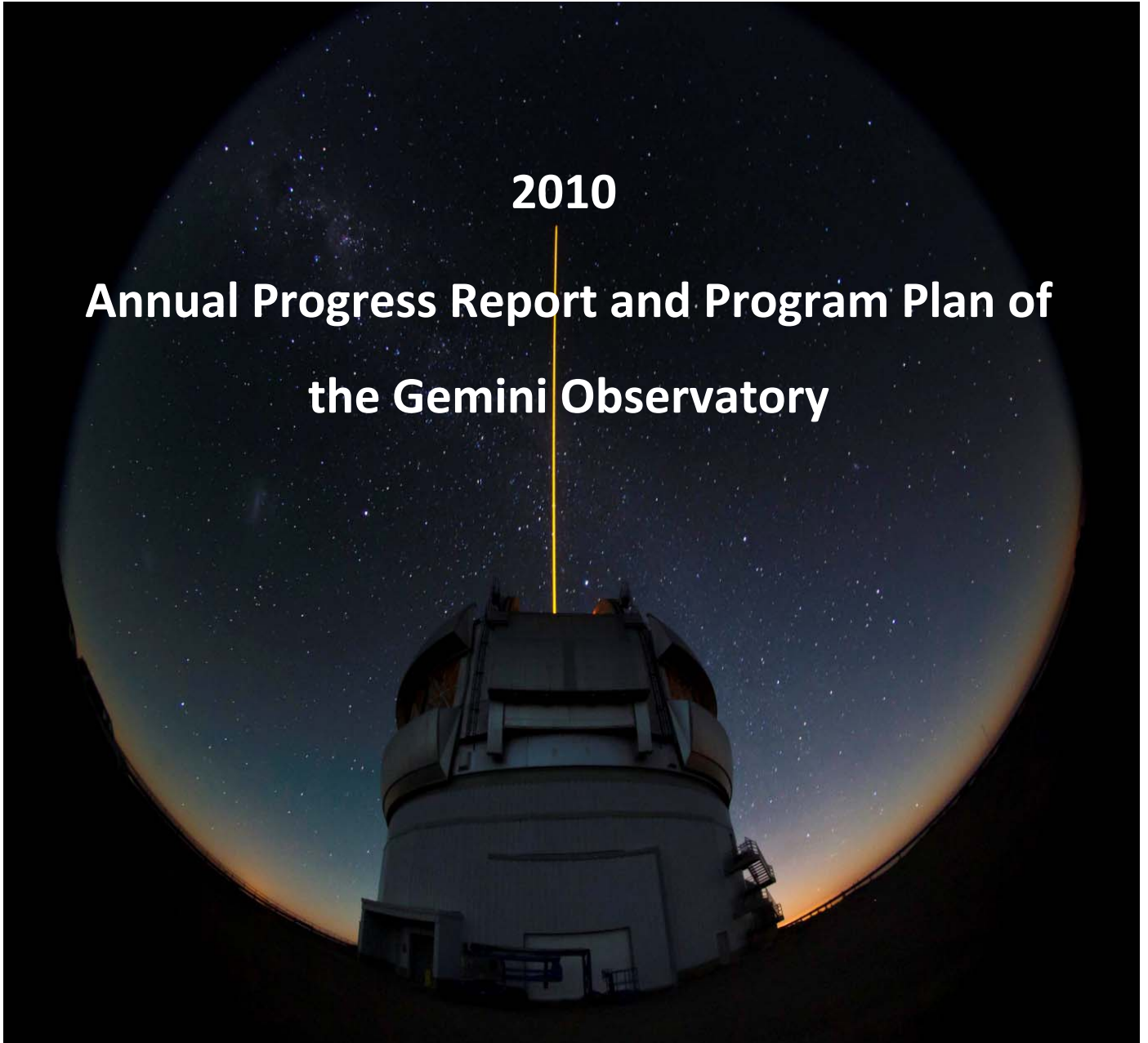




2010

**Annual Progress Report and Program Plan of
the Gemini Observatory**



Association of Universities for Research in Astronomy, Inc.

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Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.



Section 1

Director's Summary & Overview

Gemini Observatory / AURA / Travis Rector (U. Alaska Anchorage)

Gemini Observatory Legacy Image

1. Director's Summary and Overview

The Gemini Observatory is a forefront astronomy research facility. After transitioning from the energy and anticipation of the construction period to ongoing operations over the past decade, we now strive to achieve long-term sustainability, while also maintaining our competitive advantage, within a constrained budget. In the future, we will capitalize on the unique strengths built into the Gemini telescopes, leverage off synergies with other facilities, and allocate our finite resources to maximize the quality and quantity of our scientific product.

Gemini's budget challenge is not unique in the current global economic environment, and we have critically examined all aspects of operating Gemini as we seek to maximize research functionality to support our international community. While these budget reductions will result in some loss of capability and service to the scientific community, we aim to retain fundamental functions. The core requirements that determine the path forward, established by the Gemini Board in 2010, are:

- To deliver and operate high-quality instruments that represent the priorities of our community;
- To provide a high fraction of queue operations with appropriate data quality control, data products, and completion fraction;
- To have the ability to remotely operate the telescopes; and
- To better interface with our partner communities.

While seeking to fulfill these goals, we will take advantage of and develop our existing strengths, which include the international partnership. The partners bring diverse benefits and perspectives to the Observatory and enhance its scientific results. As operations and instrumentation become more complex, and the research questions more profound, international collaboration provides effective solutions. A second strength is the innovative instrumentation and operations capabilities of the Observatory. Merely supporting technical capabilities and operations as they currently exist with no further development would result in a facility that falls behind its competitors.

Within this framework, we present activity designed to have Gemini Observatory remain a world-class international facility, operating telescopes in both the northern and southern hemispheres. The transition to new operations requires short-term investments, which will provide for long-term sustainability under a reduced recurring budget in the future. A central element of this future includes developing advanced new instrumentation to meet the needs of Gemini's diverse and demanding community. Technology both enables and limits our discovery horizon in astronomy. National facilities like Gemini must strive to achieve a balance to ensure that a baseline of competitive instruments is always available, while pushing some research frontiers in bold new directions. This balance is never easy to achieve, but is essential for the long-term vitality and sustainability of Gemini, and it is reflected in the blend of instruments now offered and planned for development. While the exact details of the next generation of instruments is still evolving, what is clear is that we will provide our community with a combination of advanced laser-based adaptive optics systems and "workhorse" instruments, capable of effectively supporting a wide range of optical, near-, and mid-infrared programs.

Queue observing has proven to make efficient use of the Gemini telescopes to deliver scientifically useful data. We have evaluated the existing queue-based science operations in detail and identified its truly essential components, which are incorporated in our plans to carry Gemini forward. We will leverage existing investments and with additional development, reduce the net human effort of running

the queue. The key objective is to reduce the burden not only on staff, but on all users as they develop their observing programs.

In 2011 and beyond we also plan to develop base facility observing and move toward a remote telescope operations model. The advantages of this model, including long-term cost savings, are significant. The period of the transition presents a unique opportunity to introduce this modern and improved approach. We expect base facility observing to be a useful segue into more remote observing, such as from the partnership home countries.

The changes to improve interactions with the partner communities are more subtle, but they represent a crucial shift of attention throughout Gemini. While the National Gemini Offices will remain as a key interface between their local communities and the Observatory, the Observatory must directly engage with the scientific and technical members of the partnership and respond to their needs, considering both strategic goals and shorter-term interests. Greater visibility and communication between the Observatory's managing leadership and the partner communities is important, which continuing scientific and technical interaction further support. Restructuring scientific and user advisory committees will improve the partners' communication pathways.

Essential to all of this activity will be the maturing of Gemini's internal planning system that links and coordinates activity observatory-wide, promotes a working culture of open communication and accountability, and enables the wise allocation of resources to achieve our objectives. These signs of growth and evolution are all manifestations of a maturing observatory, rightfully taking its place alongside contemporary facilities that collectively serve as our primary portals on the Universe.

As we demonstrate in the following pages, Gemini has been a powerful tool for astronomical research. Concentrating on our core mission, our plans for the coming decade will ensure that Gemini stays in the forefront of research for the astronomical community. Equally important is the immense value of Gemini's ability to educate and inspire the public at large, young and old, most of whom have never experienced first-hand what a telescope can reveal about the universe.

1.1 Observatory Vitals and Key Strengths

Many entities compose Gemini Observatory, from the international partner agencies that created and sustain it, to the people that operate it, to the technology that enables it, to the creativity of the research community that harnesses it. Here we describe the basic ingredients of Gemini and what distinguishes this observatory from so many others.

1.1.1 The Gemini Partnership

Nearly 20 years ago, AURA—with the NSF—was instrumental in assembling an international group of astronomers and technologists who believed that they could build a unique, powerful, ground-based observatory with two telescopes, one in the Northern Hemisphere and the other located in the Southern Hemisphere. Each telescope's clarity of vision would rival that of the Hubble Space Telescope (HST), with a vast single-piece mirror having at least four times the collecting area of then existing telescopes.

As a result of these efforts, in 1993 the United States, United Kingdom, Canada, Chile, Argentina, and Brazil came together to form the government-to-government Gemini Partnership. The current partners are the United States, the United Kingdom, Canada, Australia, Brazil, and Argentina¹. Table 1-1 shows the national astronomy-research-funding agencies that compose the international Partnership under the International Gemini Agreement. They are listed in the order of their respective partnership shares.

Country	National Agency
United States	National Science Foundation (NSF)
United Kingdom	Science and Technology Facilities Council (STFC)
Canada	National Research Council (NRC-CRNC)
Australia	Australian Research Council (ARC)
Brazil	Ministério da Ciência e Tecnologia (MCT)
Argentina	Ministerio de Ciencia, Tecnología e Innovación Productiva (MCTIP)

Table 1-1: Current Gemini Partner Agencies

1.1.2 Twin 8 m Telescopes

Each of Gemini's two telescopes has a high-quality, 8 meter monolithic primary mirror. These highly automated telescopes

incorporate active and adaptive optics to produce very high-resolution systems. Moreover, they take advantage of two of the highest-quality established observing sites on the planet and collectively provide full coverage of both the Northern and Southern skies. Gemini's most widely known distinction among other 8–10 m class observatories is its highly optimized infrared (IR) design. The telescopes employ unique sputtered multi-layered silver coatings on their primary, secondary, and tertiary mirrors that, together with other facets of their design, achieve extremely low emissivity, diffraction-limited performance at near-infrared (NIR) and mid-infrared (MIR) wavelengths, and smooth stable point-spread functions (PSFs). This performance combination renders Gemini the world's most sensitive ground-based telescopes at MIR wavelengths.

The Gemini North telescope is one of the four largest optical/infrared telescopes that stand in the summit region of Mauna Kea about 4175 m (13,700 ft) above sea level on the Big Island of Hawai'i. Mauna Kea's summit is acclaimed as the world's premier Northern Hemisphere observing site, being surrounded by a thermally-stable tropical sea, bathed in dry trade winds above the inversion layer, atop a massive mountain with very gradual slopes, and absent of major sources of light pollution. In the south, sharing much of the common infrastructure with the other AURA-managed facilities on Cerro Pachón and nearby Cerro Tololo, the Gemini South telescope stands on a ridge in the Andes at 2743 m (9000 ft) elevation on Cerro Pachón. Located some 300 m from the 4 m SOAR telescope, Gemini South's location has proven to be one of the best-developed observing sites in the Southern Hemisphere.

Each telescope feeds a modern suite of imagers and spectrometers, which collectively provide the Gemini community with access to the optical, near-infrared, and mid-infrared ground-accessible spectral windows. Each telescope nominally mounts three instruments concurrently, plus an adaptive optics (AO) system that can feed any instrument, and a calibration system, all on a Cassegrain turret. Redirecting the beam with a movable mirror allows rapid instrument changes and on-the-fly responses to changing sky or instrument conditions, or time-critical observations. The instruments are normally mounted for periods of many months, which avoids lost observing time and cost due to frequent remounting. The instruments are highly integrated into Gemini's control systems and facilitate queue as well as classical observing.

¹ Australia joined the Partnership in 2000. In 2003, Chile reduced its participation to that of an observing-site host.

Gemini's Hilo Base Facility (HBF) is located on the University of Hawai'i-Hilo campus. The facility provides office and lab space for science, engineering, and administrative staff, and supports data processing and other operations needs. Like its counterpart in Hilo, the Gemini South Base Facility (SBF) overlooks the Pacific Ocean but from La Serena, Chile. The SBF provides office, lab, and meeting space for science, engineering, and administrative staff, network and data-processing equipment, and a remote operations room. It is located within the same gated compound as the operations bases for the AURA-operated CTIO and SOAR observatories.

1.1.3 Science Operations – Optimizing Scientific Return

Time on the Gemini telescopes is awarded to each of the partner's national communities in proportion to the partner's financial contribution to capital investments and operating costs of the Observatory. Each partner has its own National Gemini Office (NGO), which acts as the interface between the local community and the international Gemini Observatory. The NGOs interact with the Observatory on many planes. These include managing a National Time Allocation Committee (NTAC) in each respective country. The NTACs collect the observing proposals from their respective constituents each semester and conduct peer reviews to evaluate and prioritize them.

The results of all of the NTAC deliberations are then forwarded to the International Time Allocation Committee (ITAC), composed of representatives of the national partners and the Observatory staff. The ITAC merges all of the national evaluations and reaches a consensus prioritization of the entire set. The result is the grouping of all the proposals into three broad scientifically prioritized sets, referred to as Bands 1, 2 and 3, where Band 1 is the highest-priority set and Band 3 is the lowest. The Observatory then devises a plan to schedule the Bands within the overarching national allocations. Given the size of Gemini's community and total time available, this process by design results in an oversubscription of observing time. The Observatory's challenge, then, is to obtain high-quality data for as many programs as possible, ranked by Band, in each given semester.

1.1.4 Classical and Queue-Based Operations

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

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

1.1.5 A World Class Staff

Part of Gemini's success to date is attributable to Gemini's staff. They are diverse, competent, and passionate about ensuring that they provide the highest quality scientific product possible. They consist of over 20 nationalities and are the heart of what it means to run a truly international partnership. Integrating facilities that are 10,000 km apart to function seamlessly under a two-telescope one-observatory paradigm has been essential to the overall success of the Observatory, and this is a reflection of the adaptability and ingenuity of Gemini's staff.

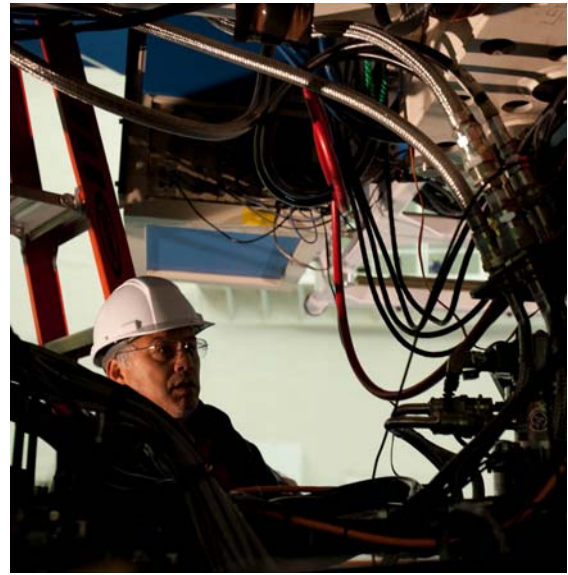


Figure 1-1: Gemini's staff consists of a highly diverse blend of scientific, technical, and administrative expertise. Operating a pair of 8 m telescopes as a single observatory across 10,000 km is a complex undertaking – one that is made possible through a dedicated team focused on providing our user community with superb service and capabilities.



Section 2

Gemini Science Achievements, Users & Staff Research Programs

Gemini Observatory/ AURA/ Sydney Girls High School Astronomy Club/
T. Rector/ A. R. Lopez-Sanchez (AAO)/ Australian Gemini Office

Gemini Observatory Legacy Image

2. Science Achievements

The international user community continues to benefit from the range of observing capabilities and observing modes, along with the full-sky access that Gemini offers. The optical and infrared imagers and spectrographs are widely-used workhorse instruments. Adaptive optics further pushes these capabilities, and users have taken advantage of the NIR instruments that can be used in this mode, making AO a regular part of Observatory operations. We continue to introduce new capabilities. Commissioning of GNIRS on Gemini North began during this report period, with strong demand for significant science programs during system verification time. The results of these programs will begin to emerge over the next year.

This year's science highlights show mature use of other recent offerings, especially NIFS in the North and NICI in the South. Beyond the obvious benefit of simultaneous spatial and spectral information inherent to integral field spectroscopy, NIFS can be enhanced with AO using either natural or laser guide stars, and it remains the most sensitive NIR integral field spectrograph on an 8m-class telescope. The strength of NICI is contrast, reaching $\sim 10^{-6}$ with the coronagraphic mask in place. Even without use of the coronagraph, the simultaneous imaging at H and K bands enhances contrast, where comparison of the different wavelength images can help distinguish faint companions from static speckles.

2.1 The First Generation of Star Formation in a Distant Galaxy

Swinbank and collaborators used NIFS to measure star formation in a $z = 4.92$ galaxy, which emitted light at the time when the Universe was just over a billion years old (Swinbank et al. 2009). Fortuitously, a foreground cluster, MS 1358+32, serves as a gravitational lens to amplify the background galaxy's emission. The NIFS data show a total star formation rate of at least $42 M_{\text{sun}}/\text{year}$, which would be sufficient after 15 million years to account for the observed mass of stars currently detected in Hubble Space Telescope (HST) and Spitzer Space Telescope observations, $M_{\text{stars}} = 7 \times 10^8 M_{\text{sun}}$. However, most of the total mass of the galaxy is not already in stars so the galaxy probably has a reservoir of material to continue building its stellar mass.

Other measurements indicate that the galaxy's stars are relatively young. Together, these findings suggest that we are seeing this galaxy's first episode of star formation. This example offers a unique insight into how the oldest stars in the Galaxy may have formed. The new star formation is concentrated in several distinct areas, not the galaxy's nucleus. These stellar nurseries exhibit star formation rates that are unusually high for their size compared to star-forming regions in the Milky Way or typical areas of other nearby galaxies, although they are similar to the extreme cases of starburst galaxies.

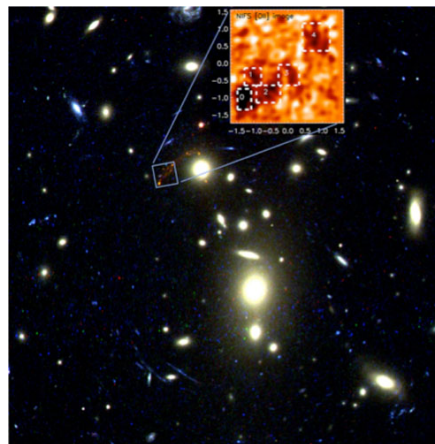


Figure 2.1 - The foreground cluster apparent in this Hubble Space Telescope image acts as a gravitational lens, allowing the measurement of star formation from the [O II] emission in the NIFS observation (dark patches of inset).

2.2 Galactic-Scale Outflow at $z=2$

The intergalactic medium is observed to be enriched in metals (elements more complex than helium) compared with primordial abundances, which requires early generations of star formation to produce the metals and a process to expel them from the galaxies in which they formed. The galactic outflows

responsible for this enrichment must therefore be extremely energetic for the material to escape a galaxy's strong gravitational pull. Alexander et al. (2010) find direct evidence for such a galactic superwind in the $z = 2.07$ sub-millimeter galaxy SMM J1237+6203 using the spatial and spectral coverage NIFS provides. Specifically, the team measures spectrally broad [O III] emission that is correlated with the largest velocity offsets, which is characteristic of a galaxy-wide outflow.

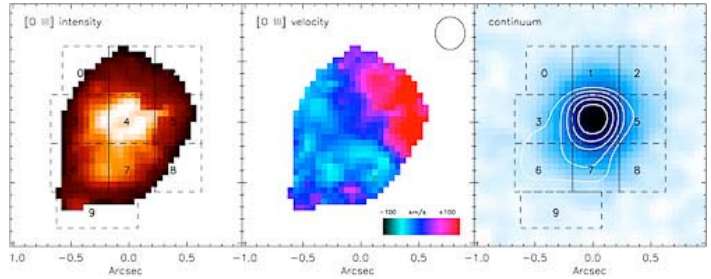


Figure 2.2 - [O III] intensity (left), narrow [O III] velocity map (middle), and line-free continuum image (right) show significant variations on sub-arcsecond scales.

Outflows and superwinds are also important as the likely source of feedback that suppresses further star formation, thus accounting for the sharp decline in the cosmic star formation rate since its peak at redshifts between $z = 2$ and 3. Either the stars themselves (through winds and supernovae) or winds and jets associated with the active galactic nucleus that is present could provide the energy to drive the outflow in this case. Moreover, the total energy of the outflow (integrated over time) is comparable to the binding energy of the galaxy spheroid.

2.3 A Close Substellar Companion to a Young Solar Analog

The first discovery from the Gemini NICI Planet-Finding Campaign reports a substellar companion to PZ Tel, a K0 star located at a distance of 51 pc (Biller et al. 2010). The projected separation between the two objects is $0.33''$, which corresponds to 16.4 AU. Multiple observational epochs confirm the common proper motion of the primary star and PZ Tel B, as opposed to being a chance projection. The multi-wavelength observations yield an estimated mass of $36 \pm 6 M_{\text{Jup}}$ in this young (~ 12 Myr) system. With colors corresponding to spectral type of M7, “this object will be a new benchmark companion for studies of ultracool, low-gravity photospheres,” according to the team. The orbit of the brown dwarf is very eccentric, yet the measured $70\mu\text{m}$ excess of PZ Tel implies that its dusty circumstellar region has not yet been significantly disrupted.

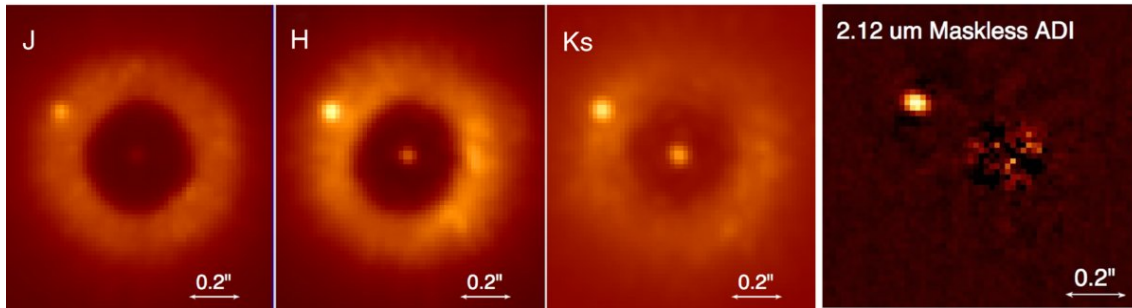


Figure 2.3 - (left) Direct imaging with NICI clearly shows PZ Tel B, and the primary at the center of the images appears faint through the translucent focal plane mask. (right) Most of the light of the primary has been subtracted with the angular differential imaging processing of maskless images.

2.4 Resolving Extragalactic Stellar Populations to Trace Galaxy Formation

Very deep NICI images of five regions in the outer envelope within the disk of the spiral galaxy M83 reveal some of the faintest stars ever detected in the infrared using a ground-based telescope.

Photometric measurements extending fainter than $K = 23$ yield ages of asymptotic giant branch (AGB) stars in color-magnitude diagrams. Davidge (2010) finds evidence for galaxy development from the inside out, with the star formation occurring later in the outer regions than in the interior. This conclusion has profound implications for models of galaxy formation. Rather than be monolithic entities that formed all at once, galaxies do grow and change over time, albeit slowly. Specifically, a large galaxy like M83 probably accreted intergalactic material that then became dense enough to form stars in the process. M83 shows evidence for development over a 10 billion year timescale. In contrast, distant galaxies of the early Universe have not had time to undergo these later stages of evolution.

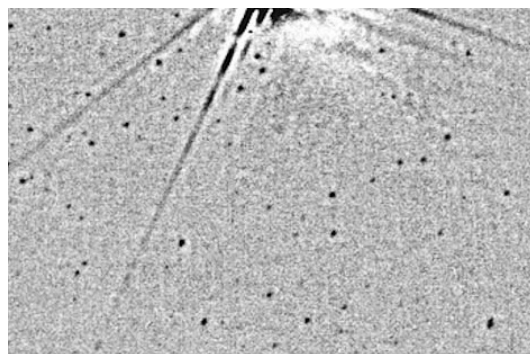


Figure 2.4 - A portion of the NICI H band field of view (approximately 4" x 10") shows individual resolved stars in M83. The spikes are due to the bright star used for AO correction.

2.5 Staff and Community Users Research Programs (Semesters 2009B and 2010A)

Once again the Gemini-N and Gemini-S telescopes were predominantly operated in queue mode during the semesters for which this report applies. The demand in recent semesters is plotted in Figure 2.5. The systematically higher demand for time at Gemini-N is likely due to the greater range and capabilities of instruments that are deployed at Gemini-N. As described elsewhere in this report, that imbalance in capabilities is being addressed through new instruments and/or upgrades at Gemini-S including GEMS, GSAOI, FLAMINGOS-2, GPI, and GMOS-S CCD upgrades.

Detailed information about the programs incorporated into Gemini's queue (Bands 1-3) during 2009B and 2010A can be found in Appendix I. This includes program ID, name and nationality of the PI, the title of the program, instruments used, and amount of time awarded. Publications stemming from research or work conducted by Gemini's science and engineering staff can be found in Appendix II. This Appendix also includes publication information based upon Gemini observing programs completed by our international science community. Combined, these important metrics of various science programs give an indication of the breadth and sophistication of the research that is being conducted on a regular basis using the Gemini telescopes.

