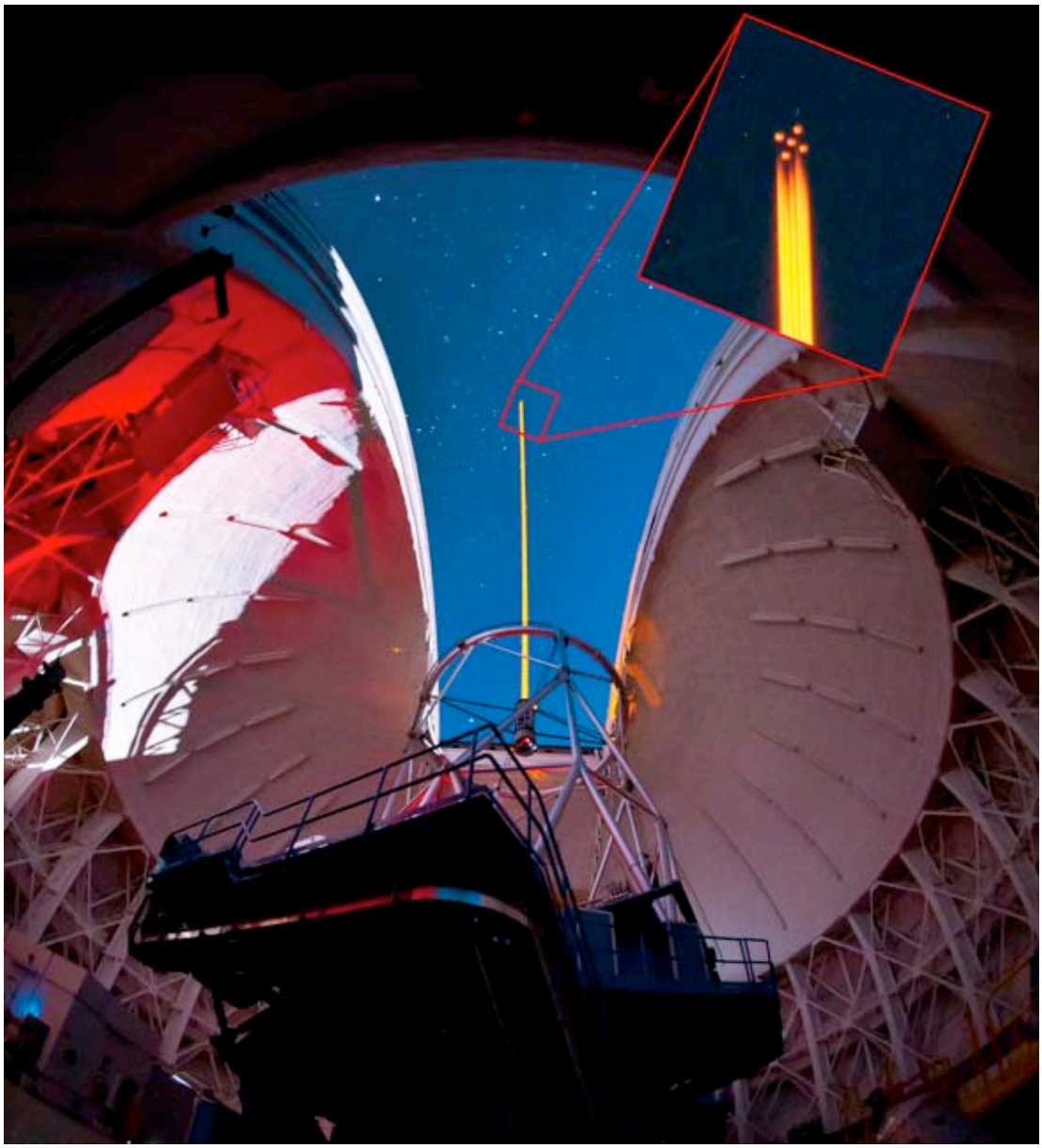
2011

Annual Progress Report and Program Plan of the Gemini Observatory



Association of Universities for Research in Astronomy, Inc.

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1 Introduction and Overview

The mission of Gemini Observatory is

To advance our knowledge of the Universe by providing the international Gemini Community with forefront access to the entire sky.

This annual progress report shows the 2011 activities toward fulfilling this mission. The starting point is the twin 8-m telescopes and their instrument capabilities that are available to the user community (Table 1-1). The community's scientific interests range from the Solar System to the most distant galaxies and quasars, and the variety of optical and infrared imagers and spectrometers that Gemini offers are sufficiently flexible to enable this range of scientific pursuits. In addition, there are more specialized capabilities, such as the current NICI and the upcoming GPI—while designed for planet-hunting—that are also available for general use.

Gemini North			Gemini South		
Instrument	**Description**	**Band**	**Instrument**	**Description**	**Band**
GMOS-North	Multi-object imager and spectrograph R~5000, hundreds of objects at a time	Optical	GMOS-South	Multi-object imager and spectrograph R~5000, hundreds of objects at a time	Optical
NIRI	Imager	Near-IR	FLAMINGOS-2	Imager and multi-object spectrograph ~80 spectra at a time	Near-IR
GNIRS	Long-slit, cross-dispersed spectrograph; 5000≤R≤18000	Near-IR	NICI	Dual-channel coronagraphic imager Internal 85-element AO	Near-IR
NIFS	Integral-field spectrograph R~5000 Has coronagraphic mode	Near-IR	GPI	Planet imaging AO coronagraph IFU imager	Near-IR
Michelle	Imaging spectrometer, longslit R~5000 Cross-dispersed R~30000	MID-IR	GSAOI	AO imager, for use with GeMS Rapid tip-tilt on readout	Near-IR
Altair	Facility AO system Single natural guide star	Near-IR	T-ReCS	Imager and spectrograph 100≤R≤1000	Mid-IR
Altair LGS	Facility AO system Single laser guide star	Near-IR	GeMS	Facility multi-conjugate AO system Five laser guide star constellation	Near-IR
Notes: Mid-IR instruments are diffraction limited in natural seeing. Near-IR instruments are diffraction limited with AO.					

Table 1-1: Gemini instruments and facility systems, including future capabilities.

The Observatory's systems of science operations also contribute to the community's use of the facilities. We offer both queue and visitor ("classically-scheduled") observations according to user choice. The queue makes targets of opportunity (ToOs) a regular and popular mode of use. We fully support astronomical researchers from preparation of observations through data reduction to enable scientific return. We maintain an archive of all data including their essential calibrations, which is open to all after a proprietary period for the original investigators.

This report begins with the scientific results (Section 2), including science highlights and a summary of observing programs. Section 3 describes science operations and user services. Development activity during the year is covered in Section 4. Results from the active education and public outreach program appear in Section 5. We conclude with a budget summary (Section 6) and a brief listing of plans for the future (Section 7).

2 Scientific Accomplishments

The Gemini user community throughout the international partnership and including Observatory staff are responsible for the scientific accomplishments using the facility. They continue to take advantage of highly sensitive instruments, including GNIRS and NIFS, and they effectively use the target of opportunity (ToO) capability to capture transient events.

2.1 Science Highlights

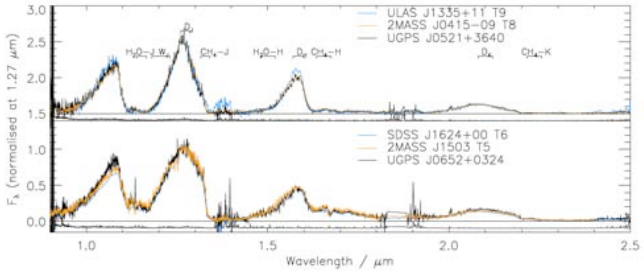

Figure 2-1: The GNIRS spectrum of cool brown dwarf UGPS J0521+3640 (black) is intermediate between types T8 and T9, shown by templates in orange in blue.

Return of GNIRS

GNIRS was returned to regular facility operation at Gemini North in semester 2011A. The first publication using GNIRS at Gemini North spectrally identified cool brown dwarfs, which bridge the gap between stars and planets. Only during the last few years have enough cool brown dwarfs been discovered to begin to test the physical models that describe their atmospheric physics. Still, the population remains sufficiently small that each new discovery is significant. Burningham and collaborators (2011 MNRAS 414 L90) observed several candidates identified in the UKIRT Infrared Deep Sky Survey Galactic Plane Survey, and GNIRS spectroscopy (Figure 2-1) allowed a secure identification of one as a type T8.5, with a temperature between 600 and 650K and a mass of about 14 to 32 times the mass of Jupiter.

The most distant quasar

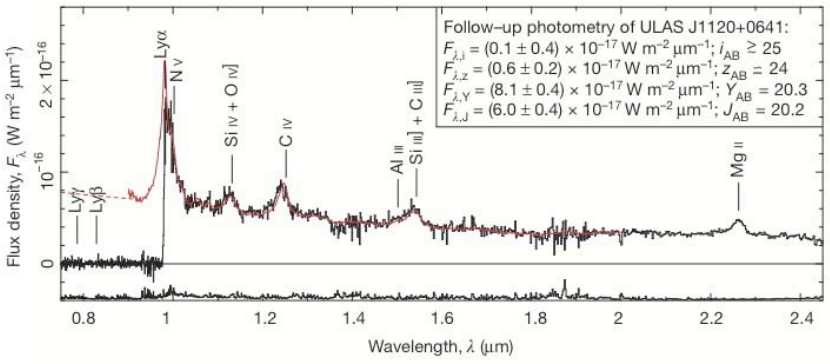

Figure 2-2: Spectrum of a z = 7.1 quasar (black), using GNIRS longward of 1.005μm. The red line shows a composite spectrum of lower-redshift quasars.

GNIRS observations were critical to identify the most distant quasar (redshift z = 7.1) known, in the work of Mortlock et al. (2011 Nature 474 616). At this redshift, the Universe was only about 770 million years old. A particular challenge to cosmologists is to account for the formation of a supermassive black hole so quickly.

The spectrum of the quasar is normal, comparable to those at much lower redshift (Figure 2-2), and implies a black hole mass M_{BH} = 2 x 10^9 M_{Sun}. The extremely high

redshift of ULAS J1120+0641 also offers the possibility of quantitatively exploring the epoch of reionization in the early Universe. The locally-ionized zone around this quasar is smaller than those of comparable quasars at redshifts between 6.0 and 6.4, implying that the native environment of ULAS J1120+0641 was substantially more neutral. The profile of Lyα line specifically implies that the neutral fraction exceeded 0.1.

Transients in the high-redshift Universe I

Rapid followup of transient sources with Gemini has revealed some interesting objects in the distant and very distant Universe. Two interesting cases were originally detected as gamma ray bursts (GRBs) by NASA's Swift satellite. A GMOS spectrum and multiband infrared images obtained with NIRI enabled a rapid redshift determination (z = 0.35) and localization of the source Swift 1644+57.

The persistence of the high-energy signature and other characteristics have led to interpretation of the event as the tidal disruption of a star by the galaxy's central supermassive black hole (Levan et al. 2011 Science 333 199 and Zauderer et al. 2011 Nature 476 425). Subsequent high-energy flares arose as portions of the star fell into the black hole, while the optical and NIR emission remained consistently bright. Favorable geometry contributed to the observed brightness of the event, with the signal boosted as viewed along the emergent jet.

Transients in the high-redshift Universe II

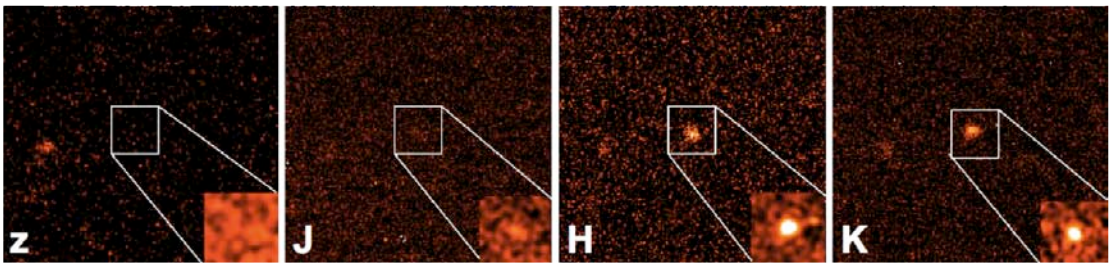

Figure 2-3: Images of GRB 090429B, at redshift z = 9.4.

A different source, GRB 090429B, has now been identified as a relatively normal GRB, with the exceptional property of being the most distant GRB at z = 9.4 (Cucchiara et al. 2011 ApJ 736 7). This is yet another source that pushes star formation in galaxies to the earliest times in the history of the Universe, since a normal GRB would not arise from the very first generation of star formation. The challenge of this work was to measure the photometric redshift from GMOS-N and NIRI data; spectral observations had been precluded immediately after the event when clouds arrived on Mauna Kea. The source was not detected in the z band, yet appears significantly in the *H* and *K* bands (Figure 2-3).

Measuring a massive black hole

M87 is a nearby luminous galaxy that offers excellent opportunities to measure its physical properties accurately. An important one is the mass of the central black hole, since black hole growth is fundamentally tied to galaxy formation and evolution. The conclusion from Gebhardt and collaborators (2011 ApJ 729 119), who used NIFS and the ALTAIR adaptive optics (AO) system to study the galaxy's central region, is that M87 hosts the most massive directly-measured black hole, with a mass $M_{BH} = 6.6 \times 10^9 M_{Sun.}$

While the mass of M87's black hole had been estimated previously, the improved sensitivity of the new observations yields a more robust result. They resolve scales of less than 10 parsecs in the central 3 arcsecond area of M87 (Figure 2-4). The black hole's region of influence is isolated on these small scales, reducing confusion of the mass contributions of stars and dark matter. Indeed, this measurement is insensitive to assumptions about the galaxy's dark matter halo, although this component remains significant on larger scales.

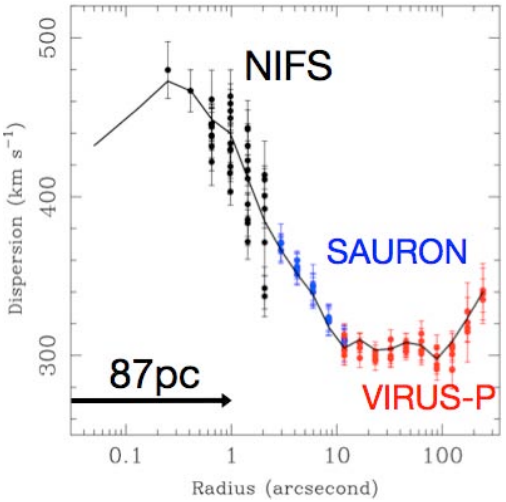

Figure 2-4: Velocity dispersion versus radius in M87. These measurements from several telescopes combined with detailed models of stellar dynamics yield the central black hole mass.

Measurements of black holes in massive galaxies remain crucial. The central black hole mass is correlated with a galaxy's stellar velocity dispersion. The result from M87 is somewhat discrepant, however, suggesting that the correlation is not well calibrated at the high-mass (and high-galaxy-luminosity) end.

Science with NICI

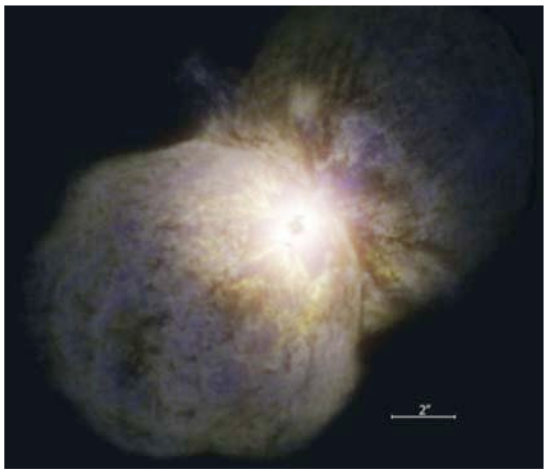

Figure 2-5: Eta Carinae observed with NICI, in Brγ, H_2, and [Fe II] (red, green, and blue; without continuum subtraction).

NICI offers high-contrast, which makes it useful for planet hunting, as in the on-going NICI planet-finding campaign. It is also a general-purpose dual-beam AO facility imager, which has been used for a range of science. One recent example is the study of the stellar source eta Carinae (Figure 2-5; Artigau et al. 2011 AJ 141 202). As a supermassive star near the end of its life, it has exhibited stellar explosions that astronomers have observed, including the "Great Eruption" from 1837 to 1858.

The team used the current high spatial resolution and archival images to measure the proper motion of individual knots, linking some to the Great Eruption and identifying others with a secondary eruption of the 1890s. One new discovery is the notable structure of the [Fe II] emission, another bipolar distribution embedded in the larger Homunculus nebula. The team concludes that the apparent butterfly shape of this nebula is a superposition of emission from two epochs of ejecta, now located 2000 to 4000 astronomical units from the central star.

2009 Jupiter impact

An amateur astronomer first identified the 2009 collision on Jupiter as a spot on the giant planet, and subsequent observations with powerful telescopes including Gemini and astronomers' analysis have yielded several discoveries. With such an unplanned event, the rapid ToO capability was essential. The thermal emission from the scarred atmosphere included the central impact location itself along with a distinct halo toward the northwest. Diffraction-limited observations with Gemini and other large telescopes could distinguish these areas.

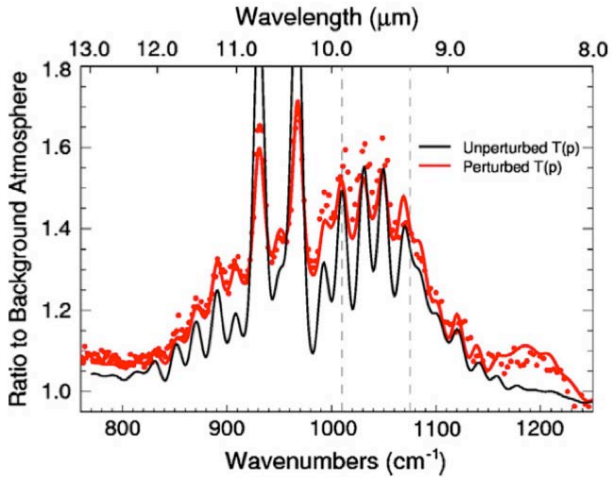

Figure 2-6: T-ReCS spectrum of the Jupiter impact site (red points). The model that fits well (red line) requires enhanced stratospheric ammonia and heating of the atmosphere; ammonia alone (black line) is insufficient.

Most significantly, spatially resolved spectroscopy was possible, to separate the impact site material and the ejecta. Analysis of the spectra implies that the impactor was not a comet (as the last prominent collision, Comet Shoemaker-Levy 9 had been, in 1994) but a rocky body like an asteroid (Figure 2-6; Fletcher et al. 2011 Icarus 211 568). The most unusual aspect of the result is that Jupiter should have removed all asteroids from its orbit long ago. Either this impact was an exceptional occurrence, or more rocky material exists in the outer Asteroid Belt or Kuiper Belt than had been previously predicted.

