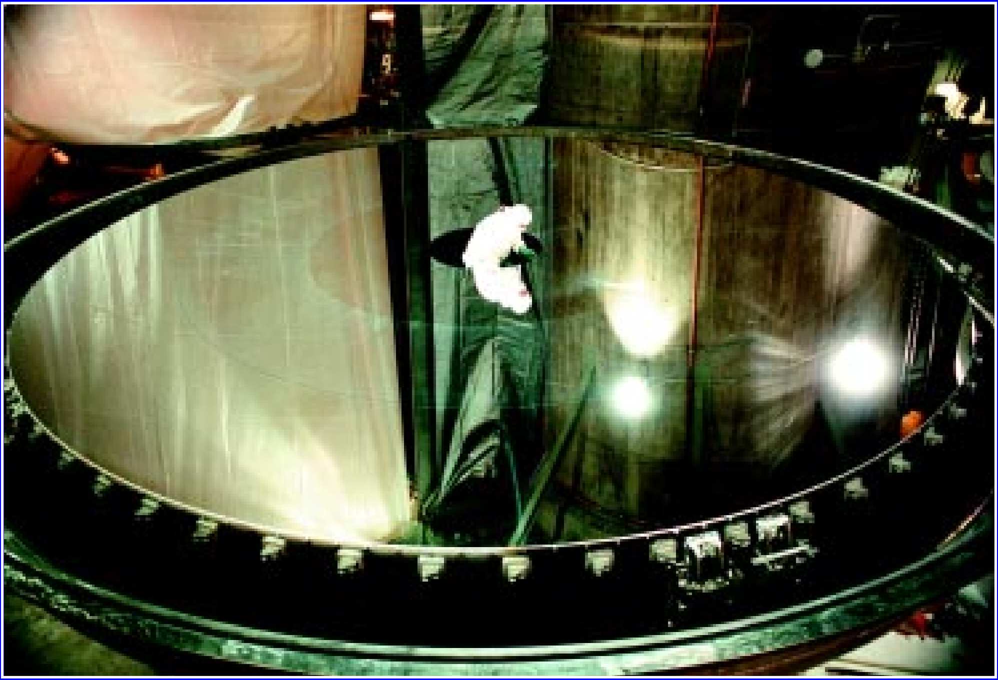
GEMINI OBSERVATORY NEWSLETTER

ISSUE 18 **JUNE 1999**

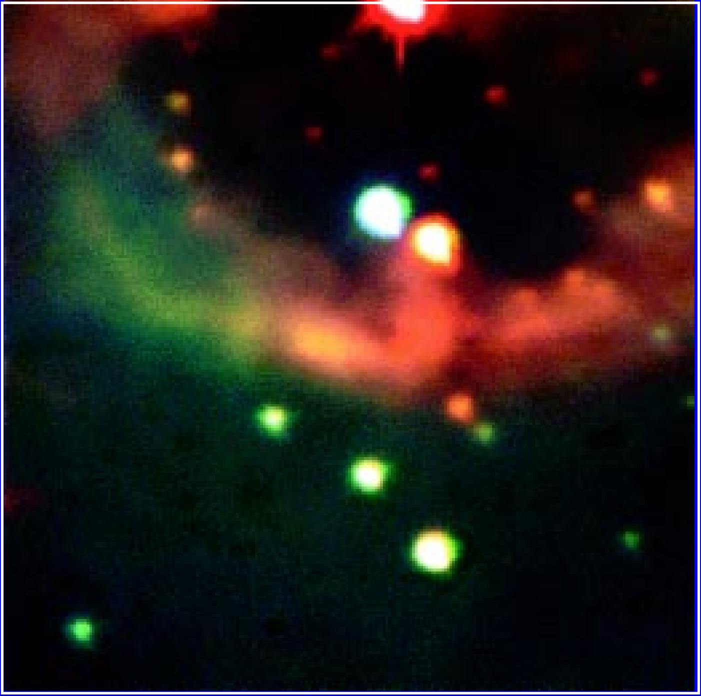
INSIDE:

COMMEMORATIVE GEMINI NORTH DEDICATION ISSUE



Systems Engineer John Filhaber inspects the aluminum coating on the primary mirror in December, 1998.

