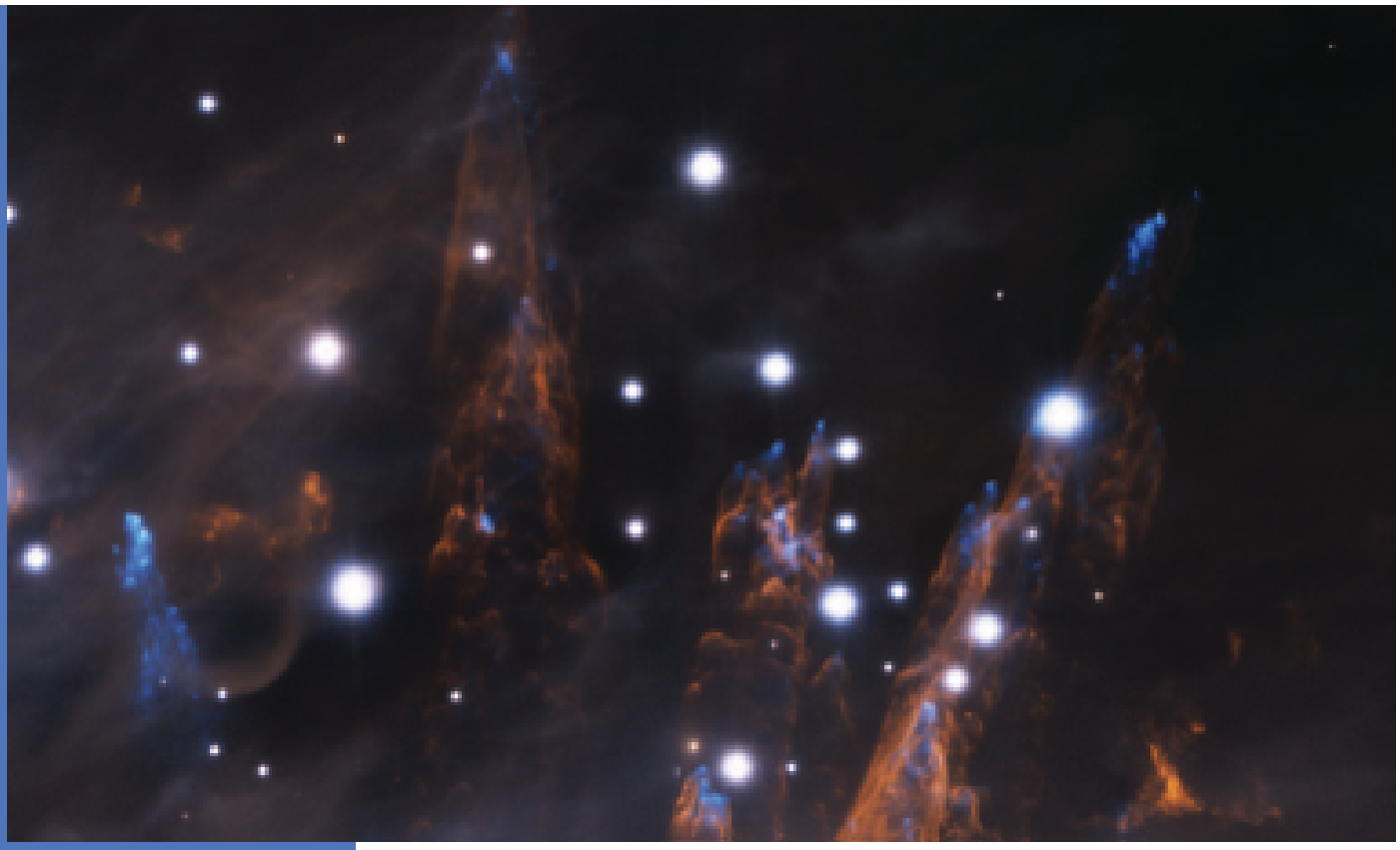

2013 Annual Progress Report and 2014 Program Plan of the Gemini Observatory

GEMINI OBSERVATORY
Explorando el Universo, compartiendo sus maravillas y misterios

AURA
Association of Universities for Research in Astronomy, Inc.

NSF NRC·CNRC Australian Government Australian Research Council Ministerio de Ciencia, Tecnología e Innovación Productiva Presidencia de la Nación Ministry of Science, Technology and Innovation BRASIL

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1 Executive Summary

The Gemini Observatory consists of twin 8-meter diameter optical/infrared telescopes located on two of the best observing sites on the planet. Locations in the northern and southern hemispheres (Hawai'i and Chile) provide access to the entire sky. A range of instrumentation provides imaging and spectroscopic capabilities, with enhancements from adaptive optics and specialized instrumentation. The vast majority of activity within the Observatory is dedicated to maintaining and supporting operations on behalf of the international scientific community of the Gemini Partnership. The Observatory's goal is to enable their scientific progress, as they address problems on all scales of the universe, from the nearby objects in the Solar System to the largest cosmological structures. Gemini continues to improve its offerings as an efficient and nimble observatory that can respond to users' needs.

Beyond operations, the two additional core programs of Gemini are instrumentation and facility development and the "transition" to a reduced budget level. Development projects provide new capabilities for users and improve existing ones, with the results eventually becoming part of regular operations. Investments through the Transition Program will result in long-term cost savings and provide long-term sustainability so operations can continue with fewer Observatory staff members.

Following a brief introduction (Section 2), this report present science highlights based on user publications during the year (Section 3). These results show the rapid adoption of novel and unique instrumentation including the Gemini Multi-conjugate Adaptive Optics System (GeMS), major results from a dedicated campaign to find extrasolar planets, and quick response to user's needs to identify and characterize a new-found neighbor beyond the Solar System.

Section 4 reports progress of Observatory operations. This area includes the fundamental daytime preparations and nighttime usage of the telescope and instruments, along with scientific support of users. The publication rate based on observations with Gemini facilities continues to increase, and usage of Gemini North and Gemini South is now comparable. Dedicated projects provided the near-infrared imager and spectrograph FLAMINGOS-2 for user science, supported visiting instruments to expand the offered capabilities, delivered improved data reduction and software tools, and performed regular telescope maintenance including a recoating of the primary mirror at Gemini North. Performance metrics are reported here, including completion rates for queue observing programs executed by Gemini staff, subscription rates for telescope time, overall telescope usage, and fault rates.

Activity within the Transition Program is also reported in Section 4, with the effort supported by the operations and maintenance budget and operations staff. Significant progress was made in several important projects, including the quality assessment pipeline, which will reduce staff effort to assess data during nighttime observing, an automated system to comply with requirements of using laser guide star adaptive optics systems, training of non-research observers, and management of the program. In addition, several items that had not originally been planned for 2013 delivered results,

including savings by reducing rented storage facilities, savings with a new summit transport system in Chile, and plans for savings on information systems fees.

The high priority plans for instrumentation and facility development (Section 5) were realized. These included completion of the in-house development on GeMS and its delivery with science instrument Gemini South Adaptive Optics Imager for regular science use, repair of the catastrophic lens failure of FLAMINGOS-2 and handover to Operations for regular science use, and delivery and first commissioning of the Gemini Planet Imager (GPI). The lower priority development projects suffered some delays, the most significant of which is a contracting delay for the new Gemini High-resolution Optical Spectrograph (GHOS).

Gemini aims to broaden participation in science and technical fields and to inform the general public about our activities, especially in the local communities of our telescope sites (Section 6). The flagship public outreach programs, Journey Through the Universe in Hawai'i and Viaje al Universo in Chile, attracted over 17,000 participants in 2013. School visits of the portable StarLab planetarium reached over 4,000 people at both sites. Strategic communications concentrate on scientific users, and a shift to a quarterly and electronic publication of the *Gemini*Focus newsletter in 2013 provides them with more timely and accessible information. Successful workforce development initiatives include a teleworking policy, improved employee recognition programs, and succession planning throughout the Observatory. To encourage broadening participation, Gemini continues to support regular internship programs.

values in $1000	**2013 Budget**	**2013 Cash Expenses**	**2013 Commitments**	**2013 Expenses and Commitments**	**VAR Budget vs. Expenses**	
					$	**%**
O&M	30,179	28,358	1,463	29,821	358	1.2%
IDF	7,111	3,816	1,446	5,262	1,849	26%
FDF	1,152	314	193	507	645	56%
Special	17	166	2	168	(151)	
Total	38,459	32,654	3,104	35,758	2,701	7%

Table 1-1: 2013 budget and actual expenditures, by fund.

Section 7 describes the Gemini organization and budget. The financial planning and reporting process has been improved, leading to better analysis of spending and meeting budget targets. The introduction of a Deputy Associate Director for Operations position supports these improvements and provides additional oversight over the Transition Program. Table 1-1 provides a summary of the 2013 budget by fund: Operations and Maintenance (O&M); Instrument Development Fund (IDF); and Facilities Development Fund (FDF). The Special Grants and Award Fund includes the small grants and awards to individual investigators. The most significant variance (in IDF) is due to delay of contractual milestones, which delay payments from Gemini. O&M spending in 2013 exceeds partner contributions for the year, as planned, relying on past unspent funds to smooth the transition to lower budget levels. These three funds support the staff of 182 full-time equivalents (FTE), listed in Table 1-2.

Section 8 presents the program plan for 2014. The majority of activity and budget are dedicated to regular operations, and this area remains the highest priority across the Observatory. Planned milestones for specific small projects within operations are listed. Operations can support four instruments plus adaptive optics at each site. Temporary staff increases in 2014 are dedicated to short-term projects, especially in support of the Transition Program. Within this program, the largest effort is dedicated to develop base facility operations (allowing for regular observing from each base site, reducing summit support), a project that will be fully implemented at the end of 2016. Work will continue on other transition projects, with emphasis and priority on those that will deliver savings.

Function	FTE
Administration	14.9
Directorate	5.5
Public Information/Library	6.4
Safety	2.8
Engineering	61.6
Information Systems	12.1
Science Operations	54.6
Aircraft Spotter	4.7
Science Interns	2.7
Instrumentation Development	17.5
Total	182.7

Table 1-2: 2013 staffing, by full-time equivalent.

GPI will remain the highest priority development project, until delivery for regular science operations in the second half of 2014. GHOS will make progress toward a preliminary design review, and the detectors in the Gemini Multi-Object Spectrograph (GMOS) at Gemini South will be upgraded.

Administrative improvements will concentrate on financial areas, continuing to lead regular financial reporting and improving tools for better analysis, and leading several savings projects that are part of the transition. Gemini's Public Information and Outreach group will continue with regular educational outreach programs, including Journey Through the Universe and Viaje al Universo, and public information dissemination, including publication of the quarterly newsletter and regular press releases. Goals for 2014 are to increase local outreach partnerships and increase engagement in social and new media.

2 Introduction and Overview

Gemini Observatory's mission 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 2013 activities toward fulfilling this mission. The starting point is the twin 8-meter telescopes and their instrument capabilities that are available to the user community. The Gemini user community's scientific interests range from the Solar System to the most distant galaxies and quasars, and Gemini Observatory's variety of optical and infrared imagers and spectrometers are sufficiently flexible to enable this broad range of exploration. More specialized capabilities are also available for general use.

Gemini offers both queue and visitor observations according to user choice. The queue makes targets of opportunity a regular and popular mode of use. Gemini supports astronomical researchers from preparation of observations through data reduction to enable efficient and effective scientific return. The Gemini data archive, which includes calibrations, is open to everyone after an eighteen-month proprietary period for the original investigators.

Against this backdrop of regular operations, observatory staff and our community partners continue to work toward the delivery of new capabilities. This year marked the complete transformation of Gemini South, with the Gemini Multi-Conjugate Adaptive Optics System (GeMS) completing system verification and being offered for use through the regular proposal cycle, FLAMINGOS-2 also becoming a regular offering, and the beginning of commissioning the Gemini Planet Imager (GPI).

We recognize in 2013 the first year without participation of the United Kingdom, one of the founding members of the international partnership. The corresponding budget change has stimulated fundamental shifts in Gemini operations and service delivery. We will execute these tasks that support the future sustainable operation of Gemini in new ways as part of the Gemini "Transition," activities that will continue through 2015.

This report begins with highlights of scientific results (Section 3). Section 4 describes progress in all areas of operations, the largest of which are science and engineering. Instrument development activity during the year is covered in Section 5. Results from the active education and public outreach program appear in Section 6. It concludes with an organizational and budget summary (Section 7) and a program plan for 2014 and future years, through the Gemini Transition (Section 8).

3 Science Highlights

The annual science highlights from Gemini are the work of the international user community. They use both telescopes and their instruments to pursue a diversity of scientific topics.

3.1 First Results using GeMS/GSAOI

The first refereed astronomy paper based on data using GeMS demonstrates the effective use of young, lower mass stars to determine the age of a star cluster. The infrared sensitivity and resolution the adaptive optics system provides for the Gemini South Adaptive Optics Imager (GSAOI) science instrument enable the measurements of the stars in the low-mass cluster Haffner 16 in the Milky Way (Davidge *et al.* 2013 *PASP* 125, 1181).

In particular, photometry of the fainter pre-main sequence stars is possible. These become essential for determining the cluster's age accurately because the higher-mass stars that are usually used as an age diagnostic are often absent in low-mass clusters. The result yields an age $\lesssim 10$ Myr for Haffner 16. In contrast, trying to use optical measurements results in an age about 2Myr greater.

Figure 3-1: These observations importantly demonstrate the utility of the GeMS AO system even in relatively poor conditions. The delivered image quality provides full width at half-maximum in the Ks band less than 0.16 arcseconds. This represents a significant improvement over the natural seeing, which, on the night these data were obtained, was roughly 0.8 arcseconds—a value worse than average at Gemini South on Cerro Pachón.

One of the broader interests of lead author Tim Davidge (Dominion Astrophysical Observatory, Canada) is the origin of the field star population. Isolated pre-main sequence stars are observed in the solar neighborhood, in the absence of the clusters where they would be expected to have formed. Haffner 16 is an example of the dissolution of a cluster in process, providing evidence of the transition of stars from a cluster to the field. In particular, the sub-solar mass population is deficient in this cluster, which the authors suggest is a result of the dynamic evolution of Haffner 16, having lost protostars of sub-solar masses.

This cluster contains a large population of pre-main sequence stars that are still accreting material, demonstrated by their line emission. This is unexpected given the age of Haffner 16, whereas the accretion phase usually ends after only a few Myr. This extended period of mass buildup may eventually result in somewhat overly massive stars for their place on the main sequence. A suggestion is that the accretion is not shut off in this case because the supernovae and strong stellar winds of the massive stars that normally disrupt accretion are absent.

Other GeMS/GSAOI based on early observations papers have been published. Among them, Zyuzin and collaborators (2013 *ApJ* 775 101) resolve an extended feature near the Vela pulsar, demonstrating that the pulsar itself does not exhibit any excess infrared emission and instead associating the feature with the counter-jet observed in X-rays. In addition, the first in a series of technical summaries of the system is in press (Rigaut *et al.*, 2014 *MNRAS* 437 2361).

3.2 Gemini NICI Planet-Finding Campaign

Astronomers have evidence for hundreds of planets around stars beyond the Sun, but only a handful are observed in direct imaging. The planets are intrinsically faint, and detecting them near their bright host stars adds to the challenges. The Near-Infrared Coronagraphic Imager (NICI) at Gemini South has provided greater sensitivity than previous ground- or space-based instruments, being able to detect an object one million times fainter than its bright host at a projected separation of 1 arcsecond. Michael Liu (University of Hawaii) and a large international team from across the Gemini partnership and beyond have used the instrument for the Gemini NICI Planet-Finding Campaign, the largest, deepest systematic search for planets through direct imaging. The result is that fewer stars than previously expected show evidence for planets, which will require some updates to theories of planet formation and survival. While some low-mass (substellar) companion objects have been detected, the Campaign did not image any unknown planets.

The first comprehensive result from the Campaign considers stars of about 2 times the mass of the Sun, based on observations of 70 of them (Nielsen *et al.* 2013 *ApJ* 776 4). The team concludes that less than 10% of these stars have massive (greater than 10 $M_{Jupiter}$) planets at distances of about 40–650 astronomical units (AU) from their hosts. While known examples of imaged planets were observed, the systematic analysis of the total program reveals that these systems are uncommon. Fewer than 10% of these stars are likely to have planets like HR8799, for example, which has a 7 $M_{Jupiter}$ planet at a distance of about 70 AU. Two additional publications similarly find no new planets and set limits on their likelihood in young moving groups (Biller *et al.* 2013 *ApJ* 777 160) and around stars having debris disks (Wahhaj *et al.*, *ApJ*, 773 179).

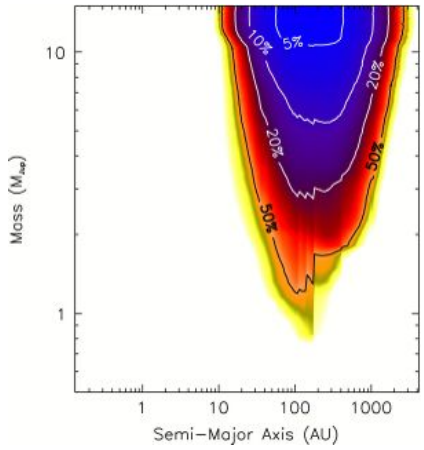

Figure 3-2: Probability that a star of the given mass has a giant planet at the corresponding semi-major axis location. Only high-mass planets at relatively large distance are more than 10% probable.

The search for planets is painstaking work. One source of confusion is the chance superposition of a distant star, which can mimic the appearance of a faint companion to the nearby host star of interest. Multiple observations of the candidate objects can distinguish these scenarios, and unfortunately, most of the time the less-interesting

chance alignment is the conclusion. Another important detail of the work is to determine the ages of the stars. Because age has a strong effect on the appearance of planets and other low-mass companions—they are brighter and hotter when formed, and fade and cool over time—the inferred planet properties are sensitive to the stellar age.

3.3 The Sun's Closest Neighbor Found in a Century

Large proper motion suggested that the object detected with NASA's Wide-field Infrared Survey Explorer satellite (WISE), WISE J104915.57-531906 is nearby, with parallax measurements confirming the distance of only 2pc. This is the closest stellar system found in a century, and the third closest overall. The combination of WISE and other near-infrared surveys has provided multi-epoch data for such proper motion searches, enabling detection of nearby cool (and optically-faint) objects. WISE alone, having exceeded the original planned lifetime, provides the multiple observations required. Kevin Luhman (Penn State University) discovered the large proper motion of WISE J104915.57-531906 in the WISE data and recovered the object in other earlier surveys to obtain a more accurate distance measurement.

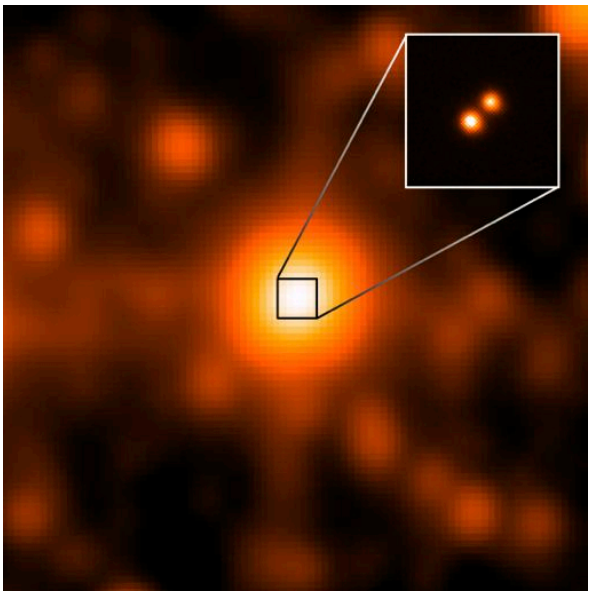

Figure 3-3: WISE J104915.57-531906 lies at the center of the larger image. It appears as a single object in this image from WISE. Higher resolution observations using GMOS-South revealed its binary nature (inset) and enabled classification of the brown dwarf pair.

The outstanding question was then what is this object? Director's Discretionary Time enabled spectroscopy with the Gemini Multi-Object Spectrograph (GMOS) on Gemini South to provide an answer, and more. Luhman classified the object as an L8 dwarf, showing good agreement with a template spectrum. For ages less than 10 Gyr, the temperature is well below that of the hydrogen burning limit. Also considering the strong lithium absorption, Luhman concludes that the object is a brown dwarf (Luhman 2013 *ApJL* 767 1).

The unexpected bonus was the resolution of the source into two components in the acquisition image (Figure 3-3). The pair is separated by 1.5 arcseconds, which corresponds to 3 AU. Examination of archival images does not show either source at this location at earlier times, arguing that they are in a common binary system. The secondary is only about half a magnitude fainter than the primary, which suggests that it is also a brown dwarf and near the L/T transition. Brown dwarf models are sensitive to age, so a binary system offers robust tests of models and potentially strong constraints on mass, assuming the objects formed at the same time.

3.4 The Surprisingly Low Black Hole Mass of an Ultraluminous X-Ray Source

Ultraluminous X-ray sources have luminosities exceeding 10^{39} erg s^{-1}. These luminosities require either normal accretion onto an intermediate mass black hole (having mass 100–1000 M_{Sun}) or radiation at near- or super-Eddington rates. Jifeng Liu (Chinese Academy of Sciences) and colleagues used GMOS on Gemini North to measure the mass of the black hole in the ultraluminous X-ray source (ULX) in M101 (*Nature* 2013 503 500). They conclude that this is not an example of an intermediate mass black hole, and instead M_{BH} = 20–30 M_{Sun} (Figure 3-4). Surprisingly, then, the accretion disk is relatively cool, which violates expectations for high Eddington accretion onto a stellar mass black hole. The overall X-ray spectrum is soft, lacking the signature hard X-rays that emerge from Comptonization of photons in a hot corona of the accretion disk, which is detected in other systems that emit at close to the Eddington luminosity.

The GMOS spectroscopy also enabled detailed study of the stellar companion that provides the accreting material. The presence of broad helium lines and absence of corresponding hydrogen lines classify the companion as a Wolf-Rayet star. The configuration of the system rules out mass transfer by Roche lobe overflow, and instead points to the stellar wind as the source of accreting material. The efficiency of the wind accretion is another surprise of the M101 ULX system, and it will require new theoretical work that includes this important process.

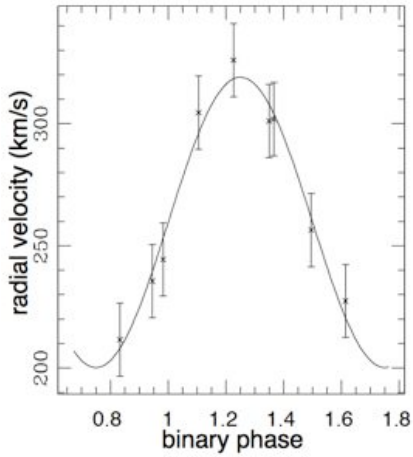

Figure 3-4: Radial velocity measurements show an orbital period of ~8.2 days, and the system dynamics indicate a black hole mass of 20–30 M_{Sun}.

3.5 GRB 130606A

The high-redshift gamma-ray burst denoted GRB 130606A rapidly demonstrated its utility as a probe of the intergalactic medium—both along the line-of-sight to Earth and through the interstellar medium of its host galaxy. On June 6, 2013, Ryan Chornock (Harvard University) and colleagues used GMOS at Gemini North to obtain sensitive observations of the GRB's afterglow within 13 hours of when NASA's Swift satellite first detected the burst (2013 *ApJ* 774 26). They used the data to measure reionization in the early universe and properties of the host galaxy (Figure 3-5).

At redshift z = 5.91, GRB 130606A remains one of just a handful of spectroscopically confirmed GRBs at z~6. Quasars have been used to probe the intergalactic medium (IGM) at this epoch, when the universe was only one billion years old. This work is the first to provide a similarly high-quality GRB spectrum for analysis. An advantage of pursuing this work with GRBs is that there is no expected bias toward highly ionized areas, as may be the case with quasars. The net results along this single sightline are similar to those obtained based on quasar observations, showing an increase in the Lyman-α optical depth from z = 4.9 toward larger redshifts.

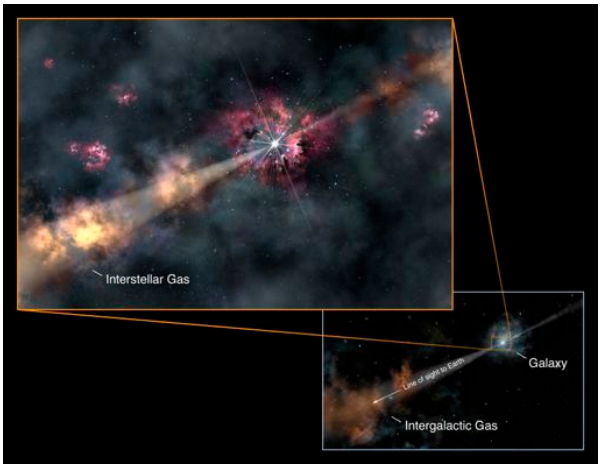

Figure 3-5: Artist's illustration shows how light from the GRB passes through the interstellar medium of the host galaxy (close-up view, left) and the intergalactic medium (wide view, right).

A particular feature is that the IGM appears nearly opaque in a region around z = 5.77, although measurable Lyman-β and Lyman-γ flux show that the IGM is still significantly ionized over this high-redshift interval. In addition, at the redshift of the host galaxy, Chornock *et al.* establish an upper limit on the neutral fraction of the IGM of 0.11.

A number of absorption lines were used to determine the host galaxy's redshift. Some of these lines are useful tracers of the galaxy's metallicity, with the expected result of low metallicity—about one-tenth of solar values. Assuming these lines are optically thin, it sets a lower limit; *e.g.*, [Si/H] $\lesssim$ -1.7. The non-detection of some ionized sulfur lines sets an upper limit of [S/H] $\gtrsim$ -0.5.

3.6 Observing the Accretion Disk of the Active Galaxy NGC 1275

Integral field spectroscopy is a powerful tool to reveal the physical processes at the centers of galaxies, and combined with adaptive optics techniques, the activity is revealed on physically small scales. The central galaxy of the Perseus cluster, NGC 1275, offers a rich case study, where scales of the accretion disk can be probed directly.

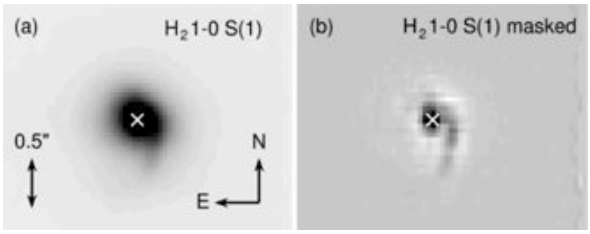

Figure 3-6: Emission in the central 50pc of NGC 1275 shows the flow of molecular hydrogen along a streamer into the accretion disk.

Julia Scharwachter (Australian National University) and colleagues used the adaptive optics system Altair with the Near-infrared Integral Field Spectrograph (NIFS) on Gemini North to trace the ionized and molecular gas on scales of 35 pc in NGC 1275 and deduce the properties of the central supermassive black hole and the accretion disk that feeds it. They find a black hole mass $M_{BH} \leq 8 \times 10^8 M_{Sun}$ based on models of the molecular disk (Scharwachter *et al.* 2013 *MNRAS* 429 2315). This value agrees with the established relationship between stellar bulge and black hole mass, the so-called M-sigma relationship, though the upper limit is higher than some other measurements. Some of the discrepancy may be due to the significant molecular contribution, which the team observes through H_2 emission. The large velocity dispersions and emission line ratios point to shock excitation as an important process in the turbulent accretion disk, which is fed by molecular gas traveling along streamers. The morphology and kinematics of the disk are detected directly on scales of 50 pc, with the expected result that the disk axis is aligned perpendicular to the axis of the radio jets.

4 Operations

4.1 Gemini Publications and User Relationships

Overall, the number of publications per year based on observations at Gemini continues to increase over time, with some fluctuations (Figure 4-1). During 2013, 200 refereed publications appeared, with 114 based on observations from Gemini North and 110 based on observations from Gemini South. This is the first year the publication rates of both telescopes are comparable. A significant fraction (35%) of these 2013 publications are based on observations from more than one program. Gemini staff are primary or co-authors of about 20% of Gemini publications in recent years, and in total have contributed to 86 refereed publications in 2013. The publication information available at the Gemini website now features improved tools for searching publications by users. Appendix A contains a complete list of the 2013 staff publications, and all refereed publications based on Gemini data are listed in Appendix B. Appendix C provides more detail about research staff members' distribution of effort.

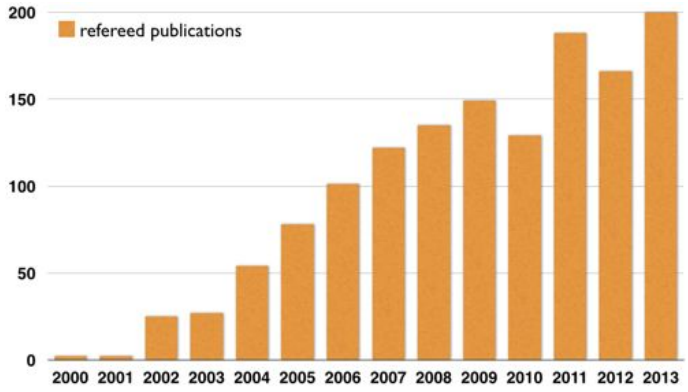

Figure 4-1: Number of publications based on Gemini observations, by year.