2.2 Publications Based on Gemini Data

The number of papers based on Gemini data that are published or accepted for publication in refereed journals has surpassed 1000. During 2011, 188 of these appeared. Members of Gemini's science staff are first authors or co-authors on 35 (19%) of these papers in 2011, and contributed an additional 39 refereed publications not based on Gemini data. A complete list of the 2011 publications appears in Appendix A.

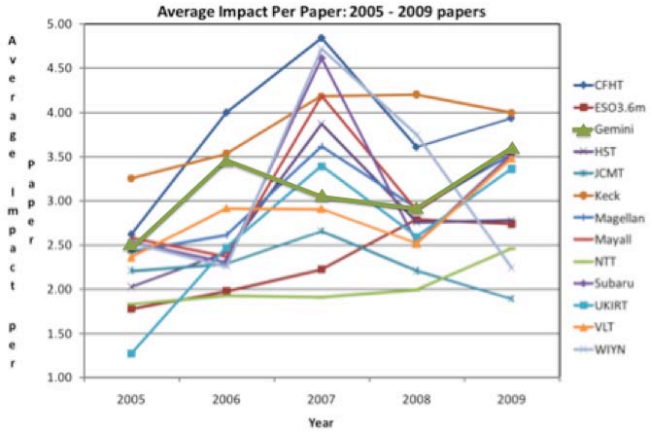

Figure 2-7: Average impact per refereed paper, courtesy D. Crabtree.

Analysis of the impact of publications considers publications through 2009. Citation rate measures impact, and it is normalized relative to the median for papers in *The Astronomical Journal* of the same year. This normalization allows comparison of

papers of different ages. The average impact per Gemini paper is comparable to that of other facilities (Figure 2-7).

2.3 Observing Programs

In seeking to optimize the scientific return on investments made, Gemini offers both queue and classical observing modes according to user choice. Gemini's rapidly reconfigurable multi-instrument system is the efficient and effective operational backbone behind Gemini's queue mode: the scientific ranking of a program determines its priority for execution, and each is completed under the sky conditions it requires. Queue-based operations rely upon the Observatory staff conducting researchers' observations according to the scripts the researchers prepare to define their programs. When appropriate to the study in question, a queue-based model makes more efficient use of highly oversubscribed observing time (e.g., best seeing conditions or relatively rare low water vapor conditions). Observations and calibrations can be more optimally utilized across multiple programs, enhancing the science productivity of the Observatory on behalf of the entire partnership.

Queue observing has made Gemini one of the most effective ToO observing systems available, both for fast-response targets (such as transients like gamma ray bursts) and slow-response follow-up targets (such as distant supernovae or newly discovered Solar System objects). The fast (15-minute) delivery of data to the Gemini Science Archive and subsequently to the Principal Investigator (PI) team enhances this capability. Currently approximately 25% of the highest-ranked Band 1 programs are ToOs.

Hands-on observing by a PI team using a fixed block of time—classical observing—can also be valuable. Advantages of classical operations include programs that involve new, experimental observing procedures, the training of young scientists, technology explorations, and instrument commissioning. Moreover, these programs are extremely useful for maintaining direct contact with the community and for the community to remain familiar with the Observatory and its staff. Gemini supports classical observing in response to demand, currently around 10% of available time.

Recognizing the advantages of having users visit the telescopes and work through a night of observations, Gemini also welcomes visiting queue observers. We make every effort, within the constraints of priority and weather conditions, to schedule the visitor's approved queue program while the PI is at the summit. This approach has been particularly useful for students who come for one to three weeks, during which they fully participate in observatory life and often complete some data reduction and begin scientific analysis.

Semester	Telescope	Programs	Classical	Joint
2010B	GN	133	10	17
2010B	GS	97	9	23
2011A	GN	128	5	16
2011A	GS	97	9	19

Table 2-1: Program numbers

Table 2-1 provides summary information about the numbers of programs scheduled on the Gemini telescopes in semesters 2010B and 2011A. This table lists total programs, those planned for classical observations, and those that are joint, where multiple partners contributed time for the observations. A full list of program titles and more complete information appears in Appendix B.

3 Science Operations and Serving Users

3.1 Operations Metrics

Gemini tracks completion rates for queue programs, acquisition times, and weather and fault losses for both telescopes, in an effort to optimize the efficiency of the nighttime operations. The central metric is the completion rate of the queue programs scheduled on the Gemini telescopes, as this directly relates to our scientific productivity. The goal is to deliver complete data sets, with a priority on completing queue programs once they are started. Figure 2-1 shows the current statistics. The completion fractions of the most recent Band 1 programs will increase, as some of them are granted rollover status to continue observations in subsequent semesters. Band 3 completion rates tend to improve during periods of poor weather, and Band 2 tends to suffer. Band 3 programs typically have relaxed observing conditions, in order to facilitate some observations despite their lower rank. The 2010B and 2011A semesters show some of this effect.

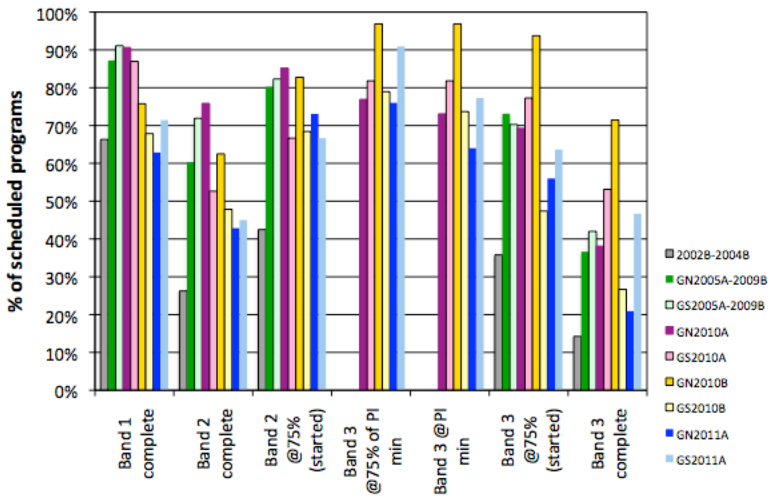

Figure 3-1: Program completion statistics

The Band 3 queue has been fully filled to ensure that some viable program was always available to make use of the telescopes, despite the expectation of significant time loss due to weather. A consequence of this approach is that many PIs went through the effort of fully preparing the observations through Phase II without receiving any data in the end. To alleviate this problem, starting with semester 2011B the queue is under-filled, with the Band 3 queue reduced to 20% of total time.

Gemini introduced homogeneous software for all instrument operations and acquisitions in 2008, which has produced efficiencies. The three minutes saved per acquisition compared with previous values results in an effective additional three nights per semester per telescope for science use. The acquisition times for all instruments are available in the Science Operations area of the Gemini website http://www.gemini.edu/sciops/?q=sciops and are competitive with those of other large telescope facilities.

The net science use of the facility further depends on time lost to weather and faults, and scheduling time for instrument commissioning and engineering activities. Figure 3-2 summarizes the current information, per site and per semester, with a long-term average (2005 through 2009A) for comparison. Note the large amount of commissioning time at Gemini South in 2011A, which will continue through 2012 and 2013 as several new instruments are made available for community use (FLAMINGOS-2, GeMS, and GPI).

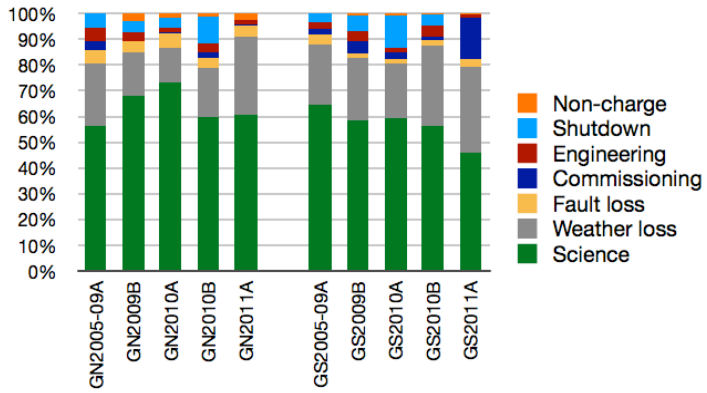

Figure 3-2: Nighttime use fractions

The Observatory continues to work to reduce the telescope time lost to faults. Figure 3-3 shows the monthly fault rates as a percentage for 2011 and the trend (in lost hours) over recent semesters. The average time lost to faults at Cerro Pachón over this period meets the target goal of 4%, where fault rate is measured against time excluding weather loss. The average at Mauna Kea is greater, due to a combination of the harsher environment and instrumentation, either more complex (such as the laser system) or older (such as NIRI), although the overall trend over recent semesters is toward reduced faults. Gemini has recently introduced new methods to better track persistent faults that lead to time loss, so these have high priority for correction during regular operations and maintenance.

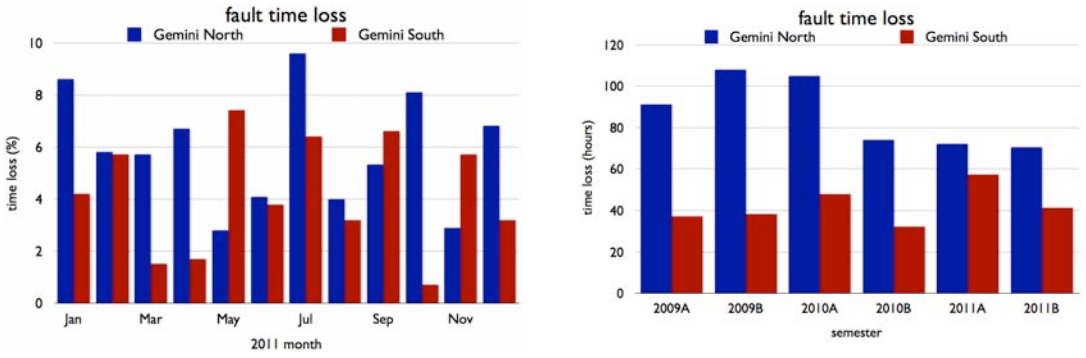

Figure 3-3: Monthly average fault rate during 2011 (left), and the longer term trend (measured in absolute hours) over recent semesters (right). Significantly, the long-term trend is toward a declining fault rate at Gemini North.

3.2 Time Exchange

Gemini continued to exchange telescope time with the Subaru Observatory and the W. M. Keck Observatory during this reporting period. The Subaru exchange program has been popular and successful, with all instruments on all telescopes open for use,

resulting in eight nights exchanged in semesters 2010B and 2011A. The Keck exchange has always been restricted to use of HIRES on Keck and the mid-infrared instruments on Gemini (Michelle and T-ReCS). In semesters 2010B and 2011A, a total of two nights were exchanged. The program is not offered for 2012A.

3.3 Full and Distributed Support Model

Gemini Observatory and the National Gemini Offices (NGOs) together fully support their users. Use of the Observatory is open to the entire international community, so information about the facility, instrument capabilities, and their use is public and accessible. Gemini also remains committed to providing data reduction tools in an open (non-proprietary) platform. As a result, the Gemini community continues to grow, with nearly one-fifth of recent PIs being new to Gemini over the last four semesters (Table 3-1).

Semester	% new PIs
2010A	20.2
2010B	25.4
2011A	17.3
2011B	24.6

Table 3-1: New PIs

While sharing support between staff at the Observatory and the NGOs, the latter are the local face of Gemini within their communities. Gemini and the NGOs have worked during 2011 to improve the total support to users. New initiatives include better access for the NGOs to Observatory documentation, including the Helpdesk archive, nightlogs, and the internal web, and instrument training. NGO staff have continued to make regular visits to the Observatory sites, and Gemini staff have visited several NGOs during 2011.

3.4 Efficient Operations

Planning for the long-term reduced budget that is a consequence of the withdrawal of the UK from the Gemini partnership after 2012 has already begun, with an emphasis on making operations more efficient. One element of the planned changes is to have non-research staff execute queue observations. The introduction of these professional observers has begun, with three already trained and observing this year. The candidates for these positions are similar to the current System Support Associates and Data Analysis Specialists at Gemini, either having technical backgrounds and interest in astronomy, or being PhD astronomers who choose not to pursue research careers.

An important element in improving efficiency is to reduce human effort through improved tools and software. New software for the International Time Allocation Committee (ITAC) was introduced for the May 2011 ITAC meeting. The web-based user interface was designed to lead to a more effectively filled queue (recognizing individual target constraints of position and sky conditions, rather than treat each program as an average), and the software automates some of the required reporting of results, including preparing messages for proposers.

3.5 Serving Users

Instrumentation

Gemini is fundamentally a service facility, not a research institute, so serving the users of the international community is our goal. One obvious and crucial element of that service is to deliver the science capabilities the users desire. As we describe in subsequent sections, Gemini is poised to deliver a number of new and unique capabilities. Completing these projects has the highest priority through 2011. The recent reorganization of the Observatory is in part an effort to isolate the required effort and

prevent regular operations from demanding key personnel, even if operations may suffer at times as a result. Moreover, the next-generation instrument projects that are in progress reflect the scientific needs users have expressed.

Software

New software development initiated in 2011 puts tools for users' benefit first. The largest and highest-priority software effort during the second half of the year is the improvement of the Phase I and Phase II tools that community astronomers use to propose and execute observations. The first set of these new tools were made available at the end of 2011, for use in the 2012A Phase II, and the first revision to the Phase I interface will be distributed in early 2012 for use in the 2012B proposal cycle. Some elements of these new tools include:

- Improve Phase II skeletons – to use Phase I information and knowledge of "best practices" to produce fewer errors in observing plans
- Automate calibrations – to use configuration of the science observations to define required calibrations, and therefore be updated if the science configuration changes
- Improve guide star selection – to facilitate finding and selecting guide stars
- Improve proposal editing capabilities – to let users upload typeset documents containing scientific justification and other components and to provide easier editing of observation elements in the database

Data Reduction

To help users work with their Gemini data, the Observatory and NGOs have jointly organized and presented data workshops. The first was held in 2010 (with the US NGO), and by-products have included worked examples of data reduction and cookbooks for installation of Gemini data reduction tools. In 2011, Gemini was fully engaged in the South American Gemini Data Workshop, organized with the NGOs from Argentina, Brazil, and Chile, which occured at the end of October. We also provided some speakers and expertise for an Australian-led workshop on observational techniques used at a variety of facilities.

The first component of the data quality assessment pipeline is now operational at Gemini, automatically reducing incoming data to provide GMOS image quality measurements in real time during nightly operations. The infrastructure behind the system is established, so adding more instruments and more functions is straightforward. Elements of the pipeline are part of users' scientific data reduction, so they will benefit when these tools appear in the users' package. In addition, new work in 2011 has updated the GNIRS data reduction package and prepared the FLAMINGOS-2 and GSAOI packages for use during instrument commissioning.

Formal Interactions with Users

Gemini's advisory structure has been reorganized. With its first meeting in November 2011, the Science and Technology Advisory Committee (STAC) replaces the Gemini Science Committee (GSC). This committee advises the Gemini Board on long-range scientific and technical matters, including advising on scientific priorities for projects and programs. The Observatory will continue to work closely with the STAC to ensure they have the necessary information about operational consequences and staff availability to

engage in proposed projects. This new committee will not take the role of a users' committee as the GSC had done. Thus, Gemini is in the process of establishing an independent users' committee to provide direct feedback from the user community to both the Observatory and the NGOs who are responsible for providing service. The first meeting of this committee will be during 2012.

4 Instrument Development

The mission of the Instrument and Facilities Development Group is to lead instrument development so the resulting strategic portfolio is aligned with the Observatory scientific mission for decades to come. This group conducts ongoing instrumentation projects by executing professional scope, time, and cost management.

During 2011, the group has made great progress toward delivering new instrument capabilities, which will culminate in an effectively new instrument suite at Gemini South in 2012. The group also leads the upgrade of existing instruments, notably for 2011, GMOS at Gemini North.

Finally, this group along with the scientific staff, are working closely with the STAC to define the long-term instrument suite of the Observatory. Specifically, they are defining the instrument complement consistent with the 4+AO operation to be implemented during the 2012–2015 transition and the generation of instruments for the next decade.

4.1 Gemini Multi-Conjugate Adaptive Optics System (GeMS)

Figure 4-1: (left) Propagation of the Gemini South laser. (right) The 5-star constellation during technical commissioning.

The Gemini South multi-conjugate adaptive optics facility is Gemini's next generation AO system. It is currently the largest internal development project at Gemini, and it is in the final stages of commissioning at Gemini South. Once operational, it will provide an absolutely unique science capability, delivering near-uniform and excellent image quality over the full 85 arcecond square field of view.

The key GeMS subsystems include:

- A 50-W solid-state laser projecting a constellation of five artificial guide stars on the 90km high sodium layer, allowing full tomography of the atmosphere in the telescope's line-of-sight;
- Canopus, the advanced adaptive optics bench with three deformable mirrors and multiple wavefront sensors;
- A system of beam transfer optics used to relay the laser beam from the Nasmyth service platform laser to the laser launch telescope at the back of the secondary-mirror tip-tilt system;
- Infrastructure accommodating new equipment, including a seven-ton structure erected on the telescope to support the laser service enclosure and the laser itself; and
- The Gemini-South Adaptive Optics Imager (GSAOI), a 4Kx4K near-infrared camera that will serve as the main imager for GeMS.

The GeMS laser was delivered to Cerro Pachón in March 2010 and mounted on the telescope in July 2010. The first light on the sky was achieved on January 21, 2011 (Figure 4-1). Technical commissioning of the system continued through the first half of the year, achieving first engineering light with GSAOI on April 19, 2011 (Figure 4-2). Many of the AO loops were closed, and although the system was not yet optimized for science, Strehl ratios up to 20% and FWHM between 75 and 110 mas were measured.

The system went into a planned shutdown and development phase and returned to on-sky commissioning in November 2011. The current work on the laser will ensure better beam quality, stability, and reliability. The stability of the beam transfer optics was improved. Various subsystems of the Canopus AO bench were upgraded, with a particular effort to improve the throughput of the natural guide star wavefront sensors. System Verification is expected in the first half of 2012, with regular science use soon thereafter.