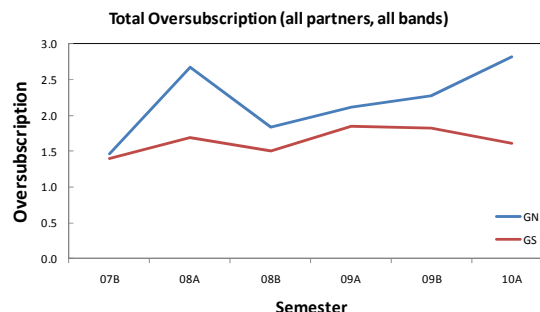
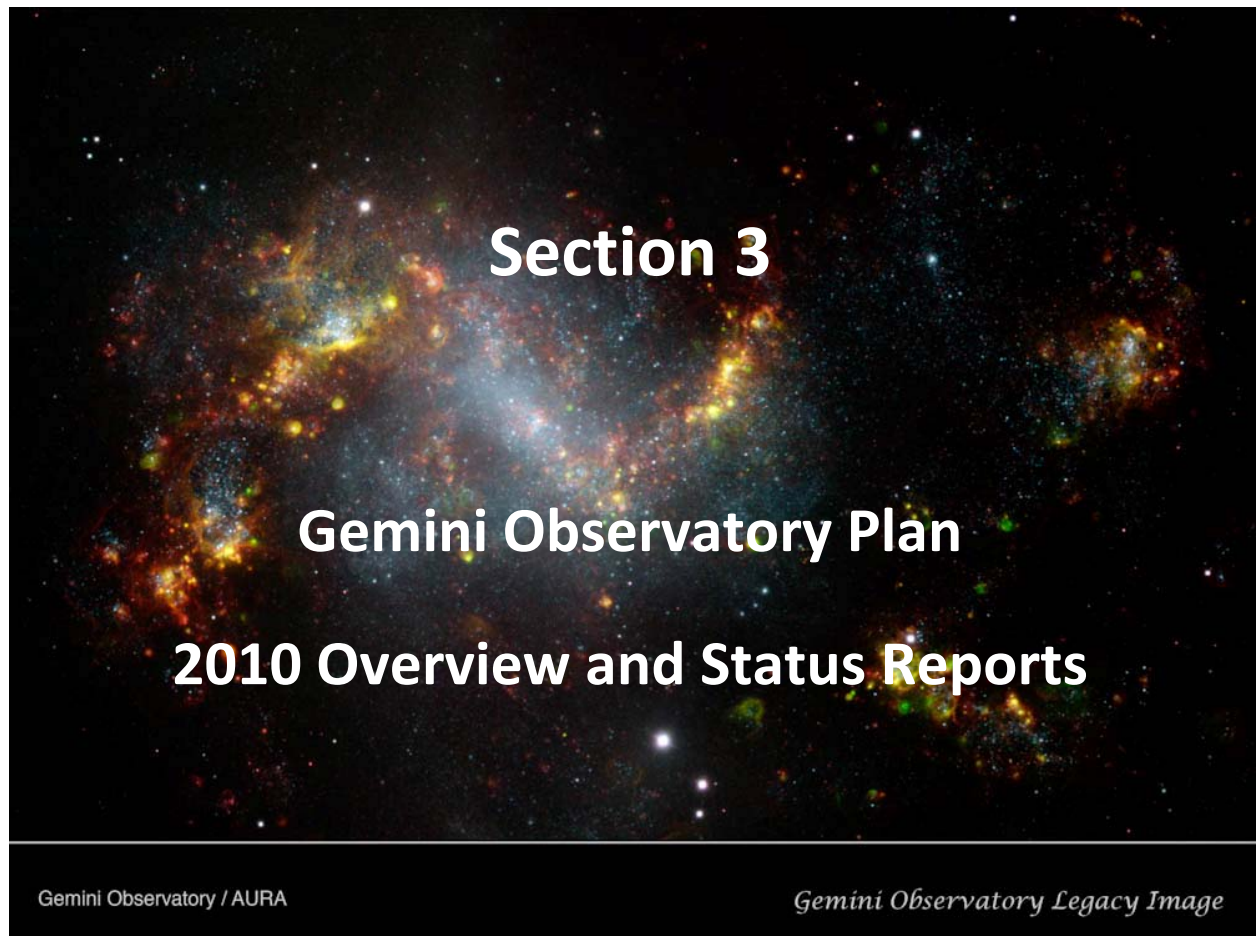


Figure 2.5 – The oversubscription rate at Gemini-N/S during the past several years is shown. The N/S difference is likely due to more popular instruments in use in Hawaii. That situation is being rectified through activity described in this report.



Section 3

Gemini Observatory Plan 2010 Overview and Status Reports

Gemini Observatory / AURA

Gemini Observatory Legacy Image

3. 2010 Observatory Plan Execution & Accomplishments

This section includes summary descriptions of work conducted across the various branches of the observatory during 2010. Additional information is provided at the end of this section in the form of tables listing project titles, summaries, and levels of completion achieved during the year. This format of reporting was adopted several years ago in an attempt to increase visibility into Gemini by essentially all elements of Gemini's community, Board, funding agencies, and stakeholders. It is designed to allow quick analysis of activity, which is particularly valuable from a management standpoint.

3.1 Directorate

3.1.1 DIR09-004 - Energy Planning Oversight & Control

In the previous year Gemini launched an energy conservation program as part of its strategy to “green” the observatory. This multidisciplinary project is primarily led by AFG but has strong technical support of Gemini engineering. This project is on-going and is manifest in various ways including the formation of a “recycling center” adjacent to the SBF, a campaign to monitor various electrical subsystems to get a baseline measurement of electrical demands, and the discontinuation of paper cups and plates at staff events. Another example of work done as part of this fairly broad initiative is the installation of new variable frequency drive amplifiers for motors on the summits. These “smart” systems monitor demand and modulate power accordingly. Finally, one of the largest offshoots from this program is a serious exploration in the use of solar panels to help power the HBF and perhaps the Mauna Kea facility. The basic approach under consideration involves the use of a commercial provider of the solar panels and inverters, who would make most of the capital investment and then sell power back to Gemini at a reduced rate compared to commercial power. Given that the Big Island has the highest cost of electricity in the entire US, the savings from this approach is significant (estimated up to ~\$50K/yr). A similar approach for the Gemini-S facilities is not financially attractive given the cost of solar systems and lower cost of electricity, making the time to recover the investment considerably longer.



Figure 3.1 – A study to evaluate the possibility of installing solar power at Gemini-N was conducted as part of a broader initiative to “green” Gemini.

3.1.2 DIR10-005 - MCCWG Staff Training Classes

The Managing Communications and Commitments Working Group has performed essentially all of the work under this project. It is listed as a Directorate level project primarily to reinforce its importance and to help instill the importance of this group's efforts, in the context of nurturing Gemini's working culture. This group has provided a number of classes to the entire staff dedicated to improving Gemini's communications and ability to make and keep commitments. Classes involve everything from the better use of e-mail to improving the way Gemini conducts meetings (creating good agendas, minutes, actions, follow-up). They are also central to further development of internal on-line systems used for everything from property tracking to leave requests, reducing paper work and the amount of administrative effort required to sustain operations. This MCCWG effort is substantially driven on a voluntary basis by about a

half dozen staff members who are particularly passionate about improving Gemini's management functions. Given the communications challenges intrinsic to a highly distributed organization like Gemini, where staff members have job function inter-links but are separated by many time zones, streamlining the methods we use to communicate is an important matter that deserves continual attention and improvement.



Figure 3.2 – The MCCWG has conducted dozens of classes at both Gemini sites to improve and modernize the methods used to conduct communications across Gemini.

3.1.3 DIR10-006 – Establish Concerns/Suggestions Blog

Another Directorate level initiative that was completed in 2010, along the lines of what has been described above, is the creation of several Blogs that enable electronic transmission of information,



Figure 3.3 – A number of Blogs now exist across the Directorate that are used to inform and transmit information to the staff in a convenient electronic format.

support Q&A, and give regular updates about important events at Gemini. The Observatory developed a Blog policy and standardized method for establishing and maintaining Blogs as another modern means of improving communications. These Blogs are used regularly to post everything from documents that can be used staff-wide for planning purposes, to links to the Director's staff presentations, to updates on scheduled activity within the Directorate that may be of interest to the staff. Overall this has been a fairly popular addition to the toolkit available to communicate with the staff. Gemini does not have a "one size fits all" mechanism for communications, so while this method is effective in many cases, for many others on the staff other methods are needed.

3.2 Administration and Facilities Group

3.2.1 AFG-010-002: Earthquake Risk Mitigation

This project is designed to ensure that all of the facilities (summits and base facilities) are protected to the maximum extent practical against earthquakes from damaging the facilities and causing harm to the facilities (base and summit) and staff. This is part of the on-going effort since the 2006 Big Island earthquake struck Gemini-N, disabling the telescope for a month. In the base facilities this project includes securing any large office items (e.g., bookshelves) against earthquakes. On the summits measures have been taken to secure large equipment including compressors and UPS units which, if toppled, could lead to significant downtime to the telescopes, damage to nearby equipment, and even to people. In the Hilo FTZ warehouse, this project leads to more careful stacking of heavy equipment and materials to help ensure that they do not come off shelves in the event of an earthquake. In other words this project basically touches all aspects of the Gemini facilities as a preventative means to reducing the impact of the earthquakes what will inevitably strike both Gemini sites, over their lifetimes.

3.2.2 AFG-010-004: Security Measures - Keyless Access

In 2010 Gemini-N began using an electronic security system at its base facility. This system is a spin-off of that used at NOAO and in fact uses a computer registry in Tucson as part of the database that enables electronic cards to be enabled and disabled. This project is linked to our Cyber-security program, which in turn is driven by NSF requirements on electronic data management within large NSF facilities. It is designed to help ensure that only staff or visitors directly associated with Gemini staff members are in the Gemini facilities and have access to critical equipment.

Overall this project was handled extremely well and is complete at the HBF. Key scan cards were issued to the entire staff and new electronic locks installed on all of the HBF doors except one, which serves as an ultimate backup in the event of a lengthy power outage that could render the key scan system off-line. The project was originally scoped to include Gemini-S. However, given resource conflicts and since the SBF is located on the AURA Recinto, which provides a fair amount of security already, it has not be extended to that facility. Likewise, due to concerns about nighttime safety and the logistics of operating a key scan system on the summit of Mauna Kea, conventional locks are still used there.

3.2.3 AFG09-011: In-house Travel Ticketing

Gemini's geographically distributed nature has led to a significant reliance on travel compared to most observatories that are relatively self-contained in a single location. To reduce costs the staff is subcritical in size to run both sites separately, so many on the staff travel between sites on a regular basis to bring extra effort and/or unique expertise to the other Gemini site. As a means to better coordinate travel and reduce costs Gemini's administrative group completed a multi-year project in 2010 to have a certified travel agent as a member of the staff who is able to book/change/search for flights in a manner that is optimal for travel efficiency and cost reduction. While the Gemini travel office is based in the HBF, through cross-training a parallel capability exists at Gemini-S so that between these two components of the Observatory's administrative services, a single comprehensive travel support service is available to the staff.

The results of this new capability have been very encouraging. The staff in general has recognized an improvement in how travel is being coordinated while travel costs have been cut since Gemini is in direct control of defining itineraries, rerouting staff who get stuck at airports, etc. In many ways this project is a model for other facilities that have a high reliance upon staff travel to learn from as it clearly demonstrates that cutting costs while improving service is possible with some out-of-the-box thinking about how to structure our team.



Figure 3.4 – The new Keyscan system was installed at Gemini-N, providing a number of modern conveniences while also increasing the security of facilities. Shown here is an early “prototype” card that was used to explain to the staff how the new system works.



Figure 3.5 – One of the more far reaching changes within Gemini's administrative services is the addition of an in-house travel office, led by a certified travel agent, which provides superb travel support for Gemini's on-the-go staff.

3.2.4 AFG-010-007: LEED Compliance Feasibility

Certification of buildings under the US Leadership in Energy and Environmental Design (LEED) program is growing in importance as facilities become more aware of energy conservation and their carbon footprint. Gemini used an intern, working on concert with our administrative group, to assess the applicability, benefits, and costs of implementing LEED standards to the HBF during 2010. LEED certification touches upon essentially all facility aspects, including cooling/heating, water use, sustainability, materials used for construction and daily operations, and environmental impact. Achieving LEED certification is a prestigious goal and is consistent with strategic objectives in energy conservation that are broadly supported by governments and communities globally.



Figure 3.6 – Determining the requirements and assessing the possible benefits of LEED certification of Gemini’s facilities was an important part of the Observatory’s overall green initiative.

The result of Gemini’s analysis of the costs and benefits of achieving formal LEED certification was that, while clearly desirable, achieving full LEED certification is not cost effective in Gemini’s current/declining budget situation. Many of the objectives of certification have already been put in place (e.g. new HVAC units in the HBF, recycling initiatives at all Gemini facilities, etc.) so in a sense the “low hanging fruit” had already been picked and the additional effort/cost of LEED certification was not practical given resource constraints. Nonetheless, this analysis made an ideal intern project and yielded valuable insights into how LEED certification works and how, under more favorable circumstances, it could have been implemented at Gemini. In general we encourage other large facilities to assess the issues and options for LEED certification of their buildings, since circumstances will naturally vary from one facility to the next but the long term benefits of such a program are clear.

3.3 Human Resources

3.3.1 HR 10-001: Mentoring Program

This innovative program was launched in 2010 as part of AURA’s overall initiative to nurture a diverse workforce. Led by Gemini’s HR team and with outstanding support from the International Mentoring Association, the program featured all-day training in the objectives and techniques of mentoring at both Gemini sites. This training included topics like –

- Installing Gemini’s Mentoring Initiative
- Attributes of Successful Mentors
- Building Mentoring Relationships
- Experiencing the Mentoring Relationship
- Practicing mentoring through group role playing

This program is specifically focused on junior members of the science and engineering



Figure 3.7 – Developing a robust mentoring program is an important part of Gemini’s program, to foster career development of our younger staff members and tap expertise along new dimensions of the more seasoned staff members.

staff, but also extends to external students that are pursuing careers in astronomy. At this point about 30 members of Gemini's staff are actively participating in this mentoring program – a testament to the positive working culture that Gemini's staff has nurtured as a means of building career development bridges for Gemini's younger staff members.

3.3.2 HR10-013: Change Management Training

An essential component of managing Gemini's downsizing over the next several years has been through Change Cycle training for the staff. This has been handled through the help of a professional consultant (an occupational psychologist) that has not only provided training to Gemini's management team but cross trained Gemini's HR manager to make it possible for this training to be offered to the entire Gemini staff. In general this training has been very well received as many have recognized its

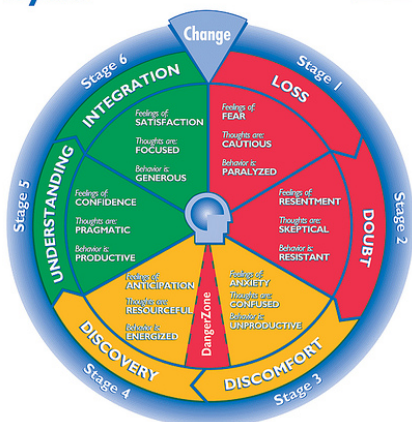


Figure 3.8 – Understanding the “Change Cycle” is central to understanding how to not only cope with but ultimately benefit from the inevitable changes that are found not only in the workplace, but throughout life.

applicability to essentially any form of change that occurs in life. By explaining the normal reactions people have to unanticipated (and unwanted) change, including a sense of loss and doubt that eventually transforms into the discovery of new opportunities and ultimately integration back into a new set of possibilities. This training is part of a broader program at Gemini to minimize the impact of the significant (~30 FTE) staff reductions that are necessary to adapt to our reduced budget. Beyond Change Cycle training, it also includes efforts to retain key members of the staff, utilize a variety of communication methods to provide regular updates to the staff on key issues, and provide transitional support for those who no longer have a position at Gemini.

Like other aspects of Gemini's staff development efforts and projects designed to reduce costs while preserving core capabilities, the Change Cycle training is an interesting component of Gemini's Transition Plans that may serve as a useful example for other facilities to study.

3.4 Information Systems

3.4.1 ISG10-009: MK Summit Server Upgrades/Replacements

This important project involved identifying all of the Mauna Kea based computers that were approaching their end-of-life design times, the software running on them, and developing a program that seamlessly swaps out this aging equipment with new, more modern computers. Given the mission critical nature of this work, the failure of which would expose nighttime operations to delays, the successful execution of this project was essential to the Observatory. No downtime was recorded as a result of this complex switch-out of computers, which is akin to replacing the engine in a car while it is still running – a testament to the careful planning and thoughtful execution of this complex project.



Figure 3.9 – A mission critical project undertaken by Gemini's IS team was to replace an aging suite of SPARC computers with new systems.

3.4.2 ISG10-019: Gemini Cyber Security Program

As another example of the important work that is undertaken by Gemini's Information Systems (IS) group, several years ago the Observatory launched a Cyber Security project, in concert with an NSF initiative to bolster the electronic security of its various facilities. This multifaceted project initially revolved around a thorough accounting of the type, format, and location of sensitive information within Gemini's domain that would logically fall under a Cyber Security shield. From there, strategies were developed and work implemented to increase the security of Gemini's electronic assets, consistent with our internal audit of electronic information. This program includes everything from the use of encrypted wireless routers to securing the doors on server rooms. It also led to the establishment of a new password policy at Gemini in which essentially all system passwords are managed through a single registry, users are prompted to update their passwords regularly, and to comply with certain rules about their structure (length, use of alphanumeric characters, etc.). Since the threat of cyber security is ever changing and ever present, this project will likely always be part of the work carried forward by Gemini's IS team to help ensure that the extremely valuable assets the Observatory is responsible for safeguarding are always protected from outside malicious security threats.



Figure 3.10 – Cyber security remains an on-going project for Gemini's IS team, keeping the Observatory protected from external network threats and in compliance with agency-level

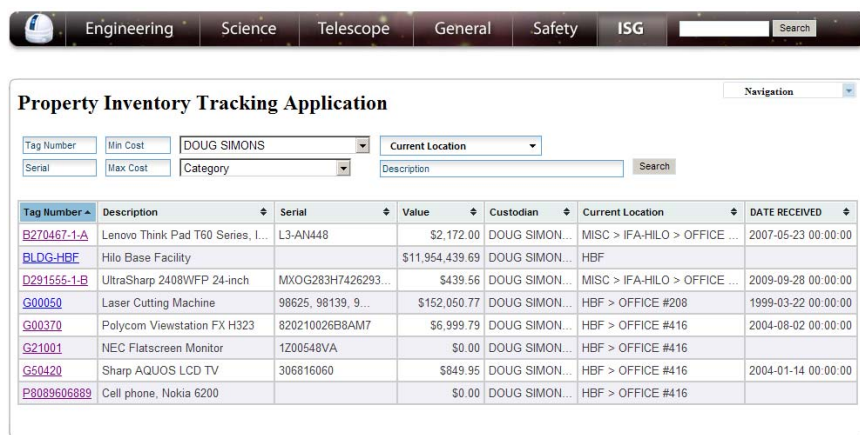
3.5 Procurement

3.5.1 PRO10-007: Continued PITA Development

Gemini's custom Property Inventory Tracking Application (PITA) has been undergoing continual improvement since its deployment. Literally millions of dollars of property is managed by the Observatory, and the responsible control and stewardship of this property is an important part of the work conducted by all members of the Observatory staff. To streamline the process of identifying who is responsible for what property, PITA was developed as a web application that is used to query a central database containing key information including the nature of the property, its current location, its value, the date it was originally received at Gemini and entered into the property database, etc. Having all of this information available electronically makes it possible to perform fairly complex queries and for anyone on the staff to update the status of the property they are responsible for, at any time. This

system is particularly useful when comprehensive annual property audits are performed, to help demonstrate in quantitative terms for the NSF the state, location, and custodianship of millions of dollars in property at any given time.

Like the Cyber Security program, property tracking will always be part of Gemini's administrative core



Tag Number	Description	Serial	Value	Custodian	Current Location	DATE RECEIVED
B270467-1-A	Lenovo Think Pad T60 Series, I...	L3-AN448	\$2,172.00	DOUG SIMON...	MISC > IFA-HILO > OFFICE ...	2007-05-23 00:00:00
BLDG-HBF	Hilo Base Facility		\$11,954,439.69	DOUG SIMON...	HBF	
P291555-1-B	UltraSharp 2408WFP 24-inch	MXOG283H7426293...	\$439.56	DOUG SIMON...	MISC > IFA-HILO > OFFICE ...	2009-09-28 00:00:00
G00050	Laser Cutting Machine	98625, 98139, 9...	\$152,050.77	DOUG SIMON...	HBF > OFFICE #208	1999-03-22 00:00:00
G00370	Polycom Viewstation FX H323	820210026B8AM7	\$6,999.79	DOUG SIMON...	HBF > OFFICE #416	2004-08-02 00:00:00
G21001	NEC Flatscreen Monitor	1200548VA	\$0.00	DOUG SIMON...	HBF > OFFICE #416	
G50420	Sharp AQUOS LCD TV	306816060	\$849.95	DOUG SIMON...	HBF > OFFICE #416	2004-01-14 00:00:00
P8089606889	Cell phone, Nokia 6200		\$0.00	DOUG SIMON...	HBF > OFFICE #416	

Figure 3.11 – An example of Gemini's electronic property track tool is shown.

functions and, accordingly, further enhancements to PITA in the future are likely.

3.6 Safety

3.6.1 SAF10-005: 4.4.6 Operational Control

An on-going component of Gemini's extensive safety program is training for staff to not only help prevent accidents from occurring but to deal with them in a timely and effective manner, should they happen. In 2010 for the entire staff this included fire evacuation drills and monthly electronic lessons that are provided by Gemini's safety manager. More specialized training is available as well, depending on the scope and nature of the work being pursued by members of the staff. For example those who may have to drive in mountainous snowy conditions receive annual training about installing chains on tires, and those who may need to work in confined spaces are given special training in the procedures required by those special and potentially dangerous circumstances.

In 2010 some of the most extensive and striking training provided was for the Mauna Kea day crew in the form of "high angle" rescue maneuvers. The day crew occasionally works on the top of the dome

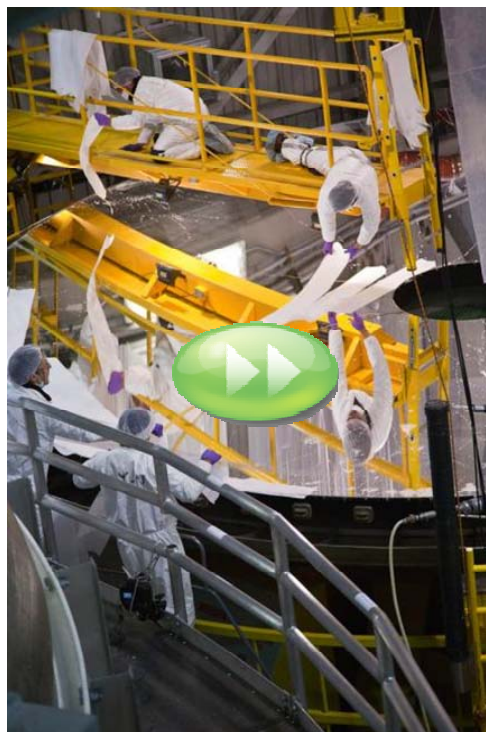


Figure 3.13 – Gemini's outreach group masterfully video recorded the coating of the Gemini-S mirror in 2010, to help document this complex process for the purpose of cross-training staff in the future.

for repair/maintenance or to inspect and clear ice from various crevices before the dome is opened. One of the purposes for this training is to give the Gemini-N day crew the skills needed

to rescue someone who has fallen from the dome and is stranded in their safety harness. Given the remote location of the summit, and the possibility of injury under these circumstances, the day crew represents the "first line of defense" while emergency personnel would be dispatched from either Hilo or PTA. The procedures learned through this training (seen in Figure 3.12) would be an essential part of the rescue effort.

In the future this same training will be offered to the Gemini-S day crew and there is interest in Hawaii to collaboratively train other observatory day crews in the same procedures.



Figure 3.12 – Among the many activities within Gemini's safety program the Observatory organized and sponsored "high angle" rescue training. Seen here are members of the Mauna Kea day crew repelling off the dome, practicing rescue procedures in the event a fellow day crew member should ever require rescue.

3.7 Public Information and Outreach

3.7.1 PIO 10-002: Gemini-S Mirror Coating Documentation

As an example of the synergies between what may seem like disparate groups within the Observatory, the exceptional videography skills of Gemini's outreach team were used to record a comprehensive video documentary about the Gemini-S mirror coating exercise completed in 2010. This documentary was developed principally to allow Gemini engineering in the future to train in advance of future mirror coating procedures. Given the durability of Gemini's coatings (~5-6 yrs) and the fact that the next time this will be performed is nominally ~2015, having this complex process on record was an important part of the Observatory's strategy to ensure that the specialized skills, techniques, and expertise needed to deposit this one-of-a-kind coating on the primary is recorded for future use.

In the end the result of this project within Gemini's outreach team was quite striking and was released through Gemini's web page for the general public to enjoy. It can be found here –

http://www.gemini.edu/gallery/v/Special-Images/Video/20101006_mirror_washing_001.jpg.html

3.8 Instrumentation Development

3.8.1 DEV 10-001: GPI Support

This project includes the oversight and management of the 6 contracts that together comprise the Gemini Planet Imager project. Gemini's instrument development group is leading the central management of those contracts, with the work occurring in California, Canada, and New York during 2010. GPI is currently scheduled for deployment at Gemini-S in 2012 and, when released, stands to be the most highly optimized high-dynamic spectro-imager ever used on a large format telescope. The combination of Gemini-S and GPI promises to yield exciting discoveries of nearby planetary systems and disks. With its built-in low resolution spectroscopy capability, GPI will allow not only the detection but the physical characterization (mass, composition, luminosity) of nearby self-luminous Jovian class exoplanets – something that has been extremely difficult to do using existing technology.

GPI represents a major leap forward in Gemini's instrument program and, by itself, nearly represents a doubling of AO investments at Gemini. It involves the invention of new technology in the form of its miniature high-order deformable mirror, the first time use of a sophisticated interferometer in a varying gravity environment, and exceptional systems engineering to achieve the necessary 3-5 nm of residual wavefront error the system must deliver to meet its design requirements. With the successful retirement of these technical risks we anticipate enormous scientific payback from GPI. Work in 2010 focused on major subsystem completion at the various GPI design/fabrication sites, prior to delivery of all components for final integration at UC Santa Cruz in 2011.

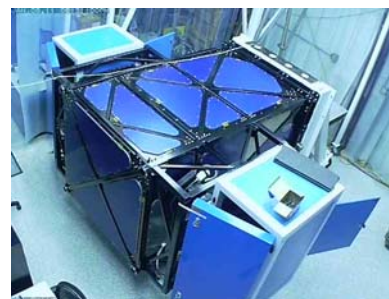


Figure 3.14 – GPI is a ~\$25M highly optimized high contrast infrared imager/spectrometer that is being built to conduct a comprehensive survey of nearby stars for self-luminous Jovian class planets. It is currently scheduled for deployment in 2012 at Gemini-S. It is shown here in the I&T facility at UC Santa Cruz.