After coating the mirror, technicians prepare to lift it 5 stories to the observing level and install the mirror into the telescope.



Efforts were rewarded with engineering first light images of the star forming region Mon R2 in February. This 3-band (JHK) composite infrared image has a field of view of about 30 arcseconds.

The Gemini Observatory Newsletter

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MESSAGE FROM THE DIRECTOR

Dr. Matt Mountain

A key facet of the human spirit, when confronted by the persistent great unknowns of our Universe, is our ability to look beyond the barriers of today, and dream a little.

And this is how the Gemini partners started the Gemini Project. Over nine years ago a group of astronomers from the United States, United Kingdom and Canada got together and believed that they could build an observatory with twin telescopes spanning both hemispheres. Each telescope would have the clarity and fineness of vision of the Hubble Space Telescope and each would have a vast single mirror with at least four times the collecting area of existing telescopes at that time.

"We have all been allowed to focus on a single mission, producing two of the world's most powerful optical/infra-red telescopes..."

We have ambitious requirements. By placing these large telescopes on the highest, clearest and driest sites on our planet, our goals are to provide our communities with the means to explore some of the darkest regions of our galaxy and investigate some of the furthest outposts of our known Universe. We want these telescopes to detect the trembling of molecules buried deep in the dark stellar nurseries of the Milky Way - giving us insights on how stars like our Sun were formed. We hope also to catch glimpses of other solar systems like our own. Ultimately, by detecting the heat from distant galaxies these telescopes will transport us back to a time when our Universe was less than a tenth of its current age, to a view of the Universe as it looked over 12 billion years ago.

Furthermore, we have to do this within a fixed budget.

Continued...

As we move toward the dedication of Gemini North and open up our first telescope "for business," this is a good time to reflect upon how far the Gemini partnership has come in an extremely short period of time. This issue of the Newsletter contains a photo-chronology of Gemini North highlighting some of the remarkable events that got us to where we are today. It's been a busy and exhilarating time. The Gemini partnership has brought together the nations of the United States, United Kingdom, Canada, Chile, Australia, Argentina and Brazil to form the Gemini international partnership. First in Tucson and now in Hilo, Hawai´i and La Serena, Chile, working with our partners we have been able to assemble a team of some of the best scientists, engineers, managers and administrators. We have all been allowed to focus on a single mission, producing two of the worlds most powerful optical/infrared telescopes - all within budget and on schedule!

The debates, designs, and drawings that have occupied the Gemini team, our partners in many institutions, in companies across the globe and in the astronomical communities of seven countries are bearing fruit. We have brought together some of the best technologies in glass, concrete, steel and computer controls. On Mauna Kea in Hawai´i and on Cerro Pachón in Chile, we are nearing completion of two of the most complex and sophisticated telescopes in the world, the twin Gemini 8m Telescopes.

"Only once in the evolution of a sentient species is this corner turned, and we who are alive now are that most fortunate generation, the people of the awakening."

Alan Dressler "The Voyage to the Great Attractor"

And it is easy to forget that these telescopes are only the machines and precision tools of astronomy. What turns a telescope into an Observatory are the people who live and work with these telescopes during the day and the observers who use the telescopes at night. So in Hawai´i and Chile we are now beginning to put together the next phase of this project, getting the people, labs, control rooms and offices in place to form a new observatory, the Gemini Observatory.

Sure we'll still have engineering problems to solve, computer code to write, and making the most of these telescopes will present us with ever-new challenges. However, after all the challenges, we always have to find a little time, perhaps between a meeting, on a flight, or on the drive home, to remember why we are doing all this!