The Users' Committee for Gemini (UCG) is fully established with an expanded slate that reflects the current partner balance. The UCG provides feedback to the Gemini Observatory on all areas of its operations that affect current users of the facility, based on the experience of the committee members as well as input collected from the larger community of Gemini users. They have been keenly interested in and have offered valuable recommendations to improve the new Data Reduction Forum, launched in December.

A special effort is being made by the Director, Dr. Markus Kissler-Patig, to attend the national meetings of the Partner communities. After attending the American Astronomical Society meeting in January, he participated in the Canada-France-Hawaii Telescope Users' meeting and the Canadian Astronomical Society (CASCA) meeting in May. In June, Conycit organized a meeting with all Chilean astronomy department heads in Santiago. The Director attended the Astronomical Society of Australia meeting in July after a week-long tour including visits at the Australian Astronomical Observatory, the Australian National University, and Swinburne University. A webinar was broadcasted from the Space Telescope Science Institute in September, followed by visits to the University of Toronto and the University of Chicago. Maxime Boccas, Associate Director for Development, represented Gemini at the Latin American Regional International Astronomical Union Meeting in Brazil in November.

4.2 Operations Summary

The Operations Division of Gemini is responsible for maintaining the instruments and telescopes to conduct science observations on sky. They monitor performance and take remedial action, as necessary, and conduct planned maintenance and improvements. They support science users, from the time allocation process, including in preparation of observations and with data reduction using tools provided by Gemini. The outcomes of these activities are described below, and Section 4.9 provides a summary of operations metrics.

Specific additional major tasks established as part of the 2013 program plan within Operations are listed in Table 4-1a. The progress with these activities, changes and decisions taken within the year, and information on other significant activities carried out in 2013 are provided throughout this section. Additional projects beyond the original 2013 program plan that were taken on during the year are listed in Table 4-1b.

Activity	Completion	Plan date	Actual date
Primary mirror coating at Gemini North	100%	2013Q1	2013Q3
Safety access platforms ship, and installed at both sites	100%	2013Q1 (GN) 2013Q3 (GS)	2013Q3
Completion of GNIRS lens replacements	0%	2013Q3	Deferred into 2014 due to resource constraints (see text)
Data reduction forum open to users	90%	2013Q1	2013Q4
First release of Development kit for Astrodata / Recipe system.	100%	2013Q1	2013Q2
Port Gemini data reduction package to IRAF 2.16	n/a	2013Q1	Delayed, not within Gemini control (see text)
Full public release of the “Ureka” release system for Gemini data reduction package, STScI software, and PyRAF	100%	2013Q1	2013Q2

Table 4-1a: Operations 2013 planned activities.

Activity	Completion
Second visit of DSSI (offered to community)	100%
Renewed visiting of TEXES (offered to community)	100%
First eavesdropping experience in operations	80%
Work toward GMOS+Altair operation	80%
FLAMINGOS-2 and GeMS Science Operations	90% (FLAMINGOS-2); 80% (GeMS)
Design and procure handling carts for A&G shutdowns	100%
Complete TCS reliability project	100%
FLAMINGOS-2 data reduction package released to public	100%
Enhanced dome shutter seal modification at GN	100%

Table 4-1b: Additional Operations 2013 activities.

4.3 Instrumentation

Two visiting instruments were offered to the community at Gemini North. First, the Differential Speckle Survey Instrument (DSSI) had completed a highly successful initial run on the telescope in 2012, and was offered to the community as a visiting instrument for Semester 2013B. There was significant interest and five programs were awarded time. The instrument visit was highly successful and data were obtained for all programs awarded time. Secondly, following discussions at the Gemini Users Meeting in San

Francisco in 2012, the high-resolution mid-IR spectrometer TEXES was offered to the community for 2014B. The completed run supported some ten science programs from the community, though poor weather reduced program completion rates.

Replacement of lenses in the Gemini Near-Infrared Spectrograph (GNIRS) short-red camera was deferred into 2014, after an analysis of demand revealed that there were few proposals requesting the affected modes and amid concern over resource allocations in light of other higher priority work. The work will now likely be carried out in mid-2014, around the time of the semester boundary.

FLAMINGOS-2 was fully commissioned in long-slit and imaging modes. It is now operating on the telescope, and despite some ongoing issues is taking science data in the regular queue and visitor modes (initially in shared-risks mode, under which it was offered for 2013B). Mechanical issues that resurfaced since its return to commissioning in April have been dealt with; other newer ones are being worked around. Image quality remains outside specification and shows a large radial gradient, and the MOS mode is not yet commissioned. FLAMINGOS-2 will settle into operations as it is, and MOS commissioning may be started in 2014. At present we do not expect that the MOS turnaround time will ever meet the original requirement, and we will need to accommodate that operationally when the mode is ready. Handover reviews have identified the most critical remaining issues and prioritized them for work in 2014.

For GeMS/GSAOI, a highly successful System Verification (SV) campaign concluded in March. Data were made available via the Gemini Science Archive (GSA). Usage in the regular queue was also successful. GSAOI programs had a higher rate of completion than the average for Band 1 overall: nine of eleven 2013A GSAOI programs were completed, one ended at 86% and only one was not started. However, the average time overrun for completed GSAOI programs was 130%. The overhead for setup was approximately as expected, but extra time was largely spent repeating “usable” data or waiting for conditions on the night. After a “shutdown” period in the southern winter, in which a significant amount of remedial work was carried out on both Canopus and GSAOI, the instrument returned to the telescope to a mixed series of runs, affected by technical problems and poor weather. As with FLAMINGOS-2 we are in the process of operational handover reviews, the final of which will be held in early 2014. We expect to accept GeMS into operations for the start of Semester 2014A and anticipate a year in which the main activities are properly settling the instrument into regular science production and improving its usability in normal operation.

4.4 Data Reduction

Implementation of the Data Reduction (DR) Forum was delayed by resource availability, specifically the web developer involved undertaking high-priority work for AURA Central Administrative Services (CAS; transferring the Gemini in-house property management system to CAS, where it is used by all AURA centers). To promote a successful launch of the DR Forum, we are now dedicating additional staff effort (beyond the original plan) to provide initial material in the forum and maintain it.

After significant delay due to staff departures and hiring, a development version of AstroData/Recipe System was released to staff, the National Gemini Offices (NGOs) and

UCG in October 2013. Work is still required on documentation before the release can be made to regular users; now scheduled for 2014.

To port the Gemini package to the latest version of IRAF has so far proved impossible due to a small number of critical bugs in the IRAF core code, which differs in a number of significant ways from the previous version and would corrupt images and spectra. These bugs are fixed in the IRAF version released with Ureka. Ureka is an astronomy software package that uses Python and IRAF, developed jointly between Gemini and the Space Telescope Science Institute (STScI), initially released to the public in June. The level of user interest in Ureka has been high: we expect that more than 2,000 user installations were been performed in 2013.

4.5 User Software Improvements

As reported in the 2012 annual report, a number of key improvements were put in place in the Phase I and Phase II packages last year, which astronomers use to submit proposals and plan observations. With those improvements in place, work has now shifted to amend the underlying infrastructure, removing code that stands in the way of further usability improvements. The first stage of this work has been completed, removing a layer that enabled direct, real-time communication between the Observing Tool (OT) and the database. This required a large amount of complex code and removing it paves the way for future improvements. For users, the first sign of change was in the December 2013 release of the OT, which has some more obvious fetch/store logic and warnings if another user has made changes to a program. The advanced features project will start in early 2014.

4.6 Remote Eavesdropping

As a result of the experiment carried out in 2012B as described in the previous year's report, it became clear that the administrative overhead of signing up users of remote eavesdropping via email contacts was prohibitive. It was agreed that Principal Investigators (PIs) should be able to sign themselves up; a Google spreadsheet was set up to enable this, and the queue coordinator and observer to relatively easily identify who is contactable on any given night. In 2013A the signup was initially restricted to Band 1 programs, and the limited usage made it possible to expand to include Band 2, as well. Both the signup rate and the call activity are relatively low now. However, the system has proved useful in specific circumstances such as pre-planned, lengthy observations (such as occultations) where a PI can be contacted to help set up the observation.

4.7 Storage and Archiving

Statistics for activity and data ingestion in the Gemini Science Archive (GSA) are given in Table 4-2. The contractual uptime requirement for the GSA is 98%, and was exceeded in all four quarters this year.

A contract amendment was signed with the Canadian Archive and Data Centre (CADC), who provide the GSA, to link science observations and calibrations using the Gemini FITS storage calibration server and its association rules. This change will allow a user employing a web browser to get a summary and detailed listing of all calibrations associated with a given science program, and to download the files. This will address a long-standing user issue, often flagged as "Data Reduction" but in fact a combination of

calibration association completeness and archive retrieval problems. Work commenced on this change in the second week of October. We expect the work to be completed quickly and after testing to be able to offer to users in 2014.

Period	Helpdesk tickets resolved[1]	Dealt with by Gemini Staff	Site Hits	Queries	Fits images ingested (all)	New rows in science table	Proprietary data users	Uptime	total file size (Gb)	total download (Gb)
Oct-Dec 2012	9	2	86,290	41,384	60,578	15,710	1,342	99.74%	1,322	348
Jan-Mar 2013	2	0	92,245	46,689	55,818	14,155	1,384	99.91%	1,484	355
Apr-Jun 2013	4	1	73,218	35,913	126,451[2]	15,834	1,426	100%	1,990	352
Jul-Sep 2013	11	3	499,512	246,098[3]	50,419	16,428	1,475	99.98%	2,073	411

[1] Gemini helpdesk tickets (external users) in the GSA category plus tickets submitted by external (non-Gemini) users directly to the CADC helpdesk system.

[2] Ingested images also count re-ingestion. During this period GN re-ingested a large number of GMOS-N images after some header fixes. New rows in Science table actually reflect how many new science datasets have been added to the archive (excluding calibrations).

[3] During this report period, CADC changed the way catalogue queries are handled in terms of authorization. This caused the PIT queries (that check if a target included in a proposal has already been observed) to be properly counted as anonymous queries, and they therefore show in the statistics.

Table 4-2: Gemini Science Archive usage statistics.

4.8 Telescopes and Enclosures

This year has seen two shutdowns, which were not anticipated in the previous annual report. On Gemini South, an unscheduled shutdown was required in March to replace failing micro-E sensors in the secondary mirror control system; the telescope was offline for 11 nights to accomplish this work. The urgency of the work was to avoid jeopardizing the FLAMINGOS-2 re-commissioning later in the year. The replaced sensors are performing very well. In the North, the coating part of the January shutdown was not completed due to water damage on the cooling system for the coating plant, incurred as a result of freezing temperatures in a winter storm while the shutdown was under way. The coating was instead carried out in September with the entire Gemini North engineering team plus two engineers from the South. The resulting coating is possibly the best that has ever been achieved at Gemini and is expected to last for five years.

Work continued on the image quality issue identified in the previous annual report, focusing on vibrational input and response. The telescope was permanently fitted with accelerometers to provide basic data on where vibrations are present; initially these were on the Instrument Support Structure and main telescope structures, but in the course of the August coating shutdown they were extended to the acquisition and guiding units (A&G). In October a visit to the North by the Telescope Scientist (T. Hayward) was used to carry out a nighttime test with the accelerometers and circular buffers from the various probes and Altair to produce a baseline set of data on vibrations and their effects. It was also possible to investigate some other issues capable of mimicking vibrational effects, including astigmatism. The whole data set is currently under investigation. Input was also sought from external consultants, including a vibration specialist company, and engineers who originally worked on design and construction of the secondary mirror tilt system. Related, work was carried out on Altair

and identified some improvements to the vibrational isolation in the optical bench. These were completed and have resulted in some improvement in the vibration response. Finally, work proceeded on design and fabrication of vibration isolation mounts for some of the cold heads.

Figure 4-2: Installation of shutter drive access platforms at Gemini South.

In a significant advance for summit safety, platforms were installed high on the domes to enable the safe removal and maintenance of the dome shutter drive motors. The work was carried out first in the South (in March) and then in the North (in July). Figure 4-2 shows work on and the complete Gemini South platforms.

4.9 Operations Metrics

The statistics in this section refer to demand and performance in the last two complete semesters: 2012B and 2013A. Approved science programs, in both queue and classical modes, for these semesters are listed in Appendix D. Figure 4-3 shows queue completion rates per telescope for all semesters to 2013A. Note that 2013A programs in Band 1 may still be completed due to rollover status. Against the somewhat tighter targets set by the Gemini Board, completion rates in Band 2 remain a cause for concern, and these have been discussed with the Board in its November 2013 meeting.

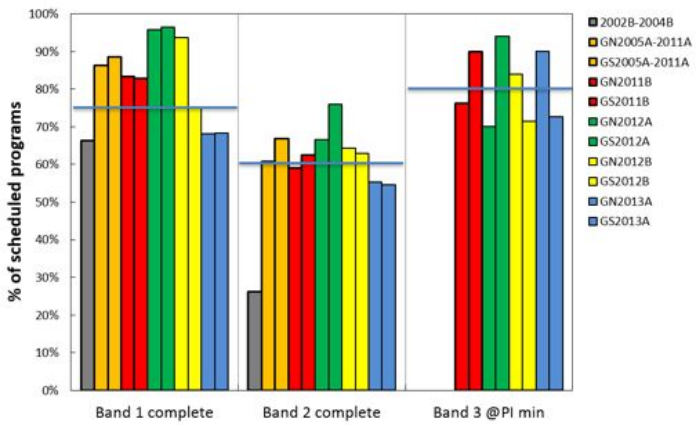

Figure 4-3: Completion statistics for GN and GS. Horizontal bars represent NSF target completion rates. Each group contains pairs of bars for north and south, and per semester; 2012B and 2013A are represented by the two blue bars at the right of each group. Note that the Bands 1 and 2 targets are based on program completion, whereas the Band 3 target is based on each PI's minimum time requirement.

Recent semesters have seen a significant increase in the amount of queue time forwarded by the Time Allocation Committees, and a corresponding decrease in classical allocations; Figure 4-4 shows the fraction of queue mode allocations over the last seven years of operations.

Tables 4-3 and 4-4 show top-level time distributions and science usage. Figure 4-5 puts these data in context of the last three years of operations. This clarifies a north/south difference previously reported, demonstrating that in the South, "Telescope and

Enclosure" have persistently dominated the fault rates, while in the North, the "Instruments and Adaptive Optics (AO) Facilities" contributes at approximately the same rate. As stated previously, we believe the difference arises in the prevalence of faults relating to NIRI's controller and Altair at Gemini North.

Semester	Site	Science	Engineering/ Commissioning	Fault loss	Weather loss	Shutdown
12B	North	61%	3%	3%	28%	5%
	South	60%	8%	5%	22%	5%
13A	North	64%	2%	4%	30%	0%
	South	60%	8%	4%	23%	5%

Table 4-3: Overall operational statistics, semesters 2012B and 2013A. Science time is distributed among Bands 1, 2, and 3 according to weather conditions and program priorities within the semester.

Oversubscription rates of the telescopes (GN and GS) by partner are shown in Figure 4-6. These rates are calculated as the ratio of the total time PIs request to the total advertised available science time. These rates do not account for the time required for standard calibrations. Such calibrations vary by instrument, resulting in an effective 10% factor at Gemini North and 5% factor at Gemini South that is not part of the oversubscription rates shown. (The difference between the telescopes is a consequence of the different instruments used, with the infrared instruments generally having larger overheads for calibration.) In addition, because programs are approved to fill 80% of the queue time available, these values further underestimate the effective oversubscription (*i.e.,* a proposer's success rate) by a factor of 25%. The distribution of time requested by instrument is shown in Figure 4-7.

Semester	Category	North	South
12B	Computer/Software	8%	16%
	Instruments & AO Facilities	38%	40%
	Telescope and Enclosure	53%	44%
13A	Computer/Software	20%	22%
	Instruments & AO Facilities	39%	25%
	Telescope and Enclosure	40%	52%

Table 4-4: Categorized fault distribution, semesters 2012B and 2013A.

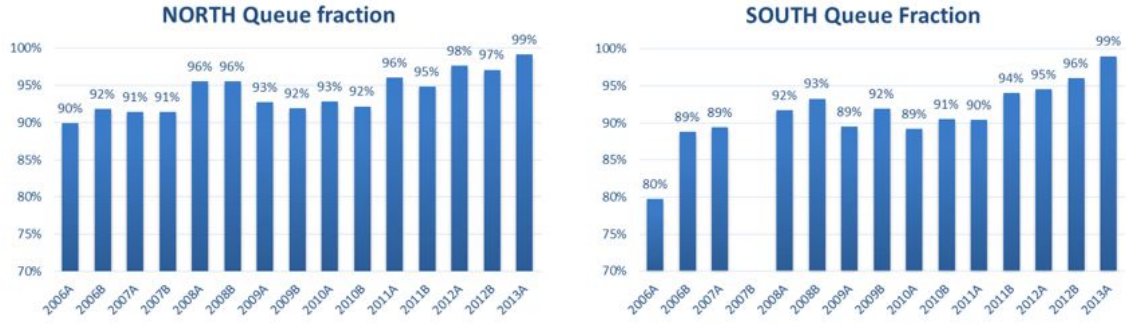

Figure 4-4: Evolution of queue fraction since 2006.

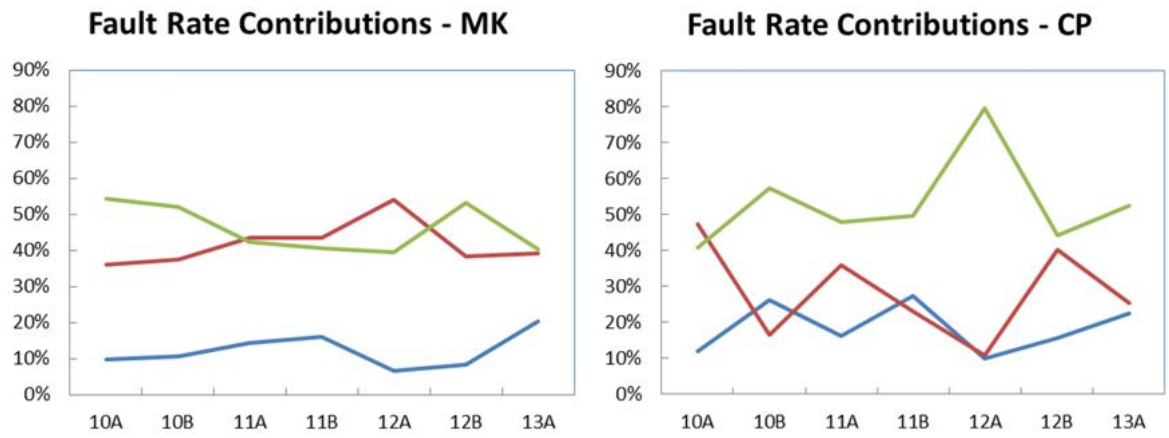

Figure 4-5: Relative contributions to fault rates, at Mauna Kea (MK, left) and Cerro Pachón (CP, right). Categories are: Telescope & Enclosure (green); Instruments & AO Facilities (red); and Software (blue).

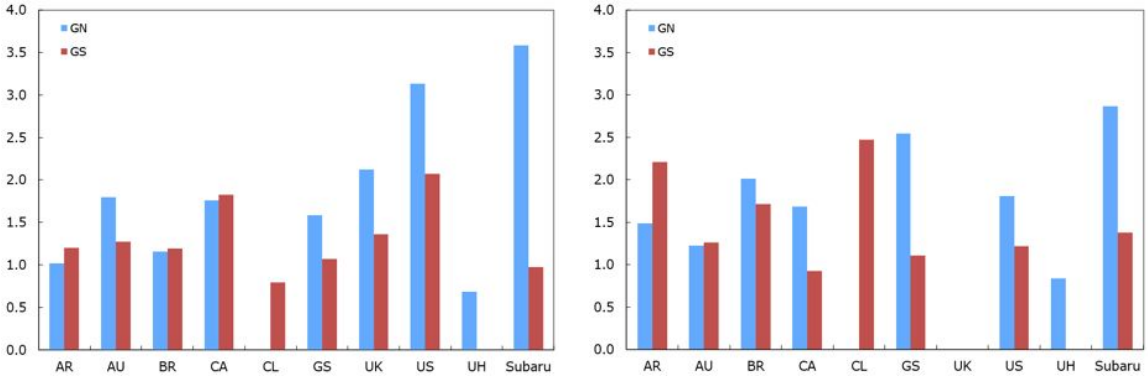

Figure 4-6: Oversubscription of Gemini North and South for Semesters 2012B (left) and 2013A (right), by partner.

4.10 Administration and Facilities

The Administration and Facilities Group (AFG) provided full support services to employees and telescope users and made significant advances on 2013 priority projects. At Gemini South, a key milestone in improving infrastructure was the installation of the air conditioning unit in the base facility computer room. Two additional Transition projects led by AFG staff are described in Section 4.12.

4.11 Safety

The Safety group now reports to the Chief Financial Officer. There were no major incidents reported in 2013. The Safety team re-launched Gemini's Safety Learning Management System called LITMOS. Various improvements were made to the training system. Gemini staff can access all Safety training courses, complete them, and the completion date is recorded in LITMOS system. Supervisors and managers have access to the training records for their employees and assign trainings for their groups.

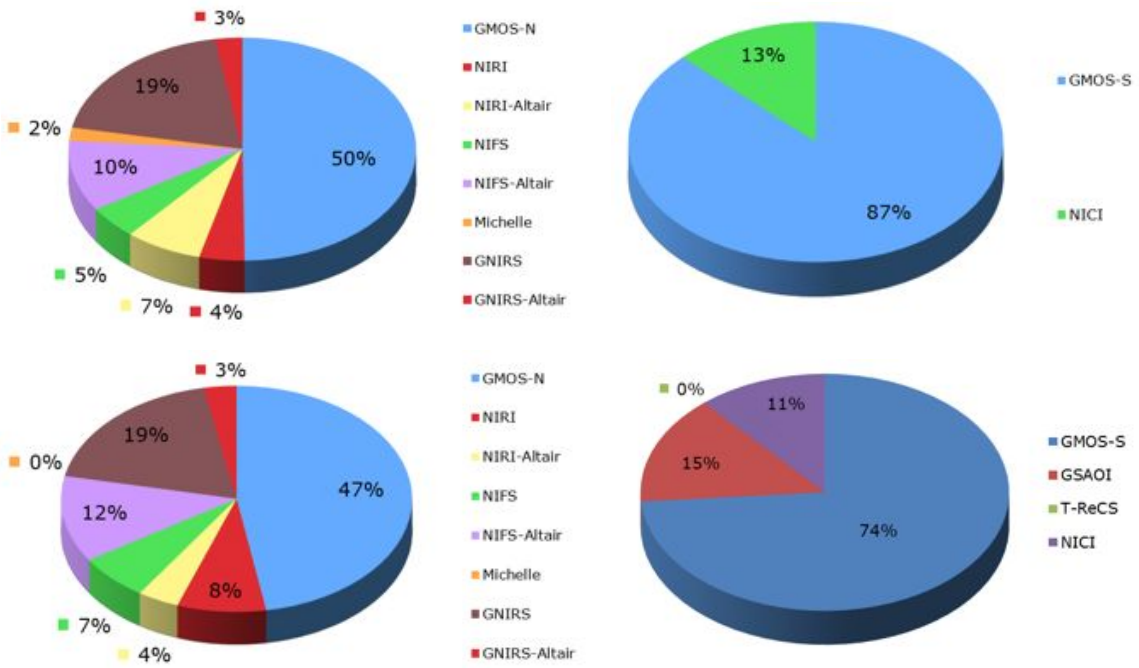

Figure 4-7: Requested time distribution across instruments in the north (left) and south (right) for Semesters 2012B (top) and 2013A (bottom).

4.12 Transition Program

The Transition Program defines the required changes at Gemini to provide sustainable operations under the reduced budget from 2013. It will be executed gradually, for completion in 2016. Reduced staffing is the most significant change and source of savings. In addition, projects within the Transition Program will reduce non-labor expenses and provide sustainability with a reduced staffing model. A strategic ranking of these savings activities was produced based on several criteria including the amount of savings, the project complexity, and project length. Within this framework, the total Transition Program continues to be managed dynamically. The resource allocation, scope, and schedule of the projects may be adjusted to meet the global goals of the Program.

In total, the savings activities will generate around $900k of annual non-labor savings by the endpoint. Four projects will provide two-thirds of this total non-labor savings, which we describe here. Of these, only Base Facility Operations had significant milestones in the original 2013 program plan.

Base Facility Operations

This project will bring the nighttime operations from the summit to the base facility by the beginning of 2016. Savings will be realized as summit lodging and meals are reduced, and the operating mode will add flexibility for visitors and better working conditions for the observers. The conceptual design review did not occur in 2013Q2 as planned, and with the loss of the project manager an interim team was established through the end of the year. Completed work in 2013 includes developing the use cases, the top-level requirements, and work package definitions, and most of the project management plan is

in place. Having lost most of the overall schedule contingency, this project is now schedule-driven in future resource allocation. These delays represent the most significant deficiency in the execution of the transition activities in 2013 and are a consequence of the limited staff effort (3 FTEs) dedicated during the year. Mitigation applied in 2014 will be to adjust and prioritize resource allocation (10 FTEs now planned for 2014) and to maintain schedule as the project's primary constraint.

Science Archive
The goal is to reduce archive services and cost without losing core capabilities. We have developed revised requirements and begun discussions with our current partner, the CADC. If they are not able to meet the new requirements, we will explore alternatives to begin in 2016, including a new bid for the contract or in-house solutions.

Hilo Base Facility (HBF) partial lease
With some staff reduction already and transfer of some administrative positions to CAS, an entire wing of the HBF has been vacated and is available for lease. A new tenant has been identified and could move in 2014, generating new revenue.

Information Systems (IS) licenses
The cost of maintenance and support contracts for the tools and systems used at Gemini will be reduced. We have inventoried all the systems and begun analyzing risks, to implement the changes in 2014.

One other large project within the Transition Program is the **Quality Assessment (QA) Pipeline**, whose goal is to provide rapid data quality assessment at the telescopes during nighttime observing. A key capability was added to the pipeline in 2013, namely a persistent database of QA metrics, which allows for daytime assessment. After departure of main developer in 2012Q3, new hiring helped regain project momentum in 2013Q3. This multi-year project is being replanned with a more limited scope, which will not significantly affect the required staff effort after 2015 or the information provided to science users.

Other Transition projects are focused on sustainability by providing tools and systems that can be easily maintained by a reduced staff in 2016. The most important of these projects is the **Real-Time (RT) systems upgrade**, which is key for the software group model and mitigation of obsolescence in the future. This project was launched in 2013Q3 and will be complete in 2016. **The Laser Guide Star (LGS) observations clearances** provides an automatic system to track and enforce Laser Clearing House (LCH) propagation windows and reduces related queue planning effort. **Science Operations training and documentation** has enabled observing by non-research observers, and the fraction of observing by non-research staff continues to increase. **Queue visualization** will provide a graphic representation of the visibilities and instrument configuration of queue observations during a semester to maximize the completion rates with reduced effort. This project met the 2013 planning milestones.

Table 4-5 summarizes the principal transition activities and their milestones originally planned 2013. The main changes or variances to highlight compared to the 2013 program plan and not mentioned above are the following.

- **Transition program management:** The basic sets of program key performance indicators (KPIs) were established in July with subsequent improvements up to October.
- **Observatory Control Systems (OCS) infrastructure** (to upgrade the software infrastructure that supports the OCS, which will reduce maintenance effort)**:** One of the project risks was realized when unexpected complexity was found in the Observing Tool (the high-level interface that scientists use to plan and execute observations), which introduced an overall delay. The future work to develop advanced features has been assigned to an independent project, and the infrastructure effort is complete.
- **Solar panels for Hilo Base Facility and Mauna Kea** were intended to reduce commercial electricity consumption, but the project was cancelled due to the impossibility of obtaining NSF contract approval.

Other activities will produce additional non-labor savings. Two projects that showed significant progress in 2013 are:

- **Downsize Foreign Trade Zone (FTZ) Storage**
  Items stored at the FTZ were evaluated, and obsolete parts were disposed of. Some items were relocated to the summit, and the remaining storage space at the FTZ was optimized. The result is to reduce the leased storage space by 42%, realizing an annual savings of $38k from 2014.
- **AURA Shared Transport**
  AURA Shared Transport Services in Chile now include new contracts for bus and carryall services and an online booking tool. This initiative reduced Gemini's transportation costs by $27k per year, and use of the booking tool has reduced staff effort.

Project	Major Milestones / Phases	Status	Plan Date	Actual/ Best Estimate Date	Variance (Months)
Transition program management	Finish program planning	Closed	2013Q2	2013Q2	+1
	Establish a basic set of KPIs and monitoring tools	Closed	2013Q1	2013Q3	+7
	Support monitoring, control, and communication activities	Closed	2013Q2	2013Q3	+3
Base facility operations	Complete conceptual design review	Ongoing / new baseline plan in July 2013	2013Q1	2013Q4	+8
	Detailed design review	Planned	2013Q3	2014Q2	+7
LCH clearances	Final Testing and Bug Fixes	Closed	2013Q1	2013Q1	0
	Project Closure	Closed	2013Q2	2013Q2	+1
Observatory Control Systems (OCS) infrastructure	Initial planning and requirements gathering complete	Replanned in March 2013	2012Q3	2012Q3	0
	Replace communications mechanism in client tools	Closed	2012Q4	2013Q1	+2
	Update clients	Closed	2013Q1	2013Q3	+4
	Define future plan for observing database and science program upgrade.	Descoped to OCS Advanced Features	2013Q2	N/A	N/A
	Final Testing, Bug Fixes and Project Closure	Closed	2013Q2	2013Q4	+6
Queue visualization	Detailed Project Plan and long-term milestones	Closed	2013Q4	2013Q4	0
	Kick-off Meeting	Closed	2013Q4	2013Q4	0
QA pipeline	QA Metrics Database	Closed	2013Q1	2013Q4	+7
	NIRI Imaging IQ	Ongoing	2013Q2	2014Q1	+6
	Developer Alpha Release	Closed	2013Q1	2013Q3	+7
Science Operations training and documentation	Queue observing carried out by non-research observers will reach 50% within 2013.	Ongoing (GN 63% GS 42% achieved)	2013Q4	2014Q1	+3
	Training Plan implemented & Documentation competed	Ongoing	2013Q4	2014Q1	+2
Solar panels for HBF and Mauna Kea	Get approval from NSF for the requested contract type	Cancelled	N/A	N/A	N/A

Table 4-5: Transition program milestones 2013.