3.8.2 DEV10-003: GMOS-N CCD Upgrade (2010 Portion)

Another important development project at Gemini is the upgrading of the GMOS-N focal plane with fully depleted red sensitive CCDs from Hamamatsu. These are similar to those being used in Subaru's

Suprime and HyperSuprime Cameras and, when used with nod-n-shuffle readout and the exceptional reflectivity of Gemini's silver coatings, stand to greatly increase the sensitivity of GMOS-N, making it competitive with any other optical MOS in the world. The push to observe the universe at high-z with facilities around the globe will be well served with these new detectors at Gemini, which will easily extend the competitive lifetime of Gemini's aging optical instruments for many years.

This project was contracted to HIA in Canada and activity in 2010 focused heavily on troubleshooting a faulty CCD controller and dealing with detector failures, leading to significant schedule slip. In parallel with DEV10-003, Gemini is developing new reduction software for the community to use with these new detectors. A follow-up upgrade of the detectors in GMOS-S is also very likely, pending closure of this project and demonstration on-sky of these new CCDs.

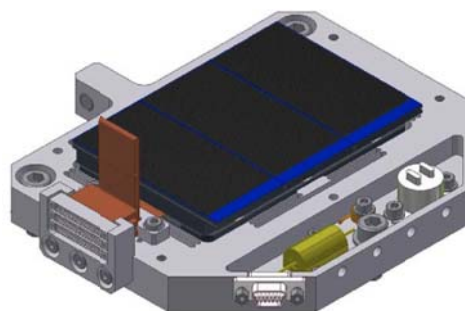


Figure 3.15 – A CAD rendering of the GMOS focal plane is shown. The new CCD mosaic for GMOS-N being developed as part of DEV10-003 will feature fully depleted CCDs having exceptional red sensitivity.

3.9 Engineering

3.9.1 ENG08-041: Engineering Tools Corporate Approach

In 2010 Gemini's engineering team made excellent progress on many fronts ranging from complex electro-optic projects like MCAO to improving the group's organization and efficiency through the implementation of modern tools like our new Document Management Tool (DMT). This customized version of a commercial web application (DocuShare) is easily extensible and ideally handles the needs of a distributed site like Gemini. Through this system a range of documents including the original drawings used to construct the Gemini telescopes, to Gemini's Interface Control Document library, to the many components of the recent 2012-15 NSF funding proposal are stored in this single system. Version control is straightforward and organization of this wide range of documents handled seamlessly



Figure 3.16 – A screen capture of Gemini's new Documentation Management Tool is shown above. This customized version of a commercial application allows efficient sharing and long term storage of documentation across Gemini's distributed sites.

through this modern tool. The adoption of DMT and Project Insight represent the amalgamation of a number of separate software applications that have been used over the years at Gemini and now cover essentially all of our project management needs. Such standardization in the tools used by Gemini leads to reduced costs (fewer licensing fees, less training across a wide range of applications, reduced maintenance, etc.) and across the board efficiency gains as DMT is used broadly at the Observatory.

3.9.2 ENG09-032: GNIRS Repair Completion

A major milestone was reached in 2010 with the restoration of GNIRS to operation at Gemini-N. This multi-year and multifaceted project was a high priority project within the Observatory and led to providing the Gemini community with a state of the art infrared spectrometer. Key components of the work completed in 2010 included important cryo-testing in the HBF, detailed acceptance testing, and commissioning on the summit of Mauna

Kea. The commissioning results for GNIRS looked so promising, early in the commissioning phase, that programs slated to use NIRI's spectroscopy mode were switched to GNIRS instead. GNIRS is the most complex cryogenic instrument at Gemini, offering several different plate scales and spectroscopy resolutions with exceptional sensitivity from 1-5 μm . One of its most powerful modes allows continuous JHK spectroscopy of objects with a single integration. GNIRS is also being offered in LGS/AO mode, allowing unique narrow slit spectroscopy of complex or high dynamic range regions.

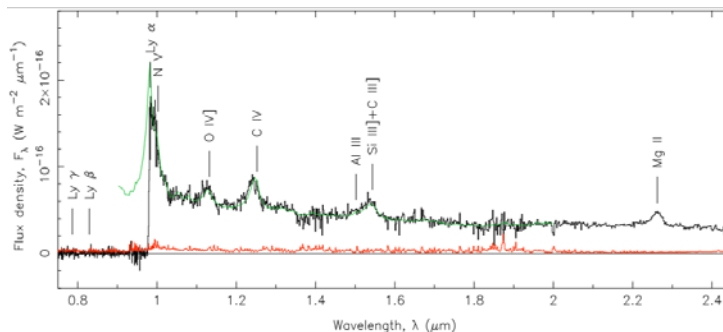


Figure 3.17 – Adapted from Mortlock et al. (2011, Nature), this GNIRS spectrum of a $z=7.08$ QSO currently sets the record for most distant quasar and demonstrates the impressive capability this instrument offers Gemini's community.

Early observations with GNIRS led to an impressive spectrum shown in Figure 3.17. This ~ 2 hour integration shows the spectrum of the most distant quasar detected to date, at a remarkable $z=7.08$. The previous record was $z=6.4$. This observation has important implications for structure formation and the reionization epoch of the early universe. Beyond the obvious astrophysical implications of this observation, the revitalization of GNIRS for Gemini's community is the first of several new and powerful capabilities that will be offered in the near future.

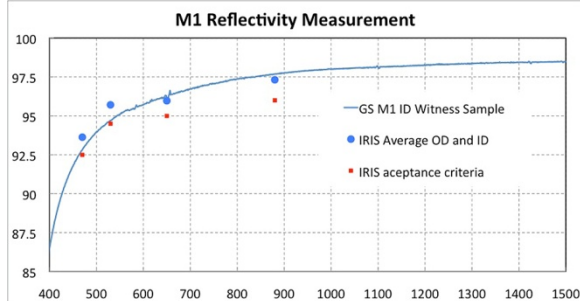


Figure 3.18 – The Gemini-S mirror was coated in 2010, after 6 years of service from the previous coating of protected silver. The measured reflectivity is shown in the bottom plot, which is approaching the theoretical maximum performance at infrared wavelengths.

3.9.3 ENG10-107: GS M1 Coating Shutdown

Another major accomplishment for Gemini's engineering team in 2010 was the deposition of a new protected silver coating on the Gemini-S primary mirror. This complex project was the culmination of many months of preparations and the result of a blend of engineering expertise from both sites focusing for several weeks on Cerro Pachon. This technology is unique to Gemini and yields a durable coating that provides thermal infrared emissivity that approaches the theoretical minimum possible for silver. The coating is tough enough to be cleaned via in-situ mirror washing and long-lasting enough to not require recoating for 5-6 years. With each coating the expertise of Gemini's coating team increases, yielding this time the best performance of any coating deposited at Gemini to date.

This project required the involvement of >30 members of Gemini’s engineering staff and nearly 4 weeks to complete. Many other forms of telescope maintenance were completed in parallel with coating the mirror, to maximize the benefit of such lengthy (and rare) extended engineering shutdowns. Safety to staff and equipment was of course paramount throughout this process. Quoting Gemini’s safety program manager, Rodrigo Sandoval, “Our goal is to make this difficult procedure as safe as possible. When you have 24 tons of glass hanging 4-stories overhead and a wide-range of chemicals, high voltage and staff scrambling to meet deadlines you have to be extra vigilant to stay safe.” There were no significant safety issues during this complex procedure – a testament to the professionalism of the staff responsible for working on ENG10-107.

3.10 Science Operations

3.10.1 SCI10-031: LGS tip/tilt with P1

Among the many interesting projects pursued by Gemini’s science staff in 2010, a “stand out” is SCI10-031, which was designed to evaluate the performance of ALTAIR/LGS when fed a tip/tilt compensation signal far (~5 arcmin) from the LGS beacon. This innovative approach was first conceived in a Gemini AOSWG meeting as a possible means of increasing sky coverage for NIFS, which does not need high strehl but instead good coupling of the AO corrected PSF into the NIFS IFU (0.1 arcsec resolution on the sky). This project was designed to (1) determine the technical feasibility of running the AO system with a tip/tilt feed coming from PWFS1 and (2) evaluate the system’s stability and performance in this mode. The initial results are captured in Figure 3.19 which shows tests conducted with “LGS only” (no tip/tilt compensation), “LGS+P1 (Fixed SFO)” which includes tip/tilt compensation but not slow-focus, and normal LGS AO. The level of correction provided, given NIFS spatial pixels of 0.1”, will yield excellent performance when NIFS is fed by this novel LGS/AO mode.

Given the promising results of these 2010 tests, the next steps in this project involve modifying PWFS1 to have a 2x2 Shack-Hartmann configuration (vs. 6x6 used in these tests) so that significantly fainter guide stars can be used. In addition, a special sodium notch filter will be purchased which transmits the full bandpass to the PWFS1 CCD, excluding sodium D light. The combination of these two enhancements to the system leads to a projected sensitivity limit of $R \sim 17.5$, which corresponds to a sky coverage of ~95% at the Galactic Pole.

Given NIFS increasing popularity and demonstrated higher sensitivity than its competitors at Keck (OSIRIS) and VLT (SINFONI), this new mode offers great promise to Gemini’s community by combining all-sky coverage with the most sensitive NIR integral field spectrometer in operation today.

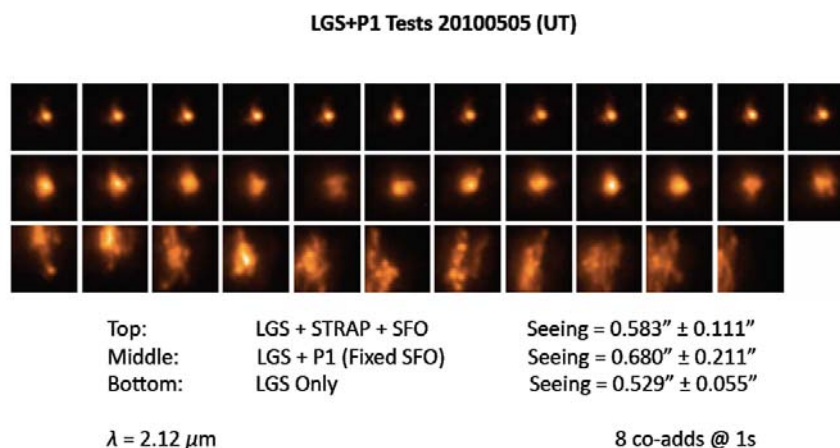


Figure 3.19 – Tests conducted under SCI10-031 in 2010 demonstrated that the use of a peripheral wavefront sensor to measure tip/tilt for use with ALTAIR provides more than adequate correction to concentrate flux in the NIFS IFU pixels. This in turn means that LGS/AO+NIFS can be used to provide >90% sky coverage for this novel mode.

3.11 Summary of 2010 Work Done at Gemini Observatory

2010 Projects for the Directorate (DIR) (Part 1)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
DIR09-004 Energy Planning Oversight & Control	Assess Gemini's current energy performance and to develop a long term energy plan for Gemini, building on the initial staff input received in the blog which was established with this objective.	01/02/09	12/31/10	100	
DIR09-A083 Cell phone policy	Develop and implement a policy governing the cell phone assignment, compensation, requirements.	06/01/09	12/31/10	58.79	12/31 Final report for 2010. This project will not be completed in 2010. We chose to tie the completion of this project to the resolution of long-standing issues related to out-of-shift support of observatory operations. This is a complicated issue on which we are making good progress. We anticipate that the resolution of those issues will be sufficiently underway to reach a final version of the Cell Phone Policy (of which there is a draft) by the end of the first quarter 2011.
DIR10-005 MCCWG Staff Training Classes	Training programs provided by members of the MCCWG, providing tools that help individuals to manage their communications and keep track of their commitments. Five classes will be available: Email training, task management, setting deadlines and following up with integrity, effective meetings and making time to think.	01/04/10	01/07/11	84.8	
DIR10-006 Establish Concerns/Suggestions Blog	Establish a Concerns/Suggestions Blog on the internal website where employees can post concerns and suggestions. Members of the Directorate will commit to checking the blog at regular intervals to addressing the issues and suggestions in staff meetings, the blog itself or some other suitable venue.	06/07/10	10/08/10	100	

2010 Projects for the Directorate (DIR) (Part 2)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
DIR10-007 Community Engagement	A multifaceted project intended to increase the level of bilateral exchange between the Gemini Observatory and user community. The project consists of several parallel tracks, recognizing that no single strategy is likely to significantly improve community relations/engagement on its own. These include the use of blogs, town hall meetings, sponsoring a data reduction workshop for the community, and speaking engagements at key universities and institutions.	01/04/10	01/07/11	100	
DIR10-007b Data Reduction Workshop	Data reduction workshop, in collaboration with NGO(s), to help Gemini users obtain their scientific results and publish their data. Part of the larger program to engage the Gemini community.	01/04/10	10/29/10	99.35	
DIR10-009 Internal Web Page Portal Redesign and Planning for Site Overhaul	Redesign internal home page, establishing top-level links that will be available from it and uniform Observatory links accessible from secondary pages. Set policies as required for internal website, including identifying content that should be public. Define the scope of a future project to eliminate outdated information and reorganize content, especially with respect to areas of overlapping interest among groups. Estimate the resources required to complete a full site upgrade.	01/04/10	02/13/10	0	This project will not be completed in 2010.
DIR10-011 Implementation plan of the new GS summit crew work schedule	Elaborate a plan to implement this new schedule	01/04/10	11/03/10	21.85	

2010 Projects for the Directorate (DIR) (Part 3)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
DIR10-013 Implement better support for Instruments	Better integrate engineering involvement into all stages of instrument procurement.	01/04/10	01/04/10	0	
DIR10-017 Establish availability of in-house resources for development and support of instruments	Some development and support of instruments are contracted out, which in some cases is not an ideal solution. As such, identify those in-house resources (from Engineering, IS, and Dev) that could produce a better result.	01/04/10	04/01/10	0	
DIR10-018 Directorate Operations	This project is a place holder for Directorate members.	01/04/10	02/11/11	100	
DIR10-020 Revised Budget Proposal	This project is in response to the Nov. 2009 Board meeting directive to develop options to continue to operate Gemini in light of the UK's withdrawal post 2012. To first order this means operating Gemini with ~25% less funding, though details of the actual level of funding available and the exact timeframe over which cuts are made remain to be determined. At this point this project is merely a planning exercise for the future. The nominal timeline for this project extends through March 2010, the time of the Board Retreat. It may be extended past that date as options are iterated with the Board and further effort is needed to resolve uncertainties.	01/04/10	05/13/10	100	
DIR10-100 Calibration Report	Project to produce the "Calibration Plan" report that the board requested.	09/01/10	12/30/10	100	

2010 Projects for the Administration Facilities Group (AFG) (Part 1)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
AFG-010-001 Green Cleaning Initiative for Gemini base facilities	Promote a healthy working environment within the base facilities via Green Cleaning; reducing stress on building occupants, improving safety and contributing to improved ecological health. Simultaneously, the project will review current practices, identify improvement opportunities and publish Green Cleaning standards for our building users.	04/23/10	01/14/11	100	
AFG-010-002 Earthquake Risk Mitigation	Provide people with a safe working environment and to be as prepared as possible for earthquakes at both sites.	02/04/10	08/30/10	100	
AFG-010-003 AFG Operations	AFG day-to-day operations include the maintenance of base-facility buildings and grounds, vehicle fleet management, travel services, visitor support, reception services, and administrative support for various departments, including the Directorate.	01/04/10	01/01/11	100	
AFG-010-004 Security Measures - Keyless Access	A key component of Gemini's long term security initiative is the installation of an electronic keyless access system at both Gemini sites, Hawaii and Chile, based on the Keyscan access system expanded in 2009 at HBF and MK summit. The system will provide programmable, controlled and trackable access to selected areas of buildings and facilities at SBF and Cerro Pachon, improving building and staff security.	01/04/10	07/08/10	15.14	Dec 30 - Rollover to 2011.

2010 Projects for the Administration Facilities Group (AFG) (Part 2)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
AFG-010-007 LEED Compliance Feasibility	Using the U.S. Green Building Council's operation and maintenance guidelines for Leadership in Energy and Environmental Design (LEED) certification standards for Existing Buildings, determine the feasibility, approximate costs and expected benefits of seeking LEED certification for the Hilo Base Facility. LEED provides a complete framework for assessing building performance and meeting sustainability goals. Based on well-founded scientific standards, LEED emphasizes state-of-the-art strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED for Existing Buildings (LEED-EB) is a set of performance standards for the sustainable operation of existing buildings. It includes building operations and upgrades of systems in existing buildings.	05/17/10	09/30/10	100	Nov 11 - E-mail sent Gemini-all with results of feasibility study.



2010 Projects for the Administration Facilities Group (AFG) (Part 3)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
AFG-010-010: HBF Solar Initiative	Perform and coordinate the necessary follow-up work each week between July and December 31st to ensure Gemini has the best chance possible in the available circumstances to bring the plan to install a solar array on the HBF roof to fruition in a short time frame. The purpose of the array is to reduce our energy costs and limit our exposure to future energy price increases. Note that the limited nature of the project's goal is in light of the many external factors, including several external authorities, involved in this process which may alter the scope of this project, or its timescale, or scuttle it altogether.	07/08/10	07/08/10	100	Dec 30 - Development of initial bid specifications undertaken. This project is complete for this year, as defined by the goal of "performing and coordinating the necessary follow-up work each week between July & Dec to ensure the best chance possible" of installing solar on the HBF in a short time frame. Follow-up work has been done and is continuing. The scope of the project now involves not just the HBF but MK too. The project description noted exgtternal factors that could alter the scope of the project or its timescale or scuttle it altogether. It is still alive. This project will be replaced by a related, but separate project in 2011.
AFG-010-011 AFG Hilo Warehouse Cost Reduction	Reduce the cost of warehousing in Hilo (draft description)	08/30/10	08/30/10	100	

2010 Projects for the Administration Facilities Group (AFG) (Part 4)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
AFG-010-012 AFG Wikiprocedia	This project seeks to inventory in a systematic way all the group activities; reviewing each activity's purpose/s, common problems and the possibility of service and cost improvement opportunities. Staff will be asked to document their procedures in a specific WIKI format. The procedures will be posted in AFG-only sections of the Web as a reference guide for all AFG staff, when working on issues.	07/08/10	10/29/10	100	
AFG-010-013 SBF Modifications Phase 1	Build consensus on potential building changes to the SBF within an US\$80K envelope. Bid the changes and commit the funds for the work in 2010. Begin work where feasible.	07/19/10	12/17/10	100	
AFG09-011 In-house travel ticketing	This project establishes a corporate travel office, thereby saving travel booking costs, costs on tickets and, at the same time improving service to our staff.	08/25/10	08/25/10	100	

2010 Projects for the Controller Group (CTR)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL
CTR10-001 Daily Operations	Daily Operations	03/01/10	12/31/10	100
CTR10-002 CONTROL Budget Training and Setup	Setting up a system that will help us streamline our budgeting process by: 1. Enable our managers to enter their budgets and than allow us to import after verification 2. upgrade to Version 9	03/01/10	12/01/10	100
CTR10-004 Accounting Internal Web Pages	To update the information and look of the accounting departments internal web pages.	03/05/10	01/01/11	100
CTR10-005 Financial Month End Closing Procedures and Timeliness	To work with both NOAO and NOAO-S to update the schedule of information (invoices and data feeds) received from both centers each month with the goal of improving the timeliness of the financial information provided to the Gemini directorate, managers, and board of directors. We will also be updated our internal timelines based upon the results of our review with NOAO and NOAO-S.	06/23/10	10/01/10	100

2010 Projects for the Human Resources Group (HR) (Part 1)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
HR10-001 Mentoring program	Develop a pilot mentoring program to cover Junior Scientists and a targeted group within Engineering at Gemini. Also to include, through Broadening Participation, remote mentoring of Science students external to Gemini in supporting their successful attainment of a PhD.	01/04/10	12/31/10	69	12/30 - Project will complete 28 January. Workshop all set for that date. Staff and MK Observatories invited.
HR10-003 HR Operations	Basic Operations	01/04/10	12/31/10	100	
HR10-005 Planning Process of 2011	Planning for 2011	07/01/10	09/15/10	100	
HR10-006 Development of formal internship program	This year, the project scope will be restricted to clarifying roles and responsibilities between HR and the intern supervisors who recruit/involve interns and ensuring HR processes are in order.	03/01/10	12/30/10	100	

2010 Projects for the Human Resources Group (HR) (Part 2)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
HR10-013 HR Change Management People - Gemini Transition	Development of plan to address taking care of our people during the transition, including: policies to define and review , outplacement methodologies, HR communications, retention, employee support services. Change training for managers and staff. Change cycle forums for managers and change/communications support for the Directorate is adapted to the developing strengths and changing needs of the mentee. The result of an effective mentoring process is a self-confident and competent professional who also values what employees can do collectively on behalf of their organization and it's strategic initiatives.	03/01/10	12/31/10	100	
HR10-014 New HR Operating Model	HR Staff recruiting and integration. Ultipro recruitment module implementation, performance management online system, and planning for further ultipro enhancements	07/02/10	12/31/10	72.57	12/30 - Systems and process audit completed (time analysis and services poll) Unfortunately, we will not be able to roll out eRecruit this year as planned. Availability of resources from UltiPro to commit to the customization of job boards for the various groups (NOAO. Gemini) Specification document was drafted and sent out to all 12/1/2010, All parties approved it on 12/9/2010, UltiPro came back and said it would take approximately 28 to 30 hours to build for all sites. Their resources are not available but should be able to have it complete by January 11,2011, per Lee Peters STScl.

2010 Projects for the Human Resources Group (HR) (Part 3)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
HR10-015 HR Compensation and Benefits	Research Health Care Reform and make necessary adjustments to Gemini's health plans in 2010/11. Research compensation benchmarking of Gemini jobs to the external market and develop a methodology to prepare a gap analysis for implementation in the 2012 review process.	07/02/10	12/31/10	100	12/30: Report on recommended benchmarking methodology delivered to Neil Barker. This goal is officially completed, just in time!

2010 Projects for the Information Systems Group (ISG) (Part 1)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ISG08-IN105 Deploy Certificate Services - NSF	Hardware Ready. Required also for HR/admin to comply with data privacy laws.	08/20/09	02/26/10	100	
ISG08-IN314 Consolidate HBF WEB servers	Virtualization of HBF Web servers and upgrade to Solaris 10	09/01/08	04/30/10	100	
ISG08-IN321 Network Redundancy	Purchase, Install & Configure Network hardware to reduce/eliminate single points of failure.	02/22/08	09/09/10	82.17	09/30 Eagle has been configured and is ready to take over should Condor fail. Currently (until the SUP720 is upgraded) the handover will be a manual task.
ISG09-003 Transition to MS Exchange 2010	Upgrade will provide new features for mobile device support, improve OWA interface and better support for Mac OSX	07/01/09	09/17/10	100	
ISG09-004 Upgrade Backup infrastructure	Upgrade will provide more online and off-line storage capacity for both GN/GS summit and base facilities.	08/02/10	10/06/10	100	
ISG09-009 WAN speed optimization	Investigate & deploy a solution to drastically improve file sharing, remote collaboration etc ...	05/06/09	03/11/10	100	
ISG09-051 (SCI09-032) Remove GN dependencies from GS web site mirrors	Make GS mirrors more useful, simplify off-site access (SCI08-121)	04/01/09	04/16/10	100	
ISG-10-001 Rearchitect Gemini DNS	Upgrade/replace aging Solaris based Domain Name Servers at each site	02/01/10	09/27/10	100	
ISG-10-002 Windows 7	Research merits and pitfalls of upgrading to Windows 7. Develop deployment plan as appropriate	01/04/10	03/16/10	100	
ISG-10-005 SBF Server upgrades/Replacements	Upgrade/replace aging SPARC and X86 hardware at the SBF base facility. Identify standalone hosts/services and appropriate applications for virtualization.	01/04/10	12/16/10	86.57	12/29: caprice was power-off; dathomir is the last one, but we are waiting the CR approval to make the change. This project can be considered completed.

2010 Projects for the Information Systems Group (ISG) (Part 2)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ISG-10-006 ISG Internal website	Improve look, usability and content. Add policies, guidelines and howto's	06/02/10	08/30/10	100	
ISG-10-009 MK Summit Server upgrades/replacements	Upgrade/replace aging SPARC and X86 hardware on MK summit. Identify standalone hosts/services and appropriate applications for virtualization.	01/04/10	09/23/10	100	
ISG-10-010 HBF server upgrades/replacements	Upgrade/replace aging SPARC and X86 hardware at the Hilo base facility. Identify standalone hosts/services and appropriate applications for virtualization.	04/26/10	12/22/10	100	
ISG-10-012 IS Configuration Management System	Develop/purchase system(s) to manage Information Systems configurations, i.e. router, firewall and switches, end-user machines and systems that fall outside of what KBOX can manage.	04/05/10	01/04/11	0.09	9/16/10 - This project has not received directorate backing for 2011 and is not approved for further planning.
ISG-10-014 Centralized Storage Expansion & Redundancy	Upgrade Netapp filers at all sites with 10TB of extra storage space. Install 'snap mirror' on each filer to permit cross-site data duplication.	01/04/10	03/22/10	100	
ISG-10-015 Syslog services	Upgrade/enhance Syslog services. Research & test syslog solutions i.e Qradar, splunk and deploy chosen solution at each site	06/30/10	02/22/11	100	
ISG-10-017 GN Print Server	Deploy new print services at Hilo - green initiative to monitor & reduce printing waste	01/04/10	03/11/10	100	
ISG-10-019 Gemini CyberSecurity Program (Phase 2)	Continued implementation of security controls, creation of policies and guidelines, introduction of staff cybersecurity training program	01/04/10	12/09/10	91.45	<ul style="list-style-type: none"> - Solarwinds monitoring software installed and configured at GS - CISCO ACS now being used to authenticate WiFi users at both sites (802.1X) - Removed Netflow configuration since this requires the new Catalyst supervisor engines to be installed, which is now scheduled for the January 2011 shutdown.