At such times I find it useful to imagine a night on Mauna Kea or Cerro Pachón. Watching one of the 50 square meters of precision glass that is controlled to a fraction of a wavelength of light and standing below our 300 ton telescope structure that moves with almost magical precision, I await that moment when the observation begins and I'm transported into a magnificent cauldron of newly forming stars or perhaps even to the edge of the known universe. At such moments, I often recall a passage that Alan Dressler excitedly wrote in his book "The Voyage to the Great Attractor." In this book about our astronomical journey so far he wrote, *"Only once in the evolution of a sentient species is this corner turned, and we who are alive now are that most fortunate generation, the people of the awakening."*

Thanks to our project team, agencies, institutions and commercial partners, the Gemini Observatory is well prepared for this exciting threshold. The first millennium of astronomy is behind us and the new millennium is beckoning ahead - this a great place to start a journey!

Thanks everyone!

GEMINI PROJECT UPDATE

Jim Oschmann and Peter Michaud

As we approach the middle of 1999, both Gemini Observatory enclosures have nearly identical appearances from the outside. Silvery paint has recently been applied to the outside of the Gemini South dome (see back cover photograph), and both structures are well sealed from the elements. However, the views from within are quite different.

Inside the Gemini North enclosure, significant progress has been made in the integration of key telescope, mount and control systems and the commissioning phase has begun in earnest. Although the process has not been without its challenges, engineering first light images have been obtained through Gemini North (see inside front cover). As we approach the formal dedication on Mauna Kea in late June, we will begin to see the full potential of Gemini.

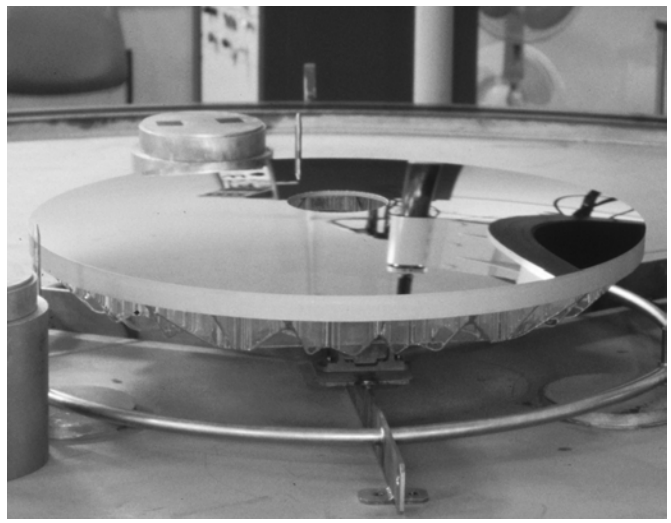
Inside the Gemini South enclosure, the azimuth track has been installed and is awaiting the construction of the mount and telescope structure - which is slated to begin in July. Key staff are preparing for the move to Chile for the ramp-up of Cerro Pachón activities. It is expected that things will progress quickly in Chile with the experience gained on Mauna Kea.

Because Gemini North has moved into the commissioning phase, while Gemini South is still under construction and integration, beginning with this issue we will present separate reports on both Gemini North and South. Following are highlights from the past 6 months at each site...

Gemini North

After successful mount pointing tests using an integrated telescope control system and mount control system in late November 1998, another milestone was reached when the Gemini North primary mirror (M1) was successfully coated with aluminum on the night of December 2-3. Although the coating chamber has presented many challenges, after several months of workarounds and electromechanical rebuilding, the Gemini team was able to apply a good coating for the commissioning phase. Problems with the coating chamber are currently being addressed by PPARC.

The Gemini North secondary mirror (M2) was delivered in late 1998, and on December 14th, it was



Gemini North sescondary mirror (M2) after almunizing at the Canada-France-Hawai´i Telescope facility.

transported to the coating chamber at the Canada-France-Hawaii telescope for coating. Thanks to Barney Magrath at the CFHT, the secondary coating was excellent. After the coating was complete, M2 was packed up and stored until the telescope was ready for M2's installation in early January. Note: In the future,both M1 and M2 will be coated with protected silver in the Gemini chamber. However, due to problems that occurred near the end of the M1 coating process, this was impossible for the first coating on M2.

