Report to the Gemini Director
19th Gemini Science Committee Meeting
14th & 15th October 2002
Sydney, Australia

This is a report to the Gemini Director summarizing the Gemini Science Committee meeting held in Sydney, Australia on 14th & 15th October 2002.

GSC members attending (partner countries in parentheses) included: Bob Joseph (University of Hawaii) in the Chair, Lori Allen (US), Taft Armandroff (US), Malcolm Bremer (UK), Luis Campusano (CH), Bruce Carney (US), Laird Close (US), Warrick Couch (AU), Ken Hinkle (US), Harvey Richer (CA), Pat Roche (UK), David Schade (CA), Ray Sharples (UK), Charles Woodward (US). Gemini Observatory personnel who attended included Jean-Rene Roy (Gemini Associate Director), Phil Puxley (Gemini Associate Director), & Doug Simons (Gemini Associate Director). Observers who attended all but the Executive Sessions included Gary Da Costa (AU), Dennis Crabtree (CA), Isobel Hook (UK), and Magnus Paterson (UK).

The GSC appreciated the comprehensive and accurate note-taking by Matthew Whiting.

The GSC met in Executive Sessions following the presentations and discussions on both days of the meeting. The following report is the consensus view of the GSC that emerged in these Executive Sessions.

The discussion centered around two broad issues: science time on the Gemini telescopes, and the scientific productivity of the Gemini telescopes. The major conclusions and recommendations follow.

1 Science time on Gemini telescopes

1.1 Science time on the Gemini telescopes

At its Durham meeting in July 2001, the GSC recommended that the Observatory concentrate on bringing the performance of the telescopes and associated systems to a high level of efficient performance and reliability, and give secondary concern to the time available for doing science. The GSC now believes that the time for this phase should be coming to an end, and that the Observatory must soon give primary consideration to protecting science time from encroachments for telescope engineering and instrument commissioning. From Semester 2004A the GSC recommends that at
least 70% of total nights be reserved for science on Gemini North, and that this limit be applied to Gemini South as soon as there are two commissioned facility instruments. The GSC recognizes that this may lead to delays in commissioning some instruments or observing modes.
1.2 Priority list of instruments & modes for commissioning

The GSC was virtually unanimous in recommending the following priorities for instrument commissioning at each telescope. These are ranked lists in order of decreasing priority.

**a) On Gemini North:**

i) Michelle in both spectroscopic and imaging modes must be fully commissioned.

ii) Altair with NIFS and LGS adaptive optics.

iii) The GSC also strongly endorses Observatory efforts to keep Michelle at Gemini as long as possible, and certainly throughout the SIRTF mission.

**b) On Gemini South:**

i) GMOS-S: MOS with “nod & shuffle” are highest priority scientifically; polarimetry and the ADC are lowest priority.

ii) T-ReCS: both spectroscopic and imaging modes must be fully commissioned.

iii) GNIRS: polarimetry has the lowest priority.

There is one divergence of opinion within the GSC on faint guide star AO (i.e. Hokupa’a 85) on Gemini South; the U.S. community very strongly endorses this capability, whereas there is much less interest from other partners.

1.3 Instrument deployment North and South

The Board asked the GSC for its recommendations on instrument deployment north and south. The GSC is also concerned that practical difficulties will limit the number of different instruments that can be offered to the users in any semester. The GSC continues to believe that Flamingos-2 is the only instrument that can reasonably be considered for such a move. However, we ask the Observatory to look at its operations plan and assess how many different instruments it can support in a given semester, how many instrument changes can be accommodated, and what the time loss associated with instrument changes is likely to be. We would like to see the Observatory’s analysis of the operational issues before making further recommendations to the Board on north-south instrument deployment.

1.4 Telescope readiness, reliability and performance
The GSC appreciates very much the Observatory’s thorough analysis in response to the request for a report on the Gemini telescopes’ operational efficiency and impulse response. Reducing the telescope settling time of ~ 10 sec for small offsets is a high priority issue for observational efficiency for all instruments.

The GSC emphasizes that resolving the uncertainties and ambiguities in image quality measurement are a very high priority, and was disappointed that the Observatory could not be more definitive on this subject at the last two GSC meetings. We request a more complete analysis of both telescopes’ delivered image quality at the next GSC meeting.