2010 Projects for the Information Systems Group (ISG) (Part 3)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ISG-10-020 Daily Email Digester	Millicent's alma mater, Pomona College, developed an ingenious way of dealing with large numbers of internal email that needed to be posted like a bulletin board type of thing. They call it The Digester. If you wanted to email everyone, you just went to this webform and put in your message. Every day this would be compiled automatically and would be sent out to all the students ONCE a day in the morning. It is an html email with set categories each with clickable subject lines. Clicking on the subject lines you are interested in jumps you to the relevant part of the Daily Digest.	05/03/10	06/28/10	100	
ISG-10-023 CP Summit Server upgrades/replacements	Upgrade/replace aging SPARC and X86 hardware on CP summit. Identify standalone hosts/services and appropriate applications for virtualization.	01/04/10	12/17/10	100	Project completed, due to software constraints some servers were re-allocated in "ISG11-005 Server Replacements 2011"
ISG-10-024 ISG Operations	ISG day-to-day operations that include responding to Helpdesk tickets, Telescope FRS, visitor support, systems maintenance and backups, security audits, purchasing & general administration, Meetings support, Websplash & updates.	01/01/10	12/31/10	0	
ISG-10-025 Remedy Enhancements	Users have requested enhancements to the new Telescope Fault Reporting and Helpdesk Systems.	08/18/10	04/15/11	0	Met with Richard Kitamura today to discuss Gemini Product tree. Am compiling and sorting through requirements from various stakeholders. Am waiting on requirements list from Andy Adamson by the end of the week.

2010 Projects for the Procurement Group (PRO)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
PRO-10-000 Procurement Department Operations	Routine daily Procurement Department operations.	01/04/10	12/31/10	100	
PRO-10-002 Address BSR issues, including Improve sole source justification and price analysis compliance	Goal: Improve compliance with sole source justification and price analysis requirements as required by BSR report and address other recommendations from the BSR report.	01/04/10	09/08/10	83.75	2010-12-30: No activity since last update. I have put the remaining tasks for this project in my personal task management system and will do them over the course of 2011.
PRO-10-007 Continued Pita development	Continue development of the Property Inventory Tracking Application.	01/04/10	01/08/11	100	
PRO-10-010 Improve export regulation compliance	Goal: Review Gemini's compliance with export control regulations, especially in the area of "deemed exports" (foreign nationals working with export controlled items inside the US) and modify policies and procedures as needed.	01/04/10	12/08/10	42.24	2010-12-30: I still haven't heard anything more from John Herzo on drafting a TAA to cover all our other instruments. Mike and I still need to meet and work out a plan for logging transfers of F2 information as required by the F2 TAA.
PRO-10-011 Additional backup for Dom and Alice	Goal: To find and train an additional person (besides Winnie) to cover for Alice and/or Dominic when they are out. Ideally this would be someone who we could hire a temp to cover some of their regular duties when they are substituting for Alice or Dom.	01/04/10	04/06/10	100	

2010 Projects for the Safety Group (SAF)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL
SAF10-00 Safety Operations	Regular operations for Safety Staff	01/04/10	04/23/10	33.33
SAF10-001 4.2 S&H Policy	Annual Review, Communication, Proof of training	09/27/10	10/29/10	0
SAF10-002 4.3.1 Hazard Identification	Support Engineering Group in performing "Risk Assessment" in their operating procedures using Standardized Flow Chart (SFC) and Standardized Work (STW).	01/04/10	12/17/10	72.26
SAF10-003 4.3.3 Objectives and Targets	Work with each group to define Safety KPI's according to their operations	01/04/10	12/16/10	40
SAF10-004 4.4.2 Competence & Training	Provide and confirm legally required Safety training occur in Gemini	01/04/10	12/31/10	73.98
SAF10-005 4.4.6 Operational Control	Review and update Safety procedures: Fall prevention, Lockout, Electrical Safety and Confined Space.	01/04/10	12/31/10	66.5
SAF10-006 4.4.7 Emergency Preparedness	Development and review of Emergency procedures: Evacuation, fire, use of extinguishers, drills, earthquake, disruption plan, severe weather, riot acts, bomb threat, communications.	01/04/10	12/30/10	27.86

2010 Projects for the Public Information and Outreach Group (PIO)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL
PIO10-001 Ongoing Operations	This includes all ongoing PIO activities as detailed in the individual tasks that are included in this project.	01/04/10	12/31/10	98.57
PIO10-002 Gemini South Mirror Coating Documentation	Timelapse (HD video and still photography) documentation of entire coating process for the GS primary mirror. This includes "training" by Kirk Puahua-Pummill with Manuel P. and full-presence for all stages of mirror coating from instrument removal to installation. This product is helpful for safety and overall process training as well as educational programming related to careers, as a media resource and sharing overall operations with public/media.	01/04/10	02/09/10	100
PIO10-003 GeminiFocus "Evolution Plan"	Reduce data from December 2009 GeminiFocus reader survey and partner country distribution plans and develop plan for future content, media (printed vs. electronic) and distribution of GeminiFocus.	01/04/10	07/08/10	100
PIO10-004 GN/GS Program Parity	Begin implementing a Journey through the Universe-type program in Chile as pilot project by engaging scientists in local classrooms and provide limited training to scientists to prepare for classroom visits. Goal will be to have at least 6 Gemini scientists participate in first year program with invitation for up to 4 CTIO scientists as well in 2010.	01/04/10	03/22/11	100

2010 Projects for the Development Group (DEV)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL
DEV10-001 GPI Support	Support for GPI- includes build phase support and management, required software development as Gemini deliverables, and commissioning contracting negotiations.	01/04/10	12/31/10	100
DEV10-002 GPI Campaign	GPI will have a large campaign science program; we need to develop and implement a method to select to team with Board direction.	04/01/10	12/31/10	100
DEV10-003 GMOS-N CCD Upgrade (2010 Portion)	Continuing contracted work started in 2009 to procure and integrate new red-sensitive deep-depletion CCDs into GMOS-N with an upgraded controller and other misc. components. CCD vendor is Hamamatsu; integration vendor is HIA.	01/04/10	01/25/11	100
DEV10-004 NIRI / GNIRS controller upgrade/s	Upgrade the NIRI, and ideally and optionally, the GNIRS detector controllers. This would work would require a call for proposals and a down-select. We are doing this upgrade in the context of developing a comprehensive observatory plan to simply the number of different controller types we use. The project will consist of two competitive RfPs: one for the controller, and one for the integration work.	01/04/10	01/25/11	30.42
DEV10-006 Improving New Instrument Handover Procedures	The phase between on-site acceptance testing and the start of science operations for new Gemini instruments is poorly defined and always results in confusion in roles and responsibilities between the vendor, Development, Engineering, and Science. We need to clarify the process and ensure enough resources are appropriately scheduled to efficiently accept, commission, handover, and operate new Gemini instruments. We should have the structure of this phase in place before our next round of new instrument development.	07/01/10	08/03/11	100
DEV10-007 2010-2015 Instrument Plan Development	We need to develop the plan for the next generation of Gemini instruments. The process will include meetings in each individual partner country and culminate in a large collaboration-wide meeting, similar to the previous Aspen meeting. Astronomer time is mainly to attend and contribute to National and Aspen-like meetings.	01/04/10	01/25/11	11.44
DEV10-008 2011 Planning	We need time to make our 2011 plan.	01/04/10	01/25/11	100
DEV10-009 Professional Development	Development Group members professional development and training.	01/04/10	01/25/11	100
DEV10-013 Presentations and Meetings	Development makes lots of presentations to the Board, GSC, OPSWG, etc. This task encapsulates the time necessary to accomplish all of them.	01/04/10	01/25/11	100

2010 Projects for the Engineering Group (ENG) (Part 1)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ENG08-012 GN LGS fac improv	The purpose of this project is to finish undone tasks related to LGS system. Most of the tasks are geared towards improving night time efficiency, and fixing faults.	01/01/08	09/02/10	100	
ENG08-031 GeMS (phase 1 and 2)	Complete GeMS phase 1 and 2	12/27/05	10/13/11	95.12	LGSF: progress on laser alignment is according to schedule. progress on BTO is reasonable but it is absolutely key to finish identifying this week the LBBS CPU space. Canopus: EIG mechanism functionality test done, progress on design for transport frames but material delivery delayed and effective construction work started 1 week late on Tuesday Nov 2. By Monday 8th, we will confirm the tentative date for shipping.
ENG08-041 Eng Tools Corp Approach (G. Arriagada)	Engineering Tools corporate Approach project includes two main sub-projects: The Gemini Management Planning Tool and the Engineering Documentation Management Tool (DMT). The appropriate DMT is being searched to implement and deploy it during 2008. At the end of 2008 the Planning Tool (PI) will be at the 98% level of completion and the DMT will be at the level of 80% level.	11/19/07	01/03/11	94.22	
ENG08-049 MK UPS upgrade	MK Site Emergency electrical Power Upgrade (ENG05)	01/25/08	10/07/10	66.71	New UPS is fully integrated to the site. Still pending the installation of a larger fuel tank for the generator. Transfer from Helco to Generator power with the load configured for emergency is now fully automated.

2010 Projects for the Engineering Group (ENG) (Part 2)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ENG09-010 GN & GS SALSA (STAGE 1)	ASCAM & BOCAD integration, FAA approval of camera systems, SOP for laser use	05/01/09	11/05/10	98.63	Two important news: -GS LIS has been fully commissioned is under SPEC!! (Because of that GN LIS MUST be recommissioned in Middle next year, we found that PLC, EPICS and hardware was never finished) -ASCAM dome issue: After the Mask installation, ASCAM was found in a dome not closing state.
ENG09-011 : GNIRS Eng AT + Commis- sioning	Install GNIRS on the GN telescope and perform instrument recommissioning from Engineering point of view.	01/02/09	12/15/10	100	
ENG09-032 GNIRS Repair completion	This project involves completion of the GNIRS repair work that is currently being performed at the HBF.	01/02/09	08/02/10	100	
ENG09-032A GNIRS Lenses Recover Project	This project is to procure and recover GNIRS lenses for final science configuration.	08/28/09	02/07/11	100	
ENG09-122 ISS Vibration mitigation	Reduce the vibration level at the ISS. This task includes the following: 1. Program planning phase 2. ISS vibration measurement and data analysis campaign 3. Cryo pump vibration mitigation engineering 4. Instrument vibration characteristics measurement and analysis 5. Altair vibration investigation	01/02/09	04/09/12	15.98	Updated 12/16/09 Need to consider outside contractor for vibration measurement
ENG09-209 New M2 Control H/S		01/01/08	03/22/12	27.4	
ENG09-210A: Engineering Safety (Chas Cavedoni)	For planning purposes shutter tie off is going to be considered done by the end of 2009 For planning purposes enclosure access door will be considered done at GN by the end of 2009	01/02/09	12/31/10	54.44	Rollover task of this project shall continue in accordance with ENG11-210A. ENG09-210A which previously rolled over in 2010 shall terminate at the end of 2010.

2010 Projects for the Engineering Group (ENG) (Part 3)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ENG10-001 SPIE 2010	Encourage Engineers to present a paper at the conference. 16 vacancies for presenters plus four to be filled per CE's discretion. Project plans subject to 2010 budget approval.	01/04/10	07/05/10	100	
ENG10-008 ITAC Project (Devin D.)	Time Allocation Committee Software to stream-line the current TAC process. The new software will provide a set of tools where lot of manual effort from the science team can be reduced by automating them.	04/05/10	10/28/11	49.02	During this break from ITAC most of my time was absorbed by the December release tasks, working with Nicolas, making the actual release, and handling issues that came up as a result of the release (a few faults and working around memory issues with the gnodb machine). There were also a few days of unaccounted for ITAC time supporting co-worker tasks.
ENG10-101S O&M GS 6- Month Maint May Shutdown	This project includes the detailed plan to execute the shutdown. Detailed plan of preparations to execute the shutdown.	01/08/10	05/14/10	100	
ENG10-102N O&M GN in Situ Wash	This project covers the detailed in situ wash plan. Detailed in situ was improvements plan. Detailed in situ was preparation plan.	01/04/10	07/30/10	100	
ENG10-102S O&M GS in Situ Wash (T. Vucina)	This project covers the detailed in situ wash plan. Detailed in situ was improvements plan. Detailed in situ was preparation plan.	01/04/10	11/24/10	58.01	
ENG10-103: O&M Eng. Spares Project (S. Hardash)	Current spares inventory list. Spares inventory list update program. Each group spares procurement plan development program.	01/04/10	12/31/10	75.89	
ENG10-104: O&M Eng. writing procedures (G. Arriagada)	Each group writes procedures plan for the year.	03/01/10	01/04/11	1.41	

2010 Projects for the Engineering Group (ENG) (Part 4)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ENG10-105 O&M 2010 Facility Preps for GS M1 Coating	O&M 2010 Facility Preps for GS M1 Coating	01/04/10	09/15/10	100	
ENG10-106: O&M 2010 GS coating process preps	O&M 2010 GS coating process preps	01/04/10	09/27/10	100	
ENG10-107 OM 2010 GS M1 Coating Shutdown	Includes all the activities to be executed during the shutdown.	01/01/10	10/31/10	99.77	
ENG10-108 O&M Eng managers duties	Time allocated to execute all the tasks in the engineering managers duties instructions set	01/04/10	01/19/11	79.46	
ENG10-109N: O&M GN Management Tasks	GN TIO M planning duties Attendance of eng, managers and techs to coordination meetings and safety meetings TTMs shifts time accounting.	12/23/09	12/25/11	99.82	
ENG10-109NA O&M GN Management Tasks	TTM calendar	01/12/10	12/28/11	100	
ENG10-109S: O&M GS Management Tasks	This project covers: GS TIO M planning duties Attendance of eng, managers and techs to coordination meetings and safety meetings TTMs shifts time accounting.	11/02/09	02/25/11	83.68	
ENG10-109SA O&M GS Management Tasks	In this project is placed the TTMs calendar. Due to the different work schedule this task was treated separately.	08/26/09	12/31/10	99.15	
ENG10-110N: O&M GN Predictive Maint & Routine Ops Tasks	This project covers: All routine daily telescope and instrument functional checks performed by the day crew All daily, weekly, monthly, etc. routine plant room, fifth floor checks, dome checks, instruments checks. All routine clerical work. All routine janitorial work. Preparation and operation of laser system.	01/04/10	07/01/11	68.22	

2010 Projects for the Engineering Group (ENG) (Part 5)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ENG10-110S O&M GS Predictive Maint & Routine Ops Tasks	This project covers: All routine daily telescope and instrument functional checks performed by the day crew. All daily, weekly, monthly, etc. routine plant room, fourth floor checks, dome checks, instruments checks. All routine clerical work. All routine janitorial work.	01/04/10	12/31/10	100	
ENG10-111N O&M GN Corrective Maintenance Tasks	Telescope, enclosure, instruments and support building corrective maintenance tasks included in this project are: Escalation team related activities. Escalation team triggered corrective maintenance tasks. Fault Reports triggered corrective maintenance activities. Corrective maintenance activities triggered by predictive maintenance inspections. Pending corrective maintenance tasks identified by previous year's Fault Reports list. Snow removal activities. Hurricane threat activities. Big Earthquake triggered activities. Any other corrective maintenance activities not covered by the list above.	10/26/09	12/31/11	63.84	

2010 Projects for the Engineering Group (ENG) (Part 6)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ENG10-112N O&M GN Preventive Maintenance Tasks	Telescope, enclosure, instruments and support building preventive maintenance tasks included in this project are: Site maintenance programs triggered activities. Instrumentation maintenance program triggered activities. Telescope systems and enclosure maintenance program triggered activities. LGSF maintenance program triggered activities.	11/12/09	10/14/11	55.89	
ENG10-112S O&M GS Preventive Maintenance Tasks	Telescope, enclosure, instruments and support building preventive maintenance tasks included in this project are: Site maintenance programs triggered activities. Instrumentation maintenance program triggered activities. Telescope systems and enclosure maintenance program triggered activities.	11/05/09	01/25/11	86.96	
ENG10-113 O&M Software Operations Support	O&M Software Operations Support	12/01/09	01/20/11	100	
ENG10-113A SW Development Tasks	Upgrade of all the operational software for new instruments	10/05/09	12/31/10	91.58	GMOS N CCD has taken more resources than expected to resolve some ICD issues, but we are making steady progress. We are making progress in Gems, but the interruptions due to GMOS N CCD have impacted this effort.
ENG10-113B Small HW/SW Tasks (A. Nunez & D. Dawson)	Small HW/SW Tasks	10/29/09	11/06/10	97.69	The final software release for 2010 was done first week of December. Uncompleted tasks will be re-evaluated and rolled over for the next release in March. This project is closed and marked completed

2010 Projects for the Engineering Group (ENG) (Part 7)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
ENG10-114 O&M Engineering Training	All the annual training activities for the entire engineering group. It also includes 7 hours per FTE requested by Polly to train people thru the MCCWG Staff Training Classes	07/01/09	02/14/11	90.75	
ENG10-115 O&M GN Jan & Jul Months Shutdown	This project includes the detail of plan and preparation to execute the shutdown.	10/21/09	01/04/11	98.03	Both shutdowns for the year are complete and marked 100%. Only planning for Jan '11 shutdown left before project is complete.
ENG10-116 64-bit Migration	From the original Linux Migration Requirements, there are two pending requirements that were not completed as part of the project. This project, commits to complete those remaining tasks, so that the original project which is around 2-years is closed: 1. DHS Migration 2. 8-Monitors for Operational Workstations	10/19/09	05/25/11	31.13	On Friday Sep 24th there was a Linux Migration meeting SWISG plus Andy S. from Science participated. The 64-bit for other than the DHS application continues under this project.
ENG10-500 HBF Detector Lab	Refurbish the room and construct a Detector Lab Including Purchasing and outfitting of infrastructure	03/01/10	02/07/11	35.93	25_Sep_10 : Today I & Manuel updated this project and moved it to "Active" status and e-mailed the result to Gustavo. Overall progress is about 39% effort and 55% spending. This does not include any purchasing of optical test equipment which is not yet approved and is a change in scope of the original project objectives
ENG10-700 ICD and Requirements Updates	Updating ICDs and associated requirements	09/22/09	10/06/11	18.68	

2010 Projects for the Science Group (SCI) (Part 1)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-001 Nighttime Science Operations	Obtaining science data on both telescopes. This project covers nighttime observers and SSAs, and all associated nighttime training. It includes all science staff nighttime support provided at the summits and at the base facilities. It also includes nominal engineering done during night operations, such as queued engineering and post shutdown checkouts. It does NOT include nighttime work associated with instrument commissioning, which is covered in the commissioning projects. Hours track to the nighttime operations timecard accounts.	01/01/10	12/31/10	98.08	
SCI10-002 Daytime Science Operations	Daytime operations in direct support of nighttime science operations. This project includes all of the nominally scheduled daytime roles except instrument points of contact (HSO, daySSA, DAS, QC). It encompasses a number of sub-tasks: Phase II support, Queue planning, Data Quality Assessment, day SSA operations support, GSA operations, Head of SciOps coverage, and attendance to daily meetings. This project maps to the day operations timecard accounts.	01/01/10	12/31/10	97.78	
SCI10-003 Altair Science Support	Nominal instrument operations support. Includes all routine instrument support and small improvements defined by the instrument teams within the allocated resources.	01/01/10	12/31/10	99.15	
SCI10-005 GMOS Science Support	Nominal instrument operations support. Includes all routine instrument support and small improvements defined by the instrument teams within the allocated resources.	01/01/10	12/31/10	79.5	
SCI10-006 GNIRS Science Support	Nominal instrument operations support. Includes all routine instrument support and small improvements defined by the instrument teams within the allocated resources.	01/01/10	12/31/10	99	

2010 Projects for the Science Group (SCI) (Part 2)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-007 Michelle Science Support	Nominal instrument operations support. Includes all routine instrument support and small improvements defined by the instrument teams within the allocated resources.	01/04/10	12/31/10	99	
SCI10-008 NICI Science Support	Nominal instrument operations support. Includes all routine instrument support and small improvements defined by the instrument teams within the allocated resources.	01/01/10	12/31/10	99.01	
SCI10-009 NIFS Science Support	Nominal instrument operations support. Includes all routine instrument support and small improvements defined by the instrument teams within the allocated resources.	01/01/10	12/31/10	99	
SCI10-010 NIRI Science Support	Nominal instrument operations support. Includes all routine instrument support and small improvements defined by the instrument teams within the allocated resources.	01/01/10	03/14/13	99	
SCI10-011 Phoenix Science Support	Nominal instrument operations support. Includes all routine instrument support and small improvements defined by the instrument teams within the allocated resources.	01/01/10	12/31/10	99.87	
SCI10-012 T-ReCS Science Support	Nominal instrument operations support. Includes all routine instrument support and small improvements defined by the instrument teams within the allocated resources.	01/01/10	12/31/10	99	

2010 Projects for the Science Group (SCI) (Part 3)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-013 Data Reduction Package support for Operations and Users	The Gemini Data reduction package is used in both observatory operations and by the community outside the observatory. This project contains tasks relating to internal support (installations on machines, upgrades etc.), external support (helpdesk responses, etc.) and both (version releases, instrument support releases etc.).	01/01/10	03/29/11	81.68	<p>It is not clear whether the NICI standalone software will be released by the end of the year. Kathleen must do it, and Kathleen is stretched very thin.</p> <p>The "patch" release for F2, GMOS, GNIRS has been transformed to a full beta release for GNIRS SV. This has to happen before the end of the year. Emma has started working on that release.</p> <p>Cross-training is simply not happening; everybody on the team is overbooked.</p> <p>The GN Mac server is ready. The GN staff desktop are slowly getting switched to use it. The bottlenecks are the users themselves.</p> <p>The project to set up a complete set of build machine will not be completed. GS is making some progress on the Mac side.</p>
SCI10-014 Semester Science Operations	This project includes all semester-related operations. It includes several sub-tasks: Phase I Process, OpsWG, Time Accounting and SciOps Statistics, Telescope scheduling and Support Schedule generation and maintenance.	01/01/10	12/31/10	99.9	

2010 Projects for the Science Group (SCI) (Part 4)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-015 Science Operations staff management	This includes all management duties and other Head of Science operations duties that are not assumed by acting heads of science operations.	01/01/10	12/31/10	98.36	
SCI10-016 Lead DAS Duties	This project includes activities related to supervision of the DAS group including support schedule, performance reviews, administrative duties and general mentoring and supervision.	01/04/10	03/09/11	99.13	
SCI10-017 Lead DPD Duties	This project includes activities related to supervision of the DPD group including support schedule, performance reviews, administrative duties and general mentoring and supervision.	01/04/10	12/30/10	99.17	
SCI10-018 Lead SSA Duties	This project includes activities related to supervision of the SSA group including support schedule, performance reviews, administrative duties and general mentoring and supervision.	01/04/10	12/31/10	99.17	
SCI10-019 Scientific Research	This project covers individual scientific research time of the science staff. Maps to the individual research timecard accounts.	01/01/10	02/23/11	62.75	
SCI10-020 Annual and Long-term Science Planning	This project covers effort associated with the annual planning process as well as long-range strategic planning activities.	01/01/10	12/31/10	99	
SCI10-021 Career Development and Training	This project covers career development related activities including mentoring, external classes and miscellaneous internal training not covered by daytime operations.	01/01/10	12/31/10	99.17	

2010 Projects for the Science Group (SCI) (Part 5)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-022 External Astronomy Activities	This includes service on external TACs, journal reviews, which is counted as research for payroll timecard purposes. PIO work and national meetings have been moved to Misc support SCI10-023	01/04/10	11/08/10	99	
SCI10-023 Miscellaneous Science Staff Support	This project covers all nominal non-operations support work by science staff. It includes a number of sub-tasks: Recruiting, staff inter-site interactions (including meetings and travel), NGO interactions, administrative work, safety work not covered under safety projects, all staff activities, and miscellaneous overhead or unplanned activities.	01/01/10	12/31/10	99.15	
SCI10-024 Science Software Development	This project will track the science staff effort needed for general software development not covered in other specialized Band 1 projects. The effort includes: - administering software planning in Project Insight, including working with scistaff to define and prioritize new tasks and requirements - strategic software development planning -logistics of software releases including general testing, web page updates, and science staff presentations -meetings with the software engineering group that discuss requirements, testing, and release planning. This is the 2010 equivalent of SCI09-140.	01/04/10	12/31/10	99.2	

2010 Projects for the Science Group (SCI) (Part 6)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-025 Telescope Scientist Support	The telescope scientist is a new position for 2010. This project accounts for time spent carrying out TS duties in the same way that an instrument support project accounts for time spent by an instrument scientist.	01/04/10	12/31/10	100	
SCI10-109 Instrument performance monitoring: Science images (SCI09-077, ENG09-078 some overlap)	Regularly measure the total throughputs of all instruments to monitor the system health of all instruments.	01/04/10	12/31/10	36.66	Automatic monitoring implemented for NIRI and GMOS throughputs in imaging mode. Goal of the project for end of 2010 was to have GMOS in imaging and spectroscopic modes, NIRI, and NIFS automatic monitoring fully implemented. First version of NIFS script has been produced, but needs debugging. Project descope due to effort shortage moved NIFS script conclusion to 2011. GMOS spectroscopic scripts are in beta-version stage, currently being finalized by E. Marin. We expect GMOS spectroscopic scripts to be operational by Dec 31, 2010.