In the meantime, only two days after coating the secondary mirror, the primary mirror was installed into the telescope on December 16th. By December 23rd the summit team had successfully completed 3 nights

Continued...

of imaging with the guiding camera at prime focus and produced 0.6 arcsecond (FWHM) star images. To do this, the active optics system was used to nudge the mirror into a parabolic shape and "manually" dial out aberrations from the image. With this dramatic success, Gemini "stood-down" to give much needed time off for staff during the Christmas and New Year's holiday period.

After the holidays and a few more nights of prime focus testing, the M2 system and the acquisition and guiding system were mounted to the telescope during the second week of January. Unfortunately, several problems appeared almost immediately. The M2 system developed an intermittent problem with the tilt system actuators that eventually led to the decision to ship the Gemini South system to Hawai´i as a back-up in case it couldn't be fixed quickly. The acquisition and guiding system displayed some camera hardware and software troubles, many of which were improved by teams working together at Hilo, from Canada, the UK and IGPO staff. As a result of these problems, the Gemini South M2 system was installed on Gemini North, but frame rates on the acquisition and guiding systems' peripheral wavefront sensor were significantly lower than specifications. However, framerates were considered usable for early commissioning work.

First Gemini North summit crew to install the primary mirror

Front Row (left to right): Mike Sheehan, Luis Godoy, Deborah Alexander, Gustavo Arriagada, John White, Eric Hansen, James Patao, Kent Tsutsui Second Row: Clayton Ah Hee, Harlan Uehara, Clyde Shimooka, Andrew Gushiken, Mark Hunten, Cy Kobashigawa, Jim Oschmann Third Row: Rene Muhlberg, David Moe, Dean Simao, John Maclean, Stan Karewicz, Jim Catone Fourth Row: John Wilkes, Larry Stepp

Throughout this period of troubleshooting, staff obtained valuable experience in remote operations of the telescope. Prior to the holiday break, the summit staff consisted of 10-12 individuals and by mid January this had been reduced to 2-3 on the summit at any one time. The remainder of the support staff were now able to operate the telescope from the control room in Hilo. Already, remote operation of the telescope has proven to be a great success during one of the most difficult problem solving periods that will likely be encountered.

While work on the M2 assembly and the acquisition and guiding system progressed in mid January, many other systems were being integrated and problems were being solved. This included integration of the interlock system and work on the cassegrain rotator that initially had problems with binding cable wraps. By the end of January the telescope was working reliably enough to produce sub-arcsecond images (0.6 arcseconds) with manual tweaking of the active optics and the secondary. The loop was also closed on the peripheral wavefront sensor, and guiding through the TCS was now possible. It was time to start working toward engineering first light images with the Infrared imager QUIRC, on loan to Gemini from the University of Hawai´i.

Unfortunately, the weather added additional delays, and mechanical problems with the acquisition and guiding system still presented some limitations. However, by late February images with QUIRC were possible without the cassegrain rotator and with manual software adjustments to the active optics mirror control and secondary positioning. The peripheral wavefront sensor was now used for limited (low frequency) tip-tilt capability of the secondary. On February 26th, a three band (JHK) infrared image of the star forming region Mon R2 was obtained and engineering first light was declared! (See image on inside front cover).

Following this milestone, the decision was made to discontinue imaging for about a month and use the month of April to take the mirror out of the telescope and work on key systems that were limiting performance and reliability. These included: wavefront sensors, the primary mirror lateral actuators that were experiencing leaks, the acquisition and guiding system and the M2 assembly.