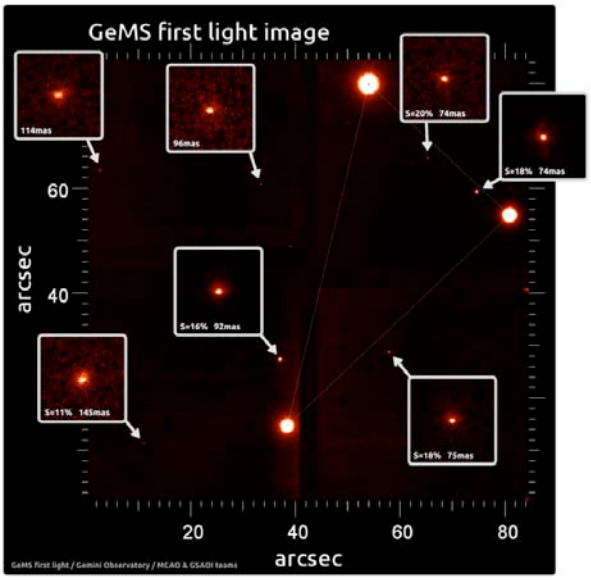

Figure 4-2: Technical first light image from GeMS.

In December 2011, another major step was accomplished in tuning the performance of the AO system and some remarkable images were obtained with GSAOI (Figure 4-3).
The FWHM at *H* band is only 80 mas with a RMS of 2 mas, which translates into a Strehl ratio of 35% at *H* which constitutes a new world record for LGS AO systems. Images (before stacking) are about 60 to 70 mas). Since then, we have obtained images down to 49 mas, closer to the goal (given the diffraction limit of 43 mas).

During laser operations, human spotters and the Visualizador de Transito Oceanico

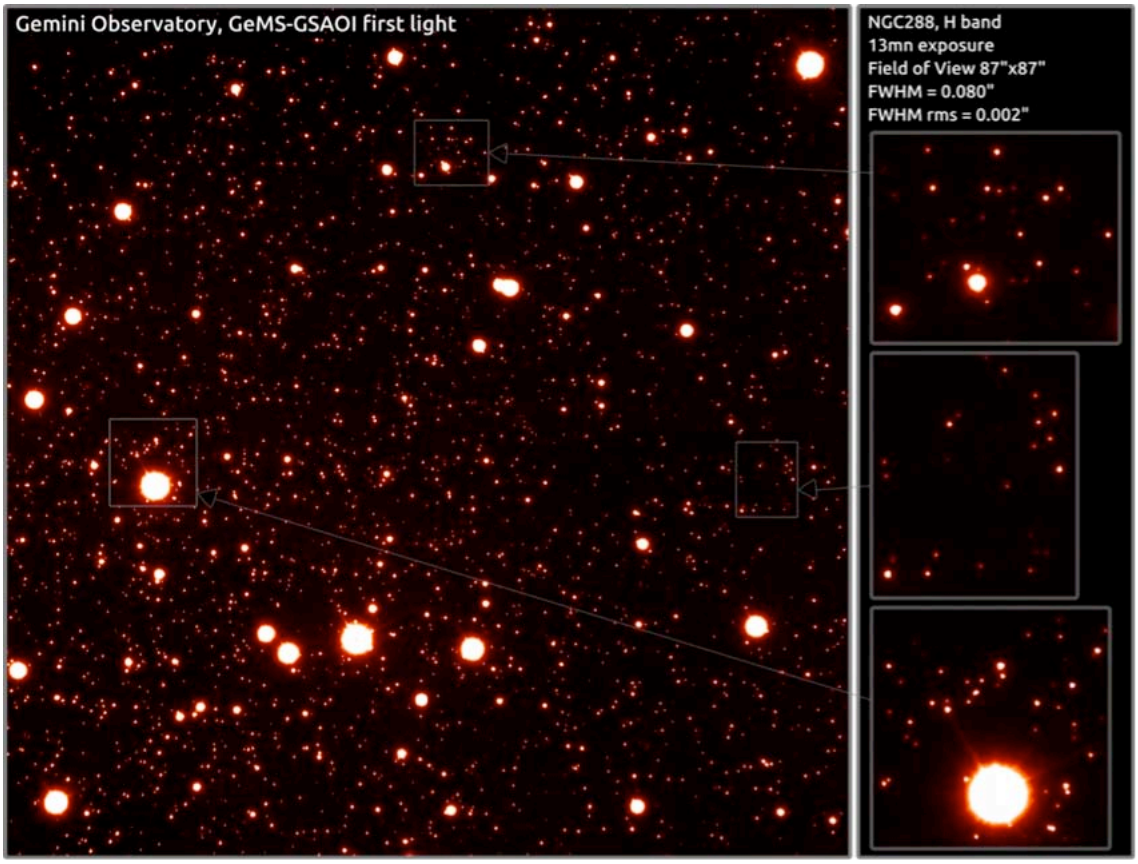

Figure 4-3: First optimized image with GSAOI.

(VITRO) technology detect and monitor aircraft near the observatory.

4.2 FLAMINGOS-2

FLAMINGOS-2 is a near-infrared wide field imager and multi-object spectrometer. It was constructed by the University of Florida Astronomy Department and delivered to Gemini South in July 2009. Although it was installed on the telescope and achieved first light during on-sky acceptance testing in September 2009, Gemini took responsibility for the instrument to perform the significant work required to release it to the community as a facility-class instrument. Key areas of attention are thermal and vacuum stability, mechanism reliability, installation of the R~3000 grism, documentation, and replacement of the science detector.

Improvements have been made in all these areas, primarily through work at the La Serena Base Facility laboratory. Anodized vacuum seals and an O-ring in the lens barrel have been eliminated. The multi-object spectroscopy (MOS) wheel mechanism was redesigned and replaced. The gate valve baffle design was improved. University of Florida delivered and installed the R~3000 grism. The detector thermal control has been improved. The replacement HAWAII-2 science-grade detector has been installed and characterized cold.

FLAMINGOS-2 moved to Cerro Pachón in early October. Following testing in the summit laboratory, acceptance testing and on-sky commissioning resumed in December

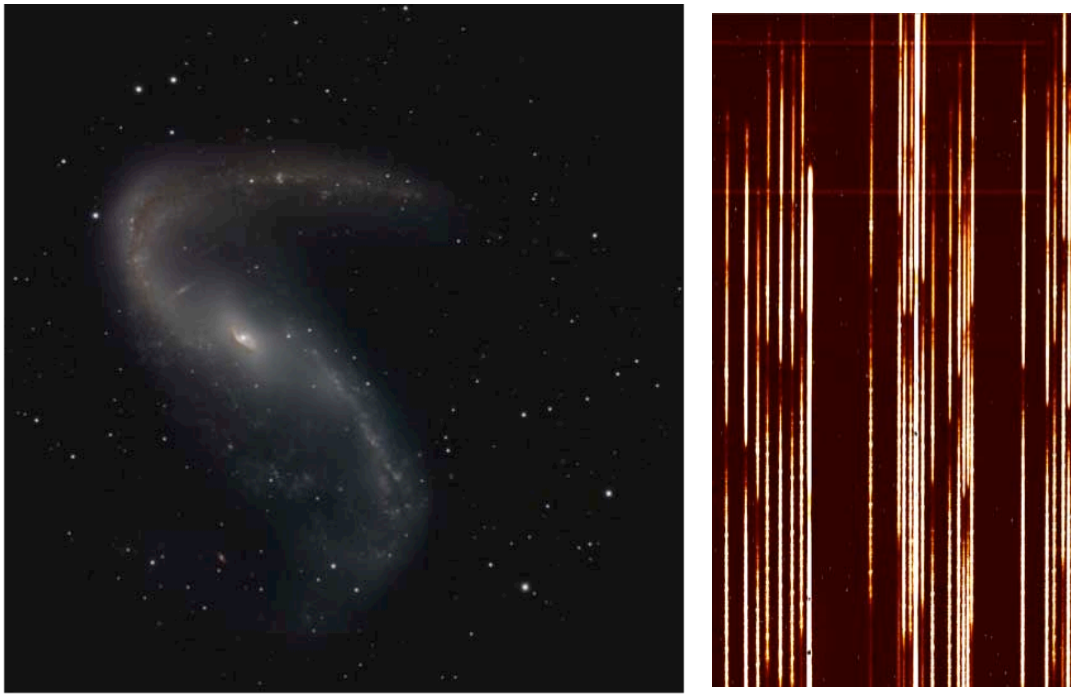

Figure 4-4: (left) NGC 2442, color composite in Y, J, and H bands. The individual exposure times are approximately 2 minutes, achieving FWHM=0.35" over the 6' x 6' field of view. (right) Example of a portion of the multi-object spectra obtained in a single exposure, obtained in December 2011.

2011, where imaging, longslit, and MOS modes were tested (Figure 4-4).

4.3 Gemini Planet Imager (GPI)

Figure 4-5: GPI in the laboratory at UCSC.

GPI is an extreme AO imaging polarimeter and integral field spectrometer, which will provide diffraction-limited data from 0.9 to 2.4 microns. The system will provide contrast ratios of 10^7 on companions at separations 0.2-1 arcseconds in observations of 1-2 hours. The science instrument will provide spectroscopy or dual-beam polarimetry of any object in the 3 arcsecond field of view. GPI is being built by a consortium of US and Canadian institutions, led

by Brice Macintosh of Lawrence Livermore National Laboratory.

The four main optomechanical subsystems have passed acceptance testing and are undergoing integration at the University of California Santa Cruz (UCSC; Figure 4-5). The last major sub-system, the integral field spectrograph, was delivered in December 2011. The integration and testing is expected to be complete in mid-2012, with delivery to Gemini South soon thereafter.

While the partnership team leads the design and construction, Gemini personnel have been deeply involved in the project in order to facilitate a smooth handover of the instrument for science use. Stephen Goodsell, the Gemini Project Manager of this program, has relocated to Santa Cruz to work closely with the instrument team.

4.4 Gemini High-Resolution Optical Spectrometer (GHOS)

In response to community demand, Gemini is pursuing development of a high-resolution optical spectrometer. The science cases that the Gemini Science Committee evaluated showed a range of essential technical requirements. Thus, the call for proposals (CfP) for the Gemini High-Resolution Optical Spectrometer (GHOS) was open to a variety of solutions, including fiber-fed and Cassegrain-mounted instruments.

The response to the CfP was good, with interest from across the partnership in the seven submitted bids. Teams from three institutions—Herzberg Institute for Astronomy, Center for Astrophysics and Space Astronomy (U. Colorado) and the Australian Astronomical Observatory — have been awarded conceptual design contracts. These will be reviewed in mid-2012, with the expectation of continuing one or more through the preliminary design phase. The delivery target is to complete science commissioning before the end of 2015.

4.5 Gemini Remote Access to CFHT ESPaDOnS (GRACES)

Given the great interest in high-resolution optical spectroscopy, Gemini is also pursuing use of the existing ESPaDOnS spectrograph at the Canada-France-Hawaii Telescope (CFHT) through the concept named Gemini Remote Access to CFHT ESPaDOnS (GRACES). The fiber input would be via GMOS-N, similar to the technique that had previously been used to feed the Bench High Resolution Spectrograph. A conduit between the telescopes already exists to convey the 270-m fiber.

The initial feasibility studies show competitive performance, especially at red wavelengths (Figure 4-6). The next step is to complete a detailed design study, which CFHT and HIA will lead. Science use of GRACES would be introduced in stages. If such a study is successful, the first stage in 2012 would allow use of GRACES in a visitor mode, likely in scheduled blocks

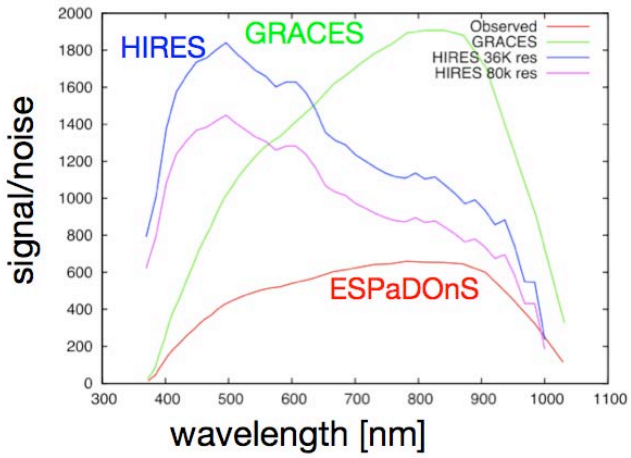

Figure 4-6: Signal/noise as a function of wavelength, for the existing instruments HIRES (at the Keck Observatory) and ESPaDOnS (at CFHT), compared with the proposed GRACES.

rather than mixed into the semester's queue. Data reduction capabilities would be provided by CFHT, not through the Gemini data reduction package.

4.6 GMOS-N CCD Upgrade

In addition to new instrumentation, the Development group is delivering improved capabilities through existing instruments, most notably through the upgrade to the GMOS-N CCDs. The initial plan was to use red-sensitive devices that have been purchased from Hamamatsu Photonics. We have encountered several difficulties working with these devices and the upgraded ARC controller over the past year. As an interim strategy, we installed e2v deep depletion CCDs in November 2011 while working to resolve the problems with the Hamamatsu CCDs.

The e2v devices offer improved performance compared with the ones currently in GMOS-N. The physical and electronic configuration is the same, so replacement was reasonably straightforward. The new CCDs arrived in Hilo in late September, and GMOS-N was off the telescope for their installation in October. Given the similarity to the current system, the transition for users has been transparent, and they will benefit from the improved (blue and red) sensitivity immediately. The long-term plan remains to install the extremely red-sensitive Hamamatsu CCDs later, likely in late 2012. Figure 4-7 compares the quantum efficiency of these various devices. If this focal plane upgrade proves successful, GMOS-S will get the improved CCDs later.

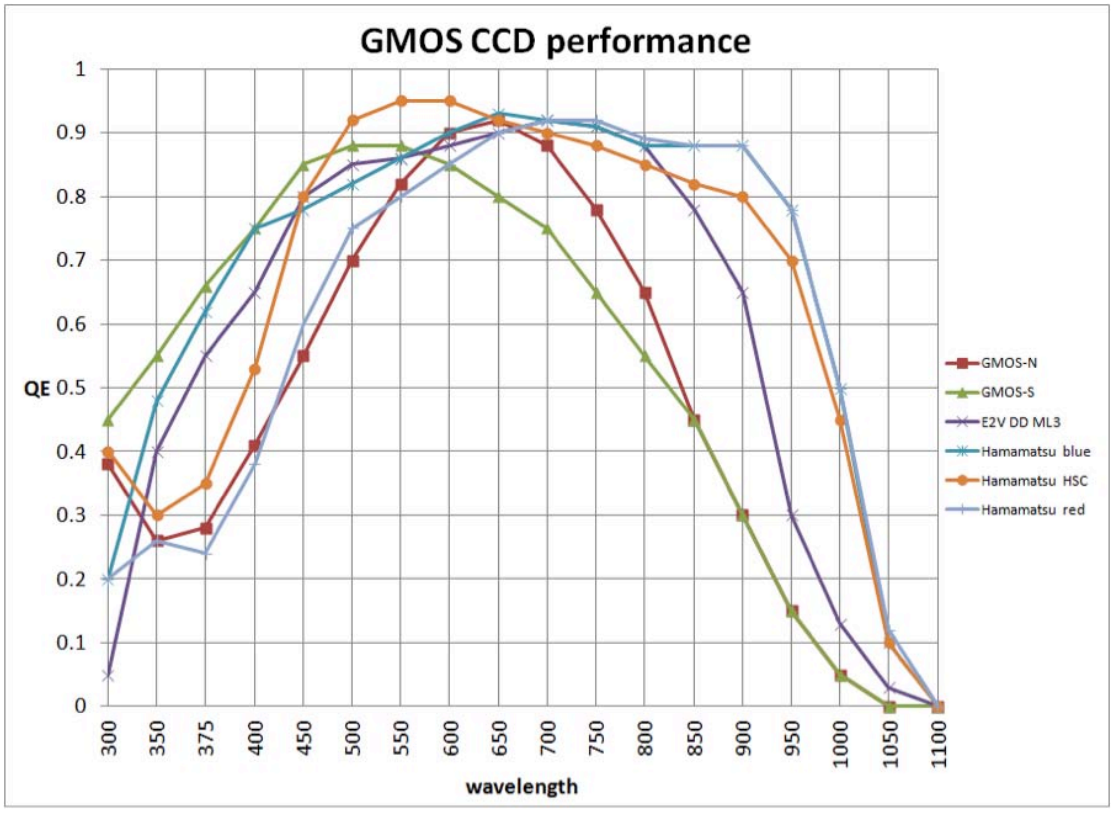

Figure 4-7: Quantum efficiency of various CCDs for GMOS. The old GMOS-N devices have been replaced with the "E2V DD ML3" CCDs. Future upgrades will install Hamamatsu devices in both GMOS spectrographs.

4.7 P1+LGS Upgrade for Use with ALTAIR

In December 2011, we installed a 2x2 lenslet and 589nm notch filter in the Acquisition and Guiding Peripheral Wavefront Sensor #1 (PWFS1) mechanism to enable guiding over wider field for tip-tilt and focus (compared to the limited 25" FOV inside Altair for natural star in the LGS mode). As a result, NIRI, NIFS and GNIRS will be able to access virtually the whole sky using AO of ALTAIR. The technical and scientific commissioning will happen early 2012 and the new capability will be offered to the scientific community in 2012B.

4.8 New Acquisition and Guiding Unit

Funding for a new Acquisition and Guiding unit has been available for a few years and work resumed late 2011 to gather the top-level requirements and consider possible compatibility with future AO systems. Conceptual work will continue in 2012 and will lead into a request for bids like any other instrument. We aim at having this more performing and more reliable facility commissioned in the 2015-2016 time frame.

5 Broader Impacts

Gemini has a keen sense of responsibility, not only to disseminate the acquired science knowledge to the broadest and most diverse audiences possible, but also to build a highly diverse staff who will perform all of the activities required to achieve the acquisition of this knowledge. We further aim to encourage new generations of diverse people to consider careers in astronomy and other science, technology, engineering, and mathematics (STEM) pursuits.

5.1 Public Information and Outreach

The 2011 education and public outreach activities are built on an ongoing foundation of well-established programs. The overall philosophy is to coordinate STEM training for grades K-12, including teacher training, classroom and community presentations, and facility tours. The total program reaches an audience of 30,000 in person each year, and we highlight some of the central components here.

Journey Through the Universe is the flagship annual nine-day education program led by Gemini staff and engaging the entire East Hawaii community. The intensive week of activities includes teacher workshops, classroom visits by astronomy researchers, public programs and lectures, and family science nights. The February 2011 program engaged over 50 astronomy educators from Hawaii and beyond who made presentations in 310 K-12 classrooms. These programs directly touched more than 6400 students and 120 teachers, with public programs reaching 2600 more. This was the seventh year of the program in Hawaii and included new support from the NASA Lunar Science Institute. Gemini Public Information and Outreach (PIO) staff have authored a paper on the

Figure 5-1: A rocket workshop during the 2011 Viaje al Universo week.