2010 Projects for the Science Group (SCI) (Part 7)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-112 SSA Training in the use of ASCAM	An automated airplane detection system has been delivered to Gemini North. We would like to have ASCAM implemented at Gemini North to streamline the LGS operations at night and to fulfill our obligation to the LGS program on Mauna Kea. Training the SSAs is in the operations and troubleshooting of ASCAM is required before we can go live on MK.	01/04/10	03/04/10	15	<p>2010 November 17 - ASCAM update</p> <p>The ASCAM network has been simplified, a new stealth computer has been purchased and installed inside SMA. Calibrations have been done, sky frames are now being subtracted off, and the compass has been corrected for Gemini North.</p> <p>The ASCAM detection algorithm for each camera has been checked and fixed to work together. The software has been migrated to Red Hat.</p> <p>In general, ASCAM has demonstrated to be stable over the last two weeks and is pushing data and auto leveling. We are now collecting a lot of data which need off-line storage. A 14TB storage disc has been purchased for this, it will hold exactly one year of data.</p> <p>The system syncs everyday and clips local storage at 80% level, keeping the latest. Since we entered this 'push and discard' mode and apparent stability, off-site capability do become relevant.</p> <p>There are still a couple of remaining issues which have to be addressed before the end of 2010. (1) Masks still need to be cut for each camera; (2) a computer needs to be installed at the base facility to imported and analysis data;(3) the data then needs to be compiled and presented to the FAA.</p> <p>This will push training the SSAs off by at least 1 year.</p>

2010 Projects for the Science Group (SCI) (Part 8)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-118 Transitioning SSAs to laser operators	The long-term plan is to have the SSAs run the laser during lgs nights. There are several steps, which need to be addressed before this can happen. We need to (1) train the SSAs by the laser operators (2) develop a simple lgs monitoring display which includes the laser status and (3) fix some of the TCC bugs/features to easy operations. For Gemini North, #1 and #2 should happen by the end of 2010.	01/04/10	08/10/11	44.71	set to rollover for 2011; start date for training dependent on software
SCI10-207 GNIRS science commissioning	Science Goal: To make GNIRS available for science use. Description: This project contains the science effort involved in bringing GNIRS back to operations on GN. The team will use this project for planning and tracking the science effort for the commissioning. Additional Notes From 2010 Planning: 75% in 2010, not on the sky until Apr/May 2010.	01/04/10	11/30/10	74.9	
SCI10-209 MCAO/GSAOI Science Commissioning	This project includes on-sky commissioning work and all work required within science to prepare GSAOI for operations. The majority of this work will come after the basic MCAO commissioning defined in the engineering projects (see ENG09-006: MCAO phase 3 and 4 for the technical commissioning).	03/01/10	01/07/11	84.1	
SCI10-225 Staff review of MIR capabilities and future direction at Gemini	Science Goal: To provide a recommendation to the Directorate on mid-IR capabilities at Gemini and their priority relative to other capabilities.	3/4/2010	5/1/2010	100	

2010 Projects for the Science Group (SCI) (Part 9)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-250 GPI preparation	The Gemini Planet Imager (GPI) will be integrated in 2010 and is planned to arrive at Gemini in 2011. Effort in 2010 will be needed to prepare the instrument and Gemini for the acceptance testing and commissioning. Tasks in this project include: preparing commissioning plans; attending team meetings and traveling to the integration sites; participating in reviews or acceptance tests that occur in 2010; and finalizing software requirements and software testing.	01/04/10	12/31/10	100	
SCI10-301 LGS tip/tilt with P1	This is the development of a new mode of operation which should permit 100% sky coverage with LGS yielding improved IQ over the seeing (FWHM ~ 0.2 to 0.4 arcsec depending on the wavelength), i.e. having an IQ=20% whenever it is IQ=70%,CC=50%. The initial phase will be to test and characterize the performance. If successful this will be followed by a rigorous commissioning of the mode including characterization metrics. This has been discussed for some time for use with NIFS, but it does have applications for GNIRS and GMOS as well, especially since there is a GNIRS item to LGS tip/tilt with the GNIRS OIWFS.	01/04/10	12/22/10	100	
SCI10-305 LGS Twilight Propagation	The plan is to investigate the possibility of propagation during twilight and would be coordinated with the Laser Safety Officer (Richard Oram) in the Optics group. Currently WMKO are working with 8 degree twilight limits.	01/04/10	12/31/10	0	

2010 Projects for the Science Group (SCI) (Part 10)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-308 Existing LGS Tasks	A variety of small operational tasks relating to ALTAIR, LGS and NGS: upgrades, characterisation, documentation etc.	01/04/10	01/14/11	27.71	
SCI10-407 ITC General Improvements	This project is for planning and execution of important general ITC work.	01/04/10	12/31/10	94.74	
SCI10-502 FITS Storage Project	Science Goals: Improve observing reliability, and reduce routine maintenance load on staff. Prevent loss of valuable FITS data. Description: Improve the hardware, software and procedures we use to store and manage our FITS data internally.	01/04/10	01/24/11	80.46	<p>Current status as of 18-Nov-2010:</p> <ul style="list-style-type: none"> - Basic system is deployed at both sites, featuring the complete header summary system, misc operational utilities, and limited calibration support. Very positive feedback, especially from GN QCs. - Calibration system is in development and is being integrated with the data reduction package / pipeline development work. - Tape server and tape hardware for GN has been purchased, awaits configuration and deployment <p>By the end of the year, I expect to:</p> <ul style="list-style-type: none"> - fully deploy the tape system at Gemini North - deploy the calibration manager system, albeit with a limited list of supported calibration types focusing on GMOS initially.

2010 Projects for the Science Group (SCI) (Part 11)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-603 Data reduction support F2	<p>Science/Operational Goals: Provide the PIs with the essential data reduction tools for Flamingos-2. Specific milestones: (to be revised once FTE loading is completed) 1. Patch release of Gemini IRAF with post-commissioning support for F2 (Imaging, Longslit, MOS) 2. Iteration 1 design of the Python-based data reduction support. 3. Implementation of the Iteration 1 design. 4. Integration of Iteration #1 to Gemini IRAF package and gemini_python package. 5. Programmer and user documentation for Iteration #1. Note: Scope of Iteration 1 is still to be defined as it depends on the performance of the adapted CL scripts currently being work on. This will be better defined as the planning process advances. Description: The objective is to first ensure that the data reduction tools developed from the existing CL scripts is adequate for a standard science reduction. The initial version of that software will need to be updated to integrate the things learned during the commissioning of the instrument. The second phase is to design the Python-based suite and the user interface. The high-level tools will be developed as part of this project. Low-level toolkits will be developed in the Toolkit project. For each development iteration, effort is required for testing and documentation.</p>	01/04/10	01/17/11	27.12	<p>Descoped in August, removing items which could not be completed ahead of the software work itself. Safety nets were identified in CL (for MOS reduction), and software design was commenced. Generally slower progress than would have been ideal but consistent with the instrument's own status and time taken from this project was put into others (SCI10-608).</p>

2010 Projects for the Science Group (SCI) (Part 12)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-606 Data Reduction Support for GMOS-N Red-Sensitive CCDs	<p>Science/Operational Goals: Ensure that it is possible to use the data reduction package to reduce GMOS-N data once the new CCDs are in place. Ensure backward compatibility.</p> <p>Description: Not all the changes required are yet known. However, it is known that the data reduction software will need to support 6 extensions in 2 amp mode (instead of 3) or 12 extensions in 4 amps mode. The software must be backward compatible and work on old GMOS-N data. It must also still work for GMOS-S. The change will affect all GMOS observing modes (imaging, longslit, MOS, IFU). New tests for the regression test framework will need to be created and added to the suite. Documentation will need to be revised.</p>	02/19/10	06/24/10	38.53	This project is on hold, pending delivery of the GMOS-N CCDs, determination of the final configuration and arrival of real datasets. A fair amount of work on the scripts has been done using simulated data. No additional work is expected on this project before the end of the year. The work not completed has already been accounted for in the 2011 GMOS DR project.

2010 Projects for the Science Group (SCI) (Part 13)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-607 Data Reduction Support for GNIRS	<p>Science/Operational Goals: Support the re-commissioning of GNIRS on Gemini North. Ensure that it is possible to reduce new and old GNIRS data with the Gemini data reduction software.</p> <p>Description: (see also Project Planning Requirements Document, attached) Re-factor the current GNIRS IRAF software to support the refurbished GNIRS. Since the new optical components will be given new ID numbers and the software gets all its configuration from lookup tables, it should be fairly straightforward to add support of the new version of GNIRS while keeping backward compatibility. The new numbers will have to be obtained during the commissioning of GNIRS. The expectation is that adding the values to the configuration files will suffice. Additional work includes testing, the creation of tests for the regression test framework, and the revision of the documentation.</p>	03/05/10	09/07/10	89.49	The software is now in the hands of the GNIRS science team for their assessment of the scientific product. Unit tests are being written in parallel. This project is expected to be completed by the end of the year.

2010 Projects for the Science Group (SCI) (Part 14)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-608 Development of Data Reduction Toolkits	<p>Science/Operational Goals: Facilitate new and improved modular data reduction tools that can be driven from both the pipeline and the interactive data reduction package. Those toolkits are the building blocks of the next generation data processing software. In 2010, driven by F2, NICI and Pipeline needs.</p> <p>Description: This is very long-term project to gradually build up a suite of toolkits to support the next generation of Python data processing software. In 2010, the primary drivers are the Pipeline Project, the F2 data reduction support, and the NICI data reduction support. Details regarding the routines will flow from the design work done for the Pipeline, F2, and NICI projects. During the early phases, the project includes infrastructure and design work such as defining the required toolkits and the setup of a framework to accept the new routines as they come in. Also planned are a set of examples and tutorials on how to use the toolkits and develop for the toolkits. The foundation of the toolkits is the AstroData software which encapsulate the specifics of each data types and hide them behind a generic interface. The first implementation is completed but a few additional features and some re-factoring is required before it can be used and distributed.</p>	01/04/10	01/01/11	60.72	<p>Time on this project was augmented with time from other projects which did not need their full allocations. At this time, work on the wavelength calibration is continuing. This has taken a lot of monitoring on the part of the project manager to keep on track and avoid scope creep. Flux calibration routines that will serve as the foundation for the pipeline flux calibration primitive are next.</p>

2010 Projects for the Science Group (SCI) (Part 15)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-612 Data Reduction Cookbooks and Documentation	<p>The goal of this project to remedy this problem by providing the user of the Gemini Data Processing Software adequate cookbooks and documentation.</p> <p>Description: The first iteration through the documentation should aim at improving the "examples" distributed with the data reduction package. For this project to be successful, it will require the active participation of the instrument scientists who are the experts when it comes to their respective instrument.</p> <p>##### Proposed 2010 Deliverables #### ** GMOS IFU Documentation, Manual wavelength calibration HOWTO, Manual fiber extraction HOWTO, GMOS Nod & Shuffle Documentation</p>	01/11/10	10/28/10	10.04	<p>Low completion due to the two major elements of the project (GMOS IFU; GNIRS). M. Maier (GMOS IFU) left Gemini before any substantial work had been completed. GNIRS team ended up oversubscribed with commissioning work. We believe that the example scripts already provided in the Gemini package will suffice for most users.</p>

2010 Projects for the Science Group (SCI) (Part 16)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-613 User-friendly distribution system for gemini_python	Science/Operational Goals: Help our community users install the gemini_python software and dependencies (mostly PyRAF dependencies). Reduce the load on the Gemini Helpdesk due to people having problems installing all the software by hand. Description: The proposal here is to work with STScI to create a minimal build and distribution framework that allows us to provide PIs with all the required DR software tools and dependencies in an easy-to-install format. To a large extent, we would be taking advantage of effort available at STScI to ensure that the distribution meets Gemini's needs too. Once in place, the distribution would be maintained jointly as part of the ongoing data reduction package maintenance project. The task described here covers implementing common build and install scripts and setting up test machines and a repository prior to that stage.	01/04/10	12/31/10	64.92	<p>November 2010: A prototype distribution exists (based on Sage, as decided mid year) and has already been used by James for GMOS data reduction. It is still missing a couple of packages (such as X11IRAF/DS9) and needs more work on documentation, changing the installation directory robustly and a few ease-of-maintenance details before being deployed for more widespread use. Nevertheless, it's essentially working. Currently we are setting up the building/testing environment on one of our RTF machines, which is the other major aspect of the project, needed to co-ordinate ongoing development on the platform. We recently succeeded in running Gemini's regression test suite manually on the new distribution (and followed up a few errors). Some scripts still need writing to co-ordinate that testing process on multiple build machines. [We also need to finish working with Andy Flach on documenting copyrights etc. before any public distribution, but there is already some time for that in the 2011 plan.]</p> <p>Development will almost certainly spill into the planned 2011 contingency, but I expect to start the year with the outline of the distribution and testing system already in place and am hopeful about completing the work within the allocated effort (lately the main factor affecting the schedule has been spending time on other projects, rather than running over effort).</p>

2010 Projects for the Science Group (SCI) (Part 17)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-614 GPI Data Reduction Software	<p>Science/Operations Goal: Provide general purpose data reduction software to GPI user. Facilitate the re-development of the GPI instrument team's IDL data reduction tools by initiating the transfer of knowledge early. Ensure that the contracted GPI data reduction tools (IDL) is on track. Description: Re-develop the IDL suite in Python by Gemini. This project aims at initiating the transfer of knowledge early. This will allow the planning for the re-development of the GPI data reduction routines to start early and be more accurate. Another goal is to monitor the project the GPI team is making on the data reduction software. Currently, that progress is not being monitored at all by anyone at Gemini. It is not expected that code will be produced in 2010 through this project. However, a plan and design considerations are deliverables.</p>	01/04/10	12/31/10	69.8	Significant mid-year descope, removing the requirement to port the IDL code to Python.

2010 Projects for the Science Group (SCI) (Part 18)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-620 QA Pipeline (was ENG09-900: Data Flow 2009)	This is the part of the project that ends in Dec 2010. The remaining of the project has been moved to SCI11-620 for planning retreat purposes. Restructuring of the Data Flow Project plan, April, 2009	02/26/09	03/11/11	66.35	<p>Despite uncertainty over the project's future and status, work continued on operations software (Recipe system etc.) which will eventually contribute to the QA pipeline (the continuation of which the Board approved in November). Most of the data reduction primitives are either complete or nearing completion. The Recipe System and FITS storage system/Calibration Manager have progressed well. The Recipe System itself gained some real maturity in the last few months of 2010. The only metrics measurement that is expected before the end of the year is IQ (seeing, ellipticity). Work has started on flux calibration also. Documentation on the primitives and unit tests are being written. Regarding deployment, discussions have started with IS to identify the hardware (virtual or otherwise) that will be needed at the base facility and the summit.</p> <p>Finally, a response to the iPDR report will be drafted by Kathleen and Paul. Also, a charge for a science staff working group will be drafted.</p>

2010 Projects for the Science Group (SCI) (Part 19)

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL	YEAR END NOTES
SCI10-703 DPD / DAS Projects Coordination Initiative	Science/Operational Goals: Optimize the resources by coordinating the software development done by the DPDs and the DAS. Description: Both groups, DPD and DAS, could benefit from the software developed by the other. With the coding environment is the same, Python/PyRAF, it makes sense to coordinate the development of the tools and avoid re-inventing tools. This project's purpose is really to get this coordination going.	01/04/10	12/22/10	36.98	August 2010: De-scoped. Will focus on the identified area of collaboration and not seek new ones. 27.5hrs of DPD effort moved SCI10-608
SCI10-807 Training sponsored by other divisions	This project contains the effort for training sponsored by other divisions.	01/04/10	11/08/10	60	
SCI10-905 UKIRT Observing Support	Paul Hirst doing some observing support at UKIRT. To be paid for by JAC.	07/20/10	12/31/10	100	
SCI11-301 LGS + P1 Upgrades Project	The current operational mode of Gemini North's Laser Guide Star Adaptive Optics system is severely restricted by the field of view of the TT guider, STRAP. This means that Altair in LGS mode does not provide full sky coverage for prospective PIs, especially with targets far from the Galactic Plane where it quickly falls to under 20%. Initial on-sky measurements and modeling suggest that the proposed upgrade would result in an average FWHM of ~0.2" over almost the entire sky, effectively eliminating this shortcoming of our system, but with reduced resolution which is well matched for NIFS observations.	10/27/09	08/29/11	11.63	

2010 Observatory Projects

TASK/TITLE	DESCRIPTION	START DATE	TARGET COMPL DATE	YEAR END PERCENT COMPL
OBS09-006A GeMS (Phase 3-4-5)	I&T on Telescope and Telescope commissioning	02/23/09	02/14/12	16.65
OBS10-006A GMOS New CCDs	This project is to support the procurement, technical and design reviews, Integration and testing, characterization and acceptance processes of the GMOS-N new Hamamatsu CCD mosaic.	01/19/10	07/27/11	1.88
OBS10-006B GMOS-N CCD science commissioning	Commissioning of GMOS-N red CCDs. This project is to cover the part of the project after the CCDs are in GMOS-N and the instrument is back on the telescope.	02/12/10	09/14/11	1.32
OBS10-007A F2 Fixes and Improvements	This project will contain all the tasks needed to fix, upgrade and improve F2 to be able to operate the instrument in a safe, reliable manner during normal operations. Not necessarily to turn F2 into a full facility instrument.	02/01/10	07/11/11	56.22
OBS10-007B F2 Science Commissioning	This project includes on-sky commissioning work and all work required within science to prepare F-2 for operations. The bulk of the science effort will be included in this project, although some science FTEs will also be in the engineering F-2 commissioning project (and some eng. FTEs will be included here). Additional Notes From 2010 Planning: 30% left to do in 2010; this includes R3K grating.	11/16/09	03/21/12	16.08
OBS11-001 New High-Resolution Optical Spectrograph	This project incorporates defining the requirements for this instrument, competing and contracting its construction, and preparations needed at Gemini for its successful integration as a facility instrument.	09/01/10	11/12/14	0



Section 4

2011 Program Plans

R. Carrasco et al., Gemini Observatory/AURA

Gemini Observatory Legacy Image

4. 2011 Program Plans

4.1 Overview

Central to Gemini's ability to successfully implement our transition plans are the tools and methodologies, developed over time, to manage various projects at the Observatory. A number of controls are in place to lead the development of activity within the Observatory and monitor the progress of its execution. In practice these project management tools are similar to what was used successfully to support the original construction of the Gemini telescopes in the 90's, but they have been scaled and configured to a facility in which the dominant form of activity is day-to-day operations and maintenance, not full-scale construction of twin 8 m telescopes. Furthermore, since the Observatory consists of a blend of administrative, scientific, and engineering staff that have different planning system needs, the degree to which they are used is a function of need within Gemini's organizational structure. Quite naturally, engineering tends to be the most rigorous in its application of these tools and this group develops the most complex plans. In contrast the administrative branch tends to generate relatively modest standalone projects that are important to the Observatory but do not push modern project management systems very hard.

Each year the Observatory works in close collaboration with the GSC to develop our annual plans and update our long range objectives. This couples community input with important decisions and priorities for work at Gemini, to make sure they remain aligned. In addition, in 2010 the approach used by the Observatory to plan work for 2011 was to proactively restrict the range of plans considered to focus precious attention on the rather large scale or strategically important projects known to be required by our transition plans. This led to the creation of so-called "Observatory" projects – those which are typically multiyear in duration and require multidiscipline expertise across the observatory to complete. These were generated and prioritized consistent with the aforementioned priorities set by the GSC and Gemini Board. The latter's priorities were cast during March 2010 during a Board retreat and are summarized as follows –

- Deliver and operate high-quality instruments that represent the priorities of our community
- Provide a high fraction of queue operations with appropriate data quality control, data products, and completion fraction
- Have the ability to remotely operate the telescopes
- Improve the interface with the partner community

With this as background and using a similar approach as that found in the previous section, described in this section are the top 10 projects being pursued at Gemini Observatory, rank ordered in priority. The current top 10 list of projects in order of priority include (project code followed by name) -

1. OBS11-008: New Cooperative Agreement
2. OBS10-006 : GMOS-N CCDs Project Overview
 - a. OBS10-006A: GMOS New CCDs (ENG10-004)
 - b. OBS10-006A1: GMOS-N CCD science commissioning (SCI10-244)
 - c. OBS10-006C: GMOS DR for new CCDs (SCI11-606)
 - d. OBS 10-006D: GMOS-N CCD Software Updates
3. OBS09-006A: GeMS (Phase 3-4-5)
 - a. OBS09-006B: GSAOI Science Commissioning (SCI11-209)

- b. OBS09-006C: GSAOI Data Reduction Software (SCI11-601)
- 4. Observatory Software
 - a. OSW11-200 ITAC Phase 2
 - b. OSW11-201 Time Accounting Timeline
 - c. OSW11-202 SALSA/Sci Ops Software-LCH Clearances
 - d. SCI11-620 QA Pipeline
- 5. OBS10-007A: F2 Fixes and Improvements
 - a. OBS10-007B: F2 Science Commissioning
 - b. OBS10-007C: Data Reduction Software for Flamingos 2
- 6. OBS11-003: GPI Observatory Project
- 7. Observatory Software
 - a. OSW11-207 ODB Replacement Design Study
- 8. OBS11-001: New High-Resolution Optical Spectrograph
- 9. OBS11-005: 2nd Generation Acquisition and Guidance Unit Observatory Project
- 10. OBS11-501: Base Facility Operations

This list of projects is subject to change in the event of the completion of projects, unforeseen events, or changing circumstances. In practice though, changes to this list are fairly slow to evolve given the typical scale of these projects and the fact that many are multiyear projects in nature. They are summarized below as representative of important work being conducted at Gemini in 2011.

4.2 OBS11-008: New Cooperative Agreement

Gemini Observatory is operated under a Cooperative Agreement (CA) between the National Science Foundation and Gemini's parent management agency, AURA. These CA's typically have durations of 5 years and are renewed through the generation of a formal funding proposal which articulates past work completed under previous funding and new proposed work to be completed with additional funding, in the future. This project was identified as the most important project for the Observatory in 2011, though much of the ground work for it was laid in 2010 through the formulation of Gemini's Transition Plan. This plan has a number of central themes including –

- Preserving both classical and queue observing modes but conduct the latter using non-research staff
- Pressing aggressively to close-out the development of several new instruments or capabilities
- Migrating nighttime operations to the base facilities in La Serena and Hilo, as a segue to engaging the community more effectively through remote operations and eavesdropping

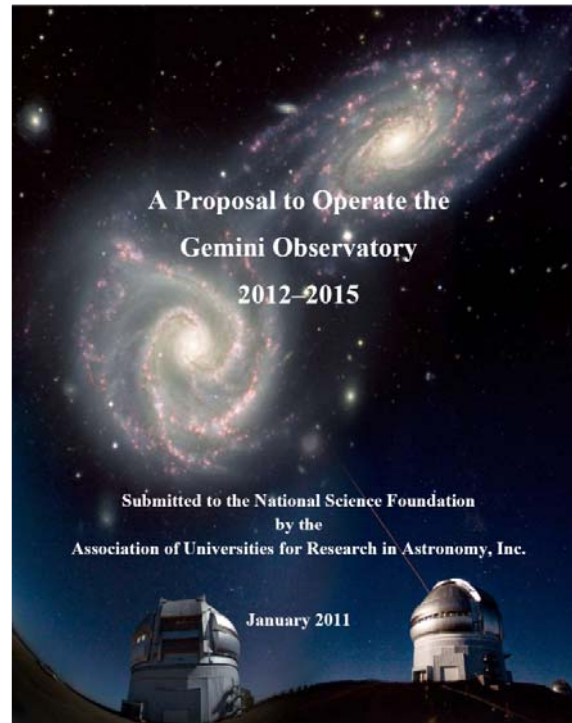


Figure 4.1 –The cover to Gemini's 2012-2015 NSF Funding Proposal is shown. This document describes future plans for Gemini and is grounded in the Transition Plans that have been developed to restructure Gemini in accord with funding cuts due to the UK's withdrawal from the Gemini Partnership at the end of 2012.

OBS11-008: New Cooperative Agreement

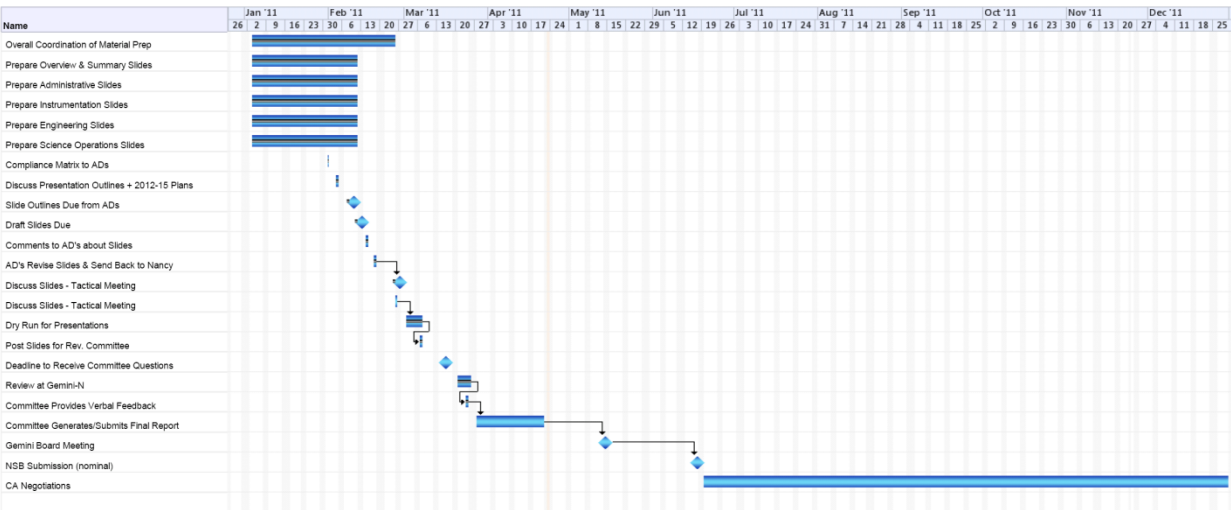


Figure 4.2 –The steps associated with the generation of Gemini’s new CA are shown in this rendition of project OBS11-008.

- Scaling the size of the staff to accommodate a reduced budget, with limited restructuring designed to preserve core capabilities like laser AO, high performance coating capabilities, etc.

The basic steps of this project include considerable overall coordination across the Directorate as they prepared presentation material for an on-site review of the proposal submitted. This was meticulously cross checked with the Charge given to the review panel by the NSF to ensure that all of the topics under consideration in the review were adequately addressed through the written material provided. Draft presentation material was crafted and reviewed internally before posting it on a secure web site to support the review. The review is a 2011 event in Hilo, with feedback provided soon thereafter to the Observatory, NSF, and Gemini Board. Once approved at the Board level, the outcome of the review is used as the basis for seeking approval at the National Science Board in mid-2011. Upon approval at the NSB level, negotiations are launched between AURA/Gemini and the NSF on the terms and conditions for a new CA which takes effect mid 2012 and remains in effect through 2015.

Normally the new CA would be synchronized to start with the expiration of the previous CA, which was nominally 2010. However, under the exceptional circumstances driven by the UK’s announced withdrawal from Gemini in late 2009, the previous CA was extended by 18 months to mid 2012, to provide additional time to generate a new proposal under the revised budget constraints Gemini must operate within. Ultimately this is all intended to be phased with a new International Agreement (IA) since the current IA is set to expire in 2015.