The GSC asks the Observatory to report on when it expects the telescopes will be out of the shared risk mode of operation, and what items are on the critical path for ending the shared risk phase for each telescope. The Gemini website says “Shared risks is expected to continue for 12-18 months for the telescope,” so most observers will assume that neither telescope is presently in shared risks mode of operation.

The GSC endorses making the performance metrics public, and we recommend explicit comparison of performance with the articulated Science Requirements.

### 1.5 High-level software readiness and reliability

The GSC appreciates the attention being given to the high-level software, and we were pleased to learn that the high-level software will be used for observations with NIRI and GMOS (in its imaging mode only) in Semester 2003A. We urge the Observatory to continue to give high priority to development and commissioning of this software. It is essential for maximizing the scientific productivity of the Observatory.

The GSC believes it is inefficient and costly in telescope time to attempt instrument commissioning without all the high-level software in place. Moreover, the commissioning process should include commissioning the software associated with running each instrument. We recommend that once there are two commissioned facility instruments on each telescope no new instrument modes be commissioned until all associated software is integrated and ready for use in the commissioning.

### 2 Scientific productivity of Gemini telescopes

#### 2.1 Recent scientific highlights

The GSC noted that important scientific results are continuing to emerge from use of the visitor’s instruments on Gemini. It was especially gratifying to see several AO studies of extragalactic objects using Hokupa’a/ QUIRC. Diffraction-limited studies of stars both at the beginning and ends of their evolution using OSCIR are no doubt only a
foretaste of what Gemini will produce when its mid-infrared facility instruments come online. The GSC encourages the Observatory to track observing programs which have not resulted in publications.

### 2.2 Data reduction software

The GSC emphasizes that there is a significant problem with reliance on IRAF for reduction of data taken with Gemini instruments. Even experienced and sophisticated IRAF users are caught out by the lack of backward compatibility in the Gemini IRAF reduction scripts. The lack of error reporting in IRAF can make it extremely time-consuming and frustrating to try to find out what is wrong. This will be a significant problem for the scientific productivity of the Observatory. The GSC recommends that the Observatory find ways to minimize this problem. Two interim suggestions are to include with the data from a given instrument a note on which IRAF versions will support the required tools for data reduction, and to automatically bundle test data with the delivered data which will enable an observer to check that it should be possible to reduce the data properly with an observer’s version of IRAF.

### 2.3 Observing time allocation

The GSC emphasizes the importance for scientific productivity of maintaining stability in the instruments offered over more than one or two semesters at each telescope so that scientific programs can be completed.

Virtually all partners agree that they want to continue national TACs, rather than to move to one international TAC for the initial review of applications for observing time.

The GSC endorses efforts to facilitate larger & multi-partner programs and wants to find ways to encourage substantial programs to get observing time.

The GSC encourages the Observatory to clear out payback obligations to instrument development groups as quickly as possible.

The GSC emphasizes the critical importance of providing opportunity for Classical Observing (as contrasted with Queue Observing). Classical Observing is not only important for training young astronomers in the art of observational astronomy, but it has historically been a sine qua non for gifted astronomical entrepreneurs. However there may be a problem with the present requirement of a minimum allocation of 3 nights, since it is very unlikely any single program will be awarded 3 nights of time on an 8 m telescope (although large multi-partner programs would certainly be an exception). We encourage the Observatory and the National Project Offices to work together to achieve significant classical observing in the coming semesters.
The GSC is interested in the relative productivity of Queue and Classical observing, and requests this information be included in the database. The GSC emphasizes the critical importance of completion of Queue programs, and would like a report on this to be included in future Observatory presentations.

There is still real concern about how effective queue observing can be conducted with the existing site monitoring instruments. The GSC recognizes the problems associated with installing new facilities on Mauna Kea, and encourages the Observatory to explore ways to get improved data on the relevant observing conditions.

2.4 Quality assessment and promptness of data distribution

The GSC is pleased that data delivery is now more prompt and encourages maintaining the goal of data distribution 2 weeks post observing, with a maximum 4 weeks. It would help observers if the data distribution on CDs included a hardcopy listing of what data is included on the CD. The GSC requests the Observatory once again to consider other data delivery modes when appropriate — especially immediate ftp. This will engage P.I.s more and contribute to improved scientific productivity.

