable reviewers
- Instruments, approximate time request, and approximate RA distribution of targets

If Letters of Intent are due on Aug 1, then the final version of the Call for Proposals should be released no later than July 1.

Access (Who can apply for a Large Program?) & Target Duplication

The GSC recommends that PIs from any country (or host partner) that opted into Large Programs should be allowed to apply, without restrictions. (i.e. host partner PIs could apply for Large Programs using either or both telescopes).

A related issue: The US has an Open Skies policy, which presumably carries over to Large Programs.

All countries should be allowed to opt-in or opt-out. Countries that opt in, as well as countries that opt out should be able to schedule any highly ranked programs, large or small, even those for which competing Large Proposals have been submitted or approved.
The goals of large programs (large, statistically complete, and homogeneous datasets) are sufficiently different from smaller programs that focus on just a few targets that the normal ‘duplication’ rules need to be reconsidered. Large programs should not be allowed to ‘reserve’ targets or prevent other programs from observing specific targets. Large Programs should not be allowed to have ‘secret’ targets.

**Data Management**

A motivating purpose for Large Programs is to create large datasets that will enable significant additional research beyond what was initially envisioned and proposed. Therefore, data management is a serious issue. Large programs should be required to provide prompt data access to all team members. A standard publication policy should be in place and required for all large programs during the proprietary period. This publication policy needs to address what happens when a subset of the team wants to publish a result without the approval of the larger team. After the end of the proprietary period, anyone should be free to publish anything using the data. This proprietary period should be specified in the Draft Call for Proposals and should be as short as possible to ensure maximum scientific return from the significant investment of the partners.

**Annual reviews**

The GSC strongly supports a critical annual review of each Large Program. The timing of these reviews and requirements on the teams need to be carefully considered and described as part of the initial Call for Proposals. These reviews are crucial to ensuring that satisfactory progress is being made and to allow programs to modify their specific time requests as necessary.

**Other open questions**

- Maximum number of semesters is 4 or 6? The GSC recommends a maximum of 6 semesters.

- When/how do countries opt-in or opt-out? For how long is the opt-in commitment? The GSC recommends that the opt-in period be set to at least the same length as the maximum number of semesters.

- The allocation of time to a Large Program over several semesters is an implicit commitment that, barring unforeseen disaster, the requested instruments will be available for the life of that particular Large Program. How will this enter into the LPTAC decision process?

- Do the standard country TACs at least see the Large Program proposals? At a bare minimum the TAC chairs should see the Large Program proposals well
ahead of their TAC meetings. What happens if a similar proposal, perhaps even
with an overlapping team, comes through the standard TAC system?

• There should be an explicit statement that Large Programs are still allowed
  through the standard TAC process. (Although given TAC dynamics that will
  probably become infrequent.)

• In the current proposal, Large Programs are allowed to include ToOs. Who has
  priority to observe a ToO between a Large Program and a Band 1 program that
  has come through the normal TAC process? What if the competing ToOs are
  asking for the same target?

• Who is ultimately responsible for the time given to Large Programs? Does a PI
  with complaints about the process or a particular review go straight to the
  Director?

Additional minor comments to help strengthen “Enabling Large Programs at Gemini”:

• The Titan Weather project does not fit the definition of a Large Program and does not
  belong on the example list. Although it has used more than 100 hours total, this
  project is a Time Domain project and is not expected to ever use more than 100
  hours in any given 4-6 semester period.

• Should the NICI campaign be mentioned? Campaign science is subtly different from
  Large Programs, but shares enough characteristics that its absence from this list is
  curious.