Journey program that will be published in the series *Organizations, People and Strategies in Astronomy*.

Viaje al Universo began in 2011 as a pilot program to bring Journey Through the Universe to Chile. The kickoff for the July week was AstroDay Chile, a public fair at which over 20 institutions from throughout Chile and abroad exhibited. Viaje al Universo was planned to bring educational activities to children during school vacations, and community visits were coordinated through neighborhood associations. The week's activities included talks, rocket workshops, and a mobile planetarium with 3D imagery, reaching about 2500 people in urban and rural areas of the local community.

The four Gemini **StarLab portable planetaria** provide in-school and community educational programming on astronomy, navigation, light pollution, and the cultural connections between the naked-eye sky and the host communities in Chile and Hawaii. In 2011, the StarLabs at Gemini North and South have visited nearly 4500 school children and families. Gemini North schools have also borrowed the equipment as part of a teacher-training program for curriculum integration.

Figure 5-2: The winner from the Australian student imaging contest—NGC 6872 interacting with IC 4970.

Several of the Gemini partners use some of their observing time for **K-12 student imaging contests**. The Australian winners recognized in 2011 had used GMOS-S to observe a pair of interacting galaxies (Figure 5-2). They also joined a **Live from Gemini** session. This program offers a virtual visit to the Gemini control room, where students hear about recent discoveries, learn about research work, and ask questions of professional

Figure 5-3. "Likes" from Gemini's Facebook page showing significant increase during Gemini Gems Facebook event in November and December 2011

astronomers.

The PIO group coordinates Gemini's efforts to disseminate information broadly. They produce the **GeminiFocus newsletter** semi-annually and issue web features and press releases regularly. More than a vehicle to inform users and the general public about the Observatory activities, the newsletter is also an opportunity to engage users and the distributed support team in the work of public information.
The PIO team is developing "**new media**" for communication. In addition to the print and static Portable Document Format of the newsletter that had been produced, GeminiFocus is now available as an interactive e-reader. The team is also producing video podcasts. Newly completed in 2011 is a two-part podcast of the primary mirror recoating at Gemini South, documentation of instrumentation milestones, and an overview of Gemini's operations. Another innovative new media initiative in 2011 was the Gemini Gems Facebook "event" in which two past Legacy Images and one science highlight was featured each week on Gemini's Facebook page each week in November and December. A marked increase in active users and "Likes" resulted as can be seen in Figure 5-3.

During 2011, a total of 10 press releases were produced and disseminated to the media (both traditional and new). These resulted in multiple high-profile stories in both print and online publications. Many of these are captured in a media-coverage archive that can be found at: http://geminipio.blogspot.com/.

Journey Through the Universe - Hawaii	**Annual Total**
Classes Visited	310
Students Impacted	6490
Astronomer/Engineer Educators	51
Public Impacted	2600
Community Partners	36
Educators/Teacher Workshop Participants	122
Chamber Event	170

Journey Through the Universe - Chile	
Classes Visited	15
Students Impacted	500
Astronomer/Engineer Educators	14
Public Impacted	800
Community Partners	10
Educators/Teacher Workshop Participants	50

StarLab - Hawaii	
Programs Presented	86
Schools Visited	8
Students Impacted	2224

StarLab - Chile	
Programs Presented	207
Schools Visited	75
Students Impacted	7230

FamilyAstro - Hawaii	
Programs Presented	29
Schools Visited	11
Students Impacted	1115
Facilitators Trained	14

AstroDay - Chile	**Annual Total**
Staff Participants	15
Estimated Attendance	2200
Community Partners	10

Other Public Programs - Hawaii	
Programs Presented	12
Participants (Students)	1286
Participants (Adults/Public)	2982

Other Public Programs - Chile	
Programs Presented	7
Participants (Students)	811
Participants (Adults/Public)	522

Teacher Training/Workshops (excluding JTtU) - Chile	
Programs Presented	1
Participants (Teachers)	50
Participants (Adults/Public)	-

Summit Tours - Hawaii	
Number of Tours	57
Participants	411

Summit Tours - Chile	
Number of Tours	24
Participants	458

Live from Gemini - Hawaii	
Number of Programs	7
Participants	297

Table 5-1: 2011 participation in PIO activities.

The PIO group leads the **Legacy Imaging** program, presenting scientific observations that happen to be beautiful and obtaining new observations to demonstrate the telescopes' capabilities. The Lagoon Nebula (Figure 5-3) release this year has attracted over 200,000 hits on the Gemini web page and was widely shown in electronic and print media around the world.

Additional statistics on the PIO activities and numbers of participants are listed in Table 5-1.

5.2 Broadening Participation of Underrepresented Groups

Gemini aims to broaden the participation of women and underserved minorities within its own workforce, and increase the participation of women and underserved minorities within the technical workforce as a whole. We participate in local workforce development initiatives, especially in Hawaii. For example, the Astronomy Workforce Task Force Initiative is addressing STEM educational needs, and the collaboration helps the observatory and potential interns find each other to work together. Gemini is an ongoing participant in the Akamai Observatory program, which matches mentors to engage with interns in technical projects. Gemini North and Gemini South each hosted 10 interns during 2011, in all areas.

Figure 5-4: A portion of the Lagoon Nebula legacy image, obtained by J. Arias and R. Barbá using GMOS-S.

National partnerships, such as the Fiske Vanderbilt Bridge Program, help identify underrepresented minority students for internships at Gemini. We have successfully completed the first of these in 2011, and our former intern is now enrolled in an astronomy PhD program. Engineering staff regularly participate in the meetings of the Society of Women Engineers, and a Gemini representative will attend the Native Indian Education Association meeting in 2012.

The Gemini mentoring program is another component that extends inside and outside the Observatory to develop human capital. The pilot program was initiated in 2010, and through 2011 we have developed it as an ongoing effort that includes training exercises and feedback to develop skills as mentors and mentees.

6 Budget and Administration

6.1 Budget

The Gemini partners contribute to the budget according to the standard cost shares shown in Table 6-1, following the International Gemini Agreement.

Partner	Cost Share
United States	50.12%
United Kingdom	23.81%
Canada	15.00%
Australia	6.19%
Brazil	2.38%
Argentina	2.50%
Total	100.00%

Table 6-1: Partners' cost shares

The Gemini budget recognizes three distinct expenditure categories: Operations and Maintenance (O&M), supported by a single fund; Development, which is primarily supported by the Instrument Development Fund (IDF) and the Facilities Development Fund (FDF); and Support Facilities (for capital facility upgrades, not operating expenses). In this last category, only the Southern Base Facility Fund had any activity in 2011. The total 2011 budget summary in terms of the funding sources is given in Table 6-2.

SUMMARY OF ALL FUNDS
As of December 31, 2011

	New Funds	Y-T-D Expenditures	Year End Encumbrances	Year End Expenditures and Encumbrances
Operations and Maintenance	32,202,956	28,441,954	1,001,781	29,443,735
Instrument Development Funds	4,449,004	4,379,860	4,013,262	8,393,122
Facilities Development Funds	315,299	1,501,339	420,936	1,922,275
Southern Base Facilities Funds	-	35,749	55,504	91,253
Totals	**36,967,259**	**34,358,902**	**5,491,483**	**39,850,385**

Table 6-2: 2011 budget by fund.

Operations and Maintenance Funds (Table 6-3). The O&M budget is divided into several broad categories, depending on the location and the activity. Labor costs are included within these categories. *Telescope Operations* includes overall effort to support each summit facility, the telescope, and its systems, including instruments. Most of the engineering operations effort of the Observatory is included in this category, along with summit site costs such as electricity. The Science Operations staff effort is part of the *Nighttime Operations, User Support, and Science* line. The nighttime work of staff astronomers (supporting both queue and classical modes) and the Science Operations Specialists who operate the telescopes are included here. The user support component includes direct user interactions to help prepare programs, development of software for data reduction, work to maintain the Gemini Science Archive, and instrument scientist duties. Scientific research effort of staff is also part of this category. The *Instrumentation Development* within the O&M budget is distinct from **Development** discussed below. It includes operations work that is organized within the Development branch of Gemini, such as major operational software projects, the Adaptive Optics team, and support for the Associate Director for Development. Table 6-3 shows the final close of the 2011 O&M budget.

The unallocated amount during 2011 (listed as *UNBUDGETED FUNDS* in the **New Funds** column) are part of a deliberate effort to smooth the transition from the current partnership to the withdrawal of the UK at the end of 2012, while leaving Gemini sustainable for the long-term at a reduced budget level. Some of the work planned to enable future, more efficient operations will continue past next year. Examples of these "investments" are improved software to reduce the human effort of operating in queue observing mode and the move to regular observations from the base facilities as opposed to the summits. The work of these projects will extend beyond 2012, and unbudgeted funds will support continuation and completion of this activity when the partner contributions are reduced.

OPERATIONS AND MAINTENANCE FUNDS
As of December 31, 2011

	New Funds	Y-T-D Expenditures	Year End Encumbrances	Year End Expenditures and Encumbrances	Variance Actual vs. Budget
GEMINI NORTH					
Director's Office	589,133	593,562	8,210	601,772	(12,639)
Telescope Operations	7,799,884	7,167,774	265,018	7,432,791	367,093
Nighttime Operations, User Support, and Science	3,127,872	3,104,502	58,088	3,162,589	(34,717)
Administration	2,833,659	2,678,348	78,006	2,756,354	77,305
Safety	48,547	53,570	22,679	76,249	(27,702)
GEMINI SOUTH				-	-
Deputy Director's Office	369,375	347,957	12,864	360,822	8,554
Telescope Operations	7,030,921	6,467,575	313,285	6,780,860	250,062
Nighttime Operations, User Support, and Science	3,438,641	3,230,843	14,562	3,245,405	193,237
Administration	1,949,155	2,008,546	112,228	2,120,775	(171,620)
Safety	315,561	331,091	4,591	335,682	(20,120)
INSTRUMENTATION DEVELOPMENT	726,140	891,750	100,104	991,854	(265,714)
PUBLIC INFORMATION & OUTREACH	672,864	627,146	12,147	639,293	33,571
AURA F&A & Mgmt. Fee	1,010,581	939,289	-	939,289	71,292
UNBUDGETED FUNDS	2,290,621	-	-	-	2,290,621
Totals	**32,202,956**	**28,441,954**	**1,001,781**	**29,443,735**	**2,759,221**

Table 6-3: Operations and Maintenance budget.

The total underspend in *Telescope Operations* is largely attributable to purchases associated with several projects that are ongoing after 2011. The most significant of these are: dome safety platforms at both sites; azimuth tape replacement and purchase of spares at both sites; upgrades to the Cerro Pachón summit facility (notably computer room air conditioning and the chiller for the laser); replacement of multipoint Polycom units; upgrade to the Mauna Kea diesel tank; and laser spares. These major projects and their costs will carry forward into 2012.

In the Gemini South *Nighttime Operations*, the major sources of underspend are: labor (due to turnover and lag in filling open positions); science staff research accounts (due to work on new instrument commissioning, especially FLAMINGOS-2 and GeMS); and intended savings with a reduction in travel and computer purchases (which were made at both sites).

The underspend in Gemini North *Administration* is primarily budgeted relocation costs that were not executed in 2011 and savings in labor costs due to lower compensation. The overspend in Gemini South *Administration* was due to increased spending on non-labor facilities services.

The project to improve the Phase I and Phase II user software was managed as part of the *Instrumentation Development* group's operations and was therefore charged against this line, but the original work was planned as part of Telescope Operations. This change accounts for the majority of the overspend shown for *Instrumentation Development* in Table 6-3.

Instrument Development Funds (Table 6-4). Most of the instrument projects that the IDF supports (a minimum of 85%) are contracts to external vendors. A fraction (12% in 2011) of the IDF goes toward work at Gemini to repair and upgrade instruments.

Past contributions were identified for the Aspen program exclusively, which is listed separately. The one remaining instrument from this program is the Gemini Planet Imager (GPI).

INSTRUMENT DEVELOPMENT FUNDS
As of December 31, 2011

	Commitment & Unspent Carryover from Prior Year	New Funds	Y-T-D Expenditures	Year End Encumbrances	Unspent & Unencumbered Balance
GENERAL					
Program Support	599,776	159,418	150,294	9,124	599,776
GHOS	-	920,654	45,083	875,571	-
GNIRS	90,000	-	-	-	90,000
GMOS CCDs	651,346	831,405	760,636	70,769	651,346
GRACES	-	312,263	111,263	201,000	-
NICI Commissioning	(16,802)	71,975	173	71,802	(16,802)
Phoenix Support	-	-	-	-	-
GSAOI Imager	26,958	342,314	131,105	211,209	26,958
Flamingos 2	136,121	1,182,653	468,471	714,182	136,121
UNBUDGETED FUNDS	-	476,795	-	-	476,795
ASPEN PROGRAM					
Program Support	994,663	-	534,607	2,139	457,917
GPI	6,139,100	151,527	2,178,227	1,857,467	2,254,933
Totals	**8,621,162**	**4,449,004**	**4,379,860**	**4,013,262**	**4,677,044**

Table 6-4: Instrument Development Funds budget.

While GHOS is expected to be a long-term project and will require future expenditures, at the moment only $900K is committed for the conceptual design phase ending in May 2012. The $477K *GENERAL UNBUDGETED FUNDS* is expected to be applied to a later stage of GHOS development. The remaining **Unspent & Unencumbered Balance** lines will each be spent on their assigned categories (e.g., $651K for future work on GMOS CCDs), but none has a formal encumbrance now.

Facilities Development Funds (Table 6-5). The largest active project of the FDF is the Multi-Conjugate Adaptive Optics (MCAO) system. The bulk of the unspent balance within this fund is allocated to develop a new Acquisition and Guiding (A&G) System.

This will be developed similar to other external procurements, with significant activity expected to start in 2012. With no contractual commitment in 2011, the A&G System accounts for $4.7M of the $4.8M total **Unspent & Unencumbered Balance**. Similar to

FACILITIES DEVELOPMENT FUNDS
As of December 31, 2011

	Commitment & Unspent Carryover from Prior Year	New Funds	Y-T-D Expenditures	Year End Encumbrances	Unspent & Unencumbered Balance
Program Support	175,126	97,173	105,004	-	167,295
Laser Service Contract	100,000	-	-	152,220	(52,220)
Spare Secondary Mirro	13,500	-	7,657	-	5,843
Array & Controller Development	87,828	-	-	-	87,828
A&G System Developm	4,696,902	105,131	51,579	24,914	4,725,540
MCAO	1,380,456	112,995	1,337,098	243,803	(87,450)
Totals	**6,453,811**	**315,299**	**1,501,339**	**420,936**	**4,846,835**

Table 6-5: Facility Development Funds budget.

the planned use of the IDF, other lines that contain an **Unspent & Unencumbered Balance** are expected to be dedicated to the specified activity, but the expenditure is not formally committed now.

Southern Base Facilities Funds (Table 6-6). Capital improvements to the Southern Base Facility were the only use of the Facilities Fund during 2011. Upgrades to the southern base facilities have provided more office space, as well as more suitable storage and work areas for network systems.

SOUTHERN BASE FACILITIES FUNDS
As of December 31, 2011

	Commitment & Unspent Carryover from Prior Year	New Funds	Y-T-D Expenditures	Year End Encumbrances	Unspent & Unencumbered Balance
SBF Improvements	80,735	-	35,749	55,504	(10,518)
Totals	**80,735**	**-**	**35,749**	**55,504**	**(10,518)**

Table 6-6: Southern Base Facilities Funds budget.

6.2 Organization and Administration

The Gemini Observatory organization was restructured during 2011, and several key personnel have changed. The current top-level organization is shown in Figure 6-1. One significant change was to consolidate all of operations activities, including engineering and science, into a single division. The number of staff assigned to the Development group has grown, in recognition of the development activity occurring within the Observatory during this year.

Doug Simons concluded his term as Gemini Director in May 2011, and Fred Chaffee is serving as Interim Director while a search for a permanent replacement is underway. The position of Chief Financial Officer has been defined, with the successful search resulting in the appointment of Diego Correa beginning in January 2012. Deborah Narcisso (AURA) has been serving as Associate Director (AD) for Administration in the interim.

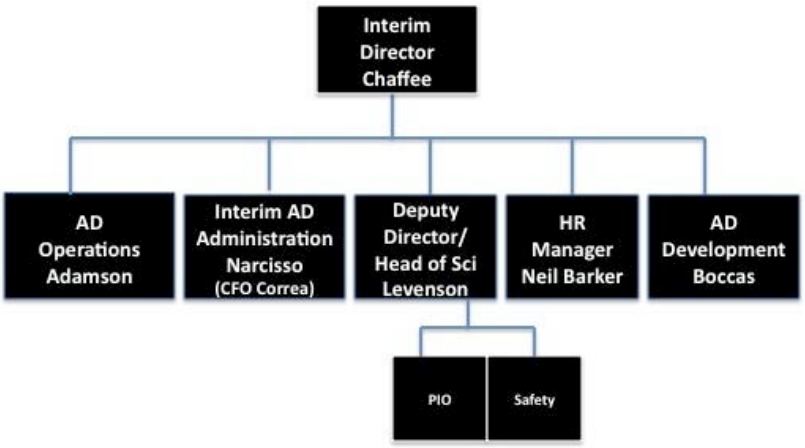

Figure 6-1: Overview organizational chart.

Within Operations, there is a Head of Science Operations for each site, and a Head of Engineering Operations for each site (Figure 6-2), all of whom report to the AD for Operations. A manager leads the Science Operations Specialist team at each site, reporting to the local Head. One manager leads the total Data Process Development team. The Heads of Science Operations serve directly as managers of the astronomy staff at their local site. Within Engineering Operations, there is one manager of each functional group, who may be located at either site and who reports to the local Head of Engineering Operations. A functional lead is identified for the other site.

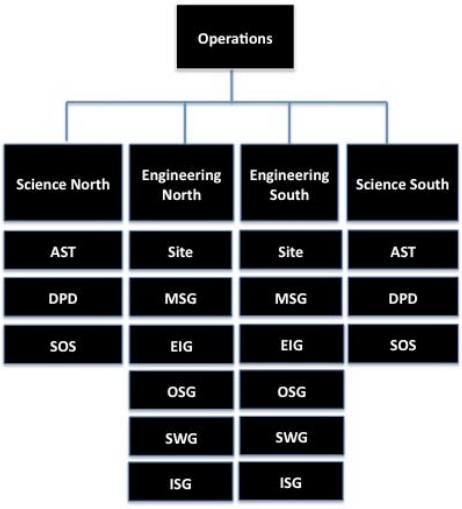

Figure 6-2: Operations structure. Within Science Operations, the primary groups are astronomers (AST), Data Process Developoment (DPD), and Science Operations Support (SOS). Within Engineering Operations, the functional groups are the summit sites, mechanical systems group (MSG), electronic and instrumentation group (EIG), optical systems group (OSG), software group (SWG) and information systems group (ISG). The reporting lines are further described in the text.