2.5 Gemini science archive

The GSC welcomed the agreement that has been reached with the Herzberg Institute of Astrophysics over a revised phase-2 workscope for the Science Archive, and looks forward to the start of operations of the basic archive in 2003.

2.6 Focal plane instrument status and new instrument development

The GSC noted that 5 of the 6 CCDs in GMOS-S are currently functioning well and that the impact of the chip failure was restricted to one end of the spectra. We recommend that any upgrade to the current CCD focal plane should only be done if it does not delay the start of science operations.

The GSC is pleased that the Flamingos-2 development is now underway (and regrets that this has taken so long). We endorse the strategies of outsourcing procurement and testing encouraged by the Observatory to reduce risk and accelerate the schedule. The GSC would like to be kept fully informed of progress on this key facility instrument.

The GSC was confused about the proposed changes to the System Verification (SV) plan for each instrument, but agrees that the “old” plan should be dropped. We emphasize that the new SV plan include the high-level software, so that it really is an end-to-end system verification. The GSC endorses a more open, inclusive SV process which involves the National Project Offices in planning and executing the system verification, and we will be happy to review the SV plans for each instrument in future. There is
substantial irony that those few who have actually reduced the data and have completed their SV data analysis are penalized by having the data made public, while those who are tardy retain ownership. This should be addressed in the new SV plan.

The GSC encourages the Observatory to continue investigation of time swaps with ESO or Keck to provide the Gemini community with some access to state-of-the-art high-resolution optical spectroscopy.

The GSC recognizes that MCAO looms very large in the Gemini future instrumentation program and we would like to be kept informed on its status. We therefore request that updates on MCAO be included in the instrumentation reports for future GSC meetings. We also would like to know if and when a formal CDR will be planned for Gemini South AO, and we recommend that at least one person from the AOWG be included in the CDR.

3 Additional matters

3.1 Reports from National Project Offices

Most NPOs reported healthy increases in requests for observing time in Semester 03A, with time on Gemini North oversubscribed typically by factors of ~4. Many of the NPOs are also planning internal workshops on Gemini instrumentation in preparation for Aspen 2003. As noted above, every partner country was opposed to establishing one international Gemini TAC and wished to retain the present system of national TACs.

3.2 GSC Working Group on Adaptive Optics

This Working Group is now established. Laird Close (US) is the chair and other members include David Crampton (CAN), Olivier Lai (CFHT, France), Mike Liu (US), Peter McGregor (AUS), Simon Morris (UK), and Francois Rigaut (Gemini).

3.3 GSC Working Group on “Abingdon II”

The GSC was pleased to learn of the progress in planning what is now the “Aspen 2003” meeting to discuss future Gemini instrumentation. We congratulate Doug Simons and his Working Group on preparations for this meeting, which will be at the Aspen Meadows Conference Center 27th-29th June 2003.

3.4 GSC Working Group on High Resolution Spectroscopy
The Working Group had received a three-page status report from Brazil describing two design options for recovering a resolving power of 50,000 for the bHROS instrument. However, this had arrived very shortly before the meeting and there was no time for the WG to discuss it. The GSC requests some guidance from the Observatory if it is to respond to this paper.

3.5 Retirement of Pat Roche from the GSC

The Chairman noted that this was Pat Roche's last GSC meeting, since his term as UK Gemini Project Scientist is just ending. He commented that Roche has contributed a significant part of the bloom of his youth to Gemini over the past 15 years, and he expressed appreciation for Roche's extraordinary wisdom and insight in his contributions to the work of the GSC over the years. Roche was exemplary in doing his Gemini homework and he had been an outstanding scientific statesman. Joseph said he was certain he was expressing the thanks and good wishes of the GSC as Roche returned to full-time teaching and research, and the GSC responded with a round of applause.

3.6 Date of next GSC meeting

It was agreed that it is now appropriate to schedule GSC meetings no more frequently than once a year. The next GSC meeting will be in La Serena, Chile on 13th & 14th October 2003. However, the GSC agreed it may be appropriate to plan a brief meeting in association with the Aspen workshop to discuss non-instrumentation issues which may have arisen.