5 Instrumentation and Facility Development

The Development Division was again extremely busy in 2013, with multiple challenging, large projects. Overall, significant progress was accomplished by completing the highest priority goals, providing three new science facility instruments on the Gemini South telescope (GSAOI, FLAMINGOS-2, and GPI) at various stage of scientific usage, described here. These were the three largest projects across the Observatory, utilizing 18.0 FTEs during the year.

Table 5-1 lists the Division's major projects and the status of planned milestones. The main changes or variances compared to the original 2013 program plan are detailed below. Most of the delays are unsurprising for instrumentation work and typical to new technology and high-risk development projects. The most unexpected case was the Gemini High-resolution Optical Spectrograph (GHOS), where the procurement process consumed a significant fraction of the overall planned schedule contingency. Some mitigation with regular collaborative and controlling meetings will be applied during the project life cycle to minimize further delays. GRACES is exceptional, set up as a prototype experiment, given the challenge of building such a long optical fiber (270m) with the proper performance, and having low priority for Gemini resource allocation.

Project	Major Milestones / Phases	Status	Plan Date	Actual/ Best Estimate Date	Variance (Months)
GeMS/GSAOI	Finish system verification in January.	Closed	2013Q1	2013Q1	+1
	Release to science operations in 2013A	Closed	2013Q1	2013Q1	0
	Streamline operations during 2013 an finalize handover to operations	Ongoing	2013Q3	2014Q1	+6
	Plan and execute winter shutdown for maintenance and further upgrades (NGSWFS, laser, ongoing risk mitigations)	Closed	2013Q3	2013Q3	+1
	Install spare deformable mirror zero by end of 2013	On hold	2013Q4	2015TBD	+12
FLAMINGOS-2	Complete lab acceptance tests and installation on telescope in 2013Q1	Closed	Q12013	2013Q2	+3
	Complete nighttime technical and science commissioning for imaging and long-slit modes.	Closed	2013Q2	2013Q3	+3
	Release for regular science operations in 2013B	Closed	2013Q2	2013Q2	+1
GPI	Complete and pass acceptance tests in 2013Q1	Closed	2013Q1	2013Q2	+3
	Pre-ship review in April	Closed	2013Q2	2013Q3	+3
	Deliver to Gemini South	Closed	2013Q2	2013Q3	+2

	Commissioning on telescope in 2013B begins	Closed	2013Q4	2013Q4	+1
GMOS-CCDs	Assess shutdown time and site in February (preference to South first, if feasible)	Closed	2013Q1	2013Q1	0
	Implement first set of Hamamatsu CCDs in GMOS in 2013Q3/4	Planned	2013Q3	2014Q2	+6
GHOS	Preliminary design phase kickoff in 2013	On hold	2013Q1	2014Q1 TBD	+12
	Preliminary design review in 2013Q4	Planned	2013Q4	2014Q4 TBD	+12
GRACES	Validate the optical fiber link in 2013Q1	Ongoing	2013Q1	2014Q1 TBD	+12
	Deliver to telescope for commissioning in 2013Q2	Planned	2013Q2	2014Q2	+12
	Offer for science use in 2013B	Planned	2013Q3	2014Q3	+12
	Test prototype system (phase 1) in 2013B to assess end-to-end performance and scientific potential	Planned	2013Q4	2014Q4	+12
A&G upgrades	Iterate project options with STAC by April 2013	Closed	2013Q2	2013Q2	0
	Conclude PMAC feasibility study	Ongoing	2013Q1	2014Q1	+6
	Prepare request for proposals on PMAC upgrades by the end of 2013	Planned	2013Q4	2014TBD	+6
New instrument – Gen4#3	Prepare elements for next instrument call for proposal by April	On hold	2013Q2	2014Q2	+12
	Issue call for proposals in 2013Q4	Planned	2013Q3	2014Q3	+9

Table 5-1: Status of 2013 planned activities.

5.1 GeMS/GSAOI

GeMS operations have been stabilized to the point of finishing Systems Verification and completing 9 of 11 programs approved for 2013A (80h accepted with an oversubscription of 3). The first GeMS science papers are described in Section 3. Laser AO runs were executed monthly from January to June. Overall observing acquisition efficiency is 45% (without including weather time loss). Sixteen programs are approved for 2013B (184h and an oversubscription of 2).

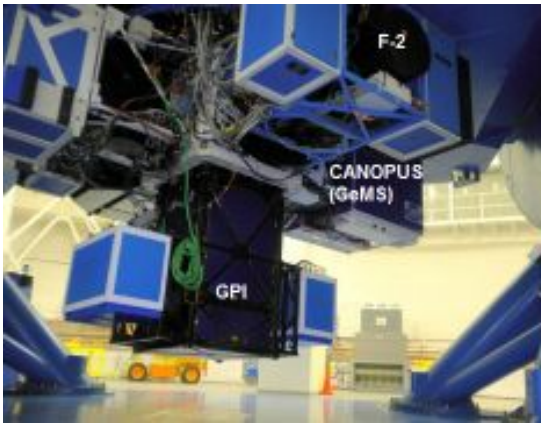

Figure 5-1: New instrumentation available at Gemini South.

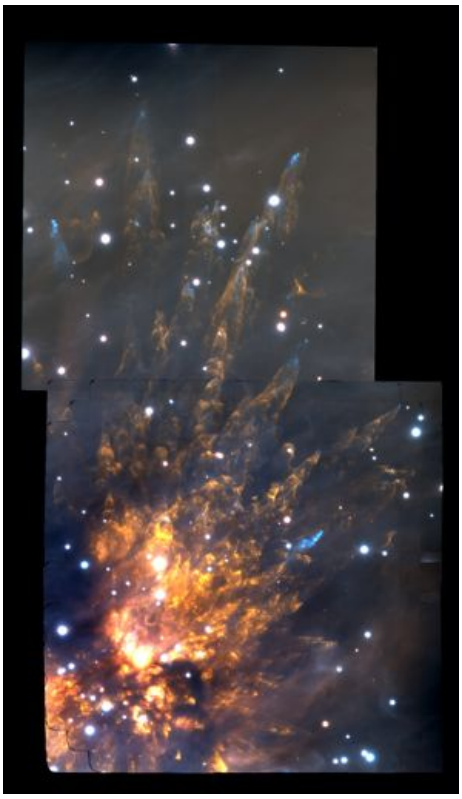

Figure 5-2: Orion “bullets” observed with GeMS/GSAOI during SV.

In the Chilean winter, modifications were made to GeMS to improve system reliability and performance. The laser was maintained and a diode was replaced. Cross training of personnel was begun to improve support depth. New mirrors with higher reflectivity were installed into the beam transfer optics. However, throughput has not been improved, and this is currently under investigation. The GSAOI dewar was opened to clean optical elements, to repair filter wheel #2 and the utility wheel, and to exchange the cold head as part of scheduled maintenance. Due to a combination of poor weather, telescope problems and GeMS issues, the September and October GeMS time was primarily spent getting the system back into working order, not making observations for science users.

The first part of the handover review to Operations was held mid-November, to review in particular the AO systems and their documentation. The second part, in January, will review other subsystems.

The main risks to GeMS remain the same and are being tackled with external procurements: deformable mirror (DM) failure (the original DM vendor restarted their fabrication process and is delayed by several years, so procurement with another vendor will delay installation by at least one year); laser power instability (maintaining peak performance with the laser remains a time-consuming task so we are exploring procurement of the latest laser technologies); Natural Guide Star Wavefront Sensor (NGSWFS) limiting magnitude (we are collaborating with the Australian National University to procure a new highly sensitive focal plane detector).

5.2 FLAMINGOS-2

The instrument suffered a catastrophic failure of the main collimator lens in 2012 that triggered an intensive 15-month-long repair shutdown ending in April 2013 when the instrument was re-installed on the telescope after the following major changes:

- Lens 1 replacement; cell redesign, and installation;
- New MOS thermal cycle procedure;
- Optical alignment;
- Realignment of On-Instrument WaveFront Sensor (OIWFS);

Figure 5-3: M17 observed with FLAMINGOS-2.

- R3K grism fix;
- Window replacement;
- New Hawaii-II detector fan-out board.

The instrument has been fully commissioned in long-slit and imaging modes and is functioning consistently and taking science data (in shared-risks mode, under which it was offered to users for 2013B). The mechanical issues that have resurfaced since its return to the telescope in April have been resolved. After realignment, image quality is outside specification at radii larger than 1.5'. The MOS mode is not yet commissioned. We do not expect that the MOS mask cycling time will ever meet the original requirement (within 1 day), which will require operational workarounds. The instrument commissioning was completed except for the OIWFS, so a peripheral wavefront sensor is used instead.

5.3 GPI

All the GPI milestones for 2013 have been met, closely following the announced schedule. There has been a superb collaboration among all the different partners and Gemini making possible this success. The laboratory performance and initial on-sky tests predict a very productive future for the instrument. The main tasks accomplished during the year were:

- General acceptance testing started on February 18 and lasted until end of May (including flexure testing);
- Acceptance review in July, with 110 of the 120 requirements met;
- Instrument shipped and received at Gemini South at the end of August;
- Post-delivery acceptance and testing (including flexure rig) was performed until end of October when the instrument was installed on the telescope;
- The first technical run, November 11–18, was very successful, showing stability of the AO system;
- The last run of the year occurred in early December, to continue technical commissioning.

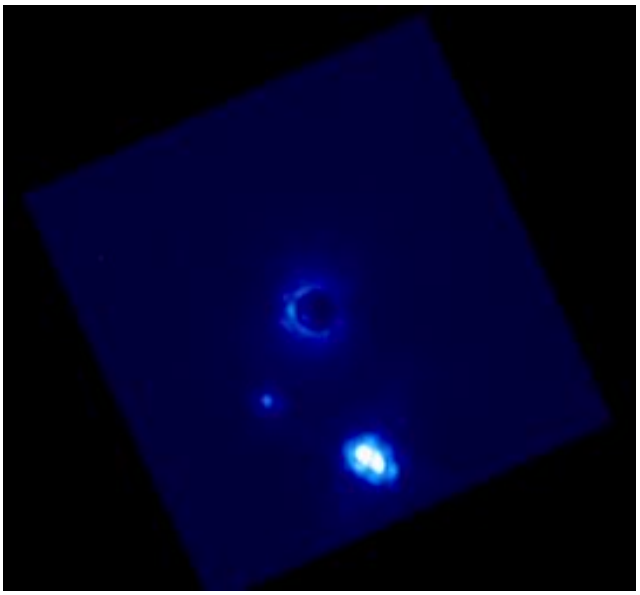

Figure 5-4: First GPI starlight image, Theta 1 Orionis B1 (November 12, 2013).

The largest impact risk to the instrument remains the actuator failure of the tweeter deformable mirror; such a failure would require 3–6 months to remediate. The risk with the largest possibility of occurrence is the early complete failure of the problematic slipping science instrument (integral field spectrograph) mechanisms. The current plan is to fix these mechanisms in the scheduled December–February 2014 remediation period.

5.4 GMOS CCD Upgrade

Both GMOS instruments will be refurbished with fully depleted Hamamatsu CCDs. Current work is to upgrade GMOS-South, which is currently equipped with E2V detectors. This development progressed well in 2013, including testing and acceptance of the science CCDs, assembly and alignment of the three detectors, and implementation of extensive electro-static discharge risk mitigation in all procedures. A difficult communication issue between the controller and the software arose in May, forcing delay of the installation at Gemini South by 6 months. Gain, read noise, and readout speed are optimized, with read noise around 4e- in used modes. The final science CCDs have been characterized, and the software acceptance testing was completed in November. We have also finalized our plan to purchase the second set of science CCDs for GMOS-N, following resolution of the controller issues and successful measurement of quantum efficiency.

5.5 GHOS

GHOS went through a successful Conceptual Design Review and down-select to one institution (the Australian Astronomical Observatory; AAO) in 2012Q3, and we had hoped to finalize all contractual arrangement and have a kickoff of the preliminary design phase early 2013. Instead, we experienced various delays related to the approval process in Australia and to the details of the main sub-contract with a commercial vendor making the spectrograph, Kiwistar Optics, until the project reached a show-stopper (in July) when the parent company of KiwiStar Optics announced they would leave the market and not participate in GHOS. AAO has worked on their contingency plan to replace the commercial company with another subcontractor (National Research Council of Canada, Hertzberg Institute for Astronomy; NRC-HIA). The details of this new contract were finalized by the end of 2013 in order to start the approval process. The overall project is therefore delayed by about one year.

5.6 GRACES

GRACES is the experiment of linking the Gemini North telescope to the ESPaDOnS spectrograph at the Canada-France-Hawaii Telescope. Simulations indicate this prototype instrument should be competitive for high-resolution spectroscopy (~45,000) with HIRES at Keck at red wavelengths. This project remains low priority for Gemini effort. The highest technical risk driving the critical path of this project is the fabrication of 270m-long optical fibers and in particular the control of the focal ratio degradation in order to couple light efficiently into the slicer. The main contractor, NRC-HIA, made several attempts in early 2013 without meeting the specifications. The fabrication was outsourced to a commercial vendor, Fibertech, who succeeded in fabricating the fiber cable with the proper performance as of the end of November. They had to develop special techniques and care in multiple areas: the polishing, the attachment of the connectors, the sheath material, and the layout of the fiber into the armored cable. We expect the fiber to be delivered to NRC-HIA in early 2014. All other opto-mechanical components to modify the spectrograph and fabricate the injection module that plugs into GMOS have been built and tested.

5.7 Other Development Activities

A summary of other minor Development Division activities and progress follows.

Gen4#3 This is the next facility instrument to be procured after GHOS, likely a versatile, efficient spectrograph that would be valuable after the arrival of the Large Synoptic Survey Telescope. We have worked on the structure for the Request for Proposals and had anticipated to launch it in 2013Q4. However, resource priorities (in particular to GPI and the Transition) forced a delay into 2014. More recently, given the ongoing uncertainty of the Gemini Instrument Development Fund, we have been encouraged by the Gemini Board to consider new alternatives to procure future instrumentation. The procurement process is therefore on hold until we have identified a new procurement model.

A&G upgrades Project scope and priority were dramatically changed at the beginning of 2013 as we refined the cost/benefit analysis and the multi-year resource plan. Instead of building new acquisition and guiding units, we will focus on reliability and performance upgrades. Priority is given to motion controls, which have been a major source of faults. We also identified the peripheral wavefront sensors as the most obvious path to improve performance by refurbishing them with newer, more sensitive. This development project is progressing slowly as it is ranked with lower priority than new instrumentation.

Altair upgrades These upgrades are near-term (2-year) modifications aimed at ensuring competitiveness of Altair for the next decade. The Altair RTC (real-time computer, Altair's "brain") remains the highest priority upgrade as it is a risk to current operations due to limited availability of spares. In 2013, we established the priorities of the upgrades and have reviewed technical aspects and requirements with the original Altair build team.

GMOS+Altair We expect to release this mode to users in 2014B. Two new science dichroic beamsplitters will allow AO corrected images in the L and M bands, which are useful for exoplanet science, and to direct laser light (589 nm) only to the Altair wavefront sensor while leaving all other optical light (400 nm–1.25 μm) to GMOS for science. On-sky tests with GMOS+Altair show significant improvement in the Z/Y (900 nm–1 μm) bands.

IR detector controller The goal is of this work is to be able to replace the GNIRS controller by the end of 2015 (and possibly the NIRI controller later). We confirmed our strategy to use ARC controllers by testing communication protocols and basic capabilities in the lab. The largest risk of this project remains the software effort.

Small project fund This initiative was approved by the Board in May 2013, but we are waiting for a few recruitments to be closed before working actively on it. The projects we fund must be competed and must deliver a specific new capability or enhancement of an old capability to Gemini.

6 Public Outreach and Broadening Participation

During 2013, the Gemini Observatory Public Information and Outreach (PIO) efforts continued to emphasize communications with our user community balanced with local (host community) outreach and educational programming. Significant progress was realized in unifying the outreach programming in the North and South as well a re-alignment of traditional *vs*. electronic print publications (with resulting cost savings). The observatory's formal Transition Plan implementation impacted the PIO effort minimally over the period of this report since most transition reductions were implemented early in the process, and a path forward was well-established as we entered 2013. Additionally, social media initiatives continued to have a profound impact on the PIO workload and core communications products resulting in significant expansion of postings and content variety.

6.1 Primary Outreach Programming

6.1.1 Local Observatory Career Awareness

Local outreach programming in both Gemini host communities continues to evolve with the needs of students, teachers, the public, and, of course, the observatory. To that end, considerable effort was brought to bear on the production of electronic and print resources to promote observatory careers for local students in both Chile and Hawai'i. Key elements of these career resources include a printed 8.5"x11" brochure (Figure 6-1) and a companion website with short video interviews of staff sharing their career passions on-camera.

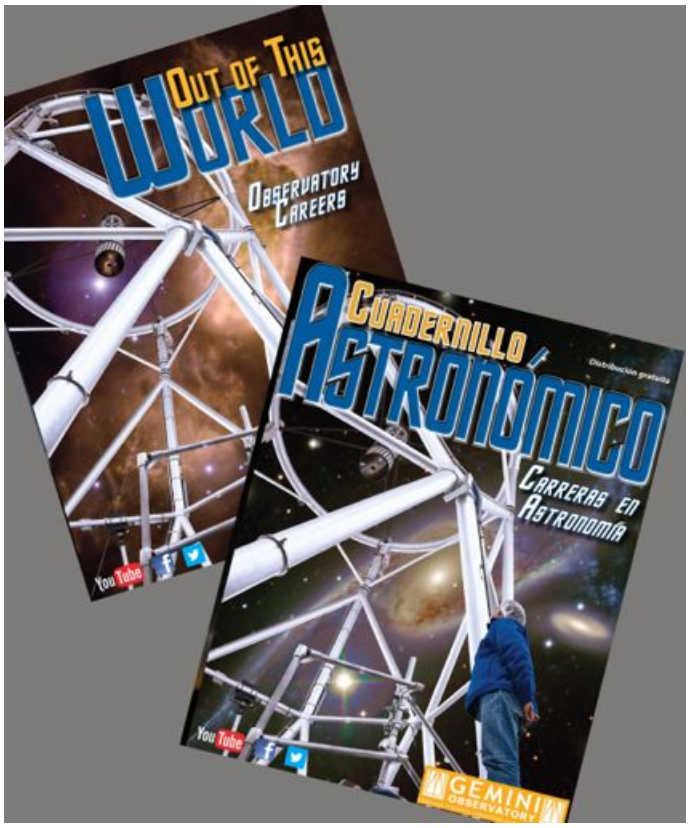

Figure 6-1: Covers of career tri-fold brochures (English and Spanish) featuring Gemini staff career highlights augmented by online resources that include brief video interviews of selected staff.

6.1.2 Hawaii's Journey Through the Universe and Chile's Viaje al Universo

Gemini's two annual flagship outreach programs, *Journey Through the Universe (JTtU)* and *Viaje al Universo* each engaged our communities and staff in 2013 with content that exposes local students and the community to the excitement of scientific discovery and the passion of our staff. Modeled on the concept of broadening participation by immersing observatory staff for a week in local schools and community events, the two programs (held in March in Hawai'i and October in Chile)

attracted over 17,200 participants (Table 6-1) and engaged local businesses, educational institutions, and local governments and officials. In Hawai'i significant planning is underway in late 2013 for the 10th anniversary of the program, which is on track to engage a record number of scientists and engineers from Gemini and all of the Mauna Kea observatories (and beyond).

6.1.3 StarLab Planetarium

Interacting with local students and teachers in Gemini's host communities, the StarLab portable planetarium program continues to directly impact local students and educators with classroom presentations and resources. In Chile this program provides live, interactive presentations to students in our Chilean host communities with content ranging from recent findings from Gemini, observatory careers, to the economic and environmental impact of light pollution. In Hawai'i, the program focus on a teacher training program that certifies teachers to borrow and operate the StarLab portable planetarium for integration into classroom curriculum in astronomy and Polynesian navigation. In total, this program significantly impacted over 4,200 students and teachers in the past 12 months and demand remains strong for this ongoing program.

6.1.4 Family Astro

This program, adapted from the long-standing Astronomical Society of the Pacific initiative, continues at Gemini and engages local families in hands-on activities in astronomy in a safe, family-engaging environment. In Hawai'i teachers are trained by Gemini staff to present the program and use the resources in special events sponsored by the local Department of Education. In Chile the Family Astro materials are used in conjunction with StarLab presentations and other public events and activities.

Activity/Event	Participants
Journey Through the Universe – Hawaii	10,192
Viaje al Universo - Chile	7,051
StarLab (Hawaii and Chile)	4,209
Other Public Events (Including Family Astro)	9,287
Live from Gemini (Hawaii)	115
Summit Tours (Hawaii and Chile)	620
Total	**31,474**

Table 6-1: Participation in outreach events 2013.

6.1.5 Live From Gemini

Utilizing videoconferencing technology, the Live From Gemini program brings students from across the Gemini partnership into the Gemini control room for a real-time experience in how science is done. Hosted by Gemini PIO staff, over 100 students and educators from Australia to the mainland US visited the Gemini North control room in 2013 (Table 6-1). Highlights from this year include Australian classes from the Australian National Gemini Office-sponsored Student Imaging Contest.

6.2 New and Social Media

2013 saw continued growth in the effort and resulting impact of social and new media on the dissemination of Gemini's results and messages. Workflow is now considerably improved due to the full implementation and regular monitoring of a centralized

scheduling spreadsheet and an interactive “Work in Progress” online document. These changes allow for more timely writing, editing, review, and approvals.

6.3 Strategic Communications

Figure 6-3: Quarterly issues of GeminiFocus, Gemini’s electronic newsletter which will include an annual printed “year-in-review’’ edition, with highlights from all 2013 issues, in January 2014.

6.3.1 Publications

While social and new media communication products continue to dominate the “new directions” for Gemini’s PIO dissemination efforts, a major milestone was met in 2013 with the complete transition of Gemini’s newsletter (*Gemini*Focus, Figure 6-3) to quarterly electronic distribution. To augment this, the first annual “year-in-review” edition will be released in January 2014. This new publication will be distributed both electronically and in a limited press run for funding agencies, partner offices and public spaces (lobbies, etc.). Electronic versions of *Gemini*Focus can be found at www.gemini.edu/node/27.

6.3.2 Press Releases and Web Features

During 2013, Gemini’s Public Information and Outreach Office developed and distributed a total of nine press releases targeted at science journalists and the scientifically literate public. Topics ranged from Gemini’s new imaging capabilities with GeMS, to how sodium “pollution” from meteors is used by laser guide stars to sharpen astronomer’s view of the universe. Collectively these releases garnered well over 50,000 unique web-hits on the Gemini website and were featured in media venues such as the Washington Post, NBC News, CNN, Discover, Space.com, and BBC. (For more media coverage sampling see geminipio.blogspot.com.)

6.4 Broadening Participation and Workforce Development

Our goal is to have a competitive and financially sustainable Observatory with a highly motivated staff. Several workforce development initiatives are therefore underway and have been developed during 2013. The remote and teleworking policy was introduced this year, and six employees have taken advantage of these flexible working arrangements. The first months showed them to remain very committed and motivated in their daily activities. Employee recognition is improved, with group managers now empowered to award recognition to their staff according to AURA guidelines. Finally, as part of the staffing planning, a succession planning initiative was launched. Managers

have identified key staff in terms of the current performance, current impact and future potential. Critical positions and skills are being mapped alongside risk assessments and mitigations to be incorporate into the sustainability plan. This process is facilitating the Observatory to look strategically at future structures and people while developing plans to leverage full talent at the Observatory.

During late 2012 a survey took place regarding attitudes of Gemini staff towards the workplace climate. This survey was intended to identify those areas where improvement and further dialogue would be beneficial in order to positively develop the workplace environment. Results were published in the second half of 2013. Based upon the feedback from the survey the Directorate initiated a review of the results by each department. Each department will follow up on one specific item actionable by them. The Directorate agreed to act on two specific areas for improvement at the observatory level: improving the transparency to the staff in terms of how decisions are made, and communicating policies and procedures more clearly across the Observatory.

Department / Specialty	Funding By	Educational Skill Level	Intern Program	2013 Interns
Engineering / Technical / Science	Akamai	Undergraduate	Akamai	3
Science	Gemini	Undergraduate/ Graduate	Univ. of Victoria	3
Science	AGUSS	Undergraduate	AGUSS	2
Engineering	Gemini/paid	Undergraduate	Univ. of Hawaii	1
Science/Engineering	Gemini	Various	Internal	5
Miscellaneous	Gemini/University of Oregon	Undergraduate	University of Oregon	1
Miscellaneous	Oregon State University	Undergraduate	Oregon State University	1
Engineering	AURA/Gemini	Undergraduate/ Graduate	Chilean Universities	3
Engineering	Unpaid	High School	Kamehameha School	1
Science	AURA	Undergraduate	IINSPIRE	1
Total				**21**

Table 6-2: Gemini interns 2013.

There has been continued investment in internship programs (Table 6-2) with partner country and Hawaii/Chile based initiatives, with 21 interns during 2013. The mentoring program is ongoing with over 20 mentoring relationships in place.

7 Administration and Finance

7.1 Finance

The Finance Team implemented a revised financial planning and reporting process to better analyze execution of Gemini's annual budget and meet budget targets. The areas addressed include the following.

Budget overview

Managers produced complete and timely quarterly reports in 2013. Account Managers prepared quarterly activity reports including the budget situation. Senior Management prepared quarterly summary reports in order to get a global overview of the budget. These reports are distributed to Gemini's Finance Committee and the NSF.

Budget account structure

Gemini's Chart of Accounts was restructured in April 2013; the total number of active accounts was reduced from 240 to 123. Signature authority on all accounts was defined consistently with Gemini's current organizational structure.

Dynamic re-allocation of budget

A single, high-level account, the Director's reserve account, was established to enable O&M budget managers to dynamically re-allocate between that account and their individual accounts as needed throughout the year. This account enables Gemini to take corrective actions following the analysis of the quarterly budget reports.

7.2 Management and Organization

Few but important changes have been made to the management structure. (See the organizational chart in Appendix E.) In July 2013, Inger Jørgensen took up the role of Deputy Associate Director for Operations. Her primary tasks are to lead the reporting and preparation of the operations budget (which covers about two-thirds of the Observatory budget) by working closely with the budget managers. She is further responsible for the oversight and coordination of the dozen transition projects within Operations (the implementation of Base Facility Operations being the largest one). Sandy Leggett has replaced Jørgensen as Head of Science Operations at Gemini North.

Michiel van der Hoeven (currently head of engineering at the Gran Telescopio Canarias) was recruited as Head of Engineering Operations at Gemini South. He will start January 1, 2014. Andy Adamson continues as acting Head until then. The rest of the structure remains unchanged.

All research scientists have an added role as members of the Science Faculty. This body, chaired by Tom Geballe, with Rodrigo Carrasco as Vice-Chair, supports the research needs of staff and promotes the scientific objectives of the Observatory.

Gemini transferred its administrative services and human resource (HR) administration in October 2012 to the AURA Central Administrative Services (CAS), based in Tucson. An HR generalist and HR assistant remained on-site at each Gemini location (Hilo and La Serena). The transition went smoothly; minor problems persist but are being worked out with the AURA staff. We will assess the overall transition to CAS and HR from a performance and financial point of view by the end of 2014, after a full year of service.

7.3 Staffing Plan for 2013 and 2014

DEPARTMENT	2012	2013 Plan	2013
ADMINISTRATION	**40.8**	**31.3**	**29.5**
ACCOUNTING	3.3	1.0	0.9
HUMAN RESOURCES	3.0	-	-
PROCUREMENT	2.9	-	-
ADMIN & FACIL	15.0	15.0	14.0
DIRECTORATE	7.4	5.7	5.5
PIO	6.3	6.5	6.4
SAFETY	2.9	3.1	2.8
ENGINEERING	**80.0**	**78.0**	**73.7**
MECHANICAL	8.5	8.0	9.0
OPTICS	8.8	9.0	7.1
ELECTR. & INSTR.	15.0	14.0	14.1
SITE OPS-N	8.8	9.0	9.0
SITE OPS-S	11.0	11.0	9.9
INFO. SYSTEMS	13.0	13.0	12.1
SOFTWARE	15.0	14.0	12.5
SCIENCE	**59.2**	**55.2**	**62.0**
SCIENCE DATA	7.6	7.0	7.3
SCIENCE ASTRON	28.8	27.1	27.0
SCIENCE SOS	19.4	19.0	20.3
SPOTTER OPS-N	0.9	0.9	3.1
SPOTTER OPS-S	0.7	0.7	1.6
INTERN	1.7	0.5	2.7
INSTR. DEVELOPMENT	**12.9**	**13.3**	**17.5**
ADAPTIVE OPTICS	2.8	5.0	5.4
DEVELOPMENT	4.6	4.3	7.2
SYSTEMS ENG	5.5	4.0	4.9
Total	**192.9**	**177.8**	**182.7**
VARIATION Y2Y		(15.1)	4.9

Table 7-1: Staffing plan in full-time equivalent (FTE).