4.3 OBS10-006 : GMOS-N CCDs Project

The highest priority project within Gemini’s instrument development program is the upgrading of the GMOS-N CCDs. The center piece of this project is to replace the original E2V CCDs in GMOS-N with fully depleted CCDs manufactured by Hamamatsu, similar in nature to what is being used for Subaru’s new HyperSuprime camera. The scientific promise of this upgrade for GMOS-N is high, as these detectors have outstanding red sensitivity as seen in Figure 4.4. This project also encompasses the generation of new data reduction software by Gemini’s data reduction development group, consistent with unique properties of these new CCDs, as well as the on-sky commissioning effort needed to test and validate the performance of the new GMOS-N focal plane. The project nominally ends in mid 2011 once GMOS-N is transferred back to science operations to use the new detector system for regular operations.

OBS10-006 : GMOS-N CCDs Project Overview (Scot K.)

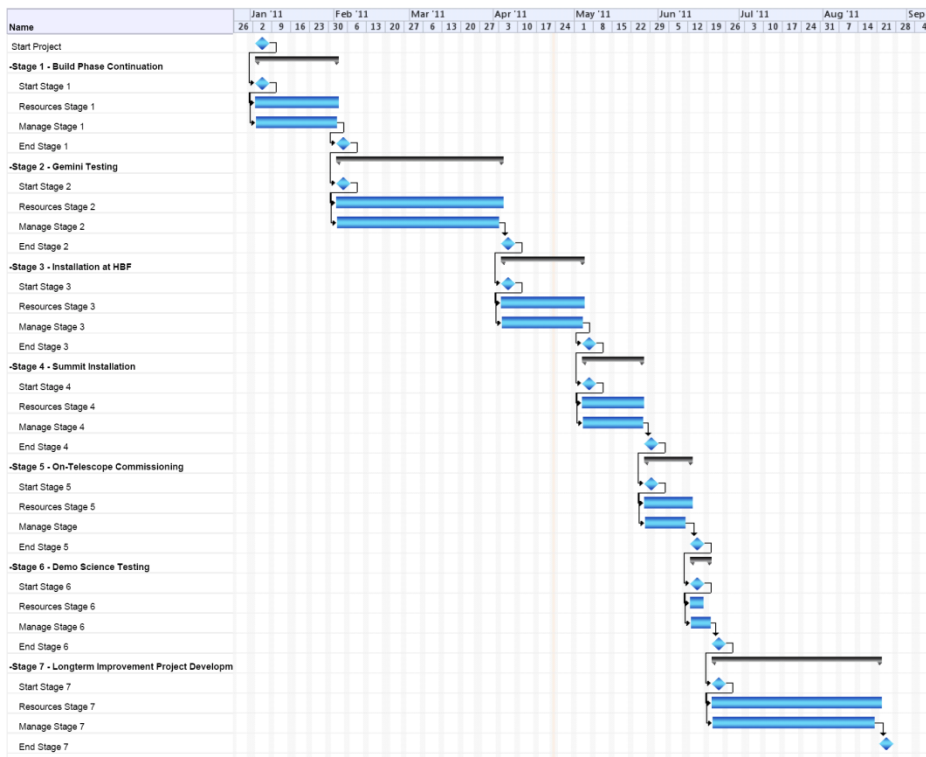


Figure 4.3 –This simplified and rolled up rendering of project OBS10-006 shows work associated with the replacement of the GMOS-N CCDs. This was identified as the highest priority instrumentation project for Gemini in 2011.

The bulk of the work associated with this project to date has been handled via contract to HIA. It includes the performance evaluation of a new, commercially developed, array controller as well as the new CCDs. Once that work is completed at HIA the new assembled system is delivered to Gemini-N, where it is further tested before being brought to the summit for integration into GMOS-N. Replacing the existing detectors in a manner that is reversible (in terms of alignment) in case a problem emerges is non-trivial and requires considerable planning and new equipment. Gemini's EIG team has been involved from the outset with this project and Gemini's detector engineer has spent considerable amounts of time at HIA assisting in its completion. Though the system has fairly good noise performance now, often the most challenging aspect of such detector replacement projects is to providing good noise performance once the system is installed on the instrument and telescope. For this reason steps will be taken before the final integration of the new detector package into GMOS-N to ensure that no unexpected ground loops or other issues emerge that significantly impact on-sky performance.

This project has suffered significant delays to date due primarily to defective and/or poorly designed controller components and two of the four CCDs Gemini purchased for this project turned out to be unusable as science grade

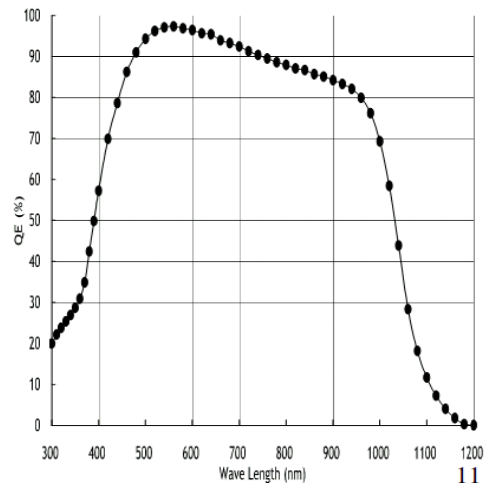


Figure 4.4 –A nominal QE curve for the next-generation CCDs that are being installed in GMOS-N is shown.

devices. It has taken time to secure a replacement CCD (recently delivered to HIA in Canada), so this project is back on track but has required considerably greater time and effort than originally envisioned.

4.4 OBS09-006A: GeMS (Phase 3-4-5)

Ranked number 3 in the list of projects underway at Gemini in 2011 is the Multi-Conjugate Adaptive Optics system, also known as MCAO or GeMS. This has been an on-going development project that, thanks to the delivery in 2010 of the high power sodium laser needed by GeMS, is now poised through this project to be commissioned on Gemini-S. This involves a multitude of effort on many fronts, including essentially all branches of Gemini engineering (mechanical, electronics, software, optics, systems). Under this project's timeline the GeMS adaptive optics bench called Canopus is delivered to the summit of Cerro Pachon and attached to the Cass cluster on Gemini-S, replacing PHOENIX on one of the two low-mass ISS ports. In addition, the Gemini-S Adaptive Optics Imager (GSAOI) is installed on one of the high mass ports. GSAOI was built by ANU and delivered to Gemini several years ago. Featuring a 4096x4096 pixel focal plane that is sensitive from 1-2.5 μm , GSAOI serves as both the commissioning and principal science camera for the GeMS system. Once these new systems are confocal and aligned with respect to the telescope's pupil, the basic system configuration required for on-sky tests is in place.

Commissioning in 2011 begins with initial tests of the laser launch system. This involves a fairly complex interplay of logistics to coordinate tests with DGAC (the Chilean equivalent of the FAA), Space Command's Laser Clearing House, and in-house diagnostics to ensure the safe propagation of a high power laser beam into the night sky above Gemini-S. Verification of the 5 beacon sodium constellation was achieved early in this program – an important milestone in the execution of this plan (see Figure 4.5). From there, a host of tests need to be conducted as part of a 5 run commissioning campaign during the Gemini-S summer months to systematically bring the entire system on-line. This involves generating a number of LUTs in the launch system and wavefront sensor probes, tests of the laser beam stabilizer, calculating and implementing the necessary position transforms needed to support targeting offsets on the sky, sequential hand-off of a series of servo loops to transfer aberrations and tilt errors from the 3 deformable mirrors in Canopus to M1 and M2 (increasing the dynamic range of the DMs in Canopus), and ultimately testing a number of different reconstructor algorithms that will optimally achieve both high and uniform strehl across the system's field of view. The complexity of this system is necessarily high and through the initial set of commissioning runs it will be operated by a fairly large team tasked with coordinating the use of its many subsystems. This is similar to the early days of commissioning the LGS AO system at Gemini-N, but the complexity of GeMS is higher. After the Jan-May 2011 series of commissioning runs the system will undergo a 6-8 month shutdown to address issues learned during the initial commissioning runs. This corresponds to the Chilean winter – a season that is unlikely to be conducive to providing the consistently clear skies that are needed by such a commissioning effort. At the end of 2011 and into 2012 commissioning of the system will resume, leading to early science operations use of GeMS by mid 2012.



Figure 4.5 - The recent "first light" for the Gemini-S laser launch system is captured by this photo (made by Maxime Boccas, Gemini). Projecting a constellation of laser beacons into the sodium layer was a first in astronomy and will help enable incredible research opportunities for Gemini's science community.



Figure 4.6 – A portion of the GeMS commissioning team is shown on the summit of Cerro Pachon in the Gemini-S control room. This team is responsible for final integration and testing of the world’s most sophisticated laser AO system in use in astronomy.

GeMS is the “crown jewel” in Gemini’s instrument suite and stands to be more transformative of the science produced by Gemini than any instrument delivered to date. It is the result of both contracted and in-house effort over nearly a decade to develop a system characterized by a complexity that is rivaled only by its potential for scientific discovery. Because it is a general purpose facility, GeMS will ultimately feed both imagers and spectrometers at Gemini-S, some of which have not even been conceived yet. It is the result of a vision for adaptive optics grounded in the mid ‘90’s, before laser AO for

astronomy was even demonstrated to be practical in terms of implementation or relevant from a science perspective. At the time, the idea of being able to perform real-time 3D tomographic analysis of the atmosphere and compensating for the induced aberrations along a telescope’s line-of-site was radical and only “lived” in the realm of the most sophisticated AO models available. It required compact high speed computational capabilities, deformable mirrors, and laser systems that did not exist at the time. Under such conditions, the pursuit of GeMS was clearly risky and required the expertise of the international Gemini science, engineering, and industrial communities. It also required the bold support of the Gemini Board and backing of the original Gemini project construction team, who was focused on commissioning two telescopes but was still able to capture in its field of view a marvelous future of discovery, illuminated by 5 tiny yellow beacons in the skies above the Andes.

4.5 Observatory Software

The next highest priority project in the allocation of resources at Gemini is a suite of new software that, together, helps support the future science operations model that is incorporated in Gemini’s Transition plan. This includes new software that is designed to support Gemini’s ITAC system, time accounting processes, laser clearing house efforts, and data quality assurance pipeline. The common theme behind

SCI11-620: QA Pipeline

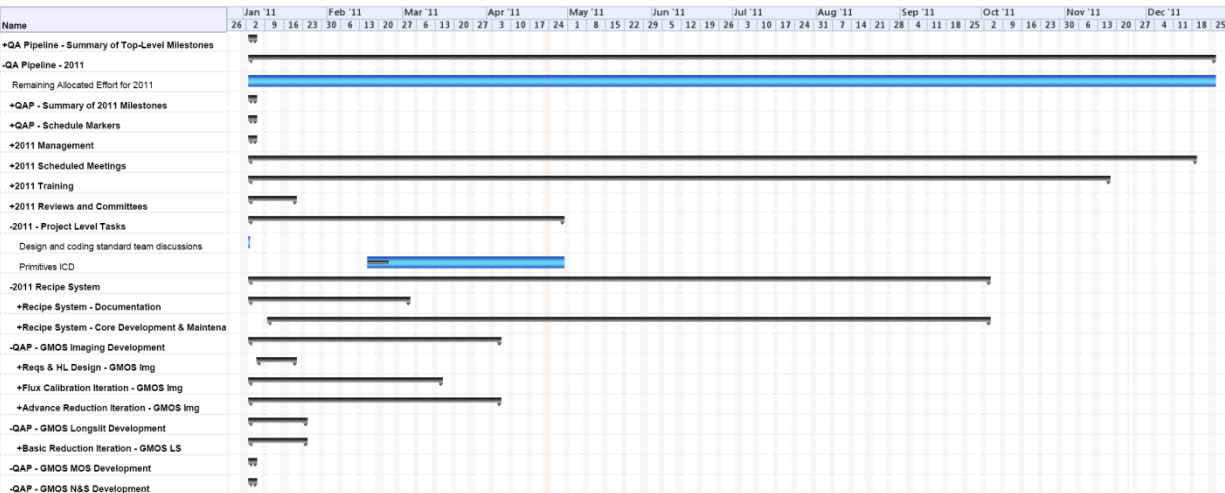


Figure 4.7 –The new Quality Assurance (QA) pipeline project is shown above in this simplified version of its multiyear plan. The system is designed to be highly modular and will be released on a mode-by-mode basis, initially for GMOS and then for successively more complex instruments at both Gemini sites.

these new software packages is to increase the efficiency of Gemini’s science operations, helping preserve core capabilities with less effort and therefore cost. They represent a near term investment that will pay dividends long term – consistent with an underlying tenet of Gemini’s Transition plan, that it requires investments up front to save money downstream and adjust for a reduced budget, long term.

In more detail, the new ITAC software is needed to replace the rather antiquated and highly labor intensive collection of independent software applications that have been used to date to manage the ingestion and analysis of observing programs to form a single integrated queue program each semester. In a similar vein, the new time accounting program is designed to automate the currently rather time consuming process needed to track the use of time each night at each Gemini site, parsing it into various forms (science, weather loss, engineering, etc.) and ensuring that each partner receives the amount of observing time they are due over the course of each semester. The new SALSA Laser Clearing House software is intended to automate the interlock system on the lasers at each Gemini site, replacing the currently manual shuttering that is used to prevent the propagation of the laser during a closure period defined by the Laser Clearing House. An additional benefit of this automation will be to reduce the response time of the system (compared to the use of a human shutter trigger), which in turn will reduce the allowed error cone to 0.1° , reducing the number of LCH driven closures each night. In other words, this new software not only reduces the effort needed to run our laser AO systems, but also increases the amount of time that will be available for laser AO applications each night. Finally, the QA pipeline is a spin-off and much simplified version of what was originally termed the “DataFlow” project. It is designed to string together components of the PYRAF reduction software that is already being developed for all Gemini instruments into automated reduction sequences that yield, on-the-fly, reduced data that the observer can use to evaluate data quality. This is done now through somewhat manual and less effective

means. Again, like the other new software described above, the underlying point to this new code is to make it possible to support a robust science operations system, capable of providing much of the same data product that is enjoyed now, but at reduced cost.

While it is important to have this software completed on schedule, the Transition plan has off-ramps built in to mitigate the risk of this new software not arriving in time. For example, failure to complete the LCH software means we continue to operate in the same fashion we are now, accepting the reduced efficiency. Similarly, the Gemini Board has expressed a willingness to relax the efficiency of the queue (e.g. open shutter efficiency, time accounting, etc.) as part of the trade space available to manage the development of new capabilities in

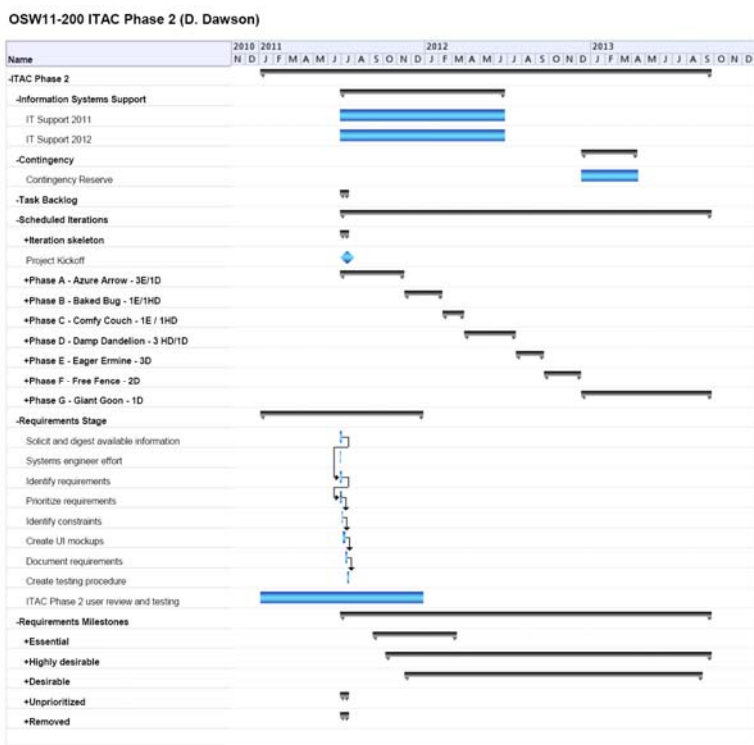


Figure 4.8 –The new ITAC software project is shown in this simplified Gantt chart. It consists of a number of releases over a multiyear period and is being designed to streamline the handling of proposals through interactions with various databases.

parallel with staff and budget reductions. This latitude may be needed and will be part of the process of dynamically managing the entire transition process.

4.6 OBS10-007A: F2 Fixes and Improvements

This project was launched in early 2010 when it became clear that FLAMINGOS-2 (F2) was not going to be successfully commissioned in its delivered state. The Observatory undertook an extensive analysis of the problems that the instrument was having, evaluated the approach, risks, and merits of pursuing repairs on the instrument, and decided to proceed with this project in large part driven by the recognition that F2 is an essential strategic part of Gemini's long-term instrumentation plans. The science potential for a cryogenic multi-slit spectrometer on Gemini-S is large with or without the problems F2 exhibited and this project reflects an underlying decision, made early in the process of developing a recovery plan, that an emphasis would be placed on repairing F2 as quickly as possible vs. other strategies at our disposal.

Figure 4.9 shows some of the many mechanical modifications made to F2 as part of this project. Much of the emphasis was placed on the large mechanisms in the MOS fore-dewar which exhibited unreliable performance during on-telescope tests in 2009. These changes include a complete redesign of the drive system and replacement of the bearing assembly used to support the large MOS wheel. The new design features tapered roller bearings for improved support and a set of concentric ruby bearings that will significantly increase the thermal pathway across this structure which needs to achieve fairly rapid cold cycles. A new Decker drive assembly was also added, as well as a new detent mechanism for the MOS wheel to improve its reliability and repeatability. Gemini engineering replaced the poorly designed getter, which became detached inside the instrument, spilling activated charcoal in the camera dewar in the process. As part of this project Gemini's electronics team is replacing the science detector for F2, which arrived substantially broken when the instrument was first tested on the summit of Cerro Pachon. In addition a rubber o-ring, which was mistakenly left by the UF team in the optical barrel of the camera optics, was removed and the barrel modified to be compatible with mechanical restraints for one of the lenses in the camera barrel.

Beyond a range of repairs and upgrades, this observatory project also includes the development of data reduction software that is capable of reducing F2 imaging, single slit, and multi-slit spectroscopy data. These components of the project need to be completed in time for on-sky commissioning, as they are an important part of the overall system used to collect, process, and analyze F2 data.



Figure 4.9 – (Top) The new MOS drive assembly, which was designed, built, and installed by Gemini engineering, is seen in the above photo. (Middle) The new MOS wheel hub, featuring new tapered roller bearings for smoother operation and concentric rings of ruby bearings for improved thermal conductivity across the hub is seen. (Bottom) The new Decker worm gear drive assembly is shown.

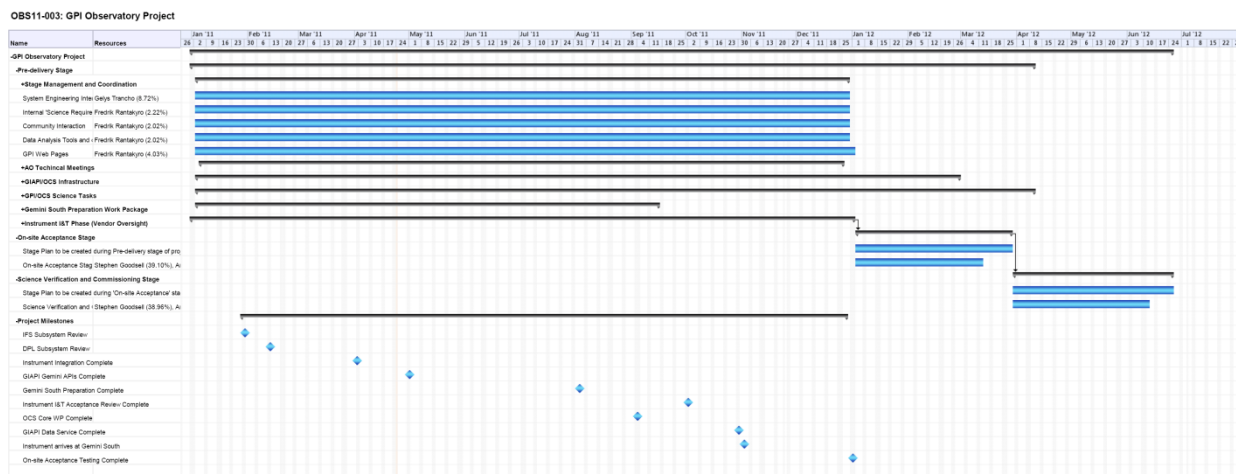


Figure 4.10 – The GPI project plan is laid out in a highly simplified form, showing basic elements of the effort required to complete the construction of GPI, ship, and commission it at Gemini-S.

The latter part of this project will be completed in late 2011 with full system tests, using a new science detector, in the SBF lab. Assuming it passes acceptance tests, which will evaluate the optical, electrical, and mechanical functionality and performance of the instrument, F2 will be shipped back up to Cerro Pachon for final commissioning soon thereafter. Given progress made to date and the nature of the repairs remaining, we remain confident that F2 will be operational in 2012.

4.7 OBS11-003: Gemini Planet Imager (GPI)

The first and only “surviving” component of the Aspen instrument program is the Gemini Planet Imager (GPI). This unique instrument was launched first among the Aspen suite primarily out of concern that its European counterpart (SPHERE), which is expected to have similar capabilities, would beat GPI to the unique exo-planet target list available to large aperture telescopes in the southern hemisphere.

In a sense GPI is a successor to NICI (Near Infrared Coronagraphic Imager) at Gemini-S, which is in the final stages of a ~50 night campaign to identify exo-planets. The combination of Gemini-S and NICI is currently the most sensitive coronagraphic imaging system in use today in astronomy. Given the unique technologies involved, GPI stands to be an order of magnitude more sensitive to exoplanets than NICI in the immediate proximity of host stars (<0.5 arcsec). Since GPI will provide not only exquisite detection sensitivity but also spectroscopic observations of new planets, this remarkable instrument will help take the field from the era of exoplanet census-taking to exoplanet characterization.

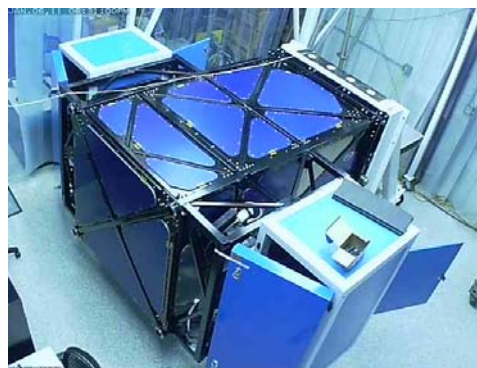


Figure 4.11 – A webcam image of the Gemini Planet Imager (GPI) as it undergoes integration and test procedures at UC Santa Cruz. This one instrument represents a near doubling of adaptive optics investment at Gemini in the ~20 year lifetime of Gemini Observatory. GPI stands to catapult ground based exoplanet research in ways and directions that are as exciting as they are unpredictable.

Work on GPI is distributed across a half dozen sites in North America and Gemini functions as central project manager for all of this activity. The instrument is currently in an I&T phase at UC Santa Cruz, where all major subsystems are being delivered. These include the main opto-mechanical bench, integral field spectrometer used as the primary science detector, coronagraphic components, low and high order AO components, calibration wave front sensor, and

central electronics and control system software. In addition Gemini is providing a new software interface called GI-API as a new standard for instrument builders to use. Data reduction algorithms are also part of the deliverables for GPI, to ensure that we have robust reduction software in place during commissioning and ultimately, throughout its lifetime. As the system is sequentially brought on-line in a lab environment, tests will be conducted in 2011 to verify end-to-end performance. As seen in Figure 4.10, a number of important milestones are scheduled to arrive in 2011, including key tests of various control systems, pre-shipment acceptance tests, and interface verifications (mechanical, optical, electronic, and software). Trades are likely in this phase that will involve the use of remaining contingencies (budget, schedule, performance) prior to shipping the instrument to Gemini-S. Commissioning is slated to occur in 2012. In the same sense that the Gemini-N laser AO system commissioning a few years ago will help streamline the GeMS commissioning at Gemini-S in 2011, so too will all of the investment in NICI pay off when GPI is commissioned. Fallback strategies for somewhat reduced capability exist in the event the system does not perform as well as hoped once it is tested on the telescope. At this point though, we remain confident that GPI will be a “game changer” in the field of exoplanet research, and be an important part of Gemini’s scientific legacy.

4.8 Observatory Software – OSW11-207 ODB Replacement Design Study

This project involves Gemini’s High Level Development Group designing a modernized update of the Observatory Control System and its storage infrastructure (Observatory DataBase or ODB). The ODB was designed nearly a decade ago and is approaching a point of obsolescence that will make it hard to support and maintain. While incremental improvements can be made on the current ODB, sweeping changes will be needed to make the desired rapid progress on the core issues that are needed. These changes will go to the very core of the OCS, the data model upon which all of its applications are built. This data model is the representation of science programs, observations, targets, plans, etc. in the software. When a change is made to the model, it necessarily ripples to all the applications that use that model, leading to considerable overhead in its support which is not compatible with a long term decline in resources at Gemini. For that reason, a project to generate requirements and study proposed solutions has been launched in 2011. A decision to actually pursue the replacement of Gemini’s ODB will be made later in 2011, once a solution has been identified and its cost, risks, and implementation challenges are understood and can be weighed against the priorities of other important software development work at Gemini.

4.9 OBS11-001 – New High-Resolution Optical Spectrograph

The next instrument to be built for Gemini will be GHOS, a new high-resolution optical spectrometer. The instrument will nominally be designed as a high throughput $R \sim 40,000$ instrument that will provide coverage of the entire optical region of the spectrum. Pushing the blue arm of the instrument to perform well at UV wavelengths is also under consideration, and is linked to an initiative at Gemini to develop a hybrid Al/Ag mirror coating that would provide good broadband reflectivity down to ~ 300 nm while not sacrificing the infrared performance Gemini’s current coatings are known for. The initial steps in the development of GHOS occurred in 2010 in the form of a solicitation for white papers from the community to provide science applications and nominal design criteria for this new spectrometer. Over twenty white papers were submitted to Gemini, analyzed by the GSC, and compiled into an assessment of nominal performance requirements. These requirements were then used to inform the 2011 portion of this project, the centerpiece of which is to issue an RfP to prospective builders, select among those proposals teams that should be funded to develop concepts for the instrument, and ultimately select a team or teams to continue its design and construction.



Figure 4.12 – The recent Gemini web splash announcing the solicitation of white papers, as an initial step in the setting of requirements for a new high-res optical spectrometer is shown.