The Development branch is organized largely according to key projects, each of which is led by a project manager. The Systems Engineering Group and Adaptive Optics are also part of this division.

The Administrative group led and completed several projects during 2011. Some of the team's main accomplishments are:

- Remodeling the La Serena Base Facility to provide more usable office space;
- Coordinating the staff mentoring program, including leading training;
- Implementing an electronic employee self-service payroll and benefit system; and
- Implementing an electronic recruiting package.

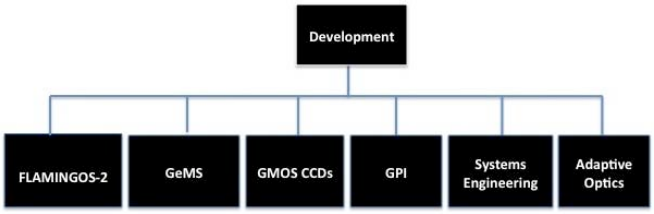

Figure 6-3: The Development branch encompasses major instrument projects, Systems Engineering, and the Adaptive Optics group.

7 Future Plans

Most of the plans for 2012 build on current activity. Some elements of the Development projects described above will be concluded, and others will continue. Specifically, science commissioning of FLAMINGOS-2 and GSAOI/GeMS are planned for early 2012. Major instrument projects such as GPI and GHOS will continue, and 2012 should see the beginning of the next new instrument development. Work on GRACES will continue, but it is unlikely to be available for scientific use before early 2013.

In the area of improvements to current capabilities, the Hamamatsu CCDs are expected to be installed in GMOS-N, with significant activity beginning at the end of the year and science availability in early 2013. With the successful completion of this project, we will then turn attention to upgrading the GMOS-S CCDs. We will make mechanical improvements and upgrade the lenses in GNIRS, and general upgrades to detector controllers are also under consideration.

The user software upgrades will continue to be the focus during 2012, with updated packages for Phase I and Phase II and the ITAC process in place for the 2012B semester proposals and programs. Later, attention will shift to operations software. More than a benefit for Observatory employees, some of these developments are essential to be able to operate more efficiently and with reduced staff under the future reduced budget. The Data Quality Assessment Pipeline will be expanded for nighttime use for several instruments and modes, and its underlying elements will be available for users' own quicklook reduction with the completion of the Gemini python package.

We will hold a Gemini Science and User Meeting in mid-2012. This is a regular opportunity for the international Gemini community to gather in order to discuss current results, to provide feedback to the Observatory on their experiences as users, and to consider the next generation of capabilities they will require to continue doing forefront research.

Planning for the move to base facility observing, an important element of Gemini's overall transition plan to more efficient operations, will be developed during 2012. Finally, the move to AURA Centralized Administrative Services will require effort to maintain continuity in Gemini operations. Accounting, procurement, and human resources functions will be part of CAS from October 1, 2012.

Table 7-1 contains a summary of these planned projects, excluding regular operations. The project portfolio has been divided into three major programs:

- Projects supporting operations for improvements and corrective maintenance
- Projects for instrumentation development (new or upgrades)
- Projects supporting the 2012–2015 transition

We have started a continuous planning process with quarterly reviews and a rolling-wave methodology to detail our plans in the short-term. On a monthly basis, we are leveling resource allocations to optimize progress in projects without affecting normal operations. We regularly review the feasibility and timing of the new possibilities that may be introduced. "Observatory projects" are those that require effort across the entire observatory and therefore cannot be planned or executed within a single group. Transition projects are the investments that will allow Gemini to realize long-term cost savings in the future. Projects to execute in 2013 through 2015 have not yet been fully planned or allocated. They include a mix of major instruments, system upgrades, and software efforts.

As this report was being revised in early 2012, FLAMINGOS-2 suffered a catastrophic failure to the large collimator lens. As a result, additional significant work on FLAMINGOS-2 is planned for the year. The specific priorities and objectives for 2012 are listed below.

Top tier:

- FLAMINGOS-2: Repair to get back on the telescope for SV before the end of the year
- GeMS: ready for SV in 2012Q4, including transition to regular operations
- GPI: final acceptance at University of California Santa Cruz in 2012Q4
- Transition plan: revise plan to align with current realities (by May), and meet project targets through the year
- Phase I/II and ITAC software: complete for 2012B observing cycle
- GNIRS: finish upgrade and return to operations by 2012Q4

Second tier:

- Base Facility Observing: specific milestones to be defined by May 1 and met throughout 2012
- GMOS Hamamatsu CCDs: ready for GMOS-N shutdown by the end of 2012
- AURA Centralized Administrative Services: transfer Gemini accounting and procurement to AURA-CAS, fully effective October 1, 2012

Number	Brief project description
Instrumentation Development Program	
OBS11-006D	GeMS Phase 6 Technical Commissioning
OBS09-006B	GSAOI Science Commissioning
OBS09-006C	GSAOI Data Reduction Software
OBS10-006	GMOS-N CCD upgrade
OBS10-007B	FLAMINGOS-2 Science Commissioning
OBS10-007C	Data Reduction Software for FLAMINGOS-2
OBS11-001	GHOS
OBS11-003	GPI
OBS11-005	Acquisition and Guiding Units-2
OBS11-102	GRACES - phase 1
SCI11-301	LGS + P1 Upgrades
OBS11-320	GNIRS phase 2 repairs (including new lens installation)
Transition Program	
DIR12-001	Gemini Transition 2012-2015
OBS11-501	Base Facility Operations
OSW11-200	ITAC Phase 2
OSW11-201	Time Accounting Timeline
OSW11-202	Laser Clearing House clearances
OSW11-220	Phase 1 and Phase 2 Improvements
OSW12-221	Phase 1 and Phase 2 Infrastructure
SCI11-102	Science Operations Training and Documentation
SCI11-620	Data Quality Assessment Pipeline
Planned for 2013-2015	
OBS12-103	New Instrument - generation 4, #3
OBS11-004	Infrared detector controller upgrades
OBS12-102	GRACES - phase 2
OBS11-002	GMOS-S CCD upgrade
OSW11-203	Queue Visualization
OSW11-205	Adaptive Queue Planning
OSW13-222	Phase I/II advanced features
TBD	Altair upgrades

Table 7-1: Large projects planned for 2012 and beyond.

Appendix A. Publications

A.1 Gemini Staff Publications

A.1.1 Gemini Staff Publications in Peer-Reviewed Journals

Bluck, A. F. L.[4]. The relationship between star formation rates, local density and stellar mass up to z ˜ 3 in the GOODS NICMOS Survey. **Monthly Notices of the Royal Astronomical Society**, 418:938-948. December, 2011.

Roth, K. C.[9]. The Spectroscopic Classification and Explosion Properties of SN 2009nz Associated with GRB 091127 at z = 0.490. **The Astrophysical Journal**, 743:204-. December, 2011.

Stephens, A.[22]; Bluck, A.[23]; Mason, R. [24]. Constraining Gamma-Ray Burst Emission Physics with Extensive Early-time, Multiband Follow-up. **The Astrophysical Journal**, 743:154. December, 2011.

Roth, K. C.[30]. Pan-STARRS1 Discovery of Two Ultraluminous Supernovae at z ≈ 0.9. **The Astrophysical Journal**, 743:114. December, 2011.

Bluck, Asa[6]. Insights on the Formation, Evolution, and Activity of Massive Galaxies from Ultracompact and Disky Galaxies at z = 2–3. **The Astrophysical Journal**, 743:87. December, 2011.

Geballe, T. R.[10]. The Circumstellar Environment of R Coronae Borealis: White Dwarf Merger or Final-helium-shell Flash?. **The Astrophysical Journal**, 743:44. December, 2011.

Geballe, T. R.[1]. Infrared diffuse interstellar bands in the Galactic Centre region. **Nature**, 479:200-202. November, 2011.

Bluck, A. F. L.[2]. The tumultuous formation of the Hubble sequence at z > 1 examined with HST/Wide-Field Camera-3 observations of the Hubble Ultra Deep Field. **Monthly Notices of the Royal Astronomical Society**, 417:2770-2788. November, 2011.

McDermid, R. M.[13]. The SAURON project - XIX. Optical and near-infrared scaling relations of nearby elliptical, lenticular and Sa galaxies. **Monthly Notices of the Royal Astronomical Society**, 417:1787-1816. November, 2011.

Carrasco, E. R.[4]. Star Cluster Complexes and the Host Galaxy in Three H II Galaxies: Mrk 36, UM 408, and UM 461. **The Astronomical Journal**, 142:162. November, 2011.

Trancho, G.[10]. Evidence for environmentally dependent cluster disruption in M83. **Monthly Notices of the Royal Astronomical Society**: Letters, 417:L6-L10. October, 2011.

Stephens, A.[22]. SN 2009md: another faint supernova from a low-mass progenitor. **Monthly Notices of the Royal Astronomical Society**, 417:1417-1433. October, 2011.

McDermid, Richard M.[10]. The ATLAS3D project - X. On the origin of the molecular and ionized gas in early-type galaxies. **Monthly Notices of the Royal Astronomical Society**, 417:882-899. October, 2011.

McDermid, Richard M.[20]. The ATLAS3D project - IX. The merger origin of a fast- and a slow-rotating early-type galaxy revealed with deep optical imaging: first results. **Monthly Notices of the Royal Astronomical Society**, 417:863-881. October, 2011.

McDermid, Richard M.[18]. The ATLAS3D project - VIII. Modelling the formation and evolution of fast and slow rotator early-type galaxies within ΛCDM. **Monthly Notices of the Royal Astronomical Society**, 417:845-862. October, 2011.

Bluck, A. F. L.[5]. Star formation in a stellar mass-selected sample of galaxies to z= 3 from the GOODS-NICMOS Survey. **Monthly Notices of the Royal Astronomical Society**, 417:289-303. October, 2011.

Jørgensen, Inger[10]; Roth, Kathy[16]. Red Nuggets at High Redshift: Structural Evolution of Quiescent Galaxies Over 10 Gyr of Cosmic History. **The Astrophysical Journal Letters**, 739:L44. October, 2011.

Stephens, A. W.[13]. The Yellow Supergiant Progenitor of the Type II Supernova 2011dh in M51. **The Astrophysical Journal Letters**, 739:L37. October, 2011.

Trujillo, Chadwick[3]. A Southern Sky and Galactic Plane Survey for Bright Kuiper Belt Objects. **The Astronomical Journal**, 142:98. October, 2011.

McDermid, Richard M.[4]. The ATLAS3D project - VII. A new look at the morphology of nearby galaxies: the kinematic morphology-density relation. **Monthly Notices of the Royal Astronomical Society**, 416:1680-1696. September, 2011.

McDermid, Richard M.[16]. The ATLAS3D project - VI. Simulations of binary galaxy mergers and the link with fast rotators, slow rotators and kinematically distinct cores. **Monthly Notices of the Royal Astronomical Society**, 416:1654-1679. September, 2011.

Winge, Cláudia[3]. The effects of the interactions on the kinematics, stellar population and metallicity of AM 2322-821 with Gemini/GMOS. **Monthly Notices of the Royal Astronomical Society**, 416:38-50. September, 2011.

Winge, C.[4]. The Compton-thick Seyfert 2 Nucleus of NGC 3281: Torus Constraints from the 9.7 μm Silicate Absorption. **The Astrophysical Journal**, 738:109. September, 2011.

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Schiavon, Ricardo[192]. SDSS-III: Massive Spectroscopic Surveys of the Distant Universe, the Milky Way, and Extra-Solar Planetary Systems. **The Astronomical Journal**, 142:72. September, 2011.

Hartung, M.[3]. Ruling out unresolved binaries in five transitional disks. VLT/NACO deep 2.12 and 1.75 μm narrow-band imaging. **Astronomy & Astrophysics**, 533:135. September, 2011.

Labrie, K.[5]. Differential microlensing measurements of quasar broad-line kinematics in Q2237+0305. **Monthly Notices of the Royal Astronomical Society**, 415:1985-1998. August, 2011.

Nitta, A.[30]; Kleinman, S. J.[31]. The pulsations of PG 1351+489. **Monthly Notices of the Royal Astronomical Society**, 415:1220-1227. August, 2011.

Chiboucas, Kristin[1]. Ultra-compact Dwarfs in the Coma Cluster. **The Astrophysical Journal**, 737:86. August, 2011.

Fisher, R. S.[3]. High-resolution Mid-infrared Imaging of the Circumstellar Disks of Herbig Ae/Be Stars. **The Astrophysical Journal**, 737:57. August, 2011.

Mason, Rachel[3]; Levenson, Nancy A.[6]. Torus and Active Galactic Nucleus Properties of Nearby Seyfert Galaxies: Results from Fitting Infrared Spectral Energy Distributions and Spectroscopy. **The Astrophysical Journal**, 736:82. August, 2011.

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Leggett, S. K.[2]. The properties of the T8.5p dwarf Ross 458C. **Monthly Notices of the Royal Astronomical Society**, 414:3590-3598. July, 2011.

McDermid, Richard M.[15]. The ATLAS3D project - II. Morphologies, kinemetric features and alignment between photometric and kinematic axes of early-type galaxies. **Monthly Notices of the Royal Astronomical Society**, 414:2923-2949. July, 2011.

McDermid, Richard M.[14]. The SAURON project - XVIII. The integrated UV-line-strength relations of early-type galaxies. **Monthly Notices of the Royal Astronomical Society**, 414:1887-1902. July, 2011.

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Hirst, Paul[2]. Jet Propulsion of Wind Ejecta from a Major Flare in the Black Hole Microquasar SS433. **The Astrophysical Journal Letters**, 735:L7. July, 2011.

Christensen, E. [35]. The Discovery and Nature of the Optical Transient CSS100217:102913+404220. **The Astrophysical Journal**, 735:106. July, 2011.

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Ball, J.[3]. Very high-energy observations of the two high-frequency peaked BL Lac objects 1ES 1218 + 304 and H 1426 + 428. **Astroparticle Physics**, 34:674-678. April, 2011.

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Rigaut, Francois[5]. Extragalactic Fields Optimized for Adaptive Optics. **Publications of the Astronomical Society of the Pacific**, 123:348-365. March, 2011.

Bodnarik, J.[29]. Whole Earth Telescope observations of the subdwarf B star KPD 1930+2752: a rich, short-period pulsator in a close binary. **Monthly Notices of the Royal Astronomical Society**, 412:371-390. March, 2011.

Jørgensen, Inger[3]. Star formation in the XMMU J2235.3-2557 galaxy cluster at z= 1.39. **Monthly Notices of the Royal Astronomical Society**, 411:2009-2018. March, 2011.

Miller, Bryan W.[18]. The HST/ACS Coma Cluster Survey. IV. Intergalactic Globular Clusters and the Massive Globular Cluster System at the Core of the Coma Galaxy Cluster. **The Astrophysical Journal**, 730:23. March, 2011.

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Geballe, T. R.[5]. Search for Organics in 103P/Hartley 2 in the Near-IR with GNIRS. **EPSC-DPS Joint Meeting 2011**, p.1557-. October, 2011.

Christou, J.[4]. Asteroid (19) Fortuna: Triaxial Ellipsoid Dimensions and Rotational Pole with AO at Gemini North. **EPSC-DPS Joint Meeting 2011**, p.1426-. October, 2011.

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Leggett, S. K.[4]. Understanding sub-stellar populations using wide-field infrared surveys. Research, Science and Technology of Brown Dwarfs and Exoplanets, **EPJ Web of Conferences**, 16:06002. July, 2011.

McDermid, R. M.[11]. The Fundamental Plane of Early-Type Galaxies. **EAS Publications Series**, 48:411-412. July, 2011.

Chiboucas, K.[4]; [6]. Dynamical and Photometric Properties of Dwarf Galaxies in Coma Cluster. **EAS Publications Series**, 48:307-308. July, 2011.

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Pessev, Peter[1]. Do Galaxies care about AGB stars ? **NOAO Proposal** ID #2011A-0405. February, 2011.

Roth, Kathy[2]. Exotic Explosions and Eruptions: Exploring a New Transient Phase-Space with Pan-STARRS. **NOAO Proposal** ID #2011A-0274. February, 2011.

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Trujillo, Chadwick[4]. Titan's Methane Weather post-Equinox: Seasonal climate change and surface geology. **NOAO Proposal** ID #2011A-0147. February, 2011.

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Bluck, Asa[1]. The HST GOODS NICMOS Survey: The Formation of Massive Galaxies.

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[1] *Gemini maintains an up-to-date database of papers based wholly or in part on Gemini data that appear in the main refereed astronomical research journals. These journals consist of: The Astrophysical Journal, The Astronomical Journal, Astronomy & Astrophysics, Astrophysical Journal, Publications of the Astronomical Society of the Pacific, Icarus, Science and Nature. In a few exceptional and well-assessed cases, we also count papers from "secondary" journals.*

[2] *Gemini's qualifying criterion is the same as that used by Hubble Space Telescope and*
[2] *Gemini's qualifying criterion is the same as that used by Hubble Space Telescope and* *European Southern Observatory. To qualify, papers based on their output, must employ in an original way an image, spectrum or data set produced by Gemini to derive new scientific results. No attempt is made to fractionate papers per telescope used in the case of papers based on the use of two or more other facilities. Hence, the same paper may be counted several times, for example by Gemini, Keck and Subaru, if it includes data from any of these telescopes.*

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Appendix B. Approved Programs

The following pages list the programs approved for both classical and queue observations on Gemini North and South during semesters 2010B and 2011A. The columns listed are the partner country allocated time, the Principal Investigator, the amount of time (measured in nights for classical observations or hours for queue programs), the instrument(s) to be used, and the program title. Queue programs are ordered by science ranking band; classical programs are unranked. All queue programs indicate Target of Opportunity status, either standard (ST) or rapid (RT). Programs on Gemini North also show use of the laser guide star facility (LGS).

GEMINI NORTH 2010B CLASSICAL

Country	PI	Time (nights)	Instrument			Title
Keck	Blake	1	Michelle			Michelle N-Band Spectroscopy of Water in Protoplanetary Disks
Keck	Bloom	1	NIRI			Connecting GRBs and Galaxies: A Study of GRB Diversity
US	Guha Niyogi	1	Michelle			Testing dust condensation hypotheses using Gemini Michelle spatially?resolved spectroscopy of O-rich AGB stars.
Subaru	Hashimoto	0.5	NIFS+Altair			Revealing the AGN Feedback in a Nearby Radio Galaxy NGC 1275
US	Lopez-Morales	1	NIRI			Search for methane fluorescence in the transiting exoplanet XO-2 b
US	Merline	2	NIRI+Altair			High-Resolution AO Imaging of Asteroids/Satellites
US	Soto	1	GMOS North			Integral Field Spectroscopy of Ultra Luminous Infrared Galaxies
US	Telesco	1	Michelle			Resolving an Asteroid Belt in a Multi-Planet System
UK/CA	Willott	3	GMOS North			The most luminous z=6 galaxies
US	Zakamska	2	GMOS North			Is there feedback from radio-quiet quasars?