Department	OPS	DEV	TRANS	Total
ADMIN+	27.1	1.3	1.1	**29.5**
ENG	54.1	14.8	4.8	**73.7**
SCI	51.1	7.4	3.5	**62.0**
DEV	6.6	10.3	0.6	**17.5**
Total	**138.9**	**33.8**	**10**	**182.7**

Table 7-2: Distribution of effort, into operations, development projects, and transition projects, by functional area.

There are currently 183 employees on a full-time equivalent basis; 53% of the staff members are based in Hilo and 47% are based in La Serena. Table 7-1 presents Gemini's staffing for the years 2012–2013. Data for 2013 show the original budgeted plan and the estimated actual values for the year. The Instrumentation Development Division is supported by all three budget funds (IDF, FDF, and O&M; see Section 7.4.2). All other personnel are supported primarily by the O&M Fund and perform O&M work, including improvement projects such as Base Facility Operations.

The effort dedicated to operations activity, development projects, and transition projects is summarized in Table 7-2. The four largest projects during the year were GeMS, GPI, and FLAMINGOS-2 (part of development), and Base Facility Operations (part of the transition). Together these four projects utilized 21 FTEs over 2013.

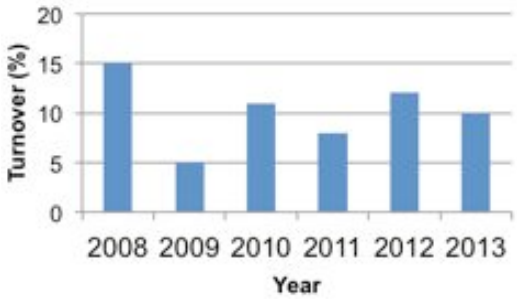

Figure 7-1: Voluntary turnover rate.

Staff turnover is currently 10% on an annualized rate. This compares to 12% during 2012 (Figure 7-1). The hiring activity is running close to 2012 levels, with the average time to fill a vacancy rising to 129 days during 2013. Improvements are being made to the recruiting process to reduce this delay.

7.4 Budget

7.4.1 Partner Contributions

The schedule of contributions for the Gemini Observatory budget is governed by a set of Administrative Guidelines, i.e., agreements made among the members of the Gemini International Partnership, including the NSF. These agreements clarify the partnership members, partnership shares, and the timing for the payment of contributions. The current apportionment of the Gemini shares is shown in Table 7-3.

Partner	Cost Share
United States	65.50%
Canada	18.65%
Brazil	6.53%
Australia	6.21%
Argentina	3.11%
Total	**100.00%**

Table 7-3: Partner cost shares.

2013 actual contributions from Gemini's partner countries consist of the US component included in NSF's FY13 Astronomical Sciences budget plus non-US partner contributions. Partner countries operate on different fiscal years, and funding agencies forward their payments in different forms and on different schedules to Gemini's Executive Agency, the NSF. Table 7-4 shows Partners' 2013 total contributions to Gemini's Operations and Instrumentation funds.

7.4.2 Expenditures by Fund

The 2013 Gemini budget recognizes three distinct funding sources: Operations and Maintenance (O&M); the Instrument Development Fund (IDF); and the Facilities Development Fund (FDF). The summary in terms of the funding sources is given in Table 7-5. The SPEC category lists the Special Grants and Award Funds, which includes the small grants and awards from the NSF and NASA to individual investigators. The following sections analyze in further detail the execution of O&M, IDF, and FDF 2013 expenditure budgets, and explain the variances of 2013 budget *vs*. forecast expenses. All values are provided in thousands of U.S. Dollars (US $1000).

Partner	O&M	IDF	Total
Canada	5,009	615	5,624
Australia	1,667	100	1,767
Argentina	815	263	1,078
Brazil	1,711	0	1,711
U.S.	17,154	1,000	18,154
Total	**26,355**	**1,978**	**28,334**

Table 7-4: 2013 Partner contributions.

values in $1000	2013 Budget	2013 Cash Expenses	2013 Commitments	2013 Expenses and Commitments	VAR Budget vs. Expenses	
					$	%
O&M	30,179	28,358	1,463	29,821	358	1.2%
IDF	7,111	3,816	1,446	5,262	1,849	26%
FDF	1,152	314	193	507	645	56%
Special	17	166	2	168	(151)	
Total	38,459	32,654	3,104	35,758	2,701	7%

Table 7-5: 2013 budget and actual expenditures, by fund.

Table 7-6 presents O&M 2013 actual expenses as of December 31, 2013, compared with the 2013 budget that the Board approved in May 2013, by cost category.

in $ 1000	2013 Budget	2013 Expenses	2013 Commitments	2013 Expenses and Commitmen	VAR 2013 Budget vs. Expenses	
	FY 2013	FY 2013	as of 12/31/13	as of 12/31/13	$	%
Non-Capital Expenditures						
Labor Costs						
Salaries	11,669	11,576	-	11,576	93	1%
Benefits	4,527	4,664	-	4,664	(137)	-3%
Temporary	105	44	3	47	58	171%
Total Labor	16,301	16,284	3	16,287	14	0%
Supplies & Equipment	1,687	1,240	334	1,574	113	8%
Travel	1,006	868	92	960	46	5%
Recruiting & Relocation	312	498	111	609	(297)	-51%
Professional Fees	1,736	1,592	23	1,615	121	7%
Meeting, Conferences, Prof Dev	168	213	5	218	(50)	-22%
Computer Software and Equip	812	717	143	860	(48)	-5%
Facilities	909	710	34	745	165	23%
Maintenance	114	132	12	144	(30)	-24%
Utilities	2,081	1,762	85	1,847	234	12%
Meals and Lodging	606	733	0	733	(127)	-19%
Total Site Costs	3,711	3,337	132	3,469	242	7%
Spares	749	514	174	688	61	9%
Other	226	57	0	57	169	39%
Indirect Costs	1,089	996	-	996	93	
Subcontracts	1,259	1,401	360	1,761	(503)	-28%
Total Non-Capital Exp	**28,917**	**27,716**	**1,379**	**29,094**	**(177)**	**-1%**
Computer	380	68	-	68	313	124%
General	744	574	84	659	85	11%
Total Capital Expenditures	**1,124**	**642**	**84**	**726**	**398**	**37%**
TOTAL EXPENDITURES	**30,179**	**28,358**	**1,463**	**29,821**	**358**	**1.2%**

Table 7-6: O&M total 2013 budget and analysis.

7.4.3 2013 Instrument Development Fund (IDF) Expenses

Table 7-7 presents the IDF 2013 budget and a comparison of 2013 actual expenses. Most of the instrument projects that IDF supports (a minimum of 85%) are contracts to external vendors. A fraction (15% in 2013) of IDF goes toward internal Gemini expenses (labor, travel, etc.). Aspen program expenses are listed separately. The one remaining instrument from this program is GPI, which is scheduled conclude in 2014.

in $1000		2013 Budget	2013 Expenses	2013 Commitments	2013 Expenses and Commitments	VAR 2013 Budget vs. Expenses	
			FY 2013			$	%
	GENERAL						
GENERAL	Program Support	382	395	112	507	(125)	-41%
	Instrument Upgrades	-	36	85	121	(121)	-201%
	GNIRS	5	17	-	17	(12)	-67%
	GMOS	541	339	62	401	140	40%
	FLAMINGOS-2	753	846	75	921	(168)	-23%
	GHOS	1,600	19	-	19	1,581	
	GRACES	205	215	95	310	(105)	-40%
	Program Support - GEN 4 Labor	113	2	27	28	85	
	MCAO Imager	110	195	-	195	(85)	-44%
	Instrument Funds Available	645	-	-	-	645	
P-ASPEN	Program Support - Aspen Labor	162	187	-	187	(25)	-16%
	GPI	2,595	1,565	990	2,555	40	2%
TOTAL	**TOTAL**	**7,111**	**3,816**	**1,446**	**5,262**	**1,849**	**43%**

Table 7-7: IDF 2013 budget and analysis.

With the exception of the Gemini High-resolution Optical Spectrograph (GHOS), IDF 2013 actual expenditures were in conformity with the approved 2013 values. This is a consequence of tighter project management at the testing and commissioning phases of significant instrumentation projects in 2013 for FLAMINGOS-2, GeMS and GPI. In the case of GHOS, signing the final contract for the design and construction has been delayed. The details of this new contract should be finalized by the end of February 2014 in order to complete the approval process.

7.4.4 2013 Facilities Development Fund (FDF) Expenses

Table 7-8 presents FDF's 2013 budget and a comparison of actual expenses as of December 31, 2013.

The largest active project of the Facilities Development Fund (FDF) in 2013 continued to be the Acquisition and Guiding (A&G) system upgrade. Given the current (relatively low) priority of this project (as approved by STAC and the Gemini Board), a small fraction of the A&G budget was spent in 2013. A new project engineer as well as a new electronics engineer, starting in February 2014, have been hired on fixed term contracts and will lead future work on the A&G system. The Multi-Conjugate Adaptive Optics (MCAO) system remained an important source of FDF's spending in 2013. The Canopus expenses and Laser Service contract payments were part of FDF's 2013 budget. The $188k outstanding commitment for Gemini South Canopus activities is for the third deformable mirror spare contract.

in $ 1000	2013 Budget	2013 Expenses	2013 Commitments	2013 Expenses and Commitments	VAR 2013 Budget vs. Expenses	
					$	%
A&G	780	137	4	142	638	82%
Laser Service Contract	64	140	-	140	(76)	-120%
MCAO - (GEMS)	308	37	189	226	82	27%
LGSF upgrades	-	-	-	-	-	
AO Science & Operations Support	-	-	-	-	-	
TOTAL	**1,152**	**314**	**193**	**507**	**645**	**56%**

Table 7-8: FDF 2013 budget and analysis.

8 2014 Program Plan

8.1 Overview through 2016

Gemini continues to work through a transition in the Partnership and a corresponding budget reduction. Changes and a reduction of service are inevitable, and core goals endorsed by the Gemini Board guide decisions:

- to deliver and operate high-quality instruments that represent the priorities of our community;
- to provide a high fraction of queue operations;
- to have ability to remotely operate the telescopes;
- to improve the interface with the partner communities.

We seek to fulfill these goals while retaining some basic operating principles. Among these are: to realize the efficiency gains from operating as two telescopes and one observatory; to conduct regular nighttime observations year-round, every day of the week; to support user scientists, including access to data reduction tools and a science archive; and to maintain an active public information and outreach program.

Elements of Gemini's operation will be to offer four instruments and adaptive optics capabilities at each site and to provide observations executed by Gemini staff (queue observing) according to user demand. Non-research observers will eventually execute the majority of queue observations. The instrument suite will be refreshed over time, and new instruments must be delivered complete, with full documentation, spares, software, and staff training. Gemini will not provide the resources to repair or recover incomplete instrument deliveries, and no major new in-house development projects are planned. The overall staffing and budget are described in the next section, with detailed plans for 2014 activity following.

8.2 Future Staffing and Budget

8.2.1 Staffing Plan through 2016

	2013	2014	2015	2016
FTEs (Jan 1)	192.9	182.7	188.1	181.6
FTEs change	(10.2)	5.4	(6.5)	(24.3)
FTEs (Dec 31)	182.7	188.1	181.6	157.3

Table 8-1: Staffing plan overview.

The long-term goal of the Gemini Transition to sustainably accommodate the reduced funding of the Partnership since 2012. Financial sustainability (with a balanced expense budget) must be reached by the end of 2015, when a new term for the Partnership agreement will begin. The Transition requires a significant reduction in staff numbers from the current levels. The staffing plan (Table 8-1) shows total labor units of 157.3 FTEs in the final state, as of the beginning of 2016.

Table 8-2 presents Gemini's planned staffing for the years 2013–2016 by functional area. These values are the basis for the labor costs reported in the long-term budgets. Another breakdown of the labor effort is into the three program portfolios: operations activity, development projects, and transition projects, according to the functional area of the staff. Table 8-3 lists the 2014 planned distribution of effort into these portfolios. The largest project in terms of planned staff effort is Base Facility Operations, with 10 FTEs across a wide range of skills allocated. The four next largest projects include (from the Transition Program) the QA pipeline (2.4 FTEs), and (from Development) continuing

projects to provide new CCDs for both GMOS instruments (3.2 FTEs); work on GPI (2.4 FTEs); and GHOS (2.3 FTEs). These large projects do not consider significant operations activities, such as maintenance shutdowns, which are also planned formally as projects. None of the other specific activities scheduled for 2014 are allocated more than 2 FTEs. The comparison with the 2013 distribution of effort shows the important changes in the plan for 2014. Development activity significantly decreases, with the closure of the major GeMS and FLAMINGOS-2 projects in 2013 and the planned closure of GPI during 2014. Resources are redirected to Transition projects, especially base facility operations, and Operations, including projects that will promote long-term sustainability, such as automated software testing and SynchroBus replacement design, described below.

DEPARTMENT	2013	2014	2015	2016
ADMINISTRATION	29.5	31.6	31.6	29.8
Administration and Finance	14.9	16.0	16.0	15.0
Directorate	5.5	6.0	6.0	5.5
Public Information/Library	6.4	6.5	6.5	6.5
Safety	2.8	3.1	3.1	2.8
ENGINEERING	73.7	78.0	74.9	68.5
SCIENCE	62.0	60.7	58.2	50.8
INSTR. DEVELOPMENT	17.5	17.8	16.9	8.3
Total	182.7	188.1	181.6	157.3

Table 8-2: 2013–2016 staffing plan by functional area.

Department	OPS	DEV	TRANS	Total
ADMIN+	29.1	0.2	2.3	**31.6**
ENG	61.1	4.5	12.4	**78.0**
SCI	54.6	1.6	4.5	**60.7**
DEV	7.4	6.8	3.6	**17.8**
2014 Total	**152.2**	**13.1**	**22.8**	**188.1**
2013 Total	138.9	33.8	10	182.7
Y2Y Change	13.3	(20.7)	12.8	5.4

Table 8-3: Planned 2014 distribution of effort into operations activity, development projects, and transition projects, by functional area, and comparison with 2013. Values are FTE.

8.2.2 Partner Contributions 2013–2015

Partner	2013	2014	2015	2016(E)(*)
US	18,154	19,583	21,612	22,045
Canada	5,624	5,624	5,624	5,736
Australia	1,767	1,667	1,667	1,700
Argentina	1,078	1,099	1,119	1,142
Brazil	1,711	1,754	1,798	1,834
Total	**28,334**	**29,726**	**31,820**	**32,457**

(*) For the 2016 budget estimate, the total of partners' contributions is assumed to change with only a 2% increase for inflation.

Table 8-4: Partner contributions 2013–2016.

Table 8-4 sets forth estimated contributions by partner for Operations and Instrumentation combined for the period 2013–2016. (The 2016 estimate assumes the total Partner contributions remain unchanged except for an inflationary increase of 2%, despite the anticipated change in the Partnership itself.) Partner contributions presented in Table 8-4 are less than the amount of expenses that Gemini needs for operations and maintenance activities during the period 2013–2016 and presented in Table 8-5. As approved by the Board, Gemini will employ unspent contributions as of December 31, 2012, to fund the planned Operations and Maintenance 2013–2016 budget deficit. (All budget tables in this section are listed in values of $1000.)

8.2.3 Overall Budget

The total 2014–2016 budget summary in terms of the main budget funds, including spending toward new savings initiatives, is given in Table 8-5. Tables 8-6 through 8-9 provide more detail. Table 8-6 shows overall spending by cost category. Tables 8-7 and 8-8 show the spending by cost category for the O&M and FDF funds. Table 8-9 shows the IDF budget by project.

	2014	2015	2016
O&M	30,130	30,581	27,892
IDF	5,274	7,871	7,112
FDF	1,556	2,057	503
Special	-	-	-
Total	**36,961**	**40,509**	**35,507**

	2014	2015	2016
Total Labor	18,772	19,583	17,140
Supplies & Equipment	1,668	1,409	1,304
Travel	1,233	1,061	990
Recruiting & Relocation	329	297	297
Professional Fees	1,694	1,758	1,606
Meeting, Conf, Prof Development	306	276	217
Computer Software and Equipment	816	781	745
Total Site Costs	3,556	3,553	3,602
Spares	1,156	937	681
Other	248	1,964	1,336
Indirect Costs	1,149	1,238	1,109
Subcontracts	5,472	7,333	6,230
-Total Non-Capital Expenditures	36,400	40,187	35,257
Computer	123	70	50
General	438	252	201
-Total Capital Expenditures	561	322	251
TOTAL EXPENDITURES	36,961	40,509	35,507

Table 8-6: Overall budget by cost category, 2014–2016.

	2014	2015	2016
Total Labor	17,203	18,030	16,449
Supplies & Equipment	1,542	1,317	1,232
Travel	964	973	895
Recruiting & Relocation	329	297	297
Professional Fees	1,694	1,758	1,606
Meeting, Conf, Prof Development	283	262	210
Computer Software and Equipment	810	778	742
Total Site Costs	3,555	3,553	3,602
Spares	693	717	681
Other	248	541	236
Indirect Costs	1,149	1,238	1,109
Subcontracts	1,140	796	583
-Total Non-Capital Expenditures	29,609	30,259	27,642
Computer	123	70	50
General	398	252	201
-Total Capital Expenditures	521	322	251
TOTAL EXPENDITURES	30,130	30,581	27,892

Table 8-7: O&M budget by cost category, 2014–2016.

	2014	2015	2016
Total Labor	392	471	60
Supplies & Equipment	45	90	70
Travel	60	20	20
Recruiting & Relocation			
Professional Fees			
Meeting, Conf, Prof Development	13	4	
Computer Software and Equipment	1		
Total Site Costs	1		
Spares	355		
Other		322	
Indirect Costs			
Subcontracts	650	1,150	353
-Total Non-Capital Expenditures	1,516	2,057	503
Computer			
General	40		
Vehicles			
-Total Capital Expenditures	40		
TOTAL EXPENDITURES	1,556	2,057	503

Table 8-8: FDF budget by cost category.

	2014	2015	2016	Total
GENERAL				
Program Support	931	1,019	594	2,846
Program Support - GEN 4 Labor	310	922	118	1,351
Instrument Funds Available	67	2,627	3,623	6,318
GHOS	2,129	2,352	2,258	6,796
Instrument Upgrades		500	500	1,000
GNIRS				18
AO upgrades (Altair, Canopus)	494	452	19	1,025
MCAO Imager				195
FLAMINGOS-2				731
GMOS	671			1,022
GRACES	25			284
Program Support - Aspen Labor				154
GPI	646			2,832
Grand Total	**5,274**	**7,871**	**7,112**	**24,573**

Table 8-9: IDF budget by project.

8.3 Science and Engineering Operations in 2014

Observatory operations in 2014 will continue to provide support for science users in the international Gemini community, conduct queue and classical observing programs according to user demand, maximize scientific use of the telescopes and instruments, and maintain a data archive. Large and Long Programs will see their first science time in 2014B, and we anticipate making significant progress toward the implementation of Fast Turnaround Programs.

8.3.1 Regular Operations

Regular operations to deliver science for users continues to have the highest priority among all activities at Gemini and occupies the vast majority of effort at the Observatory. Work that members of the Science and Engineering Operations Division at Gemini will continue to perform in 2014 includes the following.

- Maintain the instruments and telescopes in working order consistent with the requested science time on sky; monitor performance and take remedial action as needed.
- Run the International Time Allocation Committee (ITAC) process to combine the national TAC results into an executable queue and visitor program consistent with available time, conditions, and instrumentation.
- Support the user community (in conjunction with the NGOs) in preparing their observations for the telescope.
- Provide web-based documentation suitable for PI reference on instrumentation, software and observatory processes.
- Execute queue observing programs on behalf of the community as required; currently this equates to more than 90% of the observing.
- Support visiting classical observers in their execution of their programs on the telescope.
- Ensure integrity of data (headers & quality control information) entering the Gemini Science Archive.
- Support visiting instruments as needed and possible.
- Support, maintain and upgrade a data reduction package for the user community.
- Propose and execute continual improvements in instrumentation, telescope, and enclosure to maintain performance levels.
- Propose and execute continual improvements in operations software on behalf of the community and for internal usability, to maintain performance levels. These packages include: proposal preparation software; ITAC (queue filling) software; observation preparation software for successful proposals; multiobject mask generation software; observation execution software for use at the telescope; data flow software to move data into the science archive.
- Propose and execute continual improvements in operations processes on behalf of the user community, with guidance and input from the appropriate committees.
- Provide expertise and input to the Development Division in carrying out major enhancements of instrumentation.
- To ensure economical operations and a consistent interface with the user community, maintain approximate symmetry between the processes, equipment, and staffing at the two Gemini sites.
- Maintain communications between the observatory and the National Gemini Offices and ensure that NGO staff members receive appropriate training.
- Staff the third and final level of a helpdesk to respond to queries from the user community. (The first two levels are (i) national office and (ii) instrument specialists at the national offices.)

A regular system of preventive and corrective maintenance supports the first requirement of maintaining the instruments, telescopes, and enclosures in working order. Preventive maintenance is carried out at the summits on a regular schedule (daily, weekly, etc. depending on the system) using a system of work orders. More major items

requiring additional staffing are handled by planning on a variety of timescales. A central list of major maintenance work is held by the Heads of Engineering Operations and discussed weekly at the engineering operations managers meeting. Items are marked according to progress or completion, and new needs are discussed before adding to the list and determining a possible schedule. This list and the associated resource requests are input to the monthly resource leveling meeting (which covers all Observatory activities) to ensure that the work schedule is consistent with other activities.

8.3.2 Science and Engineering Operations Core Projects

In addition to this regular operations support, a number of projects with longer-term sustainability impact or to improve service to users will be undertaken in 2014. Some of the sustainability efforts were delayed from 2013 by the high-priority instrumentation projects (GPI, GeMS, FLAMINGOS-2). The core project plans for Operations follow.

Establish GeMS into regular science operations with a stable observing/staffing model

The stage of GeMS handover to Operations will be complete by January 2014. This second stage will require the team to have detailed and prioritized a list of operational improvements that will result (over time) in a system that is operationally stable, robust and operable by a small night-time team. At present there are some 5,000 hours requested in such improvements, including documentation, reliability work, and operational/usability improvements. We will address the very highest priority items on that list within 2014, which include operationally-critical improvements in usability and robustness, and move further down the list in 2015.

Absorb the Phase II of the US community

Gemini will in the coming year put considerable effort into increasing the efficiency with which science programs that are successful at the TAC/ITAC are converted into observations on the telescope (Phase II), and into better supporting scientists in converting the resulting observations into science papers. One major part of this effort is to bring the Phase II process for the US community into the Observatory in return for enhanced effort at the US National Office in generation of better cookbooks for the data reduction process or other contributions.

Commence the GPI Campaign

GPI was delivered to Cerro Pachón in 2013 and its initial commissioning stages have begun. Commissioning will be completed in the first half of 2014. Once that is done, the instrument will be made available for the general user community and the GPI Campaign observations of exoplanet candidates will commence.

Public release of quick-install GPI pipeline for non-campaign users

Supported by the Gemini Data Processing Development group, the GPI team has developed a stand-alone pipeline (in IDL) for GPI data reduction. This will be released as an executable package for PIs receiving GPI data. It will be runnable without requiring an IDL license.

Commence Large and Long Programs

Large and Long Programs (LLPs) are intended to become the flagship science programs on Gemini. The processes are under development at present, and observations on the first accepted LLPs are expected in Semester 2014B.

Inclusion of GMOS-S Hamamatsu CCDs in Gemini DR Package

Data reduction support for the red-sensitive Hamamatsu CCDs will be provided in the Gemini IRAF package as soon as commissioning data allow the determination of key parameters.

Community-wide release of the Astrodata/Recipe system

The Astrodata/Recipe system is the platform for all future Gemini data reduction, supplanting IRAF with a more scalable system based on Python. A beta release was made to the national offices and UCG earlier this year; documentation will be completed in 2014, and it will be released to the general user community.

Complete automation of operations software regression testing

Regression testing of software is a significant expense in staff time. The use of an automated, scriptable system (based on a commercial package) to carry out the tests automatically and report on discrepancies is under development, and we anticipate completing this work in 2014.

SynchroBus replacement design

The SynchroBus is a network ring via which control signals and data are transferred and synchronized between systems on the telescope (*e.g.*, top end control signals). The ring system has proven to be an operational liability, as it is impossible to simply take a part of the ring offline without affecting the rest. Replacing it is a high operations priority for sustainability after the transition. This project will replace the existing SynchrBus on both telescopes with a hub/spoke network.

8.3.3 Optional Science and Engineering Operations Projects

Additional Operations projects that will be undertaken on a best-effort basis are listed below. All of these have lower priority than regular operations and core projects. In some cases, specific resource conflicts are identified.

Complete GMOS-N+Altair

We will aim to be able to observe with the combination of GMOS-N and Altair in the near-IR once the Hamamatsu CCDs are installed in GMOS-N (currently late 2014 or early 2015).

Commission FLAMINGOS-2 MOS mode

Commissioning of the FLAMINGOS-2 multiobject mode has been approved by the Board for engineering/commissioning time in both 2014A and 2014B. Whether this work proceeds will depend sensitively on progress with image quality.

Final GNIRS lens replacements

A previous project mitigated the particle events seen in GNIRS data by replacing the culprit radioactive camera lenses. However, a lens in the short-red camera was found to have a small crack. The short-red camera was taken out of service until a replacement lens could be procured and installed. This work, and some minor

mechanical work on the grating mechanism and the installation of a leak-blocking filter for the Y-MK filter, will be carried out in 2014 depending on availability of resources.

Commence Fast Turnaround Programs

Implementation of a scheme in which PIs are able to apply quickly for short observations which are then evaluated and observed rapidly. It is possible that a prototype will be in place before the end of 2014.

SynchroBus replacement on both telescopes

If the design is completed and resources are available, the hardware replacement and commissioning of the new control bus will commence in 2014. This stretch goal builds on the design work that is a core project, listed above.

SDSU-VME interface obsolescence upgrades

This is an obsolescence mitigation project; Gemini does not have—and cannot acquire—spares of some critical interface boards connecting the existing (SDSU) controllers to their VME control systems. (The on-instrument wavefront sensors use these controllers, for example.) The work involves replacing these boards with more current versions and updating the low-level software to match the new boards.

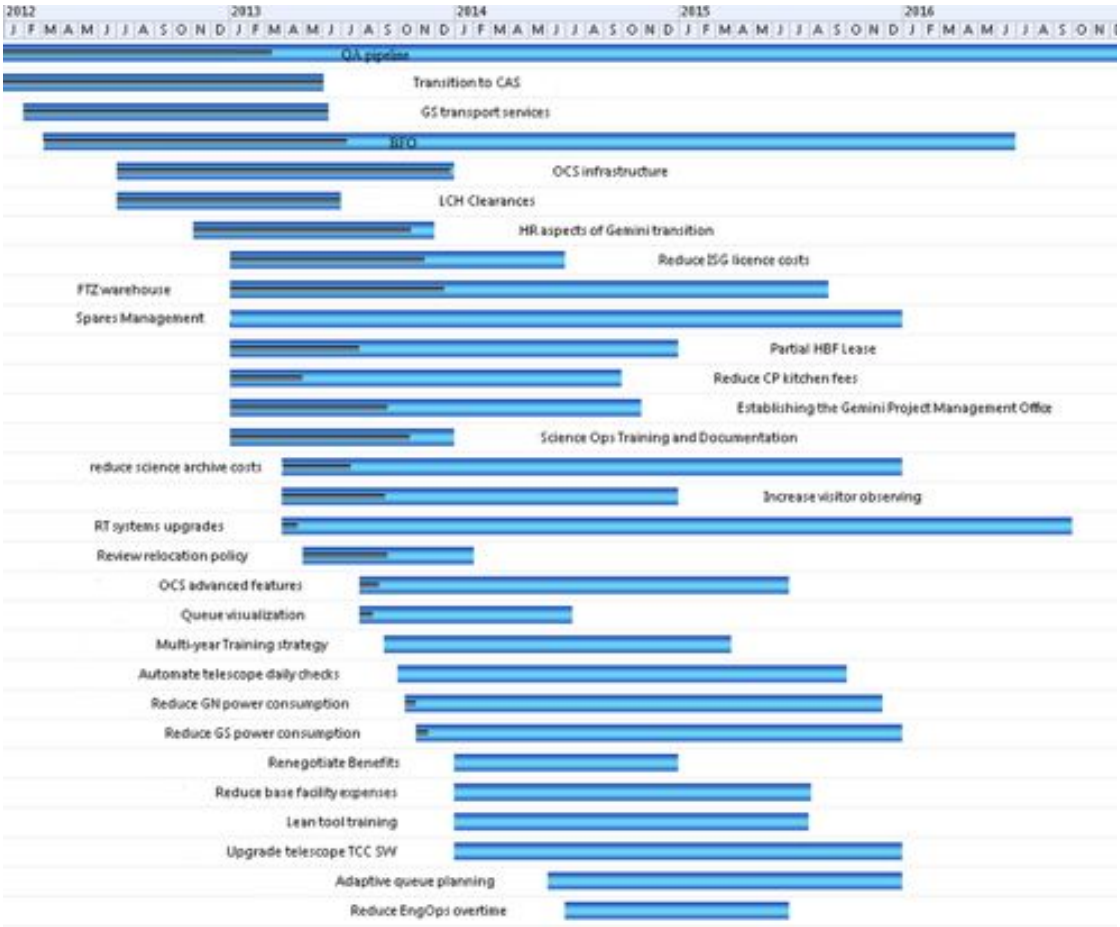

Figure 8-1: Summary Gantt chart of Transition Program.