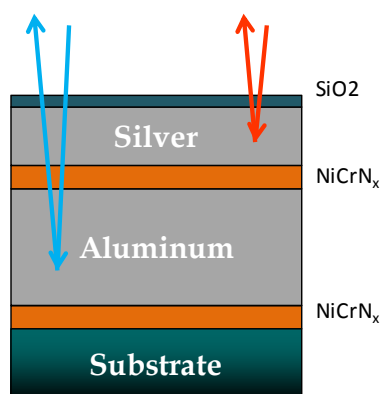


Figure 4.13 – The basic concept behind a new form of coating that would yield excellent UV – MIR reflectivity is illustrated. Silver is transparent to blue photons but an underlying layer of aluminum would reflect them back out. This takes advantage of the existing sputter coating system at Gemini.

The procurement approach used for GHOS will be different compared to previous instrument procurements and likely be based upon the use of Cost Capped Time and Materials contracts, not Fixed Price contracts used previously. Though the latter have been shown to limit financial risks to the Observatory (and partner funding agencies), this approach has been a mixed bag of successes and failures when it comes to delivering instruments on aggressive schedules. The new approach being used by

Gemini will give the Observatory much more latitude in the decision making processes used develop instruments, in essence as a collaboration between Observatory instrument development and engineering staff and teams under contract to build the instrument. This effectively transfers greater risk over to Gemini, but in the end the Observatory takes on this risk anyway, as demonstrated by the outcome of the F2 program. In net we believe this approach will yield better instrument delivery performance than has been achieved in the past, and produce a better and longer lasting working relationship between the Observatory and the community of instrument builders that underpin the future of Gemini's instrument program, and all that carries with it.

The RfP phase of the GHOS project nominally ends in late June with the arrival of proposals by teams to build the instrument. From there, at least two conceptual designs will be conducted competitively to explore design options to build the instrument. The results of those studies will be assessed by an independent review panel, tasked with recommending to Gemini how the Observatory should proceed with the instrument. Nominally the procurement goes forward under a T&M contract though it's conceivable that the studies may go forward through the PDR phase before a down-select is conducted. In any event the instrument goes into a build phase in 2012, with a nominal completion in 2015.

4.10 OBS11-005 – 2nd Generation Acquisition and Guidance Unit

The principal aim of this project is to deliver two A&G units, one for each telescope on a 5 year timescale. An important objective is for the new A&G units to have significantly better reliability over the existing pair of A&G Units. Other objectives include increasing maintainability, preserving baseline functionality, and increasing capability and retaining modularity of the new A&G units. The project approach is to outsource the design, fabrication, assembly and test of the units. The project is divided into 10 stages, starting with a stage to define the instrument technical requirements and finishing with an on-sky commissioning stage. This project will conclude (and close) with the successful commissioning of both A&G units at both Gemini telescopes.

OBS11-005: 2nd Generation Acquisition and Guidance Unit Observatory Project

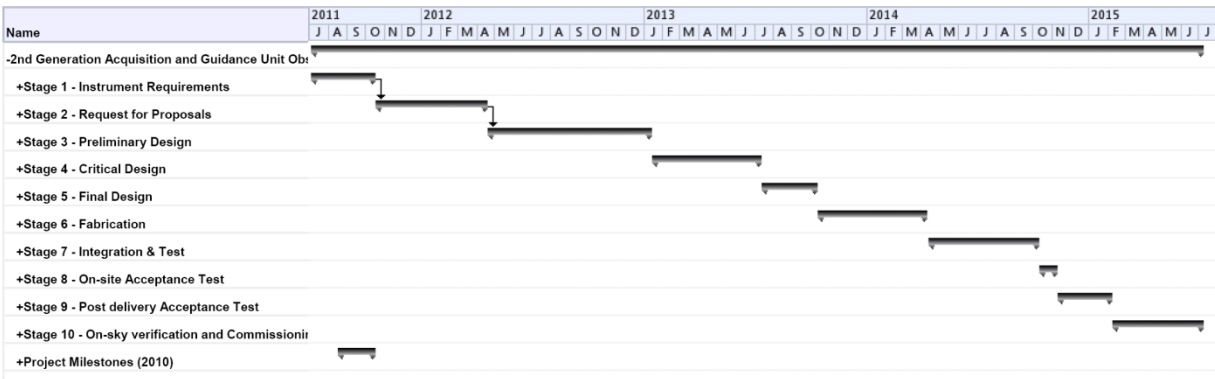


Figure 4.14 –The new A&G project plan is shown, rolled up into the 10 stages used to define it from the initial requirements definition phase to on-sky commissioning. This sequence of steps yields new A&G units at both sites in 2015.

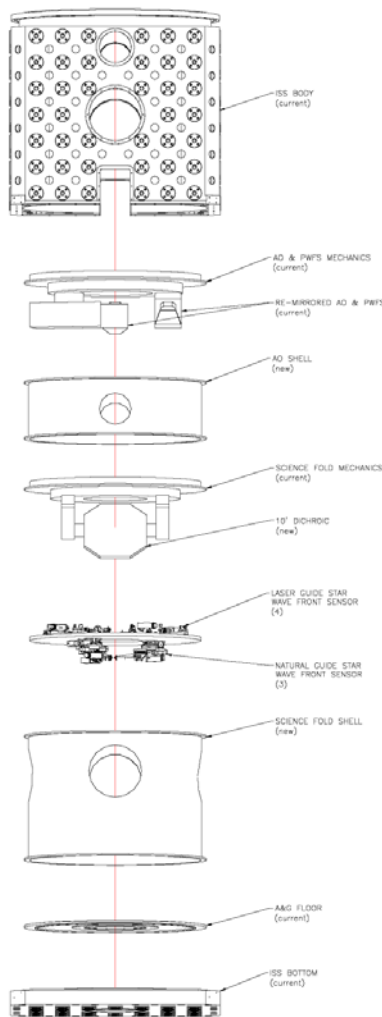


Figure 4.15 –The new A&G concept which emerged several years ago as part of the GLAO feasibility study is shown. This represents a reasonable reference point in the analysis of design options for the new A&G units.

The initial stages of this project are shown in Figure 4.14. After an initial assessment of current requirements and “lessons learned” with the existing A&G units, an RfP will be issued from Gemini’s development group to have the new A&G units built in a manner similar to any new instrument. After a down-select from submitted proposals, a team will be identified to build the new A&G units and placed under contract. As mentioned in the previous report about GHOS, this will likely be on a T&M basis. From there, a series of design reviews will occur during the design/development phase of the project, leading to its fabrication in 2013/2014, on-site acceptance testing in late 2014, and finally on-sky acceptance and commissioning at each site in 2015.

An additional consideration will be given, early in the project, to the requirements of a new Ground Layer Adaptive Optics (GLAO) system that would nominally be developed in parallel with the new A&G units. These two systems “intersect” principally through the wave front sensing systems in the new A&G units. The previously conducted GLAO feasibility study examined options and yielded a basic layout for the new A&G units, as shown in Figure 4.15. The GLAO system will require a combination of laser and natural guide star wave front sensors, not unlike the MCAO system at Gemini-S, but instead will feed the real-time control system for the actuators built into a new adaptive secondary mirror. The concept proposed is to use GMOS-like wave front sensors, down further in the unit along the telescope’s beam, to allow more of these relatively compact units in the space available. Significant challenges exist in this system, particularly of the existing concept of using an articulated tertiary mirror in the A&G unit as the science beam feed is replaced with a dichroic to transmit light into the underlying wave front sensors.

OBS11-501 Base Facility Operations (M. Sheehan)



Figure 4.16 – The basic elements of the multi-year project designed to move summit nighttime operations to the base facilities in Hilo and La Serena is shown. Activity in 2011 is focused primarily on the design aspects of the project and will lead to a build phase in 2012, then an I&T phase in 2013. By mid 2014 both telescopes should be operated nightly from Gemini’s base facilities.

These and other basic design trades will be worked out in 2011 between the A&G project and emerging GLAO project to ensure that a design which is compatible with existing space constraints, control system designs, and opto-mechanical interfaces is reached.

4.11 OBS11-501 – Base Facility Operations

Last in the series of “top 10” projects identified for work in 2011 is the beginning phase of a project which will bring summit nighttime operations to the base facilities in La Serena and Hilo. This is motivated principally by the long-term financial gains of this new model, but it also stands to improve telescope reliability through investments in systems designed to sense system failures before they lead to lost observing time. This is also part of a growing trend in astronomy to use modern technologies to remotely operate facilities that are often in remote places, atop mountains or even in the Antarctic.

This project begins in 2011 with a conceptual design that features an assessment of existing Observatory systems from the standpoint of reliability and operability from a remote site. This is part of an observatory wide failure mode analysis. This initial phase of the project is capped off in 2011 with an independent conceptual design review of the entire project. Additional details of this multi-year project can be found in Figure 4.16. Central elements of this plan include the use of an extended trial period at each site, involving science operations staff at the base facilities and technical support staff at the summits. The program would be deployed at Gemini-N first, on the expectation that the benefits of remote observing would be maximized there given the considerably higher altitude of Mauna Kea compared to Cerro Pachon.

In more detail and to give a better indication of the depth and breadth of this project from an engineering point of view, the telescope subsystems that need to be reviewed in terms of remote operability include the mount control systems (MCS), M1, M2, Primary Control System (PCS), elevation,

azimuth, and Cassegrain cable wraps and associated drive systems, elevation and azimuth encoding systems, mirror covers, locking pins, A&G units, and the central interlock system which provides a crucial layer of protection across all key subsystems in the dome. Weather monitoring systems will be revisited and augmented, particularly where there are known weaknesses like real-time fog detection. All instruments (over a dozen) would also be reviewed from the standpoint of remote access to electronics, mechanisms, power, control, etc. The laser systems at both sites would also be examined, including the beam transfer optics, laser launch systems behind M2, and already existing safety systems (SALSA). The Gemini-N laser is already run regularly from a station in Hilo and the Gemini-S laser is monitored from Gemini-N during prolonged periods of use, so in a sense we are already well down the path to remote laser operations. Essential systems from the standpoint of telescope safety include the enclosures, which means making sure the bogies, control system (ECS), top/bottom shutter drives, vent gates, and related enclosure components are ready for remote operations. Special consideration will have to be given in winter, when the domes are susceptible to icing and it is difficult to ascertain the extent of icing without visual inspection. The plant rooms on Cerro Pachon and Mauna Kea will also be assessed for readiness to adapt to remote operations. This means ensuring the hydrostatic bearing pumps, chilled glycol system, compressed air, helium refrigeration systems, UPS, HVAC, and emergency electrical generators are well understood and ready to respond automatically to a range of circumstances including unplanned loss of communications and/or power, earthquakes, prolonged periods in which the summits are inaccessible due to snow, etc.

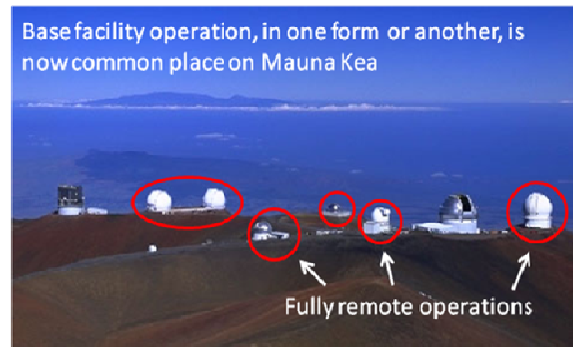


Figure 4.17 - The move toward base facility operations among the Mauna Kea Observatories is leading to a set of common needs in terms of night time summit support. Gemini will take a lead role in defining, organizing, and mobilizing a joint technical support system for the Mauna Kea observatories, consistent with the strategic vision of the Observatory to seek common areas of collaborative development.

Despite what may seem to be a daunting list of systems to validate as ready for remote operations, the experiences to date of other facilities that have taken this step are generally very positive. In fact, Gemini is uniquely poised to make this move compared to other older facilities, since much of the telemetry and monitoring infrastructure is already in place. Both base facilities prominently feature modern remote operations rooms, well equipped with Polycoms and advanced multi-head control consoles that have been demonstrated to be reliable and well designed. Both sites also have high bandwidth links between summit and base facilities and have been engineered to handle sudden loss of power and/or internet links. Finally, based upon the experiences elsewhere with retrofitting the necessary technology into an observatory to support remote operations, we expect the reliability (and uptime) to increase because we will be able to use predictive instead of preventative maintenance to trap faults before they become manifest as telescope shutdowns. In essence, what started out as a project to reduce costs within our Transition plans is turning into a project that will yield benefits from many perspectives.

4.12 Summary of 2011 Work Planned at Gemini Observatory

2011 Projects for the Directorate (DIR)

Project Name	Project Description
DIR11-002 Community Interface	The goal of this project is to successfully fulfill the Gemini Board's directive to better interface with partner communities. The outcome will be to deliver products and services the international community demands. The outcomes listed for 2011 have already been identified as desired; specific products for the out-years will be defined later.
DIR11-003 Continued MCC WG classes	The goal of this project is to continue to the Better Email, Task Management, and Effective Meetings classes in 2011.
DIR11-004 Directorate Operations	This project is a place holder for Directorate members.

2011 Projects for the Administration Facilities Group (AFG)

Project Name	Project Description
AFG11-001 HBF & MK Solar Array	This project seeks to allow the construction and operation of solar photovoltaic (PV) systems at Gemini's two principal buildings in Hawai'i via a third party ownership model in which a separate, taxable entity will procure, install and operate a solar photovoltaic system on the premises and establish a long-term contract for Gemini to purchase from the third party system owner the electricity generated by the system and consumed by Gemini.
AFG11-002 South Base Facility Renovation Phase 2	Identify feasible opportunities for the refurbishment and/or development of the SBF building to support the 2012 – 2015 Observatory Plan. The key objectives for the South Based Facility Renovations Phase #2 plan are to support the following points: <ul style="list-style-type: none"> • Obtaining management consensus for refurbishment and development options that supports the plan and are within the allocated budget • Obtaining architectural plans and specifications • Obtaining bids for the construction work in accordance with the plan • Undertaking the construction work • Inhabit the new refurbished area
AFG11-004 Wikiprocedia	This project will add further content to the on-line encyclopaedia of Administration and Facilities processes for Gemini North and South actions. It will complete the full inventory of AFG Wikiprocedures, (e.g. it will add another 90 Wikiprocedures to the 110 already entered in Wikiprocedia). This project will ensure all entries maintain the required standard of input, (e.g. containing the relevant documented fields that are completed levels of specifications.)
AFG11-005 Keyless entry, limited GS implementation	The system will provide programmable, controlled and trackable access to selected areas of buildings and facilities at SBF and Cerro Pachon, improving building and staff security. As an integrated program across both sites, the keyless access system will also improve the quality and efficiency of the visitor handling process.
AFG11-006 Scrap sell-off GS	To dispose of Fleet Vehicles at Control Preta via the bid process
AFG11-007 Task Management Tool (AFG)	Establish a reusable scheduling template within Project Insight to assign AFG routine tasks and subtasks to AFG members. The frequency of the tasks in the draft schedule will be deferred by dates, times and frequency as indicated in Wikiprocedia. The final schedule will consider year round resource scheduling that promotes cross-site scheduling and feedback to stimulate internal benchmarks.
AFG11-008 GS Carryall Decision	The GS Carryall service has been running since 2008. The current existing contract expires in November 2011. This proposed project will support the observatory in by the following: <ol style="list-style-type: none"> 1. Review costs and benefits of existing service. 2. Obtain staff feedback over likes and dislikes re: service. 3. Consider proposal requirements for Gemini under the remote observation and their impact on carryall requirements. 4. Consider contract termination, renewal or revision while considering the above factors plus <ol style="list-style-type: none"> a. Increase Aura's CP population b. Increase demand for CP bus seats with LSST c. CP bus contract renewal d. Opportunity to review CP Carryall Logistics.
AFGO11-001 AFG Basic Operations	AFG basic operations

2011 Projects for the Controller Group (CTR)

Project Name	Project Description
CTR11-002 Labor Budgeting Setup in CONTROL	This project will take our current labor planning worksheets and allow us to develop them in CONTROL by incorporating the same assumptions, etc. that we use in our current manual process. By developing the labor budget in CONTROL, we develop an automatic input of the labor into CONTROL by the various accounts and object codes. The goal is to have this on line in time for the 2012 budgeting process.
CTR11-004 New 1099 Reporting Requirements	As part of the "2010 Health Care Reform Act", there are new 1099 reporting requirements that go into effect for years beginning after 2011. As a result, we need to make sure that we have the processes in place to capture the necessary information from our vendors as well as having the necessary software in place to report to the IRS beginning in 2012.
CTRO11-001 Daily Operations	Daily Operations

2011 Projects for the Human Resources Group (HR)

Project Name	Project Description
HR10-001 Mentoring program	Develop a pilot mentoring program to cover Junior Scientists and a targeted group within Engineering at Gemini. Also to include, through Broadening Participation, remote mentoring of Science students external to Gemini in supporting their successful attainment of a PhD. External Mentoring of students could involve partnering with Fisk/Vanderbilt universities in the US and the development of other pilot initiatives for areas such as Journey through the Universe. The Mentoring Process (from the International Mentoring Association). A developmental process in which a new and an experienced employee commit to working and learning together in a mentoring relationship over at least two years for the purpose of mutual support and professional development. The mentoring process includes a series of phases in which the mentor's leadership of the process is adapted to the developing strengths and changing needs of the mentee. The result of an effective mentoring process is a self-confident and competent professional who also values what employees can do collectively on behalf of their organization and it's strategic initiatives.
HR10-014 New HR Operating Model	HR Staff recruiting and integration. Ultipro recruitment module implementation, performance management online system, and planning for further ultipro enhancements
HR11-001 HR aspects of Gemini Transition	Development of policies, communications and training to address taking care of our people during the transition, includes: policies to define and review, outplacement methodologies, HR communications, retention, employee support services. Change training for managers and staff. Change cycle forums for managers and change/communications support for the Directorate
HR11-002 eHR Implementation	Development of eHR system eliminating transactional administrative aspects of HR and making HR processes efficient and transparent to employees where appropriate. Reasons to implement: Helps deliver services in a consistent and equitable manner. Facilitates effective performance of activities throughout HR. Provides continuity in the event of a disaster. Protect records from inappropriate and unauthorized access. Provides protection and support in litigation. Allows quicker retrieval of documents and information from files. Improves office efficiency and productivity. Provides better documentation more efficiently. Frees up office space for other purposes by moving inactive records to online storage and frees up storage facilities. Digital preservation of documents.
HRO11-003 HR operations	Daily Operations Support

2011 Projects for the Information Systems Group (ISG)

Project Name	Project Description
ISG11-001 Re-architect DNS Platform	DNS is the core of all the communications inside and outside Gemini, this project addresses the need of a new DNS platform, up to the current world standards and capable of satisfying internal needs that are not possible with our current deployment. This project will re-architecture the DNS from the core and it will be built around Gemini's requirements. Every unit in Gemini will see the benefits of it providing a stable, secure and more manageable system.
ISG11-002 Upgrade Backup Infrastructure	Replace the current systems (tape libraries, backup servers, storage space), with systems with more capabilities, capacity, and in the case of the tape libraries, with a system with a larger count of tapes.
ISG11-003 Retire NIS+	Implement distributed, replicated LDAP services for cross-platform user accounting & directory services. This will replace NIS+ which is unsupported and incompatible with Linux & Apple, and interoperate with Active Directory, consolidating user accounts for Windows & Unix.
ISG11-004 O&M Data Storage Support	Provide ongoing support for all centralized data storage systems. Large, enterprise class storage systems in place at HBF, SBF, MKO and CPO provide for the storage needs for much of the observatory. Subsequently, these systems are highly complex and require maintenance and support. At this point in time NetApp "filers" are used exclusively for this purpose and therefore this project will address the support needs specific to that infrastructure.
ISG11-004 O&M Data Storage Support	Provide ongoing support for all centralized data storage systems. Large, enterprise class storage systems in place at HBF, SBF, MKO and CPO provide for the storage needs for much of the observatory. Subsequently, these systems are highly complex and require maintenance and support. At this point in time NetApp "filers" are used exclusively for this purpose and therefore this project will address the support needs specific to that infrastructure.
ISG11-005 Server Replacements 2011	Server class computers at HBF, SBF, MKO and CPO will be replaced on an ongoing basis. Hardware that has been identified as "end of life" by its OEM, lacking fault tolerance, exhibiting repeated errors or failures, at risk due to unavailability of "hot spares" , limiting OS upgrade due to hardware constraints, or in excess of 4-years old will be replaced or consolidated. Servers will be assessed on a case-by-case basis and a specific migration plan defined dependent upon individual and unique needs.
ISG11-006 Gemini Cyber Security Program	The goal of the project is to identify cyber security vulnerabilities within the organization, quantify the potential threat and determine the overall risk to Gemini. Ideally all risk should be eliminated, however in practice each identified risk shall be evaluated in terms of impact and cost. In most cases, risk mitigation and/or reduction techniques shall be employed.
ISG11-007 Remedy Enhancements	The project entails modifications to Gemini's Remedy software applications to improve the functionality and usability of the system for the various user groups. Modifications/enhancements are anticipated for the following applications, Telescope Fault Reporting System, Facilities HelpDesk and Gemini External Helpdesk. It is anticipated that the Gemini Product tree will be integrated into the Remedy Telescope Fault Reporting system. The end product of this project will be a suite of improved applications.
ISG11-008 O&M ISG Operations and Support	Operation support, for Daily tasks, Help-desk, non-project work.
ISG11-100 Web Services Development	This project is to develop web services applications requested to the SWISG that are not part of the O&M activities

2011 Projects for the Procurement Group (PRO)

Project Name	Project Description
PRO-10-002 Address BSR issues, including Improve sole source justification and price analysis compliance	Goal: Improve compliance with sole source justification and price analysis requirements as required by BSR report and address other recommendations from the BSR report.
PRO-10-010 Improve export regulation compliance	Goal: Review Gemini's compliance with export control regulations, especially in the area of "deemed exports" (foreign nationals working with export controlled items inside the US) and modify policies and procedures as needed.
PRO11-001 Continued Pita development	The goal for the remainder of 2010 is to finish up most of the major Pita features needed for basic NSF mandated property tracking, and get started on spares tracking features for Engineering. The 2011 Pita project would be to (1) finish the spares tracking features for Engineering, (2) increase automation of property tracking tasks in Pita to save staff time, and (3) add features requested by other departments to aid them in operations planning (for example, features to remind people about scheduled maintenance or to evaluate an item for upgrade/replacement at a certain date).
PRO11-003 Assessment of export regulation compliance	The focus of the 2010 project has evolved into proper ITAR licensing for foreign nationals who work with IR detectors and controllers. The 2011 project will focus on identifying our remaining export regulation compliance issues, if any, and developing a plan for a follow-on project to remedy the issues identified.
PRO11-005 Update Property Tracking Procedures	While Gemini's actual property tracking practices are in compliance with NSF requirements the written procedures and policies are fragmented and out of sync with current practices. The goal of this project would be to prepare a single new document describing Gemini property tracking policies and procedures that meets NSF requirements and tracks current practices.
PRO11-013 New Emergency Requisition Policy	The goal of this project is to come up with a policy for when a requisition may be designated as emergency and then implement the policy. Processing requisitions on an emergency basis takes additional Procurement staff time as compared to ordinary requisitions and delays processing of non-emergency reqs. The new policy will aim to limit emergency status to those requisitions where the additional burden and delay to other requisitions is justified.
PROO11-002 Procurement Department Operations	

2011 Projects for the Safety (SAF)

Project Name	Project Description
SAF11-01 Business recovery and continuity plan	Develop a plan to ensure that appropriate responses are made to incidents that disrupt business, and that business continuity requirements are quickly identified and managed
SAF11-02 Chemical Management Program	Control of chemicals and their hazards from purchase approval, proper storing, labeling, internal transportation, usage, spill containment and procedures, proper disposal and training.
SAF11-03 Personal Protective Equipment	Assess risk in job operations at Gemini in order to identify required PPE, create PPE matrix, define standard PPE for operations, identify suppliers, manage budget, set maintenance guidelines, train in fit testing, use and disposal.
SAF11-04 Fire Control Program	Identify all ignition sources/flammable materials at Gemini and evaluate volumes/types of fire that could occur, set prevention rules and confirm controls are established (extinguishers, suppression systems, etc), schedule drills and training.
SAF11-05 Ergonomics Program	Assess job postures, improve location ergo conditions, introduce daily stretching program, posture confirmation.
SAF11-06 Gemini Safety legal and other requirements	Confirm safety legal requirements for Hawaii and Chile and their applicability to Gemini operations, develop an updated list and create a methodology to monitor new regulations and updates.
SAF11-07 Safety Web Page Upgrade	Update current Gemini Safety web page introducing Hercules more friendly user with detailed information of the content.
SAF11-08 Creation of Safety Joint Committees / Walkthroughs	Introduce a committee per site to perform Safety Walkthroughs, develop schedule, define methodology to publish results and monitoring closure of findings.
SAF11-09 Hercules - Management review	Perform Gemini Safety Management System annual review and document actions to improve system implementation among the Organization.
SAF11-10 Safety Training Program - Specific level by Group	Identify specific safety topics related to group's operations, develop training material, define training methodology by group, perform education as scheduled.
SAF11-11 SLT Safety Walkthroughs	Plan and have SLT to perform Safety Walkthroughs during the year (3)
SAF11-12 S&H Policy Annual Communication	Perform S&H Policy Annual Communication through Safety Topic of the Month, e-mail, Safety Boards and Observatory publications.
SAF11-13 Emergency Drills	Plan and perform annual Emergency Drills (2)
SAF11-14 Contractor Safety Requirements update	Review current Contractor Safety Guidelines and update requirements according to Hercules roll out.
SAF11-15 Safety Roles and Responsibilities review by Group	Confirm each Group perform a review of their safety responsibilities to comply with Hercules requirements.
SAFO11-00 Safety Operations	Regular Safety Operations

2011 Projects for the Public Information and Outreach Group (PIO) Part 1

Project Name	Project Description
PIO11-001 PIO Program Management	Includes all personnel management issues, planning, staff meetings and mentoring of new staff. In addition key staff have management duties that have been deputized by the PIO Manager as indicated in the resource distribution.
PIO11-002 Publications	Includes the twice-annual GeminiFocus newsletter, Gemini Annual Report, graphic arts support for staff (HR plaques, conference poster assistance etc.), Legacy Image prints. (Note: Spanish language public brochure is included as a separate project for 2011).
PIO11-003 New Media Development	Development and ongoing production of "new media", primarily for web delivery including podcasts based on Gemini science, engineering and milestones, maintenance of Gemini Facebook friends group and other possible initiatives as technologies evolve.
PIO11-004 Web Content Development	Ongoing development, frequent writing and oversight of production and layout (with IS webmaster staff) of twice monthly (average) websplashes, updates to Gemini PIO webpages and "About Gemini" content as well as assistance with webpage upgrades and improvements.
PIO11-005 Journey Through the Universe (Hawaii)	Planning, logistics and coordination of one of Gemini's most extensive educational programs. Because this program engages all of the Mauna Kea observatories, the Hawaii Department of Education, many local businesses and leaders, as well as dozens of astronomers and over 100 teachers each year, the organization of this requires a significant amount of time and resources during the entire year and after the one-week "Journey Week".
PIO11-006 Live from Gemini	Live from Gemini (LfG) allows audiences from across the Gemini partnership to participate in a live videocast from the Gemini control rooms. Significant advance planning, testing and logistics are all required to execute a successful LfG program and few staff are qualified to present the program. In 2011 our goal is to include science staff in presentations when possible.
PIO11-007 StarLab (Hawaii)	The StarLab portable planetaria (Gemini has 3), provides programming and equipment loans and training (on planetarium equipment) to Hawaii and Chile schools and educators. Scheduling and execution of programs requires significant attention and resources given the popularity of these programs and training needed to present programs.
PIO11-008 StarLab (Chile)	The StarLab portable planetaria (Gemini has 3), provides programming and equipment loans and training (on planetarium equipment) to Hawaii and Chile schools and educators. Scheduling and execution of programs requires significant attention and resources given the popularity of these programs and training needed to present programs.
PIO11-009 AstroDay Chile	A "flagship" Gemini South program that engages dozens of local astronomical and educational institutions and facilities from Chile. Much advance planning and support is needed to foster broad participation and the program grows significantly each year. In 2011 AstroDay Chile will be combined with a pilot initiative to include a version of the successful Journey through the Universe program in Chile for the first time.
PIO11-010 FamilyAstro	Program is offered in both Chile and Hawaii and allows families to participate in learning in an informal and fun environment that has been developed and tested by the Astronomical Society of the Pacific. Events are scheduled throughout the year, usually as a partnership with local schools or civic organizations.
PIO11-011 Misc. Public Events	This includes active participation in events like the Hilo County Fair, open houses, AstroDay Hawaii, local fundraisers and speakers for public functions in both Hawaii and Chile.