GEMINI NORTH 2010B QUEUE - Band 1 (Part 1)

Country	PI	Time (hrs)	Instrument	ToO	LGS	Title
US	Allen	8.5	NIRI+Altair			A Multi-Epoch Survey for Faint, Close, Low-Mass Tertiaries to Nearby Spectroscopic Binaries: The Second Epoch
AR	Arias	2.5	NIRI			Infrared monitoring of the expanding envelope of Be stars II
CA	Balogh	13.5	GMOS North			The transition of galaxy groups from an invigorating environment to a suffocating one
UK/US	Bastian	21	NIFS+Altair		LGS	Testing IMF universality through the direct detection of low mass stars in starburst galaxies
GS	Berger	6	GMOS North	ST		Exotic Explosions and Eruptions: Exploring a New Transient Phase-Space with Pan-STARRS
UH	Bresolin	10.9	GMOS North			Testing for a variable upper IMF in star-forming galaxies
US/GS/ US/US/ UK/AU	Cobb/Fox/Tan vir	33	GMOS North, NIRI	RT		Exceptional Swift and Fermi GRBs: Gemini North Targets of Opportunity
US	Crenshaw	20	NIFS+Altair		LGS	The Connection Between Fueling Flows and Outflows in Active Galaxies: Ionized Spirals in Markarian 573
US	Dieterich	5.9	NIRI+Altair		LGS	Probing Stellar Physics at the Bottom of the Main Sequence: Continuing the Pursuit of Dynamical Masses
AR	Farina	3	NIFS+Altair		LGS	A 3D view of NGC 604 fields: NIFS data cubes
US	Gal-Yam	1	NIRI+Altair	ST	LGS	Identifying progenitors of core-collapse supernovae
US	Hinkle	6.3	NIRI+Altair		LGS	Luminosities for Final Flash Stars
UK	Howell	12	GMOS North	RT		Progenitor Signatures in Early Spectra of Type Ia Supernovae
CA	Janson	5	NIRI+Altair			Follow-up of the planet candidates from the NIRI B-star survey
US	Kasliwal	8	GMOS North	RT		Transients in the Local Universe
UK	Levan	20	NIRI			Lyman-alpha imaging of a known z=8.2 field
AU	Lidman	11.7	NIRI	ST		Improving Type Ia supernovae as distance indicators
UK/GS/AU	Lucas	19.5	NIFS+Altair		LGS	NIFS spectroscopy of the coolest brown dwarfs

GEMINI NORTH 2010B QUEUE - Band 1 (Part 2)

Country	PI	Time (hrs)	Instrument	ToO	LGS	Title
AU	Mackey	6	GMOS North			Exploring the accretion origin of the outer globular cluster system of M31
US	McConnell	7	NIFS+Altair		LGS	Weighing Black Holes in the Most Luminous Galaxies
UH	Meech	5	GMOS North			Mechanisms of Comet Activity -- Deep Imaging with Gemini North and UH2.2m
CA	Parker	8.6	GMOS North			Weighing KBOs IV: Continued Charaterization Kuiper Belt Binaries
UH	Pastorello	5	GMOS North	ST		The PS1 core-collapse supernova survey: deaths of very massive stars
US/CA	Peterson	8.9	NIFS+Altair			The High Mass End of the Black Hole Mass - Stellar Velocity Dispersion Relation in AGNs
BR	Riffel	8.8	NIFS+Altair			The connection between inflows and outflows in nearby active galaxies
BR	Rodriguez-Ardila	6.2	NIFS+Altair			Probing the processes involved in powering ultra-luminous infrared galaxies
US	Roe	6	NIRI+Altair			Titan's Methane Weather post-Equinox: \\ Seasonal climate change and surface geology
US	Salyk	14	Michelle			Water vapor in planet-forming regions: A new ground-based window on disk chemistry
AR	Smith Castelli	4.7	GMOS North			Exploring the faint galaxy content of the Hickson Compact Group HCG 44
BR	Steiner	1.2	NIFS+Altair			Imaging proto-planets and proto-planetary disks
US	Stocke	9	GMOS North			A Unique Milli-Second Pulsar System
US	Stritzinger	4	GMOS North	RT		Multi-wavelength spectroscopic study of young Type Ia supernovae
BR	Telles	4.7	NIFS+Altair		LGS	Gas Kinematics of a rare very low-metallicity AGN
UH	Tonry	24	GMOS North	ST		Spectroscopy of Hostless Supernovae
UH	Treister	2.1	GMOS North			Gemini/GMOS observations of a Compton-Thick AGN candidate at z~1
GS/US	Trujillo	22	NIRI			Primordial Solar System Ices
CA/US	Wilson	28.8	GMOS North			The Gemini Cluster Astrophysics Spectroscopic Survey (GCLASS)

GEMINI NORTH 2010B QUEUE - Band 2 (Part 1)

Country	PI	Time (hrs)	Instrument	ToO	LGS	Title
Subaru	Yasuda	11.3	GMOS North			Supernova Cosmology from HST Legacy Programs
UH	Aspin	3	GMOS North			Optical Spectroscopy of two FUor Candidates
BR	Barbosa	2.6	NIFS+Altair		LGS	Massive Stars in the Jet Set
GS/AU/UK	Burningham	24.5	NIRI	ST		Solving the late-T dwarf luminosity function discrepancy
US/UK	Chapman	44	NIFS+Altair		LGS	NIFS observations of high-redshift ULIRGs (submm and radio selected): a detailed comparison of cold and hot-dust z~2 ULIRGs with hydrodynamical simulations
GS	Clark	2.5	NIFS+Altair			A Spectroscopic Study of the Young Planetary Nebula, Hb 12
UK	Crowther	6.8	GMOS North			Spectroscopic follow-up to deep GMOS survey of Wolf-Rayet stars in the dwarf irregular galaxy IC10
UH	Deacon	3	GMOS North			Cool halo white dwarf spectroscopy
US	Drake	5	GMOS North	ST		The Nature of Extreme Supernova Explosions
US	Duchene	24.8	NIRI			Identification of Very Low Mass Brown Dwarfs in IC348
BR	Figueredo	7	NIFS+Altair		LGS	K-band IFU spectroscopy of HMYSOs
GS	Geballe	4	NIRI			The natures of the Quintuplet stars: J and H band spectroscopy
US	Gebhardt	6	NIFS			Rest-frame Optical Spectroscopy of Ly-alpha Emmitting Galaxies
CA/AU/UK	Gilbank	22.3	GMOS North			The Redshift One-plus GMOS Ultra-deep Emission line Survey (ROGUES)
GS/US	Herbst	6	NIRI			Near Infrared Spectroscopy of the Unique T Tauri Binary System KH 15D
UK	Johnstone	4	NIFS			Molecular Hydrogen in NGC 1275
US	Kaplan	9	NIRI			Constraining the First Eclipsing Double White Dwarf Binary in the Infrared
US	Kartaltepe	10.8	NIRI+Altair		LGS	Probing the Most Extreme Luminous Infrared Galaxies in the Universe

GEMINI NORTH 2010B QUEUE - Band 2 (Part 2)

Country	PI	Time (hrs)	Instrument	ToO	LGS	Title
GS/CA	Konstantopoulos	16	GMOS North			Revealing the Secrets of Turbulent Star-formation Suppression in the Stephan's Quintet Shock
US/CA	Law	15.9	NIRI+Altair		LGS	The Extremely Extreme: Searching for Companions in Wide M-dwarf Binaries
GS	Laycock	4	GMOS North			Black Holes and X-ray Binaries in the Youngest Nearby Starburst Galaxy IC 10.
GS	Leggett	8.5	GMOS North			Red Optical Spectra of 500K Brown Dwarfs
UK/US/AU	Lewis	24	GMOS North			Cubs in the Litter: Spectroscopy of New Andromodean Dwarfs from PAndAS
UK	Livermore	10	NIFS+Altair			Star Formation in gravitationally lensed galaxies at z~1.5
UK	McDonald	13.5	NIFS			Detecting the spectrum of the hottest known transitting exoplanet
US	Ofek	2.5	GMOS North	ST		Spectroscopic followup of shock breakout events
US	Quimby	2.8	GMOS North			The Decline of Luminous Supernovae
UK/BR/US	Romer	18	GMOS North			The Evolution of X-ray Scaling Relations Over Half A Hubble Time
BR	Storchi Bergmann	3.3	GMOS North			The nature of nuclear spiral arms in radio galaxies
US	Stritzinger	8	GMOS North	ST		Multi-wavelength spectroscopic study of young Type Ia supernovae
UH	Urbaneja	18.4	GMOS North			Metallicity gradient in M33: do HII regions and young stars tell the same story?
AR	Vega Neme	6.8	GMOS North			Unveiling the nature of Blue Compact Dwarf galaxies with IFU
UH	Wainscoat	10	GMOS North, NIRI	ST		Physical properties of large bodies in the outer solar system
AU/UK/CA	Worseck	24	GMOS North			Surveying the Post-Reionization Universe with Quasar Spectroscopy II
US	Zakamska	6	NIFS+Altair		LGS	Anomalous molecular hydrogen emission in ultraluminous infrared galaxies

GEMINI NORTH 2010B QUEUE - Band 3 (Part 1)

Country	PI	Time (hrs)	Instrument	ToO	LGS	Title
AR	Alonso	2	GMOS North			Low X-ray Galaxy Clusters
UH	Aspin	10	NIRI+Altair			NIRI and NIFS AO Observations of Young Stellar Objects
GS	Bauer	16	NIRI			Star Formation in the Outskirts of the XMMU J2235.3-2557 Galaxy Cluster at z=1.4
UK	Breedt	10	GMOS North			The space density of cataclysmic variables
CA	Breton	7.7	GMOS North			Observation of new black widow pulsar companions
CA	Chene	16	GMOS North			In Search of Large-Scale Variable Wolf-Rayet Stars. II
US	Comerford	12.8	GMOS North			Follow-up of Candidate Dual AGN Galaxies with Longslit Spectroscopy
US	Conselice	6	NIRI			The Star Formation Rates in Ultra-Massive z > 2 Galaxies
US	Cook	9	NIRI			Icy grain halos: amorphous or crystalline water ice?
US	De Buizer	6.8	NIRI			Investigating the Connection Between Green Fuzzy Emission and Molecular Outflows
US	de Pater	8	NIRI+Altair			ALTAIR/NIRI AO Imaging of Volcanic Eruptions on Io
UK	De Rosa	6	NIRI+Altair			Substellar companions to nearby A-type stars
US	Duchene	4.5	NIFS+Altair, NIRI+Altair			The physical properties of visual binaries in the Orion Nebula Cluster
GS	Fritz	7.4	GMOS North			Kinematics and stellar populations of the most massive galaxies
US	Gallagher	9.3	GMOS North, NIRI	ST		Analysis of Early Dust Formation in SNe with Strong CSM Interaction
GS	Geballe	5	NIFS			Metallicity in the Quintuplet Cluster and the Galactic Center: Evidence for a top heavy star formation history?
GS	Geballe	15	NIRI			Additional probes of the Galactic center's interstellar medium
GS	Gomez	5.3	GMOS North			Probing the Bending Mechanism Responsible for the Wide-Angle Tailed Radio Source in Abell 562

GEMINI NORTH 2010B QUEUE - Band 3 (Part 2)

Country	PI	Time (hrs)	Instrument	ToO	LGS	Title
BR	Gregorio-Hetem	3.3	GMOS North			Searching for mixing of young and older stellar clusters in the Canis Major R1 galactic star-forming region
US	Guinan	14	GMOS North			The fundamental properties and internal structure of massive stars
UH	Hodapp	12	NIRI+Altair			From Protostellar Disks to Planets: SEEDS Follow-up
UH	Hsieh	12	NIRI			Surface Characterization of Main-Belt Comet 176P/LINEAR
UK	Irwin	6	NIFS+Altair, NIRI+Altair			Uranus Cloud Structure after 2007 equinox
UH	James	5.4	GMOS North			Confirmation of the Lithium Depletion Boundary and Age of the Southern Open Cluster Blanco~1
UH	Kleyna	7	GMOS North	ST		Followup observations of MBCs found in PanSTARRS1
US	Lowenthal	26	GMOS North			Deep Imaging and Spectroscopy of a Galaxy Proto-Cluster at $z=2.3$
US	Marchis	9.5	NIRI+Altair			Refining the Mutual Orbits of Known Multiple Asteroid Moonlets
GS	Mason	2.5	NIRI			Tracing star formation in a nearby LINER
US	Matson	30	NIFS			The Structure of Mass Loss from Massive Stars
US	Matsuoka	44	GMOS North			A Search for $z \sim 7$ Quasars
US/AU	McGregor	10	NIFS+Altair			Accretion and Outflow from Young Stellar Disks
GS	Miller	1.5	GMOS North			Do the Oldest Groups Have the Oldest Galaxies?
GS	Najarro	1	NIFS+Altair			Constraining the nature of Cyg No. 12: an extremely luminous and massive star breaking all the rules
UK	Penny	22.7	GMOS North			The transformations of dwarf galaxies in the cluster environment
BR	Quireza	12	GMOS North			Chemical composition of the Local Group spheroidal dwarf NGC 205
US	Shang	7	Michelle			Resolving [NeII] 12.81\micron\ Line Profiles toward Jet-Driving Young Stars

GEMINI NORTH 2010B QUEUE - Band 3 (Part 3)

Country	PI	Time (hrs)	Instrument	ToO	LGS	Title
UH	Sonnett	18.4	NIRI			Surface Properties of Blue and Neutral Trans-Neptunian Objects with the UH 2.2-m and Gemini
US	Sromovsky	10	NIFS+Altair, NIRI+Altair			Characterization of Seasonal Changes on Uranus
US/UK	Sullivan	23	GMOS North			The Host Galaxies of Local PTF Type Ia Supernovae
BR	Teodoro	8	GMOS North			Comparison of the physical properties of galactic and extragalactic luminous blue variables
US	Trafton	4.7	NIFS+Altair			Search for Enhancement of Unidentified Titan Absorption Features over Xanadu and for Titan CH4 Humidity Gradients
UH	Urbaneja	10	GMOS North			Spectroscopic Monitoring of Luminous Blue Variable Stars in M33
UK	Warren	6	GMOS North, NIRI	ST		High-redshift quasars 5.8<z<7.2 from 3000 sq degs of the UKIDSS LAS
US/CA	Webb	19	GMOS North			Spectroscopy of Infrared Galaxies in Clusters to z = 1
US	Wilson	9	NIRI			The extinction and the distance to the Andromeda Galaxy
US/AU	Wright	11	Michelle			Magnetic fields toward massive Young Stellar Objects

GEMINI NORTH 2010B QUEUE - Band 4

Country	PI	Time (hrs)	Instrument	ToO	LGS	Title
CA	Chene	4	GMOS North			In Search of Large-Scale Variable Wolf-Rayet Stars. II
UK	Clark	11	GMOS North			Unveiling the nature of the eclipsing X-ray binary ChASeM33 8 in M33
UK	Conselice	24	NIRI			The Star Formation Rates in Ultra-Massive z > 2 Galaxies
GS	Geballe	25	NIRI			Additional probes of the Galactic center's interstellar medium
BR	Teodoro	1.7	GMOS North			Comparison of the physical properties of galactic and extragalactic luminous blue variables

GEMINI SOUTH 2010B CLASSICAL

Country	PI	Time (nights)	Instrument		Title
US	Abia	2	Phoenix		The origin of fluorine: The first determination of fluorine abundances in extragalactic AGB carbon stars
US/CL	Barrientos	5	GMOS South		Mass Calibration and Gas Physics of a Complete Sample of ACT SZE-Selected Galaxy Clusters
US	Brittain	1	Phoenix		Observation of Ro-vibrational OH Emission in Transitional Disks
Subaru	Imanishi	1	T-ReCS		Distinguishing the compact energy sources of ULIRGs
US/GS	Merline	2	NICI		High-Resolution AO Imaging of Asteroids/Satellites
US/AR	Norman	2	GMOS South		X-ray selected AGN in a Merging Cluster Environment
Subaru	Sakon	1	T-ReCS		Chemical Evolutioni of Carbonaceous Dust Formed Around Novae
US	Schlieder	1	Phoenix		Low Mass Members in Nearby Young Moving Groups Revealed
Subaru	Shimonishi	1	T-ReCS		Dust and Ices around Extragalactic Young Stellar Objects

GEMINI SOUTH 2010B QUEUE - Band 1 (Part 1)

Country	PI	Time (hrs)	Instrument	ToO	Title
CL	Barrientos	1.5	GMOS South		Mass Calibration and Gas Physics of a Complete Sample of ACT SZE-Selected Galaxy Clusters
AR	Bassino	7	GMOS South		Globular cluster systems of lenticular galaxies: looking for clues on the origin of S0s.
CL	Bauer	14	T-ReCS		What powers IR-bright, optically-unidentified, candidate Compton-thick AGNs?
GS/US	Berger	12	GMOS South	ST	Exotic Explosions and Eruptions: Exploring a New Transient Phase-Space with Pan-STARRS
BR	Cypriano	9	GMOS South		Gemini follow-up of the first gravitational arcs discovered with SOAR
US	Drake	10	GMOS South	ST	The Nature of Extreme Supernova Explosions
BR	Faundez-Abans	1	GMOS South		Kinematics of the interacting elliptical galaxies AM 546-324
UK	Fletcher	10.2	T-ReCS		Spectroscopy of Jupiter's Equatorial Dynamics and Giant Vortex Interactions
US/UK/GS/AU/US/US	Cobb/Fox/Tanvir	19	GMOS South	RT	Gamma-Ray Bursts: From Progenitors to Probes
GS	Geballe	7	Phoenix		Temperatures and Densities in the CO line-emission Disk and outflow from NGC2071 IRS1
GS	Gomez	8.1	GMOS South		Abell 3827: An Extreme Example of the Effects of Dry Mergers on the Growth of Massive Elliptical Galxies
US	Harker	7	T-ReCS		Mid-IR Observations of EPOXI Mission Target Comet 103P/Hartley 2
US/UK	Howell	10	GMOS South	RT	Progenitor Signatures in Early Spectra of Type Ia Supernovae
US	Hrivnak	7	Phoenix		Testing the Binary Hypothesis for Bipolar Proto-Planetery Nebulae
US	Jao	1.3	GMOS South		Fingerprinting a Mysterious Unseen Companion in the Solar Neighborhood
US	Kasliwal	8	GMOS South		Transients in the Local Universe
AU	Keller	16.8	GMOS South		Archaeology of the Large Magellanic Cloud - charting the age-metallicity relation with sub-giant stars.
CA	Malo	26	Phoenix		Radial Velocity of Low-mass Candidate Members of Nearby Young Associations
CL	Nagar	6.6	GMOS South		Tracing gas flows in Active Galactic Nuclei down to the innermost few parsecs