8.4 Transition Program

8.4.1 Transition Program Overview

The Transition Program enters formally its second of three years in 2014. We will closely monitor the progress on the key projects for non-labor savings and on the multi-year projects required for future sustainability, making adjustments as necessary.

Other projects are tentatively scheduled (Figure 8-1, above) but will not be triggered before we have confidence our critical resources are not overloaded and the end dates of all on-going projects will not be delayed. We have built a series of metrics and key performance indicators to track progress and activate corrections if any deviation is detected. One of the major risks during the Transition is staff disengagement. We have implemented two types of mitigation for this risk: overshoot of the staffing plan by hiring additional temporary positions in the short-term, and improved human resources processes like cross-training, active retention, and succession planning to be able to face unexpected departures.

Project	discounted annual saving	confidence factor
Base Facility Operations	336,000	0.8
Reduce cost of science data archiving	110,000	0.8
Reduce IS licenses, contracts, services	100,000	0.9
Lease part of HBF	95,000	0.7
Eliminate FTZ	56,000	0.8
Rationalize spares management	42,000	0.7
Reduce summit power consumption	36,000	0.9
Reduce CP kitchen fees	33,000	0.7
Review relocation policy	28,000	0.7
Lean tools training	25,000	1.0
Reduce base facility power consumption	22,000	0.9
GS transport services	19,000	1.0
Reduce base facilities expenses	18,000	0.7
Multi-year training program	17,500	0.7
Upgrade telescope TCC SW	7,000	0.7
Automate telescope daily checks	4,800	0.8
Review benefits	48,000	0.6
Reduce EngOps OverTime	12,000	0.6
TOTAL (confidence>0.6)	**949,300**	

Table 8-10: Expected annual Transition saving, by project. The confidence factor is a multiplicative factor used to calculate the discounted saving from the maximum possible.

Table 8-10 shows the projected annual non-labor savings from Transition projects, when complete. The savings values are discounted by the confidence factor; a project that is expected to save $100k per year and has a confidence factor of 0.7 is recorded as

annual savings of $70k. This table does not include the majority of the Transition savings, which are due to decreased staff size.

8.4.2 Transition Program Core Goals

In addition to regular management of the Transition Program, specific project goals for 2014 are listed here. The highest priority of these is the base facility operations project, which is allocated increased resources in order to recover schedule lost during 2013.

Base facility operations

to enable remote operations of telescope from base facilities by 2016

- Subsystem detailed design reviews
- Commission remote enclosure mode at Gemini South
- Implement new environmental sensors at both sites

Reduce science archive costs

to reduce costs while maintaining a usable science archive

- Design decision: negotiate contract with external provider or assess feasibility of in-house provision

Information Systems license savings

to reduce costs of software and service contracts

- Renegotiate Information Systems licenses
- Review savings

Hilo Base Facility (HBF) partial lease

to recover funds with lease of vacant area of HBF

- Obtain sublease approval
- Define lease terms
- Select a bidder

Real-time systems upgrades

to mitigate future obsolescence and provide maintenance with reduced staff

- Design review of development environment
- Design review of common support code base
- Acceptance review of development environment
- Acceptance review of common support code base

Queue Visualization

to provide tools that reduce staff effort of planning queue observations

- First release: observation selection queries and histograms
- Second release: visibility plots
- Third release: plots to identify conflicts in queue
- Fourth release: Refine plots and usability improvements
- Deploy to operations and train users
- Close project

QA Pipeline

to rovide rapid data quality assessment during nighttime observing

- Release public desktop user version of Gemini Python package (including the QAP)
- Pipeline mode for FLAMINGOS-2 imaging
- Pipeline mode for GSAOI imaging

8.4.3 Optional Transition Projects

Additional projects that are part of the long-term transition and will be undertaken on a best-effort basis in 2014 are listed below.

Downsize Foreign Trade Zone storage

to reduce costs of renting off-site facility

- Obtain authorization and dispose of unnecessary stored materials
- End FTZ shared-use agreement

Reduce Cerro Pachón kitchen expenses

to reduce costs of providing food at Cerro Pachón

- Revise arrangement for night lunches
- Service level agreement in place

Observatory Control Systems (OCS) advanced features

to improve software that controls observations and is employed by science users, enabling improvements to calibrations, observation summaries, usability, and maintenance

- Kickoff project and complete baseline plan
- Release initial software
- Release second incremental software version

Adaptive Queue Planning

to reduce staff effort of planning queue observations, to incorporate site monitoring information for real-time use, and to improve scheduling algorithms

- Approve detailed project plan

Increase visitor observing

to reduce staff effort of nighttime observing and to provide more direct interaction with users

- Phase II: full definition of visitor observing modes
- Phase III: provide documentation

Project Management Office

to manage projects and resource allocations

- Provide procedures, handbooks, templates, and documentation
- Measure effectiveness

Spares management

to complete spares inventory and organization, to analyze obsolescence across systems, and to plan a long-term acquisition strategy

- Develop procedures to track spares usage
- Measure project effectiveness

Energy savings

to reduce energy usage and expenses

- Approve detailed project plan for Gemini North, summit and base
- Approve detailed project plan for Gemini South, summit and base

Reduce base facilities expenses

to reduce expenses of operating and working in base facilities, including contracted effort and supplies

- Identify cost savings areas within Administration and Facilities
- Approve project plan to reduce costs

8.4.4 Contingency Plan

In order to mitigate the risk of a further reduction in budget beyond 2015, and to provide contingency for the primary re-structuring plan, the Observatory developed a contingency plan, which has the potential to save up to $0.5M per year. These following potential savings are identified but are not intended to be executed unless the primary plan fails to deliver the anticipated benefits.

- Reduce the Data Reduction Development group from the planned four people to a single coordinator (reduction of 3 FTE per year). The observatory would reduce its role in data reduction to setting requirements for the instrument consortia and verifying the deliveries. No support for the delivered systems would be provided. A repository for user software could be implemented in order to provide an exchange forum for the users (various incentives for users to deposit their data reduction systems or cookbooks are possible).
- Suppress one of the four managing positions (1 FTE) in the Software and ISG groups with the goal of having three manager/leader positions over the two groups, one position being shared.
- Reduce the Administration and Facilities Group by 1 FTE. This could be accomplished by reducing the administrative workload that is a consequence of regular Base Facility Operations and total reduced staff.
- The Base Facility Operations project also has the potential to reduce the science staff effort by 1.75 FTEs/year (reducing time for acclimatization and time lost standing by in poor weather). This potential saving is not included in the baseline plan, however, and is considered contingency.
- Reduce the Safety Group by 1 FTE. With turnover in the group's management, we require strong management effort in the short-term while maintaining full-time safety coordination on the summits. A new manager has the potential to reorganize and streamline these functions.

8.5 Instrumentation and Facility Development in 2014

Most of the Development Division plan for 2014 follows from projects that are in progress now. A few new activities are described and specific milestones for the projects are listed in the following sections.

8.5.1 Development Core Goals

GPI
- Remediation servicing
- Resume commissioning and verification
- Complete commissioning and verification
- Begin regular operations and Campaign

GMOS CCDs
- Implement first set of Hamamatsu CCDs in GMOS-S
- Procure and characterize the Hamamatsu CCDs for GMOS-N

GHOS
- Preliminary design phase kickoff
- Preliminary design review (best effort for 2014)

Gen4#3
- Review procurement alternatives
- Issue call for proposals

GSAOI Data Reduction Software
- Field distortion correction

8.5.2 Development Optional Projects

These additional development projects will receive resources on a best-effort basis, not to conflict with the primary goals listed above.

GMOS+Altair

to offer GMOS-N with adaptive optics
- Complete software changes
- Delivery of new dichroic beamsplitters
- New modes available for science users

GeMS upgrades
- Operational readiness review part II
- Support ANU NGSWFS upgrade project
- Conclude spare deformable mirror and electronics procurement

Altair upgrades
- Define schedule and resources for the short-term upgrades
- Issue contract for work

IR detector controller
- Contract software work
- Complete testing of new controller in lab

GRACES
- Validate the optical fiber link
- Deliver to telescope for commissioning
- Offer for science use

- Test prototype system (phase 1) to assess end-to-end performance and scientific potential

LGSF upgrades

to provide stable, high-power laser at Gemini South with reduced maintenance effort; the project will consider procurement of the newest laser technology, for laser replacement in 2016 or later

- Confirm project charter and launch a feasibility study
- Validate new laser performance through a contracted modeling study

A&G Upgrades

- Place a contract with a motion control (PMAC) integrator
- Review upgrade of peripheral wavefront sensor

Interface control document updates

to complete and update the documents that builders of new facility and visiting instruments require

- Complete interface control documents for future instruments

F2 Data Reduction Software

- MOS support (depends on MOS commissioning)

8.6 Administration and Facilities in 2014

In addition to carrying regular administration and facilities supporting activities, completing the following projects is planned for 2014:

Financial Effectiveness and Efficiency

- Implement Transition Plan administration projects as described in section 8.4 (HBF lease, eliminate FTZ, reduce CP kitchen fees, energy savings at GS base facilities, reduce base facilities expenses).
- Cooperate with CAS to actively review and monitor conformance to requirements of CAS shared services provided to Gemini as defined in the CAS charter document. Actively report any issues affecting the timeliness and quality of CAS accounting, procurement, asset management, shipment and human resources services.
- Cooperate with NOAO-S to actively review and monitor conformance of NOAO-S shared services provided to Gemini South as described in the Service Level Agreements. Review that allocated shared fees are consistent with the agreed rates, and that the information registered in NOAO-S Site Financial Report is consistent with budget and actual costs of shared services.

Administrative Policies and Procedures

- Consistent with the priority actions that resulted from the AURA climate survey, implement a system that enables all staff to access all policies and procedures through a single point, and periodically present administration and finance policies to all the Gemini staff.

Financial Planning and Reporting

- Coordinate quarterly and annual financial reports, including detailed information about budget variances as per the financial reporting requirements from the NSF and the Board.
- Continue improving the financial information tools to enable budget managers to closely track monthly expenses and budget variances.
- Deliver training to management on the use of existing financial systems and financial information (use of multidimensional analysis and dynamic data).

8.7 Public Information and Outreach in 2014

Gemini's diverse ongoing programming in education and outreach continues in 2014 based upon our commitment to share our exploration of the universe and support our communities. These communities range from students and teachers in our local host areas to the worldwide communities that encompass our science users, journalists, families, and the public-at-large.

We will lead the flagship local outreach programs Journey Through the Universe in Hawai'i and Viaje al Universo in Chile. A highlight of 2014 is the tenth anniversary of Journey Through the Universe. This program has grown significantly over the past decade and it continues to expand in community partnerships and staff/professional participants, which serve as two important metrics of the program's success. In 2014 the program is expected to feature over 70 participating scientists, engineers, and educators who will visit local classrooms in Hawai'i and share their passion for astronomy and science, technology, engineering, and mathematics (STEM) careers with thousands of local students. When combined with our AstroDay Chile, Starlab portable planetaria, Family Astro, and other long-running programming, a strong commitment to our local communities emerges as a significant Gemini theme.

Balanced with this is our commitment to broader education, outreach, and communications. Annually, we expect to produce a minimum of 8–10 press or image releases, which are distributed to the worldwide traditional and new media (journalist and blogger) communities. We will support several media visits to our facilities, produce and support multiple communications products for our user community (including the new quarterly and Annual Review issues of the *Gemini*Focus newsletter), and develop content for multiple communication products. Finally, ongoing PIO functions include supporting the myriad needs of the observatory-at-large such as photographic documentation, graphic arts, and library services.

PIO 2014 program plan highlights include:

- Integration of new "key strategic local community partnerships" metric to better evaluate local community outreach programming impact;
- Expanded effort to promote STEM and observatory career awareness in local host communities (Hawai'i and Chile);
- More effective and an expanded role of social and new media in Gemini communications efforts, and a goal to integrate the broader Gemini staff into social media effort.

Specific plans for growth within these planned activities are the following.

- Increase key, strategic local community partnerships by 1 new partner at Gemini North and two new partners at Gemini South, as well as an increase of 2 new staff participants in outreach programming at Gemini South.
- Distribute (North and South) a minimum total of 3,000 “Observatory Careers” brochures to local teachers and interested students. Access to companion website (with videos) will be tracked for a new key metric to assess impact.
- Increase Facebook and Twitter posts to a minimum of 5 per week, with 15% increases in “Likes” and “Followers”.
- Increase new media network contact list (of science/astronomy bloggers) by 30 with six significant distribution events (press or image release) during the year. Impact will be tracked by following blog articles on Gemini results that are written by bloggers on our contacts list.

Appendix A. Publications by Staff

A.1 Refereed Staff Publications

Chene, Andre-Nicolas [3]. On the origin of variable structures in the winds of hot luminous stars. *Monthly Notices of the Royal Astronomical Society*, 440:2-9. December, 2013.

Schirmer, M. THELI: Convenient Reduction of Optical, Near-infrared, and Mid-infrared Imaging Data. *The Astrophysical Journal Supplement*, 209:21. December, 2013.

Levenson, N. A. [7]; Mason, R. E. [10]. Uncovering the Deeply Embedded Active Galactic Nucleus Activity in the Nuclear Regions of the Interacting Galaxy Arp 299. *The Astrophysical Journal Letters*, 779:L14. December, 2013.

Hayward, Thomas L. [6]; Hartung, Markus [7]. The Gemini NICI Planet-Finding Campaign: The Companion Detection Pipeline. *The Astrophysical Journal*, 779:80. December, 2013.

Leggett, S. K. [8]. The Binary White Dwarf LHS 3236. *The Astrophysical Journal*, 779:21. December, 2013.

Lai, O.[9]. FIRST, a fibered aperture masking instrument. II. Spectroscopy of the Capella binary system at the diffraction limit. Astronomy & Astrophysics, 560:113. December, 2013.

Chene, Andre-Nicolas [2]. A photometric study of the nova-like variable TT Arietis with the MOST satellite. Astronomische Nachrichten, 334:1101. December 2013.

Chene, Andre-Nicolas [11]. Discovery of new companions to high proper motion stars from the VVV Survey. Astronomy & Astrophysics, 560:21. December, 2013.

Margheim, S. [32]. A statistical analysis of circumstellar material in Type Ia supernovae. *Monthly Notices of the Royal Astronomical Society*, 436:222-240. November, 2013.

Winge, Cláudia [5]. Photometry and dynamics of the minor merger AM 1219-430 with Gemini GMOS-S. *Monthly Notices of the Royal Astronomical Society*, 435:3342-3352. November, 2013.

Kissler-Patig, M. [5]. Earthshine observations at high spectral resolution: exploring and detecting metal lines in the Earth's upper atmosphere. *Monthly Notices of the Royal Astronomical Society*, 435:2574-2580. November, 2013.

Hartung, Markus [7]. Keck and VLT AO observations and models of the uranian rings during the 2007 ring plane crossings. *Icarus*, 226:1399-1424. November, 2013.

Schiavon, Ricardo P. [27]. Discovery of a Dynamical Cold Point in the Heart of the Sagittarius dSph Galaxy with Observations from the APOGEE Project. *The Astrophysical Journal Letters*, 777:L13. November, 2013.

Mason, R. E. [1]; Levenson, N. A. [3]. The Role of the Accretion Disk, Dust, and Jets in the IR Emission of Low-luminosity Active Galactic Nuclei. *The Astrophysical Journal*, 777:164. November, 2013.

Hayward, Thomas L. [5]; Hartung, Markus [15]. The Gemini/NICI Planet-Finding Campaign: The Frequency of Planets around Young Moving Group Stars. *The Astrophysical Journal*, 777:160. November, 2013.

Cardwell, A. [6]; Turner, J. [7]. Gemini Spectroscopy of the Short-hard Gamma-Ray Burst GRB 130603B Afterglow and Host Galaxy. *The Astrophysical Journal*, 777:94. November, 2013.

Chiboucas, Kristin [1]. Confirmation of Faint Dwarf Galaxies in the M81 Group. *The Astronomical Journal*, 146:126. November, 2013.

Geballe, T. R. [5]. HH 222: A Giant Herbig-Haro Flow from the Quadruple System V380 Ori. *The Astronomical Journal*, 146:118. November, 2013.

Wenderoth, E. [6]. Broad-band photometry and long-slit spectroscopy of the peculiar ring galaxy FM 287-14. *Astronomy & Astrophysics*, 559:8. November, 2013.

Michaud, Peter [15]. Outgassing Behavior of C/2012 S1 (ISON) from 2011 September to 2013 June. *The Astrophysical Journal Letters*, 776:L20. October, 2013.

Hayward, Thomas L. [5]; Hartung, Markus [17]. The Gemini NICI Planet-Finding Campaign: The Frequency of Giant Planets around Young B and A Stars. *The Astrophysical Journal*, 776:4. October, 2013.

Geballe, T. R. [7]. Evidence for H2 Formation Driven Dust Grain Alignment in IC 63. *The Astrophysical Journal*, 775:84. October, 2013.

Geballe, T. R. [3]. Fundamental vibrational transitions of hydrogen chloride detected in CRL 2136. *Astronomy & Astrophysics*, 558:L5. October, 2013.

Pohlen, M. [14]. Flux calibration of broad-band far-infrared and submillimetre photometric instruments: theory and application to Herschel-SPIRE. *Monthly Notices of the Royal Astronomical Society*, 434:992-1004. September, 2013.

Trujillo, Chad [2]; Stephens, Andrew W. [3]; Gimeno, German [4]. Limits on Quaoar's Atmosphere. *The Astrophysical Journal Letters*, 774:L18. September, 2013.

Adamson, A. J. [8]. Ice and Dust in the Prestellar Dark Cloud Lynds 183: Preplanetary Matter at the Lowest Temperatures. *The Astrophysical Journal*, 774:102. September, 2013.

Roth, Katherine C. [8]. GRB 130606A as a Probe of the Intergalactic Medium and the Interstellar Medium in a Star-forming Galaxy in the First Gyr after the Big Bang. *The Astrophysical Journal*, 774:26. September, 2013.

Stephens, A. W. [4]. The Globular Cluster NGC 6402 (M14). I. A New BV Color-Magnitude Diagram. *The Astronomical Journal*, 146:57. September, 2013.

Pohlen, M. [11]. Flux calibration of the Herschel -SPIRE photometer. *Monthly Notices of the Royal Astronomical Society*, 433:3062-3078. August, 2013.

McDermid, Richard M. [11]. The ATLAS3D Project - XXIII. Angular momentum and nuclear surface brightness profiles. *Monthly Notices of the Royal Astronomical Society*, 433:2812-2839. August, 2013.

Leggett, S. K. [17]. NPARSEC: NTT Parallaxes of Southern Extremely Cool objects. Goals, targets, procedures and first results. *Monthly Notices of the Royal Astronomical Society*, 433:2054-2063. August, 2013.

Hayward, Thomas L. [5]. The Gemini Planet-finding Campaign: The Frequency of Giant Planets around Debris Disk Stars. *The Astrophysical Journal*, 773:179. August, 2013.

Geballe, T. R. [2]. Variable Winds and Dust Formation in R Coronae Borealis Stars. *The Astronomical Journal*, 146:23. August, 2013.

Leggett, S. K. [4]. 76 T dwarfs from the UKIDSS LAS: benchmarks, kinematics and an updated space density. *Monthly Notices of the Royal Astronomical Society*, 433:457-497. July, 2013.

Turner, James [9]; Bergmann, Marcel [10]. Stellar population gradients and spatially resolved kinematics in luminous post-starburst galaxies. *Monthly Notices of the Royal Astronomical Society*, 432:3131-3140. July, 2013.

McDermid, Richard M. [21]. The ATLAS3D project- XXII. Low-efficiency star formation in early-type galaxies: hydrodynamic models and observations. *Monthly Notices of the Royal Astronomical Society*, 432:1914-1927. July, 2013.

McDermid, Richard M. [18]. The ATLAS3D project - XXI. Correlations between gradients of local escape velocity and stellar populations in early-type galaxies. *Monthly Notices of the Royal Astronomical Society*, 432:1894-1913. July, 2013.

McDermid, Richard M. [2]. The ATLAS3D project - XX. Mass-size and mass-σ distributions of early-type galaxies: bulge fraction drives kinematics, mass-to-light ratio, molecular gas fraction and stellar initial mass function. *Monthly Notices of the Royal Astronomical Society*, 432:1862-1893. July, 2013.

McDermid, Richard M. [18]. The ATLAS3D project - XIX. The hot gas content of early-type galaxies: fast versus slow rotators. *Monthly Notices of the Royal Astronomical Society*, 432:1845-1861. July, 2013.

McDermid, Richard M. [20]. The ATLAS3D project - XVIII. CARMA CO imaging survey of early-type galaxies. *Monthly Notices of the Royal Astronomical Society*, 432:1796-1844. July, 2013.

McDermid, Richard M. [15]. The ATLAS3D project - XVII. Linking photometric and kinematic signatures of stellar discs in early-type galaxies. *Monthly Notices of the Royal Astronomical Society*, 432:1768-1795. July, 2013.

McDermid, Richard M. [18]. The ATLAS3D project - XVI. Physical parameters and spectral line energy distributions of the molecular gas in gas-rich early-type galaxies. *Monthly Notices of the Royal Astronomical Society*, 432:1742-1767. July, 2013.

McDermid, Richard M. [17]. The ATLAS3D project - XV. Benchmark for early-type galaxies scaling relations from 260 dynamical models: mass-to-light ratio, dark matter, Fundamental Plane and Mass Plane. *Monthly Notices of the Royal Astronomical Society*, 432:1709-1741. July, 2013.

Christou, J. C. [15]. The Resolved Asteroid Program - Size, shape, and pole of (52) Europa. *Icarus*, 225:794-805. July, 2013.

Roth, K. C. [18]. PS1-10bzj: A Fast, Hydrogen-poor Superluminous Supernova in a Metal-poor Host Galaxy. *The Astrophysical Journal*, 771:97. July, 2013.

Hartung, Markus [2]; Hayward, Thomas L. [3]. Companions to nearby Stars with Astrometric Acceleration. II. *The Astronomical Journal*, 146:8. July, 2013.

Kissler-Patig, M. [2]. M. - σrelation for intermediate-mass black holes in globular clusters. *Astronomy & Astrophysics*, 555:26. July, 2013.

Hibon, Pascale [9]. Lyα luminosity functions at redshift z ≈ 4.5. *Monthly Notices of the Royal Astronomical Society*, 431:3589-3607. June, 2013.

Pessev, Peter M. [3]. Evidence for Two Distinct Stellar Initial Mass Functions: Revisiting the Effects of Cluster Dynamical Evolution. *The Astrophysical Journal*, 770:121. June, 2013.

Adamson, A. J. [3]. The Structure, Origin, and Evolution of Interstellar Hydrocarbon Grains. *The Astrophysical Journal*, 770:78. June, 2013.

Miller, Bryan W. [2]; Trancho, Gelys [3]. The Lick-index Calibration of the Gemini Multi-Object Spectrographs. *The Astronomical Journal*, 145:164. June, 2013.

Rantakyrö, F. T. [6]. Millimeter dust emission compared with other mass estimates in N11 molecular clouds in the LMC. *Astronomy & Astrophysics*, 554:91. June, 2013.

Kissler-Patig, M. [4]. Indication for an intermediate-mass black hole in the globular cluster NGC 5286 from kinematics. *Astronomy & Astrophysics*, 554:63. June, 2013.

Neichel, B. [2]. An upper limit to the sodium layer longitudinal and transversal altitude structure function from MCAO data. *Monthly Notices of the Royal Astronomical Society*: Letters, 432:L21. May, 2013.

Levenson, N. A. [5]; Mason, R. E. [6]. Estimations of the magnetic field strength in the torus of IC 5063 using near-infrared polarimetry. *Monthly Notices of the Royal Astronomical Society*, 431:2723-2736. May, 2013.

Stephens, A. [7]. Supernovae and radio transients in M82. *Monthly Notices of the Royal Astronomical Society*, 431:2050-2062. May, 2013.

Kissler-Patig, M. [5]. Luminosity profiles and sizes of massive star clusters in NGC 7252. *Monthly Notices of the Royal Astronomical Society*, 431:1252-1263. May, 2013.

Schiavon, Ricardo P. [5]. Nonlinear Color-Metallicity Relations of Globular Clusters. V. Nonlinear Absorption-line Index versus Metallicity Relations and Bimodal Index Distributions of M31 Globular Clusters. *The Astrophysical Journal*, 768:138-229. May, 2013.

Mason, R. [8]. Dust in active galactic nuclei. Mid-infrared T-ReCS/Gemini spectra using the new RedCan pipeline. *Astronomy & Astrophysics*, 553:35. May, 2013.

Winge, Claudia [3]. Feeding versus feedback in AGNs from near-infrared IFU observations: the case of Mrk 79. *Monthly Notices of the Royal Astronomical Society*, 430:2249-2261. April, 2013.

Bluck, Asa F. L. [3]. Gas accretion as a dominant formation mode in massive galaxies from the GOODS NICMOS Survey. *Monthly Notices of the Royal Astronomical Society*, 430:1051-1060. April, 2013.

Geballe, Thomas R. [4]. Post-equinoctial observations of the ionosphere of Uranus. *Icarus*, 223:741-748. April, 2013.

Schiavon, Ricardo P. [7]. Very Metal-poor Stars in the Outer Galactic Bulge Found by the APOGEE Survey. *The Astrophysical Journal Letters*, 767:L9. April, 2013.

Roth, K. C. [22]. PS1-10afx at z = 1.388: Pan-STARRS1 Discovery of a New Type of Superluminous Supernova. *The Astrophysical Journal*, 767:162. April, 2013.

Hibon, Pascale [4]. [O III] Emission and Gas Kinematics in a Lyman-alpha Blob at z ~ 3.1. *The Astrophysical Journal*, 767:48. April, 2013.

Winge, C. [5]. The Earliest Near-infrared Time-series Spectroscopy of a Type Ia Supernova. *The Astrophysical Journal*, 766:72. April, 2013.

Kissler-Patig, M. [2]. Limits on intermediate-mass black holes in six Galactic globular clusters with integral-field spectroscopy. *Astronomy & Astrophysics*, 552:49. April, 2013.

Kleinman, S. J. [3]; Nitta, A. [4]. Discovery of five new massive pulsating white dwarf stars. *Monthly Notices of the Royal Astronomical Society*, 430:50-59. March, 2013.

Neichel, B. [1]; Winge, C. [5]. Characterization of the sodium layer at Cerro PachÃ³n, and impact on laser guide star performance. *Monthly Notices of the Royal Astronomical Society*, 429:3522-3532. March, 2013.

Kleinman, S. J. [4]; Nitta, A. [9]. Magnetic white dwarf stars in the Sloan Digital Sky Survey. *Monthly Notices of the Royal Astronomical Society*, 429:2934-2944. March, 2013.

Winge, Claudia [4]. Polycyclic aromatic hydrocarbon in the central region of the Seyfert 2 galaxy NGC 1808. *Monthly Notices of the Royal Astronomical Society*, 429:2634-2642. March, 2013.

Roth, K. [14]. The Afterglow and ULIRG Host Galaxy of the Dark Short GRB 120804A. *The Astrophysical Journal*, 765:121. March, 2013.

Jørgensen, Inger [1]; Chiboucas, Kristin [2]. Stellar Populations and Evolution of Early-type Cluster Galaxies: Constraints from Optical Imaging and Spectroscopy of z = 0.5-0.9 Galaxy Clusters. *The Astronomical Journal*, 145:77. March, 2013.

Schirmer, M. [1]; Hildebrandt, H. [2]; Kuijken, K. [3]; Erben, T. [4]. Mass, light and colour of the cosmic web in the supercluster SCL2243-0935 (z = 0.447) (Corrigendum). *Astronomy & Astrophysics*, 551:2. March, 2013.

McDermid, R. M. [5]. How does star formation proceed in the circumnuclear starburst ring of NGC 6951? *Astronomy & Astrophysics*, 551:81. March, 2013.

Shirahata, Mai [1]. Infrared Spectroscopy of CO Ro-Vibrational Absorption Lines toward the Obscured AGN IRAS 08572+3915. *Publications of the Astronomical Society of Japan*, 65:5. February, 2013.

McDermid, Richard M. [20]. The ATLAS3D Project - XIV. The extent and kinematics of the molecular gas in early-type galaxies. *Monthly Notices of the Royal Astronomical Society*, 429:534-555. February, 2013.

Leggett, S. K. [1]. A Comparison of Near-infrared Photometry and Spectra for Y Dwarfs with a New Generation of Cool Cloudy Models. *The Astrophysical Journal*, 763:130. February, 2013.

Leggett, S. K. [7]. Furthering our knowledge of the solar neighborhood using WISE. *Astronomische Nachrichten*, 334:97. February, 2013.

Pohlen, M. [23]. The Herschel Virgo Cluster Survey - XII. FIR properties of optically selected Virgo cluster galaxies. *Monthly Notices of the Royal Astronomical Society*, 428:1880-1910. January, 2013.