In mid-April, the mirror was reinstalled in the telescope and most of the known problems were either solved or well understood with solutions well in hand. The slow peripheral wavefront sensor has been modified and is now approaching the specification speed of 200 frames per second. At least 100 frames per second will be available as we get back on the sky in May.

Additionally, in January and February, the Mirror Control System has been integrated into the Telescope Control System software and the Cassegrain rotator software has been integrated (but not yet tested).

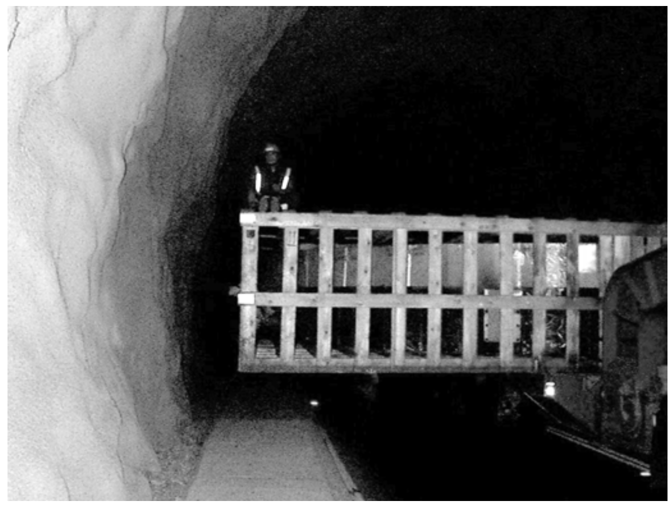
As this issue went to press, it appeared likely that Gemini North would be back on the sky by early May and work will resume on closing the active optics loop and installing the UH adaptive optics system (Hokupa'a) on the telescope for high resolution imaging tests.

Gemini South

The enclosure of Gemini South appears nearly complete from the outside, and work inside on the telescope and mount are still at the very early stages and only the azimuth track has been delivered and installed. Work on the telescope and mount will escalate during the second half of this year as staffing increases and it is anticipated that the telescope will be ready for the installation of the mirror by early in the year 2000.

The mirror is currently in storage at REOSC in France and will remain there for most of this year. The secondary is nearing completion at Zeiss Optical in Germany and expected to be finished this summer. Zeiss Optical is also in the final integration phase in the construction of the Gemini South acquisition and guiding system.

The telescope, primary mirror assembly and coating chamber have all been delivered to Chile and are awaiting transport from port to the summit for installation and construction in July. The widest load (the azimuth track) successfully completed its passage to the summit and through the tunnel that was widened for this purpose.



The Gemini South azimuth track during transport through the tunnel that was widened (at Gemini's expense) to accommodate Gemini's wide loads.

Gemini South's dome is nearly complete and has been painted, and some of the fitout contract work is still behind schedule. However, this is not expected to effect the project's critical path.

As mentioned in the Gemini North report, the Gemini South fast tip-tilt system is currently installed on Gemini North and is expected to stay there. The tip-tilt system originally planned for installation on Gemini North will be transported to Chile for installation on Gemini South next year.

INSTRUMENTS UPDATE

Dr. Doug Simons

Considerable progress has been made recently in the instrumentation program. ALTAIR, our facility adaptive optics system for Mauna Kea, passed its Critical Design Review (CDR) and now enters its fabrication phase, with a scheduled delivery to Hilo around the end of 2000. The system will be the first in the world to be altitude conjugated, providing wider corrected fields than is typically achieved in adaptive optics systems. It will also be delivered "laser ready," so it can be used with our future sodium laser projection system to provide nearly 100% sky coverage. In addition, Dr. François Rigaut has recently joined our staff as Associate Project Scientist for Adaptive Optics.

"The [ALTAIR adaptive optics] system will be the first in the world to be altitude conjugated, providing wider corrected fields than is typically achieved in adaptive optics systems."