GEMINI SOUTH 2010B QUEUE - Band 1 (Part 2)

Country	PI	Time (hrs)	Instrument	ToO	Title
CA	Naud	25	NICI		A Planet Search around Young-associations M dwarfs (PSYM survey)
US	Roe	4	NICI	ST	Titan's Methane Weather post-Equinox: Seasonal climate change and surface geology
US	Saha	20	GMOS South		Ultra Long Period Cepheids: a primary standard candle up to the Hubble flow.
US	Sahai	6	Phoenix		Caught in the Act II: A High-Velocity Outflow in pi^1 Gru, an S-type AGB star evolving into a Bipolar Planetary Nebula
BR	Sanmartim	6.7	GMOS South		The Nature of Post-Staburst Quasars
UK	Stott	33.6	GMOS South		The XCS/DXS search for the highest redshift galaxy clusters
US	Trilling	3	GMOS South		High quality optical photometry of NEOs in support of a Warm Spitzer program
CA/US	Wilson	29	GMOS South		The Gemini Cluster Astrophysics Spectroscopic Survey (GCLASS)
AU/CL/UK/US/CA	Worseck	20	GMOS South		Surveying the Post-Reionization Universe with Quasar Spectroscopy II

GEMINI SOUTH 2010B QUEUE - Band 2 (Part 1)

Country	PI	Time (hrs)	Instrument	ToO	Title
BR	Carvano	4	T-ReCS		Mineralogical analysis of peculiar vestoids and other basaltic asteroids
US	Cenko	3	GMOS South	ST	Probing the Central Black Holes of Distant, Quiescent Galaxies via Tidal Disruption Flares
BR/CL/AR	Cidale	12.5	Phoenix		Revealing the outflowing disks of B[e] supergiants
US	Comerford	12.5	GMOS South		Follow-up of Candidate Dual AGN Galaxies with Longslit Spectroscopy
AR/BR	Dors	6	GMOS South		The CNSF rings of Seyfert galaxies and their connection with the active nuclei: abundances and kinematics
UK	Farihi	20	Phoenix		The Mass Ratio of the White Dwarf - Brown Dwarf Binary GD 1400
AR	Garcia	7.3	T-ReCS		Mid-IR spectra of 3 debris disks of different ages
US	Jha	15.2	GMOS South	ST	CluLeSS: Cluster and Lensed Supernova Search
US/BR/AR	Kepler	34	GMOS South		Spectroscopy of magnetic white dwarf stars

GEMINI SOUTH 2010B QUEUE - Band 2 (Part 2)

Country	PI	Time (hrs)	Instrument	ToO	Title
GS	Lee	3.5	GMOS South		The Nature of the "Runt" Companion to the Nearby Dwarf Galaxy NGC6822
GS	Leggett	12	GMOS South		An iz Photometric Sequence for T Dwarfs
US	Masiero	11.3	GMOS South	ST	Faint, dark and small: a new population of near-Earth objects
GS	Mikles	1	T-ReCS		Dust Emission in the Wind Collision Zone of a WNh binary
GS/US	Orton	2.6	T-ReCS		Neptune's Wandering Hot Polar Anomaly
UK	Pastorello	15	GMOS South	ST	The PS1 core-collapse supernova survey: deaths of very massive stars
UK	Ramsay	3	GMOS South		Followup spectroscopy of ultra-compact binary candidates
AU	Rapoport	16.9	GMOS South	ST	Investigating GRB-SN connection for real GRBs
UK/BR/US	Romer	37.7	GMOS South		The Evolution of X-ray Scaling Relations Over Half A Hubble Time
BR	Sodre	8.5	GMOS South		How do cluster galaxies evolve?
UK/US	Song	7	T-ReCS		Resolving the Asteroid Belt of HR 8799
US/CA	Stanford	38.6	GMOS South		Dynamical Mass Estimates of South Pole Telescope SZE Selected Galaxy Clusters
US	Telesco	8.7	T-ReCS		Revealing the Structure and Mineralogy of the Beta Pic Central Disk
CL/UK/AU	Tinney	16.5	NICI		Imaging companions from the Anglo-Australian Planet Search
UK	van Loon	3.4	T-ReCS		Hunting for freshly produced dust in the recent giant eruption of the Luminous Blue Variable R71 in the LMC
CL/US/CA	Webb	33.2	GMOS South		Spectroscopy of Infrared Galaxies in Clusters to z = 1

GEMINI SOUTH 2010B QUEUE - Band 3 (Part 1)

Country	PI	Time (hrs)	Instrument	ToO	Title
CL	Anguita	15	GMOS South		Galaxy scale lenses in the RCS2: first catalog of strong lensing systems
GS	Antoniou	15	GMOS South		Counting the X-ray Binaries of the Small Magellanic Cloud.
UK	Bassa	10	GMOS South		Searching for binary companions to Fermi millisecond pulsars
CL/UK	Breedt	19	GMOS South		The space density of cataclysmic variables

GEMINI SOUTH 2010B QUEUE - Band 3 (Part 2)

Country	PI	Time (hrs)	Instrument	ToO	Title
CA	Chene	26	GMOS South		In Search of Large-Scale Variable Wolf-Rayet Stars. II
US	Crotts	10	GMOS South		Evolution of Supernova Remnant 1987A
US	Cunha	19	Phoenix		Chemical Evolution at the Edge of the Bar: Abundances at the base of the Scutum-Crux arm
US	Dieterich	41.3	GMOS South		Probing Stellar Physics at the Bottom of the Main Sequence: Calibrating the Effects of Youth, Gravity, and Metallicity on Luminosity
GS	Dors	9	GMOS South		The CNSF rings of Seyfert galaxies and their connection with the active nuclei: abundances and kinematics
BR	Dupke	3	GMOS South		A multiwavelenth study of three Fossil Groups of galaxies
BR/GS/CL	Gimeno	10	Phoenix		Unveiling the hidden core kinematics of NGC 253 - II
UK	Hatch	20	GMOS South		Spectroscopic confirmation of a galaxy proto-cluster at z=2.49
AU	Hopkins	10	GMOS South		The search for radio sources within the Epoch of Reionization
CA	Hou	6	GMOS South		Probing Dynamically Anomalous Galaxy Groups: The Striking Case of GEEC grp138
US	Kennedy	30	GMOS South		Nitrogen Abundances for Carbon-Enhanced\\ Metal-Poor Stars
GS	Kepler	14	GMOS South		Time series imaging of a massive white dwarf
US	Lambert	7	Phoenix		Exploring the Evolution of RCB stars from White Dwarf Mergers
GS	Levenson	5	T-ReCS		Testing Unification of AGN and Their Dusty Surroundings
UK	O'Halloran	8.5	T-ReCS		The PAH emission deficit in NGC 6822
GS/US	Orton	3.3	T-ReCS		Meridional Variability of Radiative vs Dynamical Forcing in Neptune
GS/US/CA	Pessev	21	GMOS South		Abundances and kinematics of intermediate-age LMC clusters.
BR	Proctor	5.5	GMOS South		Probing the dynamics in the outskirts of a Hickson compact group
AU	Rapoport	10	GMOS South,NICI	ST	Discovery of Gravitationaly Lensed GRBs
CL	Richtler	15	GMOS South		The dark halos of isolated elliptical galaxies
US	Riedel	20	Phoenix		The Motions of "Motionless" Stars

GEMINI SOUTH 2010B QUEUE - Band 3 (Part 3)

Country	PI	Time (hrs)	Instrument	ToO	Title
US/UK	Rushton	3.1	Phoenix		Pollution of the Secondary in the RS Ophiuchi System
US	Sahai	10	Phoenix		A Stellar Interloper Speeding through a Dense Interstellar Cloud
BR	Steiner	1.9	GMOS South		Stellar archeology of AGN
UK	Sullivan	18.5	GMOS South		The Host Galaxies of Local PTF Type Ia Supernovae
UK	Tadhunter	19.5	GMOS South		The evolution of quasar host galaxies
US	Thomas	36.9	GMOS South		Physical Characterization of Warm Spitzer Observed Near-Earth Objects
GS	Trancho	3	GMOS South		The puzzling near-infrared fluxes of super star clusters ? what is the nature of the red excess?
US	Walter	30	Phoenix		Simultaneity of Accretion and Outflow in Young Stars

GEMINI SOUTH 2010B QUEUE - Band 4

Country	PI	Time (hrs)	Instrument	ToO	Title
US	Bresolin	10.8	GMOS South		Testing for a variable upper IMF in star-forming galaxies
AR/GS/BR	Kepler	18	GMOS South		Time series imaging of a massive white dwarf

GEMINI NORTH 2011A CLASSICAL

Country	PI	Time (nights)	Instrument			Title
UK/CA	Willott	2	GMOS North			The most luminous z=6 galaxies
Subaru	Inada	1	GMOS North			The Direct Size Measurement of Damped Lya Systems through Lensed Quasars
US	Hallinan	1.5	GMOS North			Confirming Auroral Emissions on an Ultracool Dwarf
US	Greene	3	GNIRS			Rest-frame Optical Spectra of Narrow-line AGNs at z~ 2
US	Bian	3	GMOS North			Probing the Most Luminous Lyman Break Galaxies at z~3

GEMINI NORTH 2011A QUEUE - Band 1 (Part 1)

Country	PI	Time (nights)	Instrument			Title
AU/UK/ CA/US	Worseck	33	GMOS North			Surveying the Post-Reionization Universe with Quasar Spectroscopy III
US	Trilling	18	GMOS North			High quality optical photometry of NEOs in support of a Warm Spitzer program
UH	Tonry	9	GMOS North	ST		Type Ia Supernova Science with SuperNovAe Cross Correlation Filters
UK/US/GS	Tanvir/Fox	29	GNIRS, GMOS North, NIRI	RT		Investigating gamma-ray bursts and their use as cosmological probes
UK	Shanks	11	GNIRS			Searching for an L* QSO at z~7 in the HDFN
US	Roe	9	NIRI+Altair	ST		Titan's Methane Weather post-Equinox: Seasonal climate change and surface geology
UH	Reipurth	9	NIFS+Altair		LGS	Orphaned Protostars
UH	Pastorello	5	GMOS North	ST		Ultra-bright optical transients: giant supernovae in dwarf hosts
UK	Mislis	11	GNIRS			Very low mass eclipsing binary spectroscopy
US	Luhman	0.6	NIRI+Altair		LGS	Confirmation of a Young Low-mass Quadruple in Taurus
AU/UK/US	Lidman	26.8	NIRI	ST		Improving Type Ia supernovae as distance indicators
UH	Kleyna	3	GMOS North	ST		The Sublimation-Driven Nature of Main-Belt Comet Activity
US	Khargharia	5.5	NIRI			The Mass of the Black Hole in XTE J1118+480
US	Jha	7.8	GMOS North	ST		Adding to the Treasury: Spectroscopic Classification of High-Redshift Supernovae Discovered by HST
UH	Hsieh	7.5	GMOS North			Monitoring and Photometric Characterization of Main-Belt Comet P/Garradd
UK	Howell	10	GMOS North	RT		Optical and UV Spectroscopy of SNe Ia as Probes of Progenitors an Metallicity
CA	Hall	5	GMOS North			Using a Gravitationally Lensed Arc as an Extended Light Source
US	Grundy	12.5	NIRI+Altair		LGS	Mutual Orbits and Masses of Kuiper Belt Binaries and Multiple Systems
US	Gladders	46	GMOS North			Spectroscopy of A Complete Sample of SDSS Lenses

GEMINI NORTH 2011A QUEUE - Band 1 (Part 2)

Country	PI	Time (nights)	Instrument			Title
US	Gal-Yam	1	NIRI+Altair	ST	LGS	Identifying progenitors of core-collapse supernovae
UK	Gaensicke	3.8	GMOS North			Aiming lower: The mass radius relation of white dwarfs and low mass stars
UK	Fraser	3	NIRI+Altair	ST	LGS	Detecting the progenitors of core collapse supernovae - precision astrometry with ALTAIR
AR	Faifer	3.9	GMOS North			Globular clusters and the origin of S0 galaxies in low density environment
CA	Ellison	10.5	GNIRS			Quasars probing quasars: New constraints on the quasar phenomenon from the transverse proximity effect
BR	Dupke	6.6	GMOS North			The Mysterious Cheshire Cat Galaxy System. The First Case of Collision Between Fossil Groups?
US	Dieterich	5	NIRI+Altair		LGS	Probing Stellar Physics at the Bottom of the Main Sequence: Continuing the Pursuit of Dynamical Masses
US	Cenko	3	GMOS North	ST		Probing the Central Black Holes of Distant, Quiescent Galaxies via Tidal Disruption Flares
AR	Cellone	5.9	GMOS North			GMOS study of the gamma-ray blazar PG1553+113, its host galaxy and environment
UK	Burleigh	18.4	GNIRS			Ancient Binaries in UKIDSS: Probing the Substellar Graveyard
UH	Bresolin	9.6	GMOS North			Testing for a variable upper IMF in star-forming galaxies
CA	Bibby	12.4	GMOS North			Searching for Future Type Ibc Supernova Progenitors in the Whirlpool Galaxy (M51)
UK	Bersier	6	GMOS North	ST		The Supernovae of Gamma-Ray Bursts: Exploring the diversity of stellar explosions
GS/US	Berger	12	GMOS North	ST		Exotic Explosions and Eruptions: Exploring a New Transient Phase-Space with Pan-STARRS
BR	Barbosa	12.6	NIFS+Altair		LGS	A NIFS Study of Galactic UCHII Regions
UK/CA	Balogh	20.2	GMOS North			The transition of galaxy groups from an invigorating environment to a suffocating one
AU	Bailey	7.5	GNIRS+Altair			Near Infrared Spectra of Saturn and Titan

GEMINI NORTH 2011A QUEUE - Band 1 (Part 3)

Country	PI	Time (nights)	Instrument			Title
UH	Aspin	8	NIRI+Altair, NIFS, GMOS, Michelle	RT		Rapid ToO Observations of Newly Discovered Eruptive Variable Stars.
US	Ardila	5	GNIRS			Accretion in Close Pre-Main-Sequence Binaries

GEMINI NORTH 2011A QUEUE - Band 2 (Part 1)

Country	PI	Time (nights)	Instrument			Title
UH	Wainscoat	10	GMOS North, GNIRS	ST		Physical properties of large bodies in the outer solar system
GS/US	Trujillo	22	NIRI			Primordial Solar System Ices
UH	Treister	15	GNIRS			A Pilot Study of the Stellar Populations in AGN Host Galaxies at z~2
UK	Sutton	2.4	GMOS North			Determining the nature of the optical counterpart to NGC 4874 HLX-1
BR	orchi-Bergma	5.4	NIFS+Altair		LGS	Feeding and Feedback in nearby AGN - NGC5929
UH	Stockton	12	GMOS North			Massive Outflows in Compact-Steep-Spectrum Radio Galaxies
BR	Steiner	1.4	GMOS North			A candidate of a naked AGN
BR	Sodre	8.5	GMOS North			How do cluster galaxies evolve?
US	Sand	7	GMOS North			Diagnosing youth: Gemini spectroscopy to verify the young stellar populations in Leo~IV and Canes Venatici~I
AU	Ryder	4.8	NIRI+Altair		LGS	Extinction towards Supernovae 2010O, 2010P, and 2010cu
US	Rothberg	8	NIFS+Altair		LGS	Unveiling the Young Central Stellar Disk in the Advanced Luminous Infrared Galaxy Arp 193
UK/US	Rawle	27	GMOS North			The origin of S0 discs in the dense cluster environment
US	Pessev	30	GNIRS			Do Galaxies care about AGB stars ?
UK	Perlmutter	5	GMOS North	ST		Galaxy Cluster Supernovae at z~0.5: Dissecting the Hubble Diagram
US	Neilsen	10	NIRI	ST		A Long Multiwavelength Study of GRS 1915+105:Accretion/Ejection Physics of the Disk Wind andSynchrotron Jet

GEMINI NORTH 2011A QUEUE - Band 2 (Part 2)

Country	PI	Time (nights)	Instrument			Title
US/GS	Najarro	14	GNIRS			Metallicity in the Quintuplet Cluster and the Galactic Center: Evidence for a top-heavy star formation history?
GS	Mason	11	Michelle, NIRI			The definitive infrared SEDs of low-luminosity AGN
UK	Lumsden	10.5	NIFS+Altair		LGS	How do massive stars form? NIFS observations of Massive Young Stellar Objects
US	Luhman	0.6	NIRI+Altair		LGS	Confirmation of an Edge-on Disk around a Brown Dwarf
CA	Limoges	19.1	GMOS North			A continuing census of Galactic white dwarfs to 40 parsecs of the Sun
CA	Leggett	5.6	GMOS North, NIRI			Confirming and Characterizing Cool and Old White Dwarfs Found in the UKIRT Infrared Sky Survey
CA	Lafreniere	6.2	GNIRS+Altair			Characterization of wide substellar companions to young stars in Upper Scorpius
US	Kartaltepe	18	GNIRS			Near-Infrared Spectroscopy of Herschel-selected ULIRGs in GOODS-N at the Peak of Galaxy Assembly
GS	Hirst	4	GNIRS, GMOS North	ST		High-redshift quasars 5.8<z<7.2 in the UKIDSS LAS
US	Grundy	12.5	NIRI+Altair		LGS	Mutual Orbits and Masses of Kuiper Belt Binaries and Multiple Systems
GS	Geballe	6	GNIRS			The Natures of the Quintuplet Stars: J and H Band Spectroscopy
AU	Floyd	8.9	NIFS, GMOS North			The structure of the central engine in quasars
AR	Feinstein	3.9	GMOS North			Searching for evidence of jet-cloud interaction in radio-galaxies.
US	Cushing	12	GNIRS			Searching for the Coolest Brown Dwarfs in the Solar Neighborhood
US	Constantin	3.5	NIFS+Altair		LGS	Deciphering the least luminous AGN-like LINER and constraining the M_BH - sigma* relation
UK	Collins	24.4	GNIRS			Measuring the dynamical mass of a Brightest Cluster Galaxy at z=1.26
UH	Chambers	8.8	GNIRS	ST		GNIRS infrared spectroscopy of redshift ~7 quasars from the Pan-STARRS Survey

GEMINI NORTH 2011A QUEUE - Band 2 (Part 3)