Jørgensen, Inger [3]. Erratum: Suppression of star formation in the central 200 kpc of a z = 1.4 galaxy cluster. *Monthly Notices of the Royal Astronomical Society*, 428:923-924. January, 2013.

McDermid, Richard M. [5]. Discovery of a giant HI tail in the galaxy group HCG 44. *Monthly Notices of the Royal Astronomical Society*, 428:370-380. January, 2013.

Kleinman, S. J. [1]; Nitta, A. [6]. SDSS DR7 White Dwarf Catalog. *The Astrophysical Journal Supplement*, 204:5. January, 2013.

Schirmer, M. [1]; Diaz, R. [2]; Levenson, N. A. [4]; Winge, C. [5]. A Sample of Seyfert-2 Galaxies with Ultraluminous Galaxy-wide Narrow-line Regions: Quasar Light Echoes? *The Astrophysical Journal*, 763:60. January, 2013.

Hibon, Pascale [3]. An Exponential Decline at the Bright End of the z = 6 Galaxy Luminosity Function. *The Astronomical Journal*, 145:4. January, 2013.

Carrasco, Eleazar R. [2]. Haffner 16: A Young Moving Group in the Making. *Publications of the Astronomical Society of the Pacific*, 125:1181-1190. December, 2013.

A.2 Non-Refereed Staff Publications

Miller, B. [3]. Kinematics of star clusters in M101. *Memorie della Societa Astronomica Italiana*, 84:256. December, 2013.

Gebhardt, K. [3]. Intermediate-mass black holes in globular clusters*. Memorie della Societa Astronomica Italiana*, 84:129. December, 2013.

Diaz, R. J. [1]. Kinematic decoupled cores: counter-rotation or just inner warp? *Memorie della Societa Astronomica Italiana Supplement*, 25:37-1190. December, 2013.

Gebhardt, K. [3]. Intermediate-mass black holes in globular clusters. *Memorie della Societa Astronomica Italian*a, 84:129. December, 2013.

Trujillo, C. [3]; Stephens, A. [6]; Gimeno, G. [7]. Predicting Occultations by Kuiper Belt Objects. *American Astronomical Society, DPS meeting #45*, #511.09. October, 2013.

Trujillo, Chadwick A. [1]. A Search for Extremely Distant Sedna-Like Objects Using DECam. *American Astronomical Society, DPS meeting #45*, #511.05. October, 2013.

Trujillo, C. [2]. Beyond the Kuiper Belt Edge: Sednoids and the Inner Oort Cloud. *American Astronomical Society, DPS meeting #45*, #511.04. October, 2013.

Michaud, P. [14]. Development of Activity in Comet C/2012 S1 ISON. *American Astronomical Society, DPS meeting #45*, #407.03. October, 2013.

Walp, B. [19]. Precision Near-Infrared Radial Velocities. *American Astronomical Society, DPS meeting #45*, #204.02. October, 2013.

Miller, Bryan [1]; Kissler-Patig, M. [3]. The Velocity Dispersions of Globular Cluster Systems in Dwarf Elliptical Galaxies. *Bulletin of the American Astronomical Society*, Vol. 45, #7, #303.04. July, 2013.

McDermid, R. M. [21]. Probing the mass assembly of massive nearby galaxies with deep imaging. *Proceedings of the International Astronomical Union, IAU Symposium*, Volume 295, pp. 358-361. July, 2013.

McDermid, R. M. [20]. Revealing the origin of the cold ISM in massive early-type galaxies. *Proceedings of the International Astronomical Union, IAU Symposium*, 295:324-327. July, 2013.

McDermid, R. M. [14]. Stellar discs in massive galaxies. *Proceedings of the International Astronomical Union, IAU Symposium*, 295:314-314. July, 2013.

McDermid, Richard M. [1]. The stellar populations of massive galaxies in the local Universe. *Proceedings of the International Astronomical Union, IAU Symposium*, 295:290-299. July, 2013.

Geballe, T. [2]. Large Picture of the Galactic Center Studied by H_3^+: High Ionization Rate, Prevailing Warm and Diffuse Gas, and Non-Rotating Expanding Molecular Ring. *68th International Symposium on Molecular Spectroscopy*, id. #ETI01. June, 2013.

Chene, Andre-Nicolas [1]. Constraining massive star evolution from massive clusters. *Massive Stars: From α to Ω*, id.143. June, 2013.

Chene, A.-N. [3]. Xi Per [O7.5 III(n)((f))]: DACs, NRPs and Now Co-rotating Hot Spots with MOST. *Massive Stars: From α to Ω*, id.92. June, 2013.

Chene, Andre-Nicolas [3]. What is Initiating the Formation of Clumps in Hot-star Winds? *Massive Stars: From α to Ω*, id.86. June, 2013.

Miller, B. [3]. Kinematics and Colors of Star Clusters in M101. *American Astronomical Society, AAS Meeting #222,* #117.06. June, 2013.

Mason, R. [8]. Mid-infrared emission of AGN using RedCan. *Highlights of Spanish Astrophysics VII*, 224-229. May, 2013.

McDermid, R. M. [20]. Quenching of Star Formation in Molecular Outflow Host NGC 1266. *Proceedings of the International Astronomical Union*, 292:371-371. March, 2013.

McDermid, R. M. [21]. AGN Feedback Driven Molecular Outflow in NGC 1266. *Proceedings of the International Astronomical Union, IAU Symposium*, 290:175-176. February, 2013.

Adamson, Andy [1]. Gemini Observatory Time Allocation and Program Execution. *Organizations, People and Strategies in Astronomy Vol. 2*, 257-266. January, 2013.

Neichel, Benoit[1]; Arriagada, G. [3]; Serio, A. [4]; Araujo, C. [5]; Boccas, M. [6]; Carrasco, R. [7]; Collao, F. [8]; Diggs, S. [9]; Fesquet, V. [11]; Galvez, R. [12]; Gausachs, G. [13]; Luhrs, J. [14]; Marchant, C. [15]; Montes, V. [16]; Moreno, C. [17]; Pessev, P. [18]; Rambold, W. [19]; Trujillo, C. A. [20]; Urrutia, C. [21]; Vidal, F. [22]; Vucina, T. [23]. First On-sky Results with GeMS, the Gemini Multi-conjugate AO System. *American Astronomical Society, AAS Meeting #221*, #439.06. January, 2013.

Leggett, S. K. [4]. The Frequency of Debris Disks at White Dwarfs. *American Astronomical Society, AAS Meeting #221*, #308.02. January, 2013.

Pessev, Peter [1]; Carrasco, R. [2]; Winge, C. [3]; Neichel, B. [7]. Gemini South Adaptive Optics Imager (GSAOI) at Gemini South - Commissioning and Fist Science Results. *American Astronomical Society, AAS Meeting #221*, #305.06. January, 2013.

Schiavon, R. P. [12]. SDSS-III/APOGEE: Science and Survey Calibrations and using Open Clusters. *American Astronomical Society, AAS Meeting #221*. #250.34. January, 2013.

Schiavon, R. P. [7]. A Spectroscopic Study of Open Cluster Candidates. *American Astronomical Society, AAS Meeting #221*, #250.34 January, 2013.

Rhee, Jaehyon [1]. Stable Carbon Isotope Ratios for Giant Stars in the Globular Cluster M13 *American Astronomical Society, AAS Meeting #221*. #250.24. January, 2013.

Pessev, P. [2]. Near-IR Integrated-Light Magnitudes of Young LMC Star Clusters: Extending the Sample to Fainter Objects. *American Astronomical Society, AAS Meeting #221*. #250.05. January, 2013.

Margheim, S. J. [2]. Modeling the Binary Central Star of the Planetary Nebula PHR J1510-6754. *American Astronomical Society, AAS Meeting #221*. #249.09. January, 2013.

Gomez, P. L. [2]. Analysis and Reduction of ISPI Images in the Near-IR of Abell 1882 Galaxy Cluster. *American Astronomical Society, AAS Meeting #221*. #243.10. January, 2013.

Schiavon, R. P. [20]. APOGEE Observations of the Center of the Sagittarius dSph Galaxy. *American Astronomical Society, AAS Meeting #221*. #242.01. January, 2013.

Miller, Bryan [1]; Nunez, A. [2]. Easier Phase IIs: Recent Improvements to the Gemini User Tools. *American Astronomical Society, AAS Meeting #221*. #240.11. January, 2013.

Mason, R. [4]; Levenson, N. [5]; Radomski, J. T. [6]. Investigation of MIR Properties and Tori of Radio Loud AGN. *American Astronomical Society, AAS Meeting #221*. #204.05. January, 2013.

Hayward, T. L. [5]. The Gemini NICI Planet-Finding Campaign: Planet Frequency for Young Moving Group Stars *American Astronomical Society, AAS Meeting #221*. #149.27. January, 2013.

Hayward, T. L. [5]. The Gemini NICI Planet-Finding Campaign: The Frequency of Giant Planets around Debris Disk Stars. *American Astronomical Society, AAS Meeting #221*. #149.26. January, 2013.

Hayward, T. L. [5]. The Gemini NICI Planet-Finding Campaign: the Frequency of Giant Planets around Young A Stars. *American Astronomical Society, AAS Meeting #221*. #149.25. January, 2013.

Volk, K. [3]. An Exploration of the Dust Spectral Features of the Carbon-Rich Star V Cyg through Time and Space. *American Astronomical Society, AAS Meeting #221*. #145.01. January, 2013.

Schiavon, R. P. [9]. An Emission-Line Star Conundrum Identified by SDSS-III/APOGEE. *American Astronomical Society, AAS Meeting #221*. #144.09. January, 2013.

Schiavon, R. P. [15]. Characterization of a Large Sample of Be-type Emission-line Stars with SDSS-III/APOGEE. *American Astronomical Society, AAS Meeting #221*. #144.08. January, 2013.

Hibon, P. [4]. [OIII] Emission and Gas Kinematics in a Lyman-alpha Blob at z ~ 3.1. *American Astronomical Society, AAS Meeting #221*. #129.02. January, 2013.

Appendix B. Publications by Users

See notes for methodology.[12]

Boccaletti, A., Pantin, E., Lagrange, A.-M., Augereau, J.-C., Meheut, H., Quanz, S. P. Multiple spiral patterns in the transitional disk of HD 100546. *Astronomy and Astrophysics.* 560:A20. 12/2013.

Gibson, N. P., Aigrain, S., Barstow, J. K., Evans, T. M., Fletcher, L. N., Irwin, P. G. J. The optical transmission spectrum of the hot Jupiter HAT-P-32b: clouds explain the absence of broad spectral features? *Monthly Notices of the Royal Astronomical Society*. 436:2974-2988. 12/2013.

Gizis, J., Burgasser, A. J., Berger, E., Williams, P. K. G., Vrba, F. J., Cruz, K. L., Metchev, S. Kepler Monitoring of an L Dwarf I. The Photometric Period and White Light Flares. *The Astrophysical Journal*, 779:172, 12/2013.

Howell, D. A., Kasen, D., Lidman, C., Sullivan, M., Conley, A., Astier, P., Balland, C., Carlberg, R. G., Fouchez, D., Guy, J., Hardin, D., Pain, R., Palanque-Delabrouille, N., Perrett, K., Pritchet, C. J., Regnault, N., Rich, J., Ruhlmann-Kleider, V. Two Superluminous Supernovae from the Early Universe Discovered by the Supernova Legacy Survey. *The Astrophysical Journal*, 779:98, 12/2013.

Wahhaj, Z., Liu, M. C., Biller, B. A., Nielsen, E. L., Close, L. M., Hayward, T. L., Hartung, M., Chun, M., Ftaclas, C., Toomey, D. W. The Gemini NICI Planet-Finding Campaign: The Companion Detection Pipeline. *The Astrophysical Journal*, 779:80, 12/2013.

Tsai, C.-W., Jarrett, T. H., Stern, D., Emonts, B., Barrows, R. S., Assef, R. J., Norris, R. P., Eisenhardt, P. R. M., Lonsdale, C., Blain, A. W., Benford, D. J., Wu, J., Stalder, B., Stubbs, C. W., High, F. W., Li, K. L., Kong, A. K. H. WISE J233237.05–505643.5: A Double-peaked, Broad-lined Active Galactic Nucleus with a Spiral-shaped Radio Morphology. *The Astrophysical Journal*, 779:41, 12/2013.

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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 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 C. Research Staff Effort

Table C-1 lists the distribution of effort of staff who have research time allocated. Values are listed as FTE. Staff who have part-time appointments or who worked at Gemini for less than a full year show a total less than 1FTE. The effort is described in terms of the following categories.

- nighttime support of regular science operations
- daytime operations
  including queue coordination, routine Head of Science Operations duties, Gemini Science Archive operations, and unscheduled daytime work
- instrument support
  including instrument maintenance, troubleshooting faults and responding to instrument quality issues, defining calibrations and checkouts, performing nonroutine instrument tests, and instrument documentation
- user support
  including direct program support, visiting observer support, response to Helpdesk, and regular semester activities to allocate programs
- improvement work and small operations projects
- research
- major development projects
  including instrument commissioning
- transition projects
- management
- other operations
  including scheduled non-project staff meetings, career development and training, and outreach activities

Name	Night	Day	Instr	User	Impr	Rsrch	Dev	Trans	Mgmt	Other	Total
Gemini North											
Adamson, A	0	0	0	0	0	0.05	0	0	0.95	0	1.00
Chene, A	0.22	0.01	0.21	0.05	0	0.32	0.06	0	0	0.13	1.00
Chiboucas, K	0.21	0.15	0.06	0.04	0.04	0.39	0	0.02	0	0.10	1.00
Geballe, T	0.08	0.08	0.11	0.16	0	0.38	0	0	0	0.19	1.00
Hirst, P	0.13	0.12	0	0.02	0	0.09	0.03	0.36	0	0.25	1.00
Jorgensen, I	0	0.06	0	0.06	0	0.37	0	0	0.48	0.02	1.00
Kissler-Patig, M	0	0	0	0	0	0.05	0	0	0.95	0	1.00
Kleinman, S	0	0	0	0	0	0.05	0.65	0	0.30	0	1.00
Labrie, K	0	0	0	0.11	0	0.19	0.08	0.14	0.18	0.29	1.00
Lai, O	0.12	0	0	0	0	0.21	0.17	0	0	0	0.50
Leggett, S	0	0.18	0	0.24	0.02	0.28	0	0	0.17	0.10	1.00
Lemoine-Busserolle	0	0.16	0.22	0.09	0	0.38	0	0	0	0.14	1.00
Mason, R	0.07	0.09	0.18	0.01	0.04	0.34	0	0	0.01	0.26	1.00
McDermid, R	0.08	0.14	0.06	0.03	0.05	0.26	0	0	0	0.13	0.75
Nitta, A	0.05	0.34	0	0.04	0	0.19	0	0.29	0	0.08	1.00
Petric, A	0	0.01	0	0	0	0.05	0	0	0	0.02	0.08
Rhee, J	0.15	0.00	0.17	0.11	0	0.12	0.10	0	0	0.06	0.72
Roth, K	0.25	0.10	0.17	0.10	0.01	0.09	0.09	0	0	0.18	1.00
Stephens, A	0.14	0.03	0.09	0.14	0.27	0.10	0.01	0.10	0	0.12	1.00
Trujillo, C	0.14	0.03	0.10	0.04	0.02	0.30	0.15	0	0.10	0.11	1.00
Gemini South											
Carrasco, R	0.17	0.01	0.23	0.04	0	0.26	0.17	0	0	0.11	1.00
Conn, B	0.03	0.41	0.02	0	0	0.09	0	0	0	0.02	0.58
Diaz, R	0.18	0.02	0.09	0.09	0	0.12	0.41	0	0	0.09	1.00

Garrel, V	0.20	0	0	0	0	0.04	0.76	0	0	0.00	1.00
Gimeno, G	0.10	0.27	0.25	0.09	0	0.18	0	0.01	0	0.11	1.00
Gomez, P	0.06	0.02	0.18	0.08	0	0.14	0.49	0	0	0.03	1.00
Hartung, M	0	0	0.19	0	0	0.19	0.62	0	0	0.00	1.00
Hayward, T	0.16	0.02	0.47	0.04	0	0.15	0.10	0	0	0.05	1.00
Hibon, P	0.13	0.14	0.11	0.09	0	0.21	0.18	0	0	0.14	1.00
Hogan, E	0	0	0	0.33	0	0	0.28	0.12	0	0.26	1.00
Levenson, N	0	0	0	0	0	0.07	0	0	0.93	0	1.00
Margheim, S	0.15	0.05	0	0.20	0	0.22	0.09	0.12	0	0.16	1.00
Miller, B	0	0.01	0	0.05	0.37	0.23	0	0.16	0	0.18	1.00
Pessev, P	0.20	0.06	0.12	0.07	0	0.26	0.10	0.04	0	0.15	1.00
Rantakyro, F	0.18	0.11	0.01	0.06	0	0.05	0.54	0	0	0.06	1.00
Rodgers, B	0.05	0.28	0.00	0.06	0	0.08	0.01	0	0.44	0.07	1.00
Schirmer, M	0.17	0.24	0.04	0.08	0.12	0.13	0.16	0.01	0	0.07	1.00
Turner, J	0.06	0	0	0.52	0.01	0.13	0.02	0.03	0	0.23	1.00
Van Dam, M	0.04	0	0	0	0	0.06	0.86	0	0	0	0.96
Vidal, F	0.30	0	0	0	0	0	0.57	0	0	0	0.87
Winge, C	0.12	0.24	0.08	0.19	0	0.15	0.07	0.03	0	0.13	1.00

Table C-1: Distribution of effort of research staff.

Appendix D. Science Programs 2012B and 2013A

Gemini North Scientific Ranking 2012B

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
C	GN-2012B-C-1	Gonzalez	US	GMOS-N	The Massive Distant Clusters of Wise Survey (MaDCoWS)	20
C	GN-2012B-C-3	Littlefair	UK	GMOS-N	The origin of variability in ultracool dwarfs	10
C	GN-2012B-C-4	Papovich	US	GMOS-N	A Comprehensive Spectroscopic Survey of z > 4 Galaxies in CANDELS	20
C	GN-2012B-C-2	Yasui	Subaru	GMOS-N	Mass Accretion Rate of YSOs in Low-metallicity Environment	20
1	GN-2012B-Q-01	Bibby	US	GMOS-N	A WR+BH X-Ray Binary in M74?	1.3
1	GN-2012B-Q-02	Bosh	US	NIRI	Seasonal Change in Pluto's Atmosphere	3.2
1	GN-2012B-Q-03	Bresolin	UH	GMOS-N	Metals in the star-forming extended disks of early-type galaxies	4.3
1	GN-2012B-Q-04	Cenko	US/UK/CA	GMOS-N	Probing the Central Black Holes of Distant, Quiescent Galaxies via Tidal Disruption Flares (North)	3
1	GN-2012B-Q-05	Cobb	AU/GE/UK	GMOS-N	Exceptional Swift and Fermi GRBs: Gemini Standard Targets of Opportunity (North)	5.3
1	GN-2012B-Q-06	Davies	UK	GMOS-N	Is downsizing of the fundamental plane a selection effect?	23
1	GN-2012B-Q-07	de Mooij	CA	GMOS-N	The Strange Case of a Disintegrating Super-Mercury	15
1	GN-2012B-Q-08	Desert	US	GMOS-N	Comparative Exoplanetology of Hot-Jupiter Prototypes (North)	15
1	GN-2012B-Q-09	Desert	US	GMOS-N	Relative atmospheric compositions of a multiplanet system	8
1	GN-2012B-Q-10	Donzelli	AR	GMOS-N	The Rosetta Stone of Compact Stellar Systems	4.6
1	GN-2012B-Q-11	Fassnacht	US	NIRI	Quantifying the line-of-sight mass distributions to time-delay lenses	3.7
1	GN-2012B-Q-12	Flaherty	US	GMOS-N	Understanding the Influence of Variable Accretion on Protoplanetary Disk Structure	14
1	GN-2012B-Q-13	Fraser	UK	NIRI	Detecting the progenitors of core collapse supernovae - precision astrometry with ALTAIR	3
1	GN-2012B-Q-14	Galicher	CA	NIRI	Completing the follow-ups of the 300 stars International Deep Planet Survey (North)	3.6
1	GN-2012B-Q-15	Geballe	GE	GNIRS	The Morphology, Chemistry, and Heating of Jupiter's Aurora via 3-micron Spectroscopy	4
1	GN-2012B-Q-16	Gibson	UK	GMOS-N	Probing the atmospheres of transiting exoplanets with differential transmission spectroscopy	16.1
1	GN-2012B-Q-17	Gonzalez	US	GMOS-N	The Massive Distant Clusters of Wise Survey (MaDCoWS)	2
1	GN-2012B-Q-18	Grundy	US	NIRI	Mutual Orbits and Masses of Kuiper Belt Binaries and Multiple Systems	12.5
1	GN-2012B-Q-19	Haan	AU	NIFS	Probing the Build-Up of Nuclear Cusps in LIRGs	3.7
1	GN-2012B-Q-20	Hagele	AR	GMOS-N	Understanding the complex gas kinematics of compact, rapidly growing galaxies in the local Universe	3.6
1	GN-2012B-Q-21	Howell	US	GMOS-N	Early-time observations of Type Ia supernovae to reveal progenitors and metallicity	10
1	GN-2012B-Q-22	Hsieh	UH	GMOS-N	Target-of-Opportunity Confirmation of Sublimation in Main-Belt Comets	3
1	GN-2012B-Q-23	Jofré	AR	GNIRS	Planet-metallicity correlation in M dwarf stars	1.8
1	GN-2012B-Q-24	Kaluna	UH	GMOS-N	Water Distributions in the Main Asteroid Belt	7.5
1	GN-2012B-Q-25	Koss	UH	GMOS-N	Dual AGN Triggering in Nearby Quasars	13
1	GN-2012B-Q-26	Kriek	US	GNIRS	Resolved Kinematics of a Compact $z=2.1$ Quiescent Galaxy: Evidence for a Rotating Disk?	18
1	GN-2012B-Q-27	Leggett	Ge	NIRI	Near-Infrared Characterization of the WISE Y Dwarfs	2
1	GN-2012B-Q-28	Liu	UH	GNIRS	Near-IR Spectroscopy of an Extraordinary Brown Dwarf Binary	4.5
1	GN-2012B-Q-29	Liu	US	GMOS-N	Feedback in Unobscured vs. Obscured Quasars	15
1	GN-2012B-Q-30	Magnier	UH	GNIRS	Rare Brown Dwarfs in the Solar Neighborhood from Pan-STARRS 1	4.3
1	GN-2012B-Q-31	McConnell	UH	GMOS-N	Supermassive Black Holes in Giant Elliptical Galaxies	12
1	GN-2012B-Q-32	McGregor	AU	NIFS	Accretion and Outflow from Young Stellar Disks	5

Gemini North Scientific Ranking 2012B (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
1	GN-2012B-Q-33	Myers	US	GMOS-N	Characterizing the Circumgalactic Medium of Low and High Mass Galaxies with Close Quasar Pairs (North)	17.1
1	GN-2012B-Q-34	Okoshi	Subaru	NIFS	Survey for Galaxies associated with coincident, multiple HI gas at high redshift	8
1	GN-2012B-Q-35	Papovich	US	GMOS-N	A Comprehensive Spectroscopic Survey of z > 4 Galaxies in CANDELS	1.5
1	GN-2012B-Q-36	Perlmutter	AU	GMOS-N	Galaxy Cluster Supernovae: Dissecting the Hubble Diagram (North)	2.1
1	GN-2012B-Q-37	Rich	US	GMOS-N	Hydra I: an odd, double-lobed ``globular cluster''	12.3
1	GN-2012B-Q-38	Roe	US	NIRI	Titan's Methane Weather post-Equinox: \\ Seasonal climate change and large storm systems (North)	3
1	GN-2012B-Q-39	Shih	UH	GMOS-N	Massive Outflows in FR II Quasars and Radio Galaxies	7
1	GN-2012B-Q-40	Slater	US	GMOS-N	Deep follow-up of two new distant satellites of Andromeda	8.6
1	GN-2012B-Q-41	Smartt	UH/UK	GMOS-N	Superluminous optical transients : giant supernova in dwarf hosts (North)	12.5
1	GN-2012B-Q-42	Sonnenfeld	UK/US/AU/CA	GNIRS	Probing dark matter in the Cosmic Horseshoe	2.5
1	GN-2012B-Q-43	Stairs	CA	GMOS-N	Measuring the Orbit of a New Millisecond Pulsar/White Dwarf Triple System	14.4
1	GN-2012B-Q-44	Steiner	BR	NIFS	Search for a spatially resolved binary system of supermassive black holes	3.1
1	GN-2012B-Q-45	Storchi-Bergmann	BR	NIFS	The Co-Evolution of Supermassive Black Holes and Galaxies probed with NIFS	9.5
1	GN-2012B-Q-46	Stringfellow	US	NIRI	Is it Alive? Recovering the Supernova Impostor SN1961V	4.5
1	GN-2012B-Q-47	Tanvir	Ge/AU/UK	GMOS-N/ GNIRS/NIRI	Rapid observations of GRBs with Gemini (North)	12.5
1	GN-2012B-Q-48	Telles	BR	NIFS	A black hole in the blue compact dwarf galaxy Mrk 996 ?	2.6
1	GN-2012B-Q-49	Trujillo	Ge	NIRI	Surface Composition of Pluto's Moons Nix and Hydra	5
1	GN-2012B-Q-50	Tucker	US/AU	GMOS-N	Catching Supernovae in the Act with KISS (Kepler International Supernova Search)	18.9
1	GN-2012B-Q-51	Walsh	US	NIFS	Examining Massive Black Holes in Small, High-Dispersion Galaxies	9.5
1	GN-2012B-Q-52	Willott	CA	GNIRS	Spectroscopic confirmation of redshift 7 quasars to probe the reionization epoch	11.6
1	GN-2012B-Q-53	Wright	CA	NIFS	Resolving Host Galaxies of z~2 Quasars	16
1	GN-2012B-Q-54	Yasui	Subaru	GMOS-N	Mass Accretion Rate of YSOs in Low-metallicity Environment	2
2	GN-2012B-Q-55	Aigrain	UK	GNIRS	Fundamental parameters for three unique young eclipsing binaries	10.7
2	GN-2012B-Q-56	Arias	AR	GNIRS	Be line profile variability in the infrared	2
2	GN-2012B-Q-57	Armond	BR	GMOS-N	Spectral classification of young stars in L935	2.2
2	GN-2012B-Q-58	Artigau	CA	GNIRS	GNIRS spectroscopy of a distant planetary-mass companion to a young M star	1.2
2	GN-2012B-Q-59	Atlee	US	GNIRS	A Spectroscopic Study of the Contribution of TP-AGB Stars to Integrated NIR Starlight	4
2	GN-2012B-Q-60	Bilikova	US	GNIRS	High-resolution Spectroscopic Study of the Complex Nucleus of EGB 6	1.7
2	GN-2012B-Q-61	Bonavita	CA	NIRI	Supermassive Planets or Ultralight Brown Dwarfs? A new Population of Wide Substellar Companions	8.8
2	GN-2012B-Q-62	Canty	UK/Ge	NIFS	NIFS spectroscopy of the coolest T dwarfs	6
2	GN-2012B-Q-63	Cauley	US	GNIRS	A Survey of Mass Flows in Herbig Ae/Be Stars	7
2	GN-2012B-Q-64	Cieza	UH	GMOS-N	Toward a more complete census of circumstellar disks with planet-induced inner holes	15
2	GN-2012B-Q-65	Couch	AU	GMOS-N	The Build-up of the Red Sequence in High Redshift Galaxy Clusters	16.4
2	GN-2012B-Q-66	Cushing	US	NIRI	The Search for Y Dwarfs in the Solar Neighborhood with WISE	36
2	GN-2012B-Q-67	Desert	US	GMOS-N	Comparative Exoplanetology of Hot-Jupiter Prototypes (North)	15