2011 Projects for the Public Information and Outreach Group (PIO) Part 2

Project Name	Project Description
PIO11-012 Library Operations	Maintain ongoing operations of the Gemini library, ordering books, fulfilling journal request, subscriptions, publication tracking, library/publications webpage maintenance and assistance with internal publications. Also assist in development and maintenance of web content.
PIO11-013 Tours N&S	Execution of summit and base-facility tours, including all logistics, safety procedures, scheduling and staff preparation and permissions. Included in this are media tours which involve even more extensive preparation and coordination.
PIO11-014 Media Relations	Development of press releases, monitoring of potential results for public dissemination, interaction with local, and international media/journalists, coordination with Gemini partnership and funding agencies and establishing relationships with our user community.
PIO11-015 Image and Information Requests	Fulfilling requests for special images, video and other resources (includes staff requests). This includes general inquiries and generic public inquiries that require sending images, CDs, publications or other materials as deemed appropriate.
PIO11-016 Virtual Tour Maintenance and Fulfillment	Maintain Gemini Virtual Tour kiosks in Hawaii and Chile and download data/fulfill requests for Virtual Tour CDs.
PIO11-017 Training and Conferences	Includes professional conferences and workshops such as AAS, NASW, CAP, ASP, NSTA, ProjectAstro.
PIO11-018 Image Production and Management	Coordination of Legacy Imaging program (selecting targets, managing data processing), acquiring images of special events and observatory milestones, organizing and "metatagging" images for easy retrieval and searching. Archiving of digital images for long-term viability.
PIO11-019 Broadening Participation & Workforce Diversity	Partnering with Gemini's HR group in supporting the AURA Broadening Participation effort by developing programs and partnerships that encourage mentoring, internships, career awareness and workforce development within our host communities.
PIO11-020 Community Civic Participation	Participation in community and civic groups such as Chambers of Commerce, Workforce Development Committees etc., where these efforts will support Gemini's broader long-term goals in utilizing our local workforce and generating support for our activities in the broad local community.
PIO11-021 Spanish Language Public Brochure	Produce Spanish language public brochure (and web page) based on GN version (produced in 2010) that includes at least 6 local staff profiles and podcasts.
PIO11-022 GeminiFocus Electronic Evolution	Expand GeminiFocus electronic distribution and reduce hard copy distribution to allow a print-run of 3000 copies by the December 2011 issue. Continue e-version publishing established in 2010.
PIO11-023 Revamping of Web Image Gallery	Redesign and Reorganize the entire Gemini Image Gallery for better organization and user-friendly access. Production and style standards will be defined and implemented for consistent presentation of content ranging from images to video/podcasts.
PIO11-024 JTTU Gemini South Program Parity	Implement Gemini South local outreach programming for increased parity with Gemini North by integrating a Journey Through the Universe pilot project in conjunction with AstroDay Chile.
PIO11-025 Reconfiguration of Graphics Support and Summit Tours Functions at GN	Re-define level of graphics support and tour accommodation at Gemini North and establish appropriate staffing resources to meet these needs. Provide First Responder and other appropriate training to all appropriate PIO staff to accomplish this transition by 2012.

2011 Projects for the Development Group (DEV)

Project Name	Project Description
DEV11-001 Generation-4 Instrumentation Planning	Plan the forth generation of Gemini instrumentation, includes decommissioning, refurbishing, and upgrading existing instruments. This ongoing project would be assessing the instrumentation needs on a regular basis (every six months) so that the Observatory can react more rapidly to community needs and changing events.

2011 Projects for the Engineering Group (ENG) (Part 1)

Project Name	Project Description
ENG08-049 MK UPS upgrade	MK Site Emergency electrical Power Upgrade
ENG09-122 ISS Vibration mitigation	Reduce the vibration level at the ISS. This task includes the following: 1. Program planning phase 2. ISS vibration measurement and data analysis campaign 3. Cryo pump vibration mitigation engineering 4. Instrument vibration characteristics measurement and analysis 5. Altair vibration investigation
ENG10-008 ITAC Project	Time Allocation Committee Software to stream-line the current TAC process. The new software will provide a set of tools where lot of manual effort from the science team can be reduced by automating them.
ENG10-500 HBF Detector Lab	Refurbish the room and construct a Detector Lab Including Purchasing and outfitting of infrastructure
ENG10-700 ICD and Requirements Updates	By late 2010, or early 2011, we should be starting the next round of Gemini instrument procurement. We currently have a set of very old ICDs which need to be updated before the next Conceptual Design Study. These ICDs form the contractual basis of work for our vendors; changing them once the Conceptual Design Studies begin can result in significant cost and schedule increases.
ENG11-095 GN & GS Laser Ops reliability and efficiency improvements	Transfer of best practices and HW improvements from GN Laser Operations to GS Laser Operations and vice versa in 2010 and 2011; Improvements will include Technical, Procedural and Maintenance improvements prioritized to improve reliability and operational efficiency of GN and GS LGSF.
ENG11-101N O&M GN Annual Maintenance Shutdowns	This project includes the detailed plan to prepare, execute, and track progress of Gemini North Shutdowns.
ENG11-101N O&M GN Annual Maintenance Shutdowns	This project includes the detailed plan to prepare, execute, and track progress of Gemini North Shutdowns.
ENG11-101S O&M GS Annual Maintenance Shutdowns	This project includes the detailed plan to prepare, execute, and track the Gemini South Shutdowns for 2011.
ENG11-102N O&M GN in Situ Wash	This project covers the detailed in situ wash plan.
ENG11-102S O&M GS in Situ Wash	This project covers the detailed in situ wash plan.
ENG11-103 O&M Eng. Spares Project	Spares Risk Assessment for each group and each system. Current spares inventory list. Spares inventory list update program. Spares purchases, based on the Risk Assessment. Spares storage for proper retrieval.
ENG11-107 O&M Corporate Approach	O&M Corporate Approach
ENG11-108 O&M Eng managers duties	Time allocated to execute all the tasks in the engineering managers duties instructions set
ENG11-109N O&M GN Management Tasks	This project covers: GN TIO M planning duties Attendance of eng, managers and techs to coordination meetings and safety meetings TTM's shifts time accounting.
ENG11-109NA O&M GN Management Tasks	This project contains the TTM's schedule and is separate from other Observatory projects/tasks due to TTM's different work schedule.
ENG11-109S O&M GS Management Tasks	This project covers: GS TIO M planning duties Attendance of eng, managers and techs to coordination meetings and safety meetings TTM's shifts time accounting.
ENG11-109SA: O&M GS Management Tasks	In this project is placed the TTM's calendar. Due to the different work schedule this task was treated separately.

2011 Projects for the Engineering Group (ENG) (Part 2)

Project Name	Project Description
ENG11-110S: O&M GS Predictive Maint & Routine Ops Tasks	All routine daily telescope and instrument functional checks performed by the day crew. All daily, weekly, monthly, etc. routine plant room, fourth floor checks, dome checks, instruments checks. All routine clerical work. All routine janitorial work.
ENG11-111N O&M GN Corrective Maintenance Tasks	Telescope, enclosure, instruments and support building corrective maintenance tasks included in this project are: Escalation team related activities. Escalation team triggered corrective maintenance tasks. Fault Reports triggered corrective maintenance activities. Corrective maintenance activities triggered by predictive maintenance inspections. Pending corrective maintenance tasks identified by previous year's Fault Reports list. Snow removal activities. Hurricane threat activities. Big Earthquake triggered activities. Any other corrective maintenance activities not covered by the list above.
ENG11-111S O&M GS Corrective Maintenance Tasks	
ENG11-112N O&M GN Preventive Maintenance Tasks	
ENG11-112S O&M GS Preventive Maintenance Tasks	
ENG11-113A O&M Software Operations Support	This project tracks the weekly operations team support tasks related to software. It provides input for fixes to Software Corrective Maintenance (tracked in ENG11-113B) and Software Releases (tracked in ENG11-113C)
ENG11-113B O&M Software Corrective Maintenance	This project tracks the work done to fix software problems assessed as critical for the normal operation of the observatory. If more effort is required for this project, resources will be obtained from ENG11-113C (Major releases).
ENG11-113C O&M Software Releases	This project contains all the tasks to fix and improve OCS applications and real time systems, scheduled throughout the year in four releases: March, June, September and December. It also plans the work to fix and improve real time systems, mostly driven by outstanding Fault Reports and science needs. The project is defined to produce four software releases per year. The OCS work is mostly allocated during the June and December releases, whereas the control, real-time and non-ocs software systems will be released in phases during the four releases.
ENG11-210A Engineering Safety	For planning purposes shutter tie off is going to be considered done by the end of 2009 For planning purposes enclosure access door will be considered done at GN by the end of 2009

2011 Projects for the Science Group (SCI) (Part 1)

Project Name	Project Description
SCI10-118 Transitioning SSAs to laser operators	The long-term plan is to have the SSAs run the laser during lgs nights. There are several steps, which need to be addressed before this can happen. We need to (1) train the SSAs by the laser operators (2) develop a simple lgs monitoring display which includes the laser status and (3) fix some of the TCC bugs/features to easy operations. For Gemini North, #1 and #2 should happen by the end of 2010.
SCI11-001 Nighttime Science Operations	Obtaining science data on both telescopes. This project covers nighttime observers and SSAs, and all associated nighttime training. It includes all science staff nighttime support provided at the summits and at the base facilities. It also includes nominal engineering done during night operations, such as queued engineering and post shutdown checkouts. It does NOT include nighttime work associated with instrument commissioning, which is covered in the commissioning projects. Hours track to the nighttime operations timecard accounts.
SCI11-002 Daytime Science Operations	Daytime operations in direct support of nighttime science operations. This project includes all of the nominally scheduled daytime roles except instrument points of contact (HSO, daySSA, DAS, QC). It encompasses a number of sub-tasks: Phase II support, Queue planning, Data Quality Assessment, day SSA operations support, GSA operations, Head of SciOps coverage, and attendance to daily meetings. This project maps to the day operations timecard accounts.
SCI11-003 Altair Science Support	Support of Altair, excluding direct interaction with members of the community (which is in the User Support project).
SCI11-005 GMOS Science Support	Support of GMOS, excluding direct interaction with members of the community (which is in the User Support project).
SCI11-006 GNIRS Science Support	Support of GNIRS, excluding direct interaction with members of the community (which is in the User Support project).
SCI11-007 Michelle Science Support	Support of Michelle, excluding direct interaction with members of the community (which is in the User Support project).
SCI11-008 NICI Science Support	Support of NICI, excluding direct interaction with members of the community (which is in the User Support project).
SCI11-009 NIFS Science Support	Support of NIFS, excluding direct interaction with members of the community (which is in the User Support project).
SCI11-010 NIRI Science Support	Support of NIRI, excluding direct interaction with members of the community (which is in the User Support project).
SCI11-012 TReCS Science Support	Support of TReCS, excluding direct interaction with members of the community (which is in the User Support project).
SCI11-013 Data Reduction Package support for Operations and Users	
SCI11-014 Semester Science Operations	This project includes all semester-related operations. It includes several sub-tasks: Phase I Process, OpsWG, Time Accounting and SciOps Statistics, Telescope scheduling and Support Schedule generation and maintenance.
SCI11-015 User Support	Combines phase II support, helpdesk support and other NGO or user support activities.
SCI11-016 Science Operations staff management	This includes all management duties and other Head of Science operations duties that are not assumed by acting heads of science operations.

2011 Projects for the Science Group (SCI) (Part 2)

Project Name	Project Description
SCI11-017 Lead DPD Duties	This project includes activities related to supervision of the DPD group including support schedule, performance reviews, administrative duties and general mentoring and supervision.
SCI11-018 Lead DAS/SSA Duties	This project includes activities related to supervision of the SSA and DAS group including support schedule, performance reviews, administrative duties and general mentoring and supervision.
SCI11-019 Scientific Research	This project covers individual scientific research time of the science staff. Maps to the individual research time card accounts.
SCI11-020 Annual and Long-term Science Planning	This project covers effort associated with the annual planning process as well as long-range strategic planning activities.
SCI11-021 Career Development and Training	This project covers career development related activities including mentoring, external classes and miscellaneous internal training not covered by daytime operations.
SCI11-022 External Astronomy Activities	This includes service on external TACs, journal reviews, which is counted as research for payroll timecard purposes.
SCI11-023 Miscellaneous Science Staff Support	This project covers all nominal non-operations support work by science staff. It includes a number of sub-tasks: Recruiting, staff inter-site interactions (including meetings and travel), NGO interactions, administrative work, safety work not covered under safety projects, all staff activities, and miscellaneous overhead or unplanned activities.
SCI11-024 Science Software Development	This project will track the science staff effort needed for general software development not covered in other specialized Band 1 projects. The effort includes: - administering software planning in Project Insight, including working with scistaff to define and prioritize new tasks and requirements -strategic software development planning -logistics of software releases including general testing, web page updates, and science staff presentations -meetings with the software engineering group that discuss requirements, testing, and release planning.
SCI11-025: Telescope Scientist Support	Support of Telescope excluding direct interaction with members of the community (which is in the User Support project). Where significant amounts of effort are known to occur at specific points in the year, they should be itemized in scheduled tasks. Where work progresses continually, the task is labeled as "ongoing".
SCI11-101 Modified Queue - Temporary SciOps Modifications	The project aims to identify and implement modifications to the Science Operations at both sites that will save science staff effort during the transition period. The saved science staff effort is instead to be used on other transition projects, e.g. software requirements and testing, and cross-training of science staff for the new science operations model. It is possible that the project will also identify long-term science operations changes that will stay in effect past the end of the transition period.

2011 Projects for the Science Group (SCI) (Part 3)

Project Name	Project Description
SCI11-102 Science Operations Training and Documentation	This project encompasses all tasks and effort required to train existing and new science staff in the operational duties associated with nighttime observing and nominal daytime telescope, instrument and data support. Broadly speaking, these are the tasks currently performed by the daytime SSA, the nighttime SSA and astronomer and the daytime Data Analyst. This project does not include any other duties such as instrument support, contact scientist, or development projects. The overall goals of the project are: 1) to have properly trained Science Operations Specialists (SOS) to perform the operational duties listed above; 2) to have the necessary documentation to support them in this work on an ongoing basis; 3) to have the infrastructure in place to provide new staff training and refresher or cross-training for these duties; 4) to have a means for evaluating performance, identifying training needs and certifying staff to perform new roles as appropriate.
SCI11-109 Instrument Performance Monitoring	The goal is to measure and monitor the performance of all Gemini instruments, on both sites.
SCI11-301 LGS + P1 Upgrades	The current operational mode of Gemini North's Laser Guide Star Adaptive Optics system is severely restricted by the field of view of the TT guider, STRAP. This means that Altair in LGS mode does not provide full sky coverage for prospective PIs, especially with targets far from the Galactic Plane where it quickly falls to under 20%. Initial on-sky measurements and modeling suggest that the proposed upgrade would result in an average FWHM of ~0.2" over almost the entire sky, effectively eliminating this shortcoming of our system, but with reduced resolution which is well matched for NIFS observations.
SCI11-407 ITC General Improvements	The Integration Time Calculators are web tools for calculating exposure times from signal-to-noise and conditions or vice-versa. These tools are essential for the Phase I (proposal) process and also highly used during the Phase 2 process. Tasks for ITC changes for specific instruments are usually part of instrument commissioning or science support projects. However, some important tasks do not fall within instrument projects. This project is for planning and execution of important general ITC work.
SCI11-502 FITS Storage Project	Science Goals: Improve observing reliability, and reduce routine maintenance load on staff. Prevent loss of valuable FITS data. Provide calibration association system Description: Improve the hardware, software and procedures we use to store and manage our FITS data internally. This will prevent loss of time due to full disks etc in a way that requires less staff load than the current system. Also provide a long term off-line "disaster recovery" archive which we can use to recover data that would otherwise be lost.
SCI11-613 Completion of user-friendly distribution system for Gemini Python	This includes some contingency for last year's project SCI10-613, final installation and release work that was expected last year to occur in 2011 and a few tasks that may run into 2011 due to resource availability.
SCI11-620 QA Pipeline	QA Pipeline needed for a successful transition plan.

2011 Observatory Software (OSW)

Project Name	Project Description
OSW11-200 ITAC Phase 2	Phase 2 of the ITAC process will build upon the work already completed (and in-progress) on this product in order to more fully realize the stakeholder's original vision. It consists primarily of requirements identified in the phase 1 planning process as either less critical or too time-consuming for the original project constraints. Plan consists of iterations sequencing work in logical chunks approximately from most to least essential.
OSW11-201 Time Accounting Timeline	This tool will significantly reduce the time required by the queue coordinators and data analysts to complete the daily data quality assessment and time accounting. The 'backlog' of features to implement in this project is in the Archive project OSW11-201 Time Accounting Timeline Backlog
OSW11-202 Sci Ops Software-LCH Clearances	This project creates an automatic system to track and enforce LCH propagation windows. This will be a comprehensive system that helps Queue Coordinators (QCs) visualize shuttering windows (the periods when the laser must not be propagated towards a given target) so that they can schedule observations in the propagation windows, aids observers to be more aware of shuttering windows for the current target, shutters the laser or prevent propagation within shuttering windows, and prevents exposures from starting that would continue into shuttering windows.
OSW11-207 ODB Replacement (Study+Execution)	HLDG should begin design work on a modernized update of the OCS and its storage infrastructure (ODB). Incremental improvements can be made here and there, but sweeping changes will be needed to make truly rapid progress on the big issues that the science staff have been awaiting. These changes must go to the very core of the OCS, the data model upon which all of its applications are built. The data model is the representation of Science Programs, observations, targets, plans, etc. in the software. When a change is made to the model, it necessarily ripples to all the applications that use that model. For that reason, a mini-project to generate requirements and study proposed solutions is required. (SW driven, Science sponsored) Project End Sep 2011)
OSW11-210 OSW Band2 Projects Preps	Plan and track progress on the preps for the Band2 OSW11-203,204, 205 and 206. Efforts from Science and Engineering are planned here. The outcome of this project is to have a solid set of requirements to develop and execute the mentioned projects.

2011 Observatory Projects (OBS) (Part 1)

Project Name	Project Description
OBS09-006A GeMS (Phase 3-4-5)	I&T on Telescope and Telescope commissioning
OBS09-006B GSAOI Science Commissioning (SCI11-209)	This document outlines the resources necessary from the science operations group for the commissioning and integration of the Gemini South Adaptive Optics Instrument (GSAOI) for project year 2011. This encompasses work to be completed by research staff, the Data Process Development group (DPD), and the new Science Operations Support Group (SOS).
OBS10-006 GMOS-N CCDs Project Overview	This project is to replace the CCDs and controller in GMOS-N. It encompasses managing the remainder of the contracted work at HIA and doing the necessary internal work at Gemini to install, test, and commission the delivered system into GMOS-N as part of a facility class system.
OBS10-006A GMOS New CCDs (ENG10-004)	This project is to support the procurement, technical and design reviews, Integration and testing, characterization and acceptance processes of the GMOS-N new Hamamatsu CCD mosaic. The core project is being executed by HIA. During 2010 Gemini Development, Engineering and Science will be actively supporting the project during the replacement phase.
OBS10-006B GMOS-N CCD science commissioning (SCI10-244)	Commissioning of GMOS-N red CCDs. This project is to cover the part of the project after the CCDs are in GMOS-N and the instrument is back on the telescope. All work in this project is expected to be in 2010.
OBS10-006C GMOS DR for new CCDs (SCI11-606)	Implement GMOS data reduction software for the new GN CCDs for the user package. This is required to support the Principal Investigator in the reduction of their data and produce scientific results.
OBS10-006D GMOS-N CCD Software Updates	
OBS10-007A F2 Fixes and Improvements	This project will contain all the tasks needed to fix, upgrade and improve F2 to be able to operate the instrument in a safe, reliable manner during normal operations. Not necessarily to turn F2 into a full facility instrument. Areas to be considered to be included in this project. Electronics & instrumentation, Detector replacement, Cryocooling and vacuum behavior characterization, Other electronic issues, Mechanics, GV baffle redesign and implementation, Wheels reliability issues, the mechanical related issues, Optics (R3K Grism) Software, Pending integration of F2 software with the rest of the observatory.
OBS10-007B F2 Science Commissioning	This project includes on-sky commissioning work and all work required within science to prepare F-2 for operations. The bulk of the science effort will be included in this project, although some science FTEs will also be in the engineering F-2 commissioning project (and some eng. FTEs will be included here). Additional Notes From 2010 Planning: 30% left to do in 2010; this includes R3K grating.

2011 Observatory Projects (OBS) (Part 2)

Project Name	Project Description
<p>OBS10-007C Data Reduction Software for Flamingos 2</p>	<p>Science/Operational Goals: Provide the PIs with the essential data reduction tools for Flamingos-2. Specific milestones: (to be revised once FTE loading is completed) 1. Patch release of Gemini IRAF with post-commissioning support for F2 (Imaging, Longslit, MOS) [Mostly done already, just need to check with real data] 2. Iteration 1 implementation of the Python-based data reduction support. 3. Integration of Iteration #1 to Gemini IRAF package and gemini_python package. 4. Programmer and user documentation for Iteration #1. 5. Full Iteration 2 that will deliver the routines needed for the later or more complicated stages of the data reduction. Description: The objective is to first ensure that the data reduction tools developed from the existing CL scripts is adequate for a standard science reduction. This is just a safety net in case we need something fast and the Python software is not ready yet. This work is mostly done and should only need testing with real data. The real project is to implement the Python-based suite and the user interface. There are two development iterations each including: design, development, testing, documentation. It is expected that the design for the first iteration will be completed in 2010. The actual release of the software will be done as part of the operation project for data reduction and it is not resources here.</p>
<p>OBS11-001 New High-Resolution Optical Spectrograph (Scot K.)</p>	<p>Gemini's next new instrument will be a high resolution optical spectrograph. This project incorporates defining the requirements for this instrument, competing and contracting its construction, and preparations needed at Gemini for its successful integration as a facility instrument. See Project Mandate for more details.</p>
<p>OBS11-003 GPI Observatory Project</p>	<p>The Gemini Planet Imager (GPI) is a \$25m+ instrument primarily designed to detect and characterize self-luminous extrasolar planets at near-infrared wavelengths at high contrast ratios. The project's primary objective is to ensure that the instrument is ready to be sent to the Observatory and the Observatory is ready to receive the instrument. It contains a mixture of instrument oversight and internal Gemini infrastructure work packages. Divided into a pre-delivery stage, a post delivery acceptance test stage and a science verification and commission stage, this project will conclude (and close) with the successful commissioning of the instrument at Gemini South.</p>
<p>OBS11-005 2nd Generation Acquisition and Guidance Unit Observatory Project</p>	<p>The 2nd Generation Acquisition and Guidance (A&G) Units project will deliver two A&G units, one for each telescope on a 5 year timescale. The primary objective is for the new A&G units to have significant increased reliability over the existing pair of A&G Units. Other objectives include increasing maintainability, preserving baseline functionality, increasing capability and retaining modularity of the new A&G Units. The project approach is to outsource the design, fabrication, assembly and test of the units. The project is divided into 10 stages, starting with a stage to define the instrument technical requirements and finishing with an on-sky commissioning stage. This project will conclude (and close) with the successful commissioning of both A&G Units at both Gemini telescopes.</p>

2011 Observatory Projects (OBS) (Part 3)

Project Name	Project Description
OBS11-008 New Cooperative Agreement	This project begins when the new 2012-2015 funding proposal is submitted to the NSF in late 2010 or early 2011. The initial phase consists mostly of the generation and organization of all of the material needed to support a comprehensive review of Gemini, by the NSF. It also includes on-site support/logistics to conduct the review at both Gemini sites. This review will nominally occur in March 2011 and its results will be forwarded to the Gemini Board in May 2011. Approval of the findings of the review committee will trigger the generation of a new Cooperative Agreement between AURA and NSF for the management of Gemini, during the period of mid 2012-2015. The effort to negotiate the new CA, which involves resources at NSF, AURA, and Gemini, is included in this project.
OBS11-501 Base Facility Operations	