Country	PI	Time (nights)	Instrument			Title
GS/UK/AU	Burningham	27	GNIRS	ST		Solving the late-T dwarf luminosity function discrepancy
UK	Breedt	19.1	GMOS North			The faintest members of the cataclysmic variable population
AR	Alonso	3.1	GMOS North			Testing the Galaxy Morphology Evolution in Intermediate Mass Galaxy Clusters
CA	Albert	18	GNIRS			Spectroscopic Investigation of Ultracool and Exotic Brown Dwarfs Found in the Canada-France Brown Dwarfs Surveys

GEMINI NORTH 2011A QUEUE - Band 3 (Part 1)

Country	PI	Time (nights)	Instrument			Title
UK	Zhang	3.5	GNIRS, GMOS North			Spectroscopic observation of a new benchmark L dwarf, a potential triple system
US	Young	20	GNIRS			Pluto's Atmospheric CH_4: Variations in time, space, and altitude
UK	Verma	8.4	GNIRS			Resolved dynamics of the first strongly-lensed galaxies discovered in the Herschel Astrophysical Terahertz Survey (H-ATLAS)
AR	Vega Neme	6.7	GMOS North			Unveiling the nature of Blue Compact Dwarf galaxies with IFU
UH	Treister	11	GMOS North			Searching for AGN activation in close mergers
US/UK	Sullivan	48	GMOS North			The Host Galaxies of Local PTF Type Ia Supernovae
BR	Steiner	1.9	NIFS+Altair			The supermassive black hole in M 104
US	Shemmer	15.5	GNIRS			Weak Line Quasars at High Redshift: Extremely High Accretion Rates or Anemic Broad-Line Regions?
BR	Schnorr Mulle	4.6	GMOS North			Tracing gas flows in Active Galactic Nuclei down to the innermost few parsecs
CA	Sato	12	GMOS North			Emission-line Diagnostics of Galaxies with Low-ionization Inflows & Outflows
CA	Robert	26	GMOS North			Star formation history in barred spiral galaxies: NGC 5430

GEMINI NORTH 2011A QUEUE - Band 3 (Part 2)						
Country	**PI**	**Time (nights)**	**Instrument**			**Title**
BR	Placco	1.3	GMOS North			A Survey for Unrecognized Carbon-Enhanced Metal-Poor Stars in the Galaxy
US	Pereira	6	GMOS North			RCSJ1419.2+5326: Kinematics of an assembling cluster at z~0.6
AU	O'Toole	9	GMOS North			The MUCHFUSS Project - Searching for the most and least massive companions to hot subdwarf stars
AU	Onken	4.5	GMOS North			Reverberation Mapping of the Dwarf Seyfert 1 Galaxy, NGC 4395
US	Oka	10	GNIRS			Continued Exploration of the Galactic Center's Central Molecular Zone by H3+ Spectroscopy
US	Modjaz	30	GMOS North			Host Galaxy Spectra of Stripped SN from the Palomar Transient Factory: SN Progenitor Diagnostics and the SN-GRB Connection
UH	lesa-Delgado	8.8	GMOS North			Abundance Discrepancy Problem and C/H ratio in Ring Nebulae
BR	ndes de Olive	7.4	GMOS North			NGC 2782: a merger remnant with inverted metallicity gradients?
GS	Mason	3	GNIRS, NIRI			What causes the low 7.7/11.3 micron PAH ratios in low-luminosity AGN?
US	Marchis	6.7	NIRI+Altair			Refining the Mutual Orbits of Known Multiple Asteroid Moonlets
CA/GS	Leggett	11.5	GMOS North, NIRI			Confirming and Characterizing Cool and Old White Dwarfs Found in the UKIRT Infrared Sky Survey
UH	James	5.6	GNIRS			High-Intermediate Resolution IR Spectroscopy of NSV 10993: A Confirmed Cepheid Member of an Eclipsing Binary System
UK	Hoare	21	GNIRS			Near-IR Spectroscopic Study of Massive Young Stellar Objects
US	Hebb	40	GNIRS			Defining the M dwarf Mass-Radius relation as a function of activity and metallicity
UK	Gosling	8.3	GNIRS			Survey of new High Mass X-ray Binarys in the Galactic Plane
UK	Goad	29	GMOS North			Toward a census of BAL variability
UK	Girven	22.5	GMOS North			Finding double degenerates in the Sloan Digital Sky Survey
GS	Geballe	35	GNIRS			Additional Probes of the Galactic Center's Interstellar Medium

GEMINI NORTH 2011A QUEUE - Band 3 (Part 3)

Country	PI	Time (nights)	Instrument			Title
US/CA	Gallagher	13.5	GNIRS			Probing Quasar Outflows with GNIRS HeI* Spectroscopy
US	Gallagher	6.1	GMOS North, NIRI			A Search for Dust Formation in the CSM Around SN 2010hq
UH	Gaidos	8	NIRI+Altair			Direct Imaging Search for Tertiary Components to M Dwarf Spectroscopic Binaries
CA/UK	Finkelstein	12	GMOS North			Spectroscopic Confirmation of LBGs in the Extended Groth Strip
CA	Cote	10.4	GMOS North			Measuring Mass-to-light in Nearby Dwarf Spheroidal Galaxies
US	Cook	20	GNIRS			Icy grain halos: amorphous or crystalline water ice?
US	Clayton	0.5	GNIRS			Z Umi: A Critical Test of the formation path(s) of R Coronae Borealis Stars
UH	Chambers	21.2	GNIRS	ST		GNIRS infrared spectroscopy of redshift ~7 quasars from the Pan-STARRS Survey
UH	Chambers	11	GMOS North	ST		GNIRS infrared spectroscopy of redshift ~7 quasars from the Pan-STARRS Survey
AU	Chakraborti	4.3	GMOS North			Testing the Supernova-Driven Supershell Story
UK	Canning	14	GMOS North			The dynamics of the merging galaxy cluster Abell 2146
CA	Bouchard	6.9	GMOS North			Transition Dwarf Galaxies in Nearby Groups
CA/US	Beck	6.8	NIFS+Altair, NIRI			Circumstellar Gas in Proto-Solar Nebula Analogs: NIFS Observations of Proplyd 253-1536
US	Bartlett	21	GMOS North			Planck SZ Clusters: Follow-up of the Planck Galaxy Cluster Catalog
AR	Arias	7	GNIRS			Be stars: diagnosis of the circumstellar environment variability through hydrogen emission lines in the near IR
GS	Adamson	6	GNIRS			A NIR Diffuse Band Survey with GNIRS
Band 4						
BR	Placco	6.7	GMOS North			A Survey for Unrecognized Carbon-Enhanced Metal-Poor Stars in the Galaxy
GS	Geballe	5	GNIRS			Additional Probes of the Galactic Center's Interstellar Medium

GEMINI SOUTH 2011A CLASSICAL

Country	PI	Time (nights)	Instrument		Title
US	Winkler	30	GMOS South		Finding and Characterizing SNRs -- Young and Old -- in M83
US	Vrtilek	20	GMOS South		Modulation tomography of the Black Hole source GRS 1716-249
US	Stubbs	40	GMOS South		Spectroscopy of Galaxies in Massive Clusters: Galaxy Properties and Dynamical Cluster Mass Calibration
US	Smith	20	NICI		Resolving the Infrared [Fe II] Emission in Circumstellar LBV Shells with NICI
US	Modjaz	20	GMOS South		Host Galaxy Spectra of Stripped SN from the Palomar Transient Factory: SN Progenitor Diagnostics and the SN-GRB Connection
US	Levesque	20	GMOS South		The Host Environments of Long-Duration Gamma-Ray Bursts
US	Kraus	10	T-ReCS		Resolving planet-cleared gaps in transitional/pre-transitional disks with NIR+MIR+sub-mm interferometry
Subaru	Honda	20	T-ReCS		25 micron imaging of southern Herbig Ae/Be stars
US	Eisenhardt	20	GMOS South		Spectroscopy and Imaging of a Complete Sample of WISE HyperLuminous Galaxy Candidates

GEMINI SOUTH 2011A QUEUE - Band 1 (Part 1)

Country	PI	Time (hrs)	Instrument	ToO	Title
UK/AU/CL/ US/CA	Worseck	27	GMOS South		Surveying the Post-Reionization Universe with Quasar Spectroscopy III
US	Winkler	2.5	GMOS South		Finding and Characterizing SNRs -- Young and Old -- in M83
UK/CL/AU	Tinney	15.9	NICI		Imaging companions from the Anglo-Australian Planet Search
US	Stubbs	5.5	GMOS South		Spectroscopy of Galaxies in Massive Clusters: Galaxy Properties and Dynamical Cluster Mass Calibration
UK	Smith	44	GMOS South		The faint red sequence emerges: A robust age-vs-mass relation at z=0.6
US	Sahu	3	GMOS South		Detecting Isolated Black Holes through Astrometric Microlensing
US	Roe	6	NICI	ST	Titan's Methane Weather post-Equinox: Seasonal climate change and surface geology
AR	Rodriguez-Ledesma	5	GMOS South		A Unique Very Low-mass High-amplitude Pre-main Sequence Periodic Variable.
AU	Rapoport	16.2	GMOS South	ST	Investigating GRB-SN connection for real GRBs
CA	Radigan	5.6	GMOS South		Confirming the First Detection of Cloud-Related Variability on a Peculiar Blue L-dwarf
GS	Orton	3.7	T-ReCS	RT	The Spectacular Revival of Jupiter's South Equatorial Belt: Temperature and Haze Characteristics
AU	Onken	1	GMOS South		Australia's 2011 Gemini School Astronomy Contest
AR	Norris	4.3	GMOS South		Confirming The Dual Nature of Ultra Compact Dwarfs
CA/US	Melis	4	NICI		Searching for a Solar system analog in HD 131488
GS	Lee	3	GMOS South		The Nature of the "Runt" Companion to the Nearby Dwarf Galaxy NGC6822
US	Jha	15.2	GMOS South	ST	Adding to the Treasury: Spectroscopic Classification of High-Redshift Supernovae Discovered by HST
UK	Huxor	2.8	GMOS South		Deep GMOS Imaging of Newly-Discovered Globular Clusters in NGC 6822
UK/US	Howell	9	GMOS South	RT	Optical and UV Spectroscopy of SNe Ia as Probes of Progenitors an Metallicity

GEMINI SOUTH 2011A QUEUE - Band 1 (Part 2)

Country	PI	Time (hrs)	Instrument	ToO	Title
GS	Hirst	19	NICI		Jet propulsion of enhanced mass-loss following a recent major flare in a microquasar
CA	Heinke	6.5	GMOS South		Ultracompact Orbital Periods in the Globular Cluster NGC 6652
CL	Hamuy	12	GMOS South	RT	Rapid ToO time-series spectroscopy of young supernovae
AR	Donzelli	3	GMOS South		Stellar populations in the distant Galactic globular cluster BH 176
BR	Damineli	6.5	GMOS South		Eclipsing binaries in the super stellar cluster Westerlund 1
BR	Cypriano	7.3	GMOS South		Spectroscopy of Giants Arcs of High Redshift Cluster CL1216-12
US/CL/UK/ GS	Cobb/Fox	17.6	GMOS South	RT	Gamma-Ray Bursts: From Progenitors to Probes
US	Cenko	3	GMOS South	ST	Probing the Central Black Holes of Distant, Quiescent Galaxies via Tidal Disruption Flares
CL	casassus	6	NICI		Search for planets in disk gaps around HD142527 and IRS 48.
UK	Bersier	6	GMOS South	ST	The Supernovae of Gamma-Ray Bursts: Exploring the diversity of stellar explosions
GS/US	Berger	12	GMOS South	ST	Exotic Explosions and Eruptions: Exploring a New Transient Phase-Space with Pan-STARRS
UK/CA/US	Balogh	32.4	GMOS South		The transition of galaxy groups from an invigorating environment to a suffocating one

GEMINI SOUTH 2011A QUEUE - Band 2 (Part 1)

Country	PI	Time (hrs)	Instrument	ToO	Title
BR	Vieira	3.6	T-ReCS		Modeling the circumstellar material of intermediate mass young stars
GS/UK	Trancho	9	GMOS South		Gemini Spectroscopy of Clusters in Interacting/Merging Galaxies Survey: NGC7252
US	Su	10	NICI		A search for the perturbing planets in large hole debris disks
UK	Soechting	21.4	GMOS South		The detailed nature of active central cluster galaxies
AR	Smith Castelli	8.9	GMOS South		Spectroscopy of the faint galaxy content of the Antlia cluster
CL	Salinas	12.2	GMOS South		The cD galaxy - cD halo connection

GEMINI SOUTH 2011A QUEUE - Band 2 (Part 2)

Country	PI	Time (hrs)	Instrument	ToO	Title
US/UK	Patience	45	NICI		A NICI survey for exoplanets and disks in the Sco-Cen association
UK	Pastorello	15	GMOS South	ST	Ultra-bright optical transients: giant supernovae in dwarf hosts
UK/CA/US	Naud	18	NICI		A Planet Search around Young-associations M dwarfs (PSYM survey)
BR	Martioli	3.2	NICI		Direct Imaging of Retracted Exoplanet Candidates to Calibrate the Mass-Luminosity Relation at Brown Dwarf Range
US	Maccarone	7.5	GMOS South		Understanding the Variability of the First Globular Cluster Black Hole
CA	Lafreniere	4.2	NICI		Characterization of wide substellar companions to young stars in Upper Scorpius
AU	Keller	5.6	GMOS South		Intermediate age star clusters of the LMC - missing links in globular cluster evolution?
US/CA	Jayawardhana	27	NICI		Supermassive Planets or Ultralight Brown Dwarfs? A New Population of Wide Substellar Companions
US	Hsieh	4	GMOS South	ST	The Sublimation-Driven Nature of Main-Belt Comet Activity
US	Harker	3.2	T-ReCS	ST	T-ReCS Comet ToO Initiative 2011A
AU	Da Costa	5.2	GMOS South		The globular cluster NGC5824: former nucleus of a tidally disrupted dwarf galaxy?
BR	Cypriano	8.6	GMOS South		Quasar pairs as beacons of high redshift clusters
UK/CL	Breedt	21.6	GMOS South		The faintest members of the cataclysmic variable population
US	Bowler	27	NICI		An Efficient Search for Young Wide Planetary-Mass Companions
CA	Bibby	10.7	GMOS South		Massive Star Progenitors of Future Type Ib/c Supernovae iin NGC 3621
GS	Bianchi	9	GMOS South		Star Formation and Evolution at Low Metallicity: Young Stellar Populations in three Local Group Environments
CL	Anguita	20	GMOS South		Mass to light ratios and evolution of galaxy scale lenses from the RCS2

GEMINI SOUTH 2011A QUEUE - Band 3 (Part 1)

Country	PI	Time (hrs)	Instrument	ToO	Title
AR/CL	Vega Neme	23.4	GMOS South		Unveiling the nature of Blue Compact Dwarf galaxies with IFU
BR	Urrutia	6	GMOS South		A census of all intergalactic HII regions in two shell galaxies with HI tidal debris.
US	Ueta	9	NICI		Probing of the Structure of Optically-Thin Proto-Planetary Nebulae with Angular Differential Imaging
UK	Smith	5.2	GMOS South		Longslit + IFU Spectroscopy of high-redshift lensed SMGs discovered in the Herschel-ATLAS
CL/UK	Rebassa-Mansergas	15	GMOS South		Finding double degenerates in the Sloan Digital Sky Survey
UK	Ramsay	3	GMOS South		Followup spectroscopy of ultra-compact binary candidates
UK	Ramos Almeida	8.6	T-ReCS		Characterizing the mid-infrared emission of radio galaxies
UK/AU	O'Toole	10.2	GMOS South		The MUCHFUSS Project - Searching for the most and least massive companions to hot subdwarf stars
UK	O'Halloran	11	T-ReCS		The PAH emission deficit in IC 5152
BR	Moraes	0.9	GMOS South		RS Oph remnant anatomy
CA	Moffat	16	GMOS South		X-ray emitting B stars in the Great Carina Nebula : curiosity or new paradigm?
US/UK/CA/AU	Miszalski	39	GMOS South		A synoptic spectroscopic survey for binary central stars of planetary nebulae
US	Mikles	8.4	GMOS South		Measuring the Mass of the Neutron Star Sco X-2 = GX 349+2
BR	Menezes	0.9	GMOS South		Stellar archeology of the inner bulge of M 104
UK	McMahon	25	GMOS South		Quasars with 5<z<6 for probing baryons at the Post Reionization frontier
UK	McDonald	9.7	T-ReCS		Dust production among the nearest stars
GS	Margheim	10.9	GMOS South		Lithium-Rich Red Giants in M22: A Experimental GMOS Program
AU	Mahony	12.3	GMOS South		Unveiling the high radio frequency source population
CA	Limoges	12.5	GMOS South		A continuing census of Galactic white dwarfs to 40 parsecs of the Sun
GS	Lemoine-Busserolle	15	GMOS South		Lyman-alpha Haloes Around QSOs at z=3-4
GS	Kepler	4.7	GMOS South		Are all high mass white dwarf stars magnetic? A test via GMOS Spectroscopy.

GEMINI SOUTH 2011A QUEUE - Band 3 (Part 2)

Country	PI	Time (hrs)	Instrument	ToO	Title
UK/US	Hynes	11.8	GMOS South		Spectroscopic Identification of X-ray Binaries in the Chandra Galactic Bulge Survey
US	Hinkle	1	NICI		Imaging the debris cloud around the final flash star IRAS15154-5258
US	Hillwig	32	GMOS South		Confirmation of the Mass Donor Star in the Unique Microquasar SS 433
US/AU	Heiner	8	GMOS South		Metals and molecules in HI-selected galaxies
BR	Gregorio-Hetem	3.3	GMOS South		Mixing of young and older stellar clusters in CMa R1
GS	Gomez	2.7	GMOS South		Exploring the Origin of the Radio Relic in Abell 13
GS	Gimeno	5	GMOS South		Imaging of interacting galaxies in compact groups: NGC 6548
CA	Cote	9	GMOS South		Measuring Mass-to-light in Nearby Dwarf Spheroidal Galaxies
UK	Chapman	12.4	T-ReCS		Supernova Progenitors in Westerlund 1: Dust Production and Crystallinity in Starburst Conditions
CA	Bouchard	13.8	GMOS South		Transition Dwarf Galaxies in Nearby Groups
US/BR	Beers	63.4	GMOS South		A Survey for Unrecognized Carbon-Enhanced Metal-Poor Stars in the Galaxy
BR	Placco	4	GMOS South		A Survey for Unrecognized Carbon-Enhanced Metal-Poor Stars in the Galaxy
CA	Heiner	4	GMOS South		Metals and molecules in HI-selected galaxies
CL	Chene	8.7	GMOS South		Constraining the evolution of young star clusters