Gemini North Scientific Ranking 2012B (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
2	GN-2012B-Q-68	Dhital	US	NIRI	The Extremely Extreme: Searching for Companions in Wide M-dwarf Binaries	6
2	GN-2012B-Q-69	Faifer	AR	GMOS-N	Disentangling the evolution of late-type galaxies in low density environments through their globular cluster systems	4.8
2	GN-2012B-Q-70	Galicher	CA	NIRI	Completing the follow-ups of the 300 stars International Deep Planet Survey (North)	18.4
2	GN-2012B-Q-71	Grundy	US	NIRI	Mutual Orbits and Masses of Kuiper Belt Binaries and Multiple Systems	12.5
2	GN-2012B-Q-72	Hilton	B]/UK	GMOS-N	The Evolution of Galaxy Cluster Mass-Observable Scaling Relations (North)	22.8
2	GN-2012B-Q-73	Hsieh	US	NIFS	Studying the Nature of Very Low Luminosity Objects (VeLLOs)	4.7
2	GN-2012B-Q-74	Kassin	Ge	NIFS	NIFS Observations of Turbulent Disks at 0.8<z<1.4: A Pilot Project Studying Disk Assembly	8.4
2	GN-2012B-Q-75	Leggett	US	NIRI	Near-Infrared Characterization of the WISE Y Dwarfs	4
2	GN-2012B-Q-76	Levan	UK	GMOS-N	Star formation rates in gamma-ray burst host galaxies (North)	3.6
2	GN-2012B-Q-77	Mackey	CA/AU	GMOS-N	Dynamics of the accreted remote globular cluster system of M31	13
2	GN-2012B-Q-78	Marshall	UK	GNIRS	The evolution of early-type galaxies with SL2S	8.8
2	GN-2012B-Q-79	Martioli	BR	NIFS	Spectral Differential Imaging of Exoplanet Candidates to Explore the Mass-Luminosity Relation at Very Low-Mass Range	6
2	GN-2012B-Q-80	Mason	BR	GNIRS	NIR spectroscopy of Palomar emission-line galaxies	4
2	GN-2012B-Q-81	McGee	US/CA	GMOS-N	The high redshift progenitors of massive galaxy clusters	9.9
2	GN-2012B-Q-82	Mignani	UK	GMOS-N	Searching for the bow-shock associated with the X-ray trail of PSR J0357+32	2
2	GN-2012B-Q-83	Petrucci	AR	GNIRS	Exploring the brown dwarf desert with Gemini	1.8
2	GN-2012B-Q-84	Phillips	US	GNIRS	Near-Infrared Spectroscopic Follow-up of Type Ia Supernovae in the Hubble Flow	10
2	GN-2012B-Q-85	Rabinowitz	US	GMOS-N	Measuring the Rotational Light Curve of (79360) Sila-Nunam : an Eclipsing Binary in the Kuiper Belt	6.6
2	GN-2012B-Q-86	Reipurth	UH	GNIRS	Orphaned Protostars	11
2	GN-2012B-Q-87	Rupke	US	GMOS-N	QSO Feedback in Action: The AGN Threshold	6
2	GN-2012B-Q-88	Schiavon	GS	GNIRS	CNO Abundances in Resolved M31 Globular Clusters Stars	9
2	GN-2012B-Q-89	Scott	AU	NIFS	Dense nuclear star clusters hosting supermassive black holes	3.5
2	GN-2012B-Q-90	Smail	CA	GNIRS	A redshift survey of ALMA-identified sub-milimetre galaxies	12
2	GN-2012B-Q-91	Sonnett	UH	GNIRS/NIRI	Surfaces of Trans-Neptunian Misfits	23.2
2	GN-2012B-Q-92	Storchi-Bergmann	US	NIFS	The Co-Evolution of Supermassive Black Holes and Galaxies probed with NIFS	8.8
2	GN-2012B-Q-93	Swinbank	CA	NIFS	Tracing the formation and evolution of star-forming galaxies across cosmic time	15
2	GN-2012B-Q-94	Thalmann	UH	NIRI	A Complete Image of the LkCa 15 Disk Gap	3
2	GN-2012B-Q-95	Trafton	US	NIFS	Investigation of Thermal Tides in Uranus' Thermosphere	16
2	GN-2012B-Q-96	Verma	CA	GNIRS	Physical properties of star-forming high-z galaxies discovered in the Herschel Astrophysical Terahertz Survey (H-ATLAS)	4.2
2	GN-2012B-Q-97	Wiersema	UK	GMOS-N	The birthplaces of host-less short gamma-ray bursts (North)	4.6
2	GN-2012B-Q-98	Willis	CA/UK	GMOS-N	Spectroscopic confirmation of a complete sample of very distant X-ray selected clusters	15
3	GN-2012B-Q-99	Beck	US	NIFS	Understanding the Jet Launching Mechanism in Young Star Outflows	8.5
3	GN-2012B-Q-100	Catalan	UK	NIRI	Unveiling the history of the Galaxy with fossil stars	10
3	GN-2012B-Q-101	Cidale	AR	GNIRS	Unraveling the nature of stars with B[e] phenomenon	7
3	GN-2012B-Q-102	Contreras	UK	NIFS	Eruptive Variables in Star Forming Regions	8.6
3	GN-2012B-Q-103	Fernandes	BR	GMOS-N	Mixing of young and older stellar clusters in CMa R1	8.5
3	GN-2012B-Q-104	Gaensicke	UK	GMOS-N	Towards a global understanding of close compact binary evolution: further constraining common envelope theories	6

Gemini North Scientific Ranking 2012B (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
3	GN-2012B-Q-105	Gizis	US	GMOS-N	Completing the nearby L dwarf sample	9
3	GN-2012B-Q-106	Hsieh	UH	GMOS-N	Characterization of the Nuclei and Active Behavior of Main-Belt Comet P/La Sagra	12
3	GN-2012B-Q-107	Lachapelle	CA	NIRI	High-contrast imaging of young systems harboring a wide low mass substellar companion (North)	6.6
3	GN-2012B-Q-108	Landt	UK	GNIRS	The influence of the UV/X-ray emission on the AGN molecular torus	4.6
3	GN-2012B-Q-109	Leggett	Ge/CA	GMOS-N	Confirming and Characterizing New, Cool and Old, White Dwarfs (North)	10.2
3	GN-2012B-Q-110	Levitan	US	GMOS-N	Orbital Periods for Two Unique, Recently Discovered AM CVn Systems	18.6
3	GN-2012B-Q-111	Limoges	CA	GMOS-N	A continuing census of Galactic white dwarfs to 40 parsecs of the Sun	8
3	GN-2012B-Q-112	Mason	Ge/BR	GNIRS	NIR spectroscopy of Palomar emission-line galaxies	8
3	GN-2012B-Q-113	Meech	UH	GMOS-N	Comets and Early Solar System Volatile Distributions	28
3	GN-2012B-Q-114	Melin	UK	GNIRS	Characterizing the energy drivers in the upper atmosphere of Uranus	24
3	GN-2012B-Q-115	Moffat	CA	GMOS-N	Challenging the hot-star winds' theory.	3.8
3	GN-2012B-Q-116	Neichel	Ge	GMOS-N	Testing the star formation histories derived from integral spectroscopy with resolved galaxies	5
3	GN-2012B-Q-117	Pracy	AU	GMOS-N	The formation of massive E+A galaxies	6
3	GN-2012B-Q-118	Quinn	US	NIRI	Close visual companions to transiting exoplanet host stars	12.9
3	GN-2012B-Q-119	Rhee	Ge	GNIRS	Stable Carbon Isotope Ratios for Seven Giant Stars in the Globular Cluster M68	2.3
3	GN-2012B-Q-120	Roediger	CA	GMOS-N	Understanding stellar populations in the red (North)	8.8
3	GN-2012B-Q-121	Sromovsky	US	NIRI	Probing Uranus' Atmosphere With Discrete Cloud Observations	16
3	GN-2012B-Q-122	Sullivan	US/UK	GMOS-N	The host galaxies of local PTF Type Ia supernovae (North)	25
3	GN-2012B-Q-123	Taylor	AU	GMOS-N	Mapping the Dark Matter Halo Around an Individual Galaxy	11.5
3	GN-2012B-Q-124	Willman	US	GNIRS	Investigating Overdensities of Cool Stars at the Edge of the Milky Way	20
4	GN-2012B-Q-125	Limoges	CA	GMOS-N	A continuing census of Galactic white dwarfs to 40 parsecs of the Sun	16
4	GN-2012B-Q-126	Neichel	Ge	GMOS-N	Testing the star formation histories derived from integral spectroscopy with resolved galaxies	15

2012B Gemini South Scientific Ranking

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
C	GS-2012B-C-4	Eisenhardt	US	GMOS-S	The Most Luminous Galaxies Found by WISE	20
C	GS-2012B-C-3	Menanteau	US	GMOS-S	Mass estimation of four z~1 ACT/SZE Discovered Galaxy Clusters	10
C	GS-2012B-C-2	Papovich	US	GMOS-S	A Comprehensive Spectroscopic Survey of z > 4 Galaxies in CANDELS (South)	20
C	GS-2012B-C-1	Tran	US	GMOS-S	Mapping Cool Gas In and Around Star-forming Cluster Galaxies at $z=1.62$	30
1	GS-2012B-Q-01	Axelrod	US	GMOS -S	LMC Microlensing Source Stars - Stripped from the SMC?	10
1	GS-2012B-Q-02	Biller	US/CA	NICI	Weather on Planets: A Search for Photometric Variability in the Young Exoplanets HR 8799bc	15
1	GS-2012B-Q-03	Cenko	US/CA/UK	GMOS -S	Probing the Central Black Holes of Distant, Quiescent Galaxies via Tidal Disruption Flares (South)	3
	GS-2012B-Q-04	Cobb	U/Ge]/UK/CL	GMOS -S	Exceptional Swift and Fermi GRBs: Gemini Standard Targets of Opportunity (South)	6.3
1	GS-2012B-Q-05	Da Costa	AU	GMOS -S	Unveiling the globular cluster, dwarf spheroidal and halo star connections	7.5

2012B Gemini South Scientific Ranking (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
1	GS-2012B-Q-06	Desert	US	GMOS -S	Comparative Exoplanetology of Hot-Jupiter Prototypes (South)	15
1	GS-2012B-Q-07	Förster	CL	GMOS -S	Late time spectral evolution of Type Ia supernova.	13.8
1	GS-2012B-Q-08	Galicher	US/CA	NICI	Completing the follow-ups of the 300 stars International Deep Planet Survey (South)	10.1
1	GS-2012B-Q-09	Gladstone	AU/CA	GMOS -S	Tracking the optical decay of ESO 243-49 HLX-1	22.6
1	GS-2012B-Q-10	Gonçalves	BR	GMOS -S	Chemical tagging with emission line populations in NGC 55	10.2
1	GS-2012B-Q-11	Hilton	UK/BR	GMOS -S	The Evolution of Galaxy Cluster Mass-Observable Scaling Relations (South)	41.3
1	GS-2012B-Q-12	Howell	US	GMOS -S	Early-time observations of Type Ia supernovae to reveal progenitors and metallicity	5
1	GS-2012B-Q-13	Johnson	US/Ge	GMOS -S	A 10,000 Star Survey for Li-rich K Giants in the Galactic Bulge	18.5
1	GS-2012B-Q-14	Kasliwal	US	GMOS -S	Rapid Spectroscopy of Elusive Transients and Young Supernovae (South)	4.8
1	GS-2012B-Q-15	Keller	AU	GMOS -S	Intermediate age star clusters of the LMC - missing links in globular cluster evolution?	4.2
	GS-2012B-Q-16	Levan	UK	GMOS -S	A new relativistic tidal disruption event?	1.5
1	GS-2012B-Q-17	Martioli	BR	NICI	Spectral Differential Imaging of Exoplanet Candidates to Explore the Mass-Luminosity Relation at Very Low-Mass Range	4
1	GS-2012B-Q-18	McConnell	US	GMOS -S	The Most Massive Galaxies and Black Holes	16
1	GS-2012B-Q-19	Menanteau	US	GMOS -S	Mass estimation of four z~1 ACT/SZE Discovered Galaxy Clusters	2
1	GS-2012B-Q-20	Myers	US	GMOS -S	Characterizing the Circumgalactic Medium of Low and High Mass Galaxies with Close Quasar Pairs (South)	26
1	GS-2012B-Q-21	Papovich	US	GMOS -S	A Comprehensive Spectroscopic Survey of z > 4 Galaxies in CANDELS (South)	1.5
1	GS-2012B-Q-22	Pignata	CL	GMOS -S	Typing the discoveries of the SUDARE survey	15
1	GS-2012B-Q-23	Rebassa-Mansergas	CL	GMOS -S	Towards a global understanding of close compact binary evolution: further constraining common envelope theories	8
1	GS-2012B-Q-24	Roe	US	NICI	Titan's Methane Weather post-Equinox: \\ Seasonal climate change and large storm systems (South)	2
1	GS-2012B-Q-25	Rovero	AR	GMOS -S	Redshift measurement of the Very High Energy source PKS 0447-439	1.2
1	GS-2012B-Q-26	Schirmer	Ge	GMOS -S	IFU observations of an extremely rare and peculiar Seyfert-2 galaxy	8
	GS-2012B-Q-27	Smartt	UK	GMOS -S	Superluminous optical transients : giant supernova in dwarf hosts (South)	7.5
1	GS-2012B-Q-28	Smith	UK	GMOS -S	Probing the Dynamics of Abell 3084 - A Joint Gemini/HST/Chandra Study of a Hyperbolic Umbilic Catastrophe	5
1	GS-2012B-Q-29	Stubbs	US	GMOS -S	Spectroscopy of Galaxies in Massive Clusters: \\ Galaxy Properties and Dynamical \\ Cluster Mass Calibration	32
1	GS-2012B-Q-30	Tanvir	AU/UK/CL/Ge	GMOS -S	Rapid observations of GRBs with Gemini (South)	9.5
1	GS-2012B-Q-31	Tinney	CL/AU	NICI	Imaging Anglo-Australian Planet Search companions	16.6
1	GS-2012B-Q-32	Torres Zafra	AR	GMOS -S	Photometric and spectroscopic study of the blazar PKS 0048-097 and its environment.	5.6
1	GS-2012B-Q-33	Tran	US	GMOS -S	Mapping Cool Gas In and Around Star-forming Cluster Galaxies at $z=1.62$	0.5
1	GS-2012B-Q-34	van Kerkwijk	CA	GMOS -S	Measuring the Mass of an Irradiated Pulsar Companion	10.5
2	GS-2012B-Q-35	Anguita	CL	GMOS-S	Mass to light ratios and evolution of galaxy scale lenses from the RCS2	14
2	GS-2012B-Q-36	Balogh	CA	GMOS-S	Galaxy Transformation in Groups within the Accretion Zone of Clusters	22
2	GS-2012B-Q-37	Berger	US/Ge	GMOS-S	Unveiling the Explosion Physics of Nature's Most Luminous Supernovae (South)	10

2012B Gemini South Scientific Ranking (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
2	GS-2012B-Q-38	C. Santos Jr.	BR	GMOS-S	ESO429-SC2: a dissolving star cluster?	1.9
2	GS-2012B-Q-39	Caso	AR	GMOS-S	The globular cluster system of the massive elliptical galaxy NGC 6876	4.5
2	GS-2012B-Q-40	Currie	US	NICI	A Panchromatic Study of the Massive Planet and Debris Disk Around beta Pictoris	8.3
2	GS-2012B-Q-41	Desert	US	GMOS-S	Comparative Exoplanetology of Hot-Jupiter Prototypes (South)	5
2	GS-2012B-Q-42	Drinkwater	AU	GMOS-S	The cause of high mass-to-light ratios in ultracompact dwarf galaxies (South)	6
2	GS-2012B-Q-43	Foley	US	GMOS-S	The Most Precise Distances to Type Ia Supernovae (South)	13.5
2	GS-2012B-Q-44	Forte	AR	GMOS-S	Exploring the globular cluster system and dwarf companions of the elliptical galaxy NGC 1395	4.8
2	GS-2012B-Q-45	Gomez	CL	GMOS-S	Towards an understanding of galaxy assembly: the Black Hole -- Globular Clusters Connection	6
2	GS-2012B-Q-46	Harrison	UK	GMOS-S	Towards a physical understanding of the large-scale effects of quasar-driven winds	22.4
2	GS-2012B-Q-47	Howell	UK	GMOS-S	Early-time observations of Type Ia supernovae to reveal progenitors and metallicity	5
2	GS-2012B-Q-48	Hsieh	US	GMOS-S	The Sublimation-Driven Nature of Main-Belt Comet Activity	3
2	GS-2012B-Q-49	Kerzendorf	CA	GMOS-S	Supernova companions	24
2	GS-2012B-Q-50	Levan	UK	GMOS-S	Star formation rates in gamma-ray burst host galaxies (South)	14.4
2	GS-2012B-Q-51	Marois	US/CA	NICI	Further constraining the nature of the enigmatic Fomalhaut b planet candidate with NICI.	10.5
2	GS-2012B-Q-52	Menezes	BR	GMOS-S	Galactic nuclei in the local universe: supermassive black holes and stellar archeology - contrasting high and low-mass galaxies	0.9
2	GS-2012B-Q-53	Motta	CL/Ge	GMOS-S	Strong lensing and dynamical constraints to study different density profiles.	10.8
2	GS-2012B-Q-54	Naud	CA	NICI	A Planet Search around Young-associations M dwarfs (PSYM survey)	5
2	GS-2012B-Q-55	Nielsen	US	NICI	The Deepest Search for Planets Around Newly Identified Young, Nearby Stars	33
2	GS-2012B-Q-56	O'Toole	AU/UK	NICI	Are all close binaries really in multiple stellar systems?	16.8
2	GS-2012B-Q-57	Rest	US	GMOS-S	Spectroscopic Time Series of η~Carinae's Great Eruption	13.5
2	GS-2012B-Q-58	Robotham	AU	GMOS-S	In Search of Milky Way Analogues	5
2	GS-2012B-Q-59	Stubbs	US	GMOS-S	Spectroscopy of Galaxies in Massive Clusters: \\ Galaxy Properties and Dynamical \\ Cluster Mass Calibration	20
2	GS-2012B-Q-60	Torres-Flores	CL	GMOS-S	Metallicty gradients and intergalactic star-formation in galaxy groups	8.5
2	GS-2012B-Q-61	Urrutia-Viscarra	BR	GMOS-S	Stars outside galaxies: HII regions in two shell galaxies with HI tidal debris.	9.9
2	GS-2012B-Q-62	Wiersema	UK	GMOS-S	The birthplaces of host-less short gamma-ray bursts (South)	9.2
2	GS-2012B-Q-63	Zhao	US	GMOS-S	The Mass Function of a New Candidate of Quiescent Low-Mass X-ray Binary	10
3	GS-2012B-Q-64	Balogh	UK	GMOS-S	Galaxy Transformation in Groups within the Accretion Zone of Clusters	5.5
3	GS-2012B-Q-65	Beers	BR	GMOS-S	A Survey for Unrecognized Carbon-Enhanced Metal-Poor Stars in the Galaxy	10
3	GS-2012B-Q-66	Bessiere	UK	GMOS-S	The evolution of quasar host galaxies	8.4
3	GS-2012B-Q-67	Burgasser	US	GMOS-S	Hunting for Halo Brown Dwarfs in the Catalina Rapid Transient Survey (South)	8.2
3	GS-2012B-Q-68	Crotts	US	GMOS-S	Spectroscopic Evolution of SNR 1987A	12.9
3	GS-2012B-Q-69	Danehkar	AU	GMOS-S	Kinematic study of planetary nebulae with potential double-degenerate nuclei	5.2

2012B Gemini South Scientific Ranking (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
3	GS-2012B-Q-70	Gagne	CA	GMOS-S	Spectroscopic confirmation of very low-mass stars and brown dwarf candidates in nearby, young moving groups	27.4
3	GS-2012B-Q-71	Hartung	Ge	NICI	Companions to nearby stars with astrometric acceleration	8
3	GS-2012B-Q-72	Leggett	Ge/CA	GMOS-S	Confirming and Characterizing New, Cool and Old, White Dwarfs (South)	17
3	GS-2012B-Q-73	Lena	US	GMOS-S	Mapping sub-kpc gas flows in NGC1365	4
3	GS-2012B-Q-74	Mesa-Delgado	CL	GMOS-S	Chemical Content of Orion Protoplanetary Disk	20.6
3	GS-2012B-Q-75	Naud	CA	GMOS-S	PSYM-wide: a search for wide-separation planetary companions to low-mass stars	20.9
3	GS-2012B-Q-76	Owers	AU	GMOS-S	Merger dynamics and Jellyfish galaxies in Abell 2744	8.4
3	GS-2012B-Q-77	Plunkett	CL	GMOS-S	Accretion rate versus protostellar mass in intermediate mass clusters: The case of M8	7
3	GS-2012B-Q-78	Rebassa-Mansergas	UK	GMOS-S	Towards a global understanding of close compact binary evolution: further constraining common envelope theories	10
3	GS-2012B-Q-79	Ridgway	US	GMOS-S	The Evolution of the Obscured and Unobscured Quasar Population	20
3	GS-2012B-Q-80	Ryder	AU	GMOS-S	The Type IIn Supernova 1978K Revisited	2.9
3	GS-2012B-Q-81	Sesto	AR	GMOS-S	Dating the most intense star formation events in the past of NGC 1316	7
3	GS-2012B-Q-82	Stanghellini	US	GMOS-S	Chemical evolution of two Sculptor galaxies through the abundances of planetary nebulae and H II regions	18.6
3	GS-2012B-Q-83	Sullivan	UK	GMOS-S	The host galaxies of local PTF Type Ia supernovae (South)	14.5
4	GS-2012B-Q-84	Beers	US	GMOS-S	A Survey for Unrecognized Carbon-Enhanced Metal-Poor Stars in the Galaxy	70
4	GS-2012B-Q-85	Heinke	CA	GMOS-S	Spectroscopy of a possible old nova in a globular cluster	2

Gemini North – 2013A Scientific Ranking

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
C	GN-2013A-C-1	Howard	UH	GMOS-N	Haze or Clear Skies in an Extrasolar Ice Giant?	10.0
1	GN-2013A-Q-1	Walsh	US	NIFS	Studying the Black Hole in the Compact, High-Dispersion Galaxy Mrk 1216	10.0
1	GN-2013A-Q-2	Verbiscer	US	GMOS-N	Mutual Event of Transneptunian Binary (79360) Sila-Nunam	9.3
1	GN-2013A-Q-3	Urata	JP	GMOS-N	Spectral Typing of the Unusual Long and Luminous Optical Transient	7.5
1	GN-2013A-Q-4	Tucker	US/AU	GMOS-N	Catching Supernovae in the Act with KISS (Kepler International Supernova Search)	12.6
1	GN-2013A-Q-5	Tobin	US	NIRI	Edge-on Disks Around the Youngest Protostars	9.1
1	GN-2013A-Q-6	Steiner	BR	NIFS	The identification of a LMXB at 0.1 pc from the Milky Way nucleus	1.8
1	GN-2013A-Q-7	Seth	US	NIFS	Testing IMF universality through the direct detection of low mass stars in starburst galaxies	18.0
1	GN-2013A-Q-8	Sanmartim	US/ BR	GMOS-N	The Nature of Post-Staburst Quasars	14.0
1	GN-2013A-Q-9	Ross	US	NIFS	Gas morpholigies and dyamics of SMGs; comparing the ionized and molecular gas	19.8
1	GN-2013A-Q-10	Roediger	CA	GMOS-N	Constraining stellar populations and the initial mass function at red wavelengths	7.1
1	GN-2013A-Q-11	Perlmutter	AU	GMOS-N	Supernovae In and Behind Galaxy Clusters: Developing the next stages of SN cosmology measurements	5.0
1	GN-2013A-Q-12	Pellizza	AR	GNIRS	A galaxy cluster at redshift 2.15?	5.1
1	GN-2013A-Q-13	Moskovitz	US	GMOS-N	Characterization of spacecraft target asteroid 2002 GT	6.3
1	GN-2013A-Q-14	Meech	UH	GMOS-N	Carbon Dioxide in the Early Solar System	6.9
1	GN-2013A-Q-15	Mechtley	US	NIRI	PSF Star Selection for HST Program 12974: UV-Faint Quasars at z=6	2.5

Gemini North – 2013A Scientific Ranking (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
1	GN-2013A-Q-16	Mason	BR/US/CA	GNIRS	NIR spectroscopy of Palomar AGN	12.0
1	GN-2013A-Q-17	Marois	CA	NIRI	Identifying elusive damped Lyman alpha system galaxies with high contrast imaging.	10.0
1	GN-2013A-Q-18	Mann	UH	GNIRS	Understanding ultracool dwarfs: ages and metallicities	11.0
1	GN-2013A-Q-19	Maksym	US/BR	GMOS-N	A Candidate Tidal Disruption Flare in Abell 1795	9.0
1	GN-2013A-Q-20	Magnier	UH	GNIRS	Rare Brown Dwarfs in the Solar Neighborhood from Pan-STARRS 1	17.5
1	GN-2013A-Q-21	Leggett	US	NIRI	Observing Weather on Y Dwarfs	48.0
1	GN-2013A-Q-22	Kilic	US	GMOS-N	Gravitational Waves from the 12 minute Orbital Period Binary White Dwarf J0651+2844	5.0
1	GN-2013A-Q-23	Kewley	AU	NIFS	Resolving the Most Distant Spiral Galaxy at z=2.54	13.5
1	GN-2013A-Q-24	Kavelaars	CA	GMOS-N	Resonance Filling: tracking KBOs near the 5:1 Neptune resonances	7.0
1	GN-2013A-Q-25	Jha	US	GMOS-N	Adding to the Treasury: Spectroscopic Classification of High-Redshift Supernovae Discovered by HST (North)	11.2
1	GN-2013A-Q-26	Hinkle	US	NIRI	Imaging the debris cloud around Sakurai's object	1.0
1	GN-2013A-Q-27	Herbst	US	GNIRS	Planet Formation in the KH 15D Circumbinary Ring	9.0
1	GN-2013A-Q-28	Hall	CA	GNIRS	Searching for Binary Quasars via Narrow-line Redshifts for Quasars with Redshifted Broad Absorption Lines	9.9
1	GN-2013A-Q-29	Grundy	US	NIRI	Mutual Orbits and Masses of Kuiper Belt Binaries and Multiple Systems	12.5
1	GN-2013A-Q-30	Goncalves	BR	NIRI	Mapping the stellar mass distribution and dust extinction in extreme starbursts	5.8
1	GN-2013A-Q-31	Gladstone	CA	GMOS-N	Determining the nature of the brightest optical counterpart to an extreme ULX	3.4
1	GN-2013A-Q-32	Gezari	US	GMOS-N	Transient Spectroscopic Signatures of Tidal Disruption Events	5.0
1	GN-2013A-Q-33	Geballe	GS	GNIRS	Basic Physical Properties of the New H-Band DIBs	10.0
1	GN-2013A-Q-34	Galicher	CA	NIRI	Completing the follow-ups of the 300 stars of the International Deep Planet Survey (North)	14.8
1	GN-2013A-Q-35	Foley	US	GMOS-N	RAISIN: Tracers of Cosmic Expansion with SN Ia in the IR (North)	9.0
1	GN-2013A-Q-36	Escudero	AR	GMOS-N	Globular clusters and the origin of S0 galaxies in low density environment	2.6
1	GN-2013A-Q-37	Dupke	BR	GMOS-N	Measuring the distance to the most luminous intermediate-mass black hole candidate with Gemini	2.0
1	GN-2013A-Q-38	Desert	US	GMOS-N	Comparative Exoplanetology of Hot-Jupiter Prototypes (North)	15.0
1	GN-2013A-Q-39	Cucchiara	US/AU	GMOS-N	Exploring the first stars with rapid GRB follow-up observations (North)	14.4
1	GN-2013A-Q-40	Crenshaw	US	NIFS	NIFS Observations of the Seyfert 1 Galaxy Mrk 509: A Minor Merger Caught in the Act of Fueling the AGN?	6.8
1	GN-2013A-Q-41	Cenko	CA	GMOS-N	Probing the Central Black Holes of Distant, Quiescent Galaxies via Tidal Disruption Flares (North)	1.0
1	GN-2013A-Q-42	Caso	AR	GMOS-N	The globular cluster systems of NGC 3610 and NGC 3613	4.1
1	GN-2013A-Q-43	Cami	CA	GNIRS	A survey of near-IR DIBs.	16.0
1	GN-2013A-Q-44	Brodwin	US	GMOS-N	The Massive Distant Clusters of Wise Survey (MaDCoWS)	29.4
2	GN-2013A-Q-45	Zhou	AU	NIRI	Solving the Mystery of Inflated Brown Dwarfs	4.7
2	GN-2013A-Q-46	Young	US	GMOS-N	Feedback in 3C 277.3	7.0
2	GN-2013A-Q-47	Syphers	US	GNIRS	Finding an Accurate Redshift for a Unique He II Quasar	0.7
2	GN-2013A-Q-48	Storchi-Bergmann	BR	NIFS	Feeding and feedback in a hard X-ray sample of Active Galactic Nuclei	7.5
2	GN-2013A-Q-49	Scharwaechter	AU	NIFS	AGN feedback: The warmest molecular gas in the multi-phase outflow in 4C 12.50	4.5
2	GN-2013A-Q-50	Scarano Jr	BR	GMOS-N	Radial Metallicity Distribution at Corotation Radius of Spiral Galaxies.	7.4

Gemini North – 2013A Scientific Ranking (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
2	GN-2013A-Q-51	Rupke	US	GMOS-N	QSO Feedback in Action: Ionization and Dust in the Wind	10.0
2	GN-2013A-Q-52	Roe	US	NIRI	Titan's Methane Weather post-Equinox: \\ Seasonal climate change and large storm systems (North)	8.0
2	GN-2013A-Q-53	Reynolds	US	NIFS	The Mass of the Black Hole in the Galactic Microquasar GRS 1915+105	20.0
2	GN-2013A-Q-54	Quinn	US	NIRI	Close visual companions to transiting exoplanet host stars	12.3
2	GN-2013A-Q-55	Najarro	GS	GNIRS	Metallicity in the Quintuplet Cluster and the Galactic Center: Evidence for a top-heavy star formation history?	5.0
2	GN-2013A-Q-56	Monteiro-Oliveira	BR	GMOS-N	Line-of-sight structures in the merging cluster A2034	3.8
2	GN-2013A-Q-57	McGregor	AU	NIFS	Turbulence as the Star Formation Inhibitor in Radio Galaxies	6.0
2	GN-2013A-Q-58	McConnell	UH	NIFS	Black Hole versus Galaxy Growth in Different Cosmic Environments	24.0
2	GN-2013A-Q-59	Marchesini	US	GNIRS	Revealing the Monsters: GNIRS Spectroscopy of Ultra-Massive Galaxies at 1.5$<$z$<$3.0	28.0
2	GN-2013A-Q-60	Lützgendorf	AU	GMOS-N	Testing Black Hole Scaling Relations by Measurements of the SMBH in the Brightest Cluster Galaxy IC 1101	7.0
2	GN-2013A-Q-61	Lena	US	GMOS-N	Mapping sub-kpc gas flows in a sample of nearby, hard X-ray selected AGNs.	10.3
2	GN-2013A-Q-62	Lemoine-Busserolle	GS	NIFS	NIFS Observations of Turbulent Disks at 0.8<z<1.4: A Pilot Project Studying Disk Assembly	8.3
2	GN-2013A-Q-63	Leggett	Ge/US	NIRI	Near-Infrared Characterization of Y Dwarfs	9.8
2	GN-2013A-Q-64	Kepler	AR/BR	GMOS-N	Are all high mass white dwarf stars magnetic?	10.0
2	GN-2013A-Q-65	Jorgensen	US/Ge	GMOS-N	RDCS J0848+4453: Stellar populations in a z=1.27 galaxy cluster	26.0
2	GN-2013A-Q-66	Jofré	AR	GNIRS	Planet-metallicity correlation in M dwarf stars	3.5
2	GN-2013A-Q-67	Hsieh	UH	GMOS-N	Target-of-Opportunity Confirmation of Sublimation in Main-Belt Comets	3.0
2	GN-2013A-Q-68	Howell	US	GMOS-N	Early-time observations of Type Ia supernovae to reveal progenitor material (North)	10.0
2	GN-2013A-Q-69	Grundy	US	NIRI	Mutual Orbits and Masses of Kuiper Belt Binaries and Multiple Systems	12.5
2	GN-2013A-Q-70	Flagey	US	GNIRS	Hunting for missing massive stars in the Galaxy	13.8
2	GN-2013A-Q-71	Ferrero	AR	GNIRS	A High Resolution Near Infrared Spectral Atlas of O stars with Gemini	1.8
2	GN-2013A-Q-72	Fassnacht	US	NIRI	Quantifying the line-of-sight mass distributions to time-delay lenses	1.2
2	GN-2013A-Q-73	Farrah	CA/US	NIRI	Deep Near-Infrared Imaging of Extreme Starburst Galaxies at 3<z<7	27.8
2	GN-2013A-Q-74	Dhital	US	NIRI	The Extremely Extreme: Searching for Companions in Wide M-dwarf Binaries	16.0
2	GN-2013A-Q-75	Desert	US	GMOS-N	Comparative Exoplanetology of Hot-Jupiter Prototypes (North)	15.0
2	GN-2013A-Q-76	Cote	CA/US	GMOS-N	The Origin of Low-Mass, Early-Type Galaxies: A GMOS/IFU Survey of the Virgo Cluster (North)	30.2
2	GN-2013A-Q-77	Cobb	US/AU	GMOS-N	Exceptional Swift and Fermi GRBs: Gemini Standard Targets of Opportunity (North)	5.5
2	GN-2013A-Q-78	Cidale	AR	GNIRS	Revealing the mass-loss history of evolved massive stars	6.1
2	GN-2013A-Q-79	Chornock	US	GMOS-N	Unveiling the Explosion Physics of Nature's Most Luminous Supernovae (North)	8.0
2	GN-2013A-Q-80	Brown	US	NIRI	First detection of Kozai evolution in an astrophysical system	4.0
2	GN-2013A-Q-81	Bresolin	UH	GMOS-N	Metals in the star-forming extended disks of early-type galaxies	4.3
2	GN-2013A-Q-82	Bian	US	NIFS	Gas Kinematics in the Most Luminous Lyman Break Galaxies at $Z\sim3$	20.0
2	GN-2013A-Q-83	Beck	US	GNIRS,NIFS, NIRI	Revealing the Structure of Gas Mass Accretion in "The Ringworld" - GG Tau A	7.2

Gemini North – 2013A Scientific Ranking (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	urs
2	GN-2013A-Q-84	Balogh	CA	GMOS-N	Dead and dying satellite galaxies at z=1	51.0
3	GN-2013A-Q-85	Young	US	GMOS-N	Feedback in 3C 277.3	7.0
3	GN-2013A-Q-86	Wooden	US	GNIRS	Searching for organic nano-grains using GNIRS spectra of the naked eye comet C/2011 L4 (PanStarrs)	5.0
3	GN-2013A-Q-87	Urrutia-Viscarra	BR	GMOS-N	The structure, kinematics and nature of the TDG in the merger remnant NGC4656/7	5.9
3	GN-2013A-Q-88	Thanjavur	CA	GMOS-N	Geometric distance of M71 from radial velocity and proper motion dispersions of matched cluster members.	4.4
3	GN-2013A-Q-89	Szkody	US	GMOS-N	Uncovering the faintest cataclysmic variables in the SDSS footprint	13.1
3	GN-2013A-Q-90	Stovall	US	GMOS-N	The Hunt for the Companion of PSR J0636+51	6.0
3	GN-2013A-Q-91	Sonnenfeld	US	GNIRS	The mass assembly of early-type galaxies with SL2S	7.6
3	GN-2013A-Q-92	Sales	BR/US	GMOS-N	Mapping the Inner Structure of OH Megamaser Merger Galaxies	12.4
3	GN-2013A-Q-93	Rembold	BR	GMOS-N	Multicolor photometry of the cluster of galaxies DEEP2 VDM 33	2.1
3	GN-2013A-Q-94	Pracy	AU	GMOS-N	Obtaining the Cosmic Gas Mass Density from 21-cm in MgII Absorption Systems	18.0
3	GN-2013A-Q-95	Pike	CA	GMOS-N	Color in the Kuiper Belt: Size vs Class	26.1
3	GN-2013A-Q-96	Patience	US	NIRI	Confirmation of Substellar and Degenerate Companion Candidates	1.0
3	GN-2013A-Q-97	Oka	US	GNIRS	Morphology and Kinematics of the Galactic Center's Central Molecular Zone and Expanding Molecular Ring	10.0
3	GN-2013A-Q-98	Oio	AR	GMOS-N	Feedback in Narrow-Line Seyfert 1 Galaxies: unveiling the nuclear complex kinematics and star formation in SDSSJ093643.13+505249.6	6.7
3	GN-2013A-Q-99	Najarro	US	GNIRS	Metallicity in the Quintuplet Cluster and the Galactic Center: Evidence for a top-heavy star formation history?	9.0
3	GN-2013A-Q-100	Liu	US	GMOS-N	Quasar Feedback at the Peak of Galaxy Formation Epoch	10.0
3	GN-2013A-Q-101	Kaplan	US	GMOS-N	Understanding the Strange Metal-Rich Companion to PSR J1816	9.0
3	GN-2013A-Q-102	Hsieh	UH	GMOS-N	Characterization of the Nuclei and Active Behavior of Main-Belt Comets	18.0
3	GN-2013A-Q-103	Ho	UH	GMOS-N	Shocks and metallicity gradients in galaxy-scale lensed galaxies	6.0
3	GN-2013A-Q-104	Hall	CA/US	GMOS-N	Monitoring Emergent Absorption Troughs in Quasars (North)	14.1
3	GN-2013A-Q-105	Gamen	AR	GMOS-N	Searching for the progenitors of two galactic supershells (North)	4.2
3	GN-2013A-Q-106	Gagné	CA	GMOS-N	Spectroscopic confirmation of very low-mass stars and brown dwarf candidates in nearby, young moving groups	10.0
3	GN-2013A-Q-107	Emery	US	NIRI	Near-Infrared photometry of KBOs and Centaurs in support of Spitzer space telescope data.	14.0
3	GN-2013A-Q-108	Cote	GS	GMOS-N	The Origin of Low-Mass, Early-Type Galaxies: A GMOS/IFU Survey of the Virgo Cluster	6.0
3	GN-2013A-Q-109	Cidale	AR	GNIRS	Developing a near infrared diagnostic for magnetism in hot, massive stars	1.9
3	GN-2013A-Q-110	Bennert	US	NIRI	Exploring the Origin of the BH Mass Scaling Relations	17.1
3	GN-2013A-Q-111	Atlee	US	GNIRS	A Spectroscopic Study of the Contribution of TP-AGB Stars to Integrated NIR Starlight	11.0
3	GN-2013A-Q-112	Atlee	US	GMOS-N	Extinction and Stellar Populations of Star Formation-Dominated Dust-Obscured Galaxies	12.0
4	GN-2013A-Q-113	Beers	BR/US	GMOS-N	Missing metal-poor stars from the HK and Hamburg/ESO Surveys (North)	54.6

Gemini South – 2013A Scientific Ranking

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
C	GS-2013A-C-1	Eisenhardt	US	GMOS South	Hot DOGs: The Most Luminous Galaxies Found by WISE	20.0
1	GS-2013A-Q-1	Trujillo	GS	GMOS-S	Distant Solar System Objects	1.0
1	GS-2013A-Q-2	Treu	US	GMOS-S	Spectroscopic study of the environment of two time-delay lenses for accurate cosmology	5.7
1	GS-2013A-Q-3	Treister	CL	GMOS-S	Black Hole Growth in Bulgeless Galaxies	7.5
1	GS-2013A-Q-4	Tinney	AU/US/CL	GSAOI	Gemini MCAO Observations of WISE Y dwarfs	15.8
1	GS-2013A-Q-5	Stubbs	US	GMOS-S	Spectroscopy of Galaxies in Massive Clusters: \\ Galaxy Properties and Dynamical \\ Cluster Mass Calibration	9.0
1	GS-2013A-Q-6	Stairs	CA	GMOS-S	A Strange Companion to the Eclipsing Binary Millisecond Pulsar J1723-2837	5.7
1	GS-2013A-Q-7	Salter	AU	NICI	Imaging Anglo-Australian Planet Search companions	9.1
1	GS-2013A-Q-8	Saha	US	GMOS-S	Establishing a Network of DA White Dwarf SED Standards	21.5
1	GS-2013A-Q-9	Ryder	CL	GSAOI	GeMS Study of Supernovae in Luminous Infrared Galaxies	6.8
1	GS-2013A-Q-10	Romani	US	GMOS-S	Weighing the Most Extreme Black Widow	7.0
1	GS-2013A-Q-11	Rest	US	GMOS-S	Spectrophotometric Time Series of η~Carinae's Great Eruption	13.5
1	GS-2013A-Q-12	Reiter	US	GSAOI	Untangling the protostars and jets in HH 900	2.4
1	GS-2013A-Q-13	Onken	AU	GMOS-S	Australia's 2013 Gemini Astronomy Contest	2.0
1	GS-2013A-Q-14	Olsen	US	GSAOI	Observing an Ongoing Minor Merger in NGC 5128	10.8
1	GS-2013A-Q-15	Menezes	BR	GSAOI	Gaseous nebulae at the center of the Milky Way with unprecedented spatial resolution	4.8
1	GS-2013A-Q-16	McConnachie	CA	GSAOI	The space motion and stellar content of Galactic satellites seen with GeMS/GSAOI	8.0
1	GS-2013A-Q-17	Keller	AU	GMOS-S	Intermediate age star clusters in the LMC	1.5
1	GS-2013A-Q-18	Johnson	US/Ge	GMOS-S	A 10,000 Star Survey for Li-rich K giants in the Galactic Bulge	21.8
1	GS-2013A-Q-19	Jha	US	GMOS-S	Adding to the Treasury: Spectroscopic Classification of High-Redshift Supernovae Discovered by HST (South)	3.9
1	GS-2013A-Q-20	Janson	US	NICI	Probing the inner gap of a newly imaged debris disk	2.0
1	GS-2013A-Q-21	Janson	CA/US	NICI	Proper motion follow-up of young planet and brown dwarf candidates in Sco-Cen	2.2
1	GS-2013A-Q-22	Honda	JP	NICI	Observations of Water Ice Distribution in the HD169142 Disk	7.5
1	GS-2013A-Q-23	Geisler	CL	GSAOI	SEARCHING FOR FOSSIL RELICS OF THE GALACTIC BULGE FORMATION PROCESS	7.5
1	GS-2013A-Q-24	Galicher	CA	NICI	Completing the follow-ups of the 300 stars of the International Deep Planet Survey (South)	8.3
1	GS-2013A-Q-25	Foley	US	GMOS-S	RAISIN: Tracers of Cosmic Expansion with SN Ia in the IR (South)	9.0
1	GS-2013A-Q-26	Faifer	AR	GMOS-S	Confirming The Dual Nature of Ultra Compact Dwarfs	7.5
1	GS-2013A-Q-27	Desert	US	GMOS-S	Comparative Exoplanetology of Hot-Jupiter Prototypes (South)	10.0
1	GS-2013A-Q-28	Damineli	BR	GSAOI	The low mass end of the starburst cluster Westerlund 1	5.3
1	GS-2013A-Q-29	Da Costa	AU	GSAOI	Environment and the evolution of dwarf galaxies: Clues from the Cen A group	4.3
1	GS-2013A-Q-30	Cypriano	BR	GMOS-S	N&S Spectroscopy of gravitational arcs in a massive Planck Cluster	7.7
1	GS-2013A-Q-31	Cucchiara	AU/Ge/US/CL	GMOS-S	Exploring the first stars with rapid GRB follow-up observations (South)	12.4
1	GS-2013A-Q-32	Cobb	CL/AU/US/Ge	GMOS-S	Exceptional Swift and Fermi GRBs: Gemini Standard Targets of Opportunity (South)	6.5
1	GS-2013A-Q-33	Chapman	CA	GMOS-S	Hunting Cloverleafs -- GMOS-S and Flamingos-2 observations of radio-loud, extremely bright millimeter galaxies	20.0
1	GS-2013A-Q-34	Cenko	US/CA	GMOS-S	Probing the Central Black Holes of Distant, Quiescent Galaxies via Tidal Disruption Flares (South)	3.0

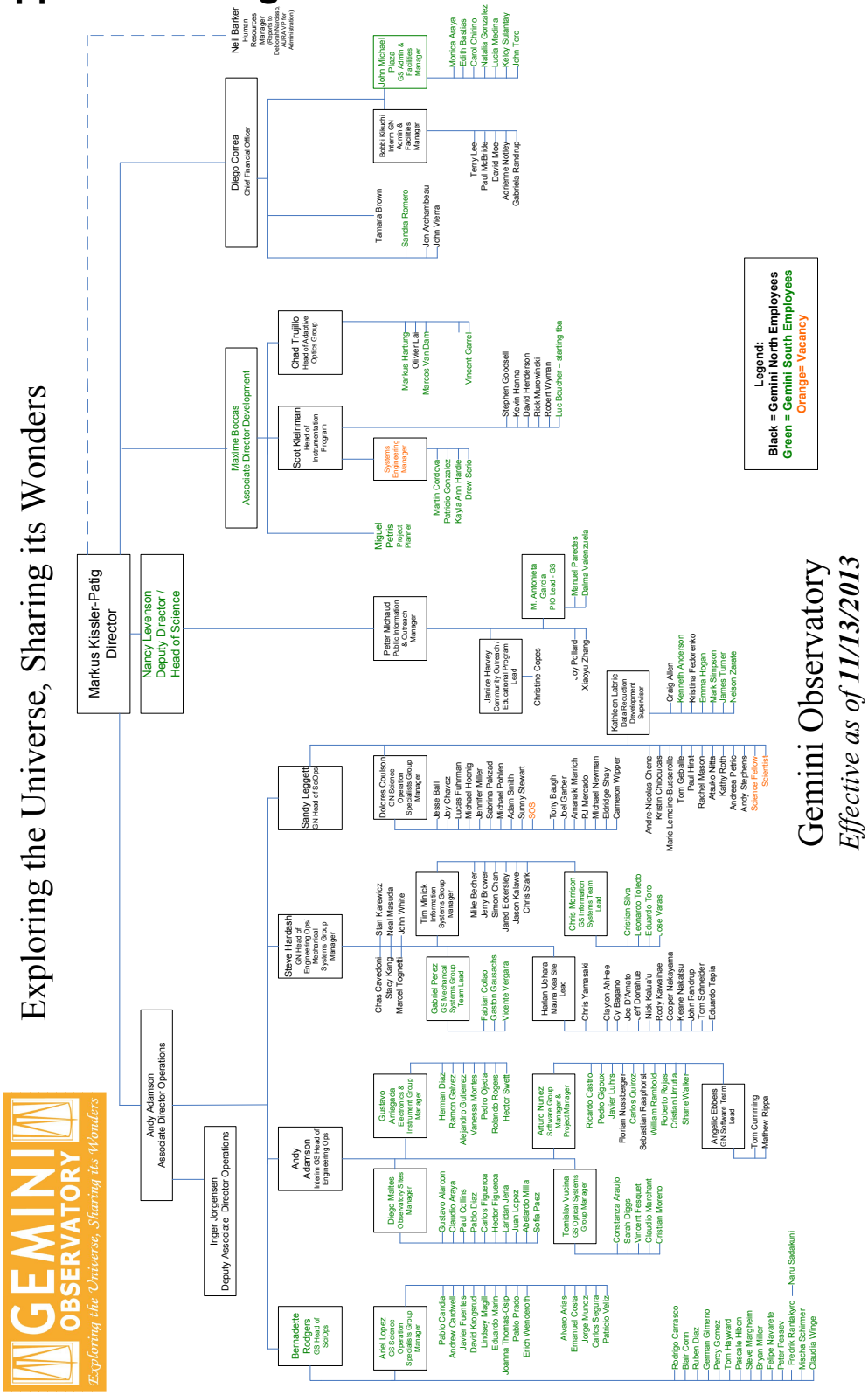
Gemini South – 2013A Scientific Ranking (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
1	GS-2013A-Q-35	Carrasco	GS	GMOS-S	Gemini Spectroscopy of an X-ray Outbursting Tidal Disruption Event Candidate	3.8
1	GS-2013A-Q-36	Cantalupo	US	GMOS-S	Ly-alpha imaging of dark protogalactic clouds and circumgalactic streams using z~2 quasars	45.0
1	GS-2013A-Q-37	Calderon	AR	GMOS-S	Spectroscopy of faint extended and compact stellar systems in the Antlia cluster	4.3
1	GS-2013A-Q-38	Bussmann	US	GMOS-S	The H-ATLAS 1000 lens survey: a pilot study	28.0
1	GS-2013A-Q-39	Bowler	US	NICI	An Efficient Search for Young Wide Planetary-Mass Companions	15.0
1	GS-2013A-Q-40	Barmby	CA	GMOS-S	HII regions in NGC 5128	14.8
1	GS-2013A-Q-41	Ammons	CA	GSAOI	A Test of GEMS Astrometric Precision for Exoplanet Detection and Mass Measurement	5.6
1	GS-2013A-Q-42	Alonso-García	CL	GSAOI	Multiple populations in the inner Galactic globular clusters	6.8
2	GS-2013A-Q-43	Winkler	US	GMOS-S	SNR Shocks and Cosmic Rays: a Critical Test in RCW86	12.2
2	GS-2013A-Q-44	Weidmann	AR	GMOS-S	Search of emission line star in nucleus of planetary nebulae	3.1
2	GS-2013A-Q-45	Stubbs	US	GMOS-S	Spectroscopy of Galaxies in Massive Clusters: \\ Galaxy Properties and Dynamical \\ Cluster Mass Calibration	5.0
2	GS-2013A-Q-46	Stanghellini	US	GMOS-S	Chemical evolution of two Sculptor galaxies through PN and HII regions abundances	18.8
2	GS-2013A-Q-47	Schreiber	CL	GMOS-S	Towards a global understanding of close binary evolution	13.0
2	GS-2013A-Q-48	Schirmer	GS	GMOS-S	Ultra-luminous galaxy-wide narrowline regions: Quasar light echoes? (South)	8.8
2	GS-2013A-Q-49	Roe	US	NICI	Titan's Methane Weather post-Equinox: \\ Seasonal climate change and large storm systems (South)	2.0
2	GS-2013A-Q-50	Rodriguez	CL	GMOS-S	Characterizing Newly Identified Young, Low-Mass Close to Earth	10.5
2	GS-2013A-Q-51	Richtler	CL	GMOS-S	Isolated ellipticals - key objects for the dark matter problem?	10.0
2	GS-2013A-Q-52	Ricci	BR	GMOS-S	Nuclear and circum-nuclear low ionization emission in massive galaxies	14.1
2	GS-2013A-Q-53	O'Toole	AU	NICI	Are all close binaries really in multiple stellar systems?	8.4
2	GS-2013A-Q-54	Nielsen	US	NICI	The Deepest Search for Planets Around Newly Identified Young, Nearby Stars	26.0
2	GS-2013A-Q-55	McConnell	US	GMOS-S	Black Holes in Luminous Southern Hemisphere Galaxies	12.5
2	GS-2013A-Q-56	Lena	US	GMOS-S	Mapping sub-kpc gas flows in a sample of nearby, hard X-ray selected AGNs.	8.4
2	GS-2013A-Q-57	Konstantopoulos	AU/CA	GMOS-S	What Are Tidal Tails Made Of?	8.0
2	GS-2013A-Q-58	Kong	US	GMOS-S	Orbital modulation of the black hole binary MAXI J1659-152	5.0
2	GS-2013A-Q-59	Johnston	AU	GMOS-S	The nature of the donor star in Cir X-1	5.5
2	GS-2013A-Q-60	Jeffery	US	GMOS-S	Deep Observations of the Open Cluster NGC 6253	23.4
2	GS-2013A-Q-61	Hughes	US	GMOS-S	Proper Motion of Oyxgen-Rich Ejecta Clumps in SN1006	2.3
2	GS-2013A-Q-62	Howell	US	GMOS-S	Early-time observations of Type Ia supernovae to reveal progenitor material (South)	10.0
2	GS-2013A-Q-63	Hou	CA	GMOS-S	Using group infall regions to study galaxy evolution	21.0
2	GS-2013A-Q-64	Hibon	GS	GMOS-S	Understanding the galaxy formation at z=3.1 with LEGOs (Ly-alpha emitting galaxy-building objects)	8.0
2	GS-2013A-Q-65	Gomez	CL	GMOS-S	The Globular Cluster - Black Hole connection in late type galaxies: the missing piece in the puzzle	3.0
2	GS-2013A-Q-66	Gagné	CA	GMOS-S	Spectroscopic confirmation of very low-mass stars and brown dwarf candidates in nearby, young moving groups	35.0
2	GS-2013A-Q-67	Fu	US	GMOS-S	Understanding the Nature of Submillimeter Galaxies with Gas Kinematics	9.4
2	GS-2013A-Q-68	Fernandes	BR	GMOS-S	Deciphering the star-formation scenario of the Sh2-296 nebula	9.4

Gemini South – 2013A Scientific Ranking (continued)

Band	Gemini ID	PI Name	Partners	Instrument	Title	Hours
2	GS-2013A-Q-69	Desert	US	GMOS-S	Comparative Exoplanetology of Hot-Jupiter Prototypes (South)	10.0
2	GS-2013A-Q-70	Desai	US	GMOS-S	The role of post-starburst galaxies in the growth of the red sequence in intermediate redshift clusters	20.0
2	GS-2013A-Q-71	den Brok	US	GMOS-S	A deep look into nuclear star clusters (South)	4.0
2	GS-2013A-Q-72	Currie	US	NICI	An Optimized NICI Imaging Search for Planets around Young Stars with Luminous Debris Disks	20.0
2	GS-2013A-Q-73	Chornock	Ge/US	GMOS-S	Unveiling the Explosion Physics of Nature's Most Luminous Supernovae (South)	9.0
2	GS-2013A-Q-74	Cellone	AR	GMOS-S	Internal kinematics of early-type dwarf galaxies with composite structure	7.2
2	GS-2013A-Q-75	Bordalo	BR	GMOS-S	Kinematics of stars and ionized gas in HII Galaxies	4.3
3	GS-2013A-Q-76	Walter	US	GMOS -S	The relation between quiescent novae, the V Sge stars, and SNe Ia progenitors	7.5
3	GS-2013A-Q-77	Vrtilek	US	GMOS -S	Imaging Black Hole and Neutron Star Binaries (South)	3.1
3	GS-2013A-Q-78	Schreiber	CL	GMOS -S	Towards a global understanding of close binary evolution	14.0
3	GS-2013A-Q-79	Sargent	US	GMOS -S	Identifying B[e] Supergiants in the Magellanic Clouds from Photometry	5.0
3	GS-2013A-Q-80	Pursimo	US	GMOS -S	Redshifts and Optical Identifications of TANAMI/Fermi AGN	16.6
3	GS-2013A-Q-81	Parsons	CL	GMOS -S	Searching for close double white dwarfs in the Sloan Digital Sky Survey	11.0
3	GS-2013A-Q-82	Menezes	BR	GMOS -S	AGN and nuclear cluster properties in Sc galaxies: a mini-survey	10.4
3	GS-2013A-Q-83	Li	US	GMOS -S	Measurement of redshift from a Blazar Candidate TXS 1530-131	2.3
3	GS-2013A-Q-84	Kepler	GS	GMOS -S	Are all high mass white dwarf stars magnetic?	4.0
3	GS-2013A-Q-85	Hou	CA	GMOS -S	Using group infall regions to study galaxy evolution	21.0
3	GS-2013A-Q-86	Hall	CA/US	GMOS -S	Monitoring Emergent Absorption Troughs in Quasars (South)	16.3
3	GS-2013A-Q-87	Ferreiro	AR	GMOS -S	Nature of the Nuclear HII region complex of the Minor Merger AM1219-430	5.6
3	GS-2013A-Q-88	Danehkar	AU	GMOS -S	A kinematic and ionization study of planetary nebulae with close-binary nuclei	8.0
3	GS-2013A-Q-89	Cavichia	BR	GMOS -S	Abundances of planetary nebulae in the barred spiral galaxies M83 and NGC 3627 (South)	4.8
3	GS-2013A-Q-90	Bussmann	CA	GMOS -S	The H-ATLAS 1000 lens survey: a pilot study	9.0
3	GS-2013A-Q-91	Beers	US	GMOS -S	Missing metal-poor stars from the HK and Hamburg/ESO Surveys (South)	54.6
3	GS-2013A-Q-92	Bannister	AU	GMOS -S	Investigation of an unusual radio variable	4.0
3	GS-2013A-Q-93	Andrews	US	GMOS -S	Continued Observations of Interacting and Dust Producing CCSNe	7.0
3	GS-2013A-Q-94	Ahumada	AR	GMOS -S	A library of spectral templates of representative open clusters	6.3
4	GS-2013A-Q-95	Beers	BR	GMOS-S	Missing metal-poor stars from the HK and Hamburg/ESO Surveys (South)	10.9

Appendix E. Organizational Chart



Appendix F. Acronyms and Abbreviations

A&G	Acquisition and Guiding units
AAO	Australian Astronomical Observatory
Altair	Altitude Conjugated Adaptive Optics for Infrared
ANU	Australian National University
AO	Adaptive Optics
ApJ	Astrophysical Journal
ApJL	Astrophysical Journal Letters
AURA	Association of Universities for Research in Astronomy, Inc.
CADC	Canadian Archive and Data Centre
CAS	(AURA) Central Administrative Services
CCD	Charge-Coupled Device
CP	Cerro Pachón
DR	Data Reduction
DSSI	Differential Speckle Survey Instrument
ESPaDOnS	Echelle Spectro-Polarimetric Device for the Observation of Stars
F2	FLAMINGOS-2, the Florida Multi-Object Infrared Grism Observing Spectrograph-2
FDF	Facilities Development Fund
FITS	Flexible Image Transport System
FTE	Full-Time Equivalent
FTZ	Foreign Trade Zone
GeMS	Gemini Multi-Conjugate Adaptive Optics System
GHOS	Gemini High-resolution Optical Spectrograph
GMOS	Gemini Multi-Object Spectrograph
GMOS-N	Gemini Multi-Object Spectrograph-North
GMOS-S	Gemini Multi-Object Spectrograph-South
GN	Gemini North
GNIRS	Gemini Near-Infrared Spectrograph
GPI	Gemini Planet Imager
GRACES	Gemini Remote Access to Canada-France-Hawaii ESPaDOnS Spectrograph
GS	Gemini South (or Gemini Staff, only in time allocation listing)
GSA	Gemini Science Archive
GSAOI	Gemini South Adaptive Optics Imager
HBF	Hilo Base Facility
HR	Human Resources
IDF	Instrument Development Fund
IDL	Interactive Data Language
IR	Infrared
ITAC	International Time Allocation Committee
KPI	Key Performance Indicator

LCH	Laser Clearing House
LGS	Laser Guide Star
LGSF	Laser Guide Star Facility
LLP	Large and Long Programs
MCAO	Multi-Conjugate Adaptive Optics
MK	Mauna Kea
MNRAS	Monthly Notices of the Royal Astronomical Society
NGO	National Gemini Office
NGSWFS	Natural Guide Star Wavefront Sensor
NICI	Near-Infrared Coronagraphic Imager
NIFS	Near-Infrared Integral Field Spectrometer
NIR	Near-infrared
NIRI	Near Infrared Imager and Spectrometer
NOAO-S	(US) National Optical Astronomy Observatory-South
NRC-HIA	National Research Council of Canada, Herzberg Institute of Astrophysics
NSF	(US) National Science Foundation
O&M	Operations and Maintenance (budget fund)
OCS	Observatory Control Systems
Ops	Operations
OT	Observing Tool
PASP	Publications of the Astronomical Society of the Pacific
PI	Principal Investigator
PIO	Public Information and Outreach
PIT	Phase I Tool
Q1	Quarter 1
QA	Quality Assessment
SOS	Science Operations Specialist
SPEC	Special grants and awards fund
STAC	Science and Technology Advisory Committee
STEM	Science, Technology, Engineering, and Mathematics
SV	System Verification
TAC	Time Allocation Committee
TCC	Telescope Control Console
UCG	Users' Committee for Gemini
US	United States
Y2Y	Year-to-Year
YTD	Year-to-Date
z	Redshift