Since encountering major budget, schedule, and technical difficulties last fall, GNIRS has been significantly changed and appears to be heading back on track. The new design is considerably simplified mechanically, yet provides essentially the same level of performance and capabilities as was anticipated in the previous design. A Restart Review will be held this summer to evaluate the new design and management of GNIRS. Assuming a positive outcome from this review, completion of GNIRS will nominally occur in approximately 3 years.

At the time of this report, NIRI is entering its 3rd cool down in Honolulu. The first two have demonstrated that all key systems reach operational cryogenic temperatures and that mechanisms work properly when cold. We anticipate installing an engineering grade ALADDIN detector in NIRI for its next cold test, in order to evaluate the performance of its optics and the noise performance of the detector/controller system within the NIRI environment.

GMOS continues to make good progress, with the recent successful delivery of the large calcium fluoride field lenses, fabrication of a large number of lens mounts, much of the filter wheel and grating turret mechanisms, the mask exchange system, etc. The first GMOS will enter an intensive integration phase soon at the UK/ATC in Edinburgh, with delivery of this instrument to Mauna Kea in late 2000.

Our mid-infrared imager (T-ReCS) is making excellent progress at the University of Florida, with CDR anticipated this summer. In order to enhance the baseline capabilities of this instrument, a relatively low cost grating assembly was added recently to the design of T-ReCS to support low-resolution mid-infrared spectroscopy at 10 and 20 µm.

Likewise, HROS will hold its PDR this summer at UCL, as considerable progress has been made with its opto-mechanical design, flexure compensation system, etc.

The on-going Instrument Program is also launching a number of new instrument initiatives during the remainder of 1999, including a conceptual design study for a new high performance coronagraph for Gemini-South, design studies for advanced cryogenic multi-object spectrometer elements, and facility polarization units for both telescopes. Various options to "fill the gap" in our near-term infrared spectroscopy capabilities are now under review as well, through a combination of visitor and/or fast-track new instruments.

PROCESS AND SCHEDULE FOR THE FIRST SEMESTER ON GEMINI NORTH

Dr. Phil Puxley

The first semester of open use on Gemini North ("2000B") will run from June 1st, 2000, until January 31st, 2001. (Thereafter, semesters will coincide with those typical for the national observatories i.e. Feb 1 - Jul 31 and Aug 1 - Jan 31). The call for proposals, together with all relevant information to support applications including telescope and instrument availability, capabilities and observing modes will be on December 1st, 1999. The primary source of this information will be the Science Operations section of the Gemini web pages - which already contain many preliminary details.

> ***"Final approval for the queue and schedule will be issued by the Gemini Director on or before April 10th, 2000."***

As described previously in this Newsletter, the application process will consist of two phases. In Phase I, applicants will apply through their National Time Allocation Committees (NTACs) or National Gemini Offices (NGOs). The deadline for these applications will be January 31st, 2000. Scientific and technical assessment of these proposals will occur within each partner country with the NTACs due to meet separately during the week of March 13th, 2000. Following electronic transmission of the recommended proposals to Gemini before March 20th, 2000, and the construction of a draft queue and classical schedule, the International Time Allocation Committee (ITAC) will meet on April 6th, 2000. Final approval for the queue and schedule will be issued by the Gemini Director on or before April 10th, 2000. A coordinated notification of the successful applicants by Gemini and the NGOs will initiate the start of Phase II in which all queue, and most classical, programs will be defined in detail by the P.I.'s or their co-P.I.'s using the Observing Tool software.

GEMINI SYSTEM VERIFICATION

Dr. Tom Geballe and Dr. Fred Gillett

System Verification at Gemini is the final step of testing prior to the use of the telescope by the Gemini community. This article describes the concept and philosophy of System Verification, the steps involved in completing it, the personnel directly involved in performing it, and the role of the Gemini community in the process.

I. System Verification – A Total Test

System Verification (SV) is a test of the total Gemini Observing system. It is distinct from commissioning, which is a separate activity that precedes SV. Commissioning of a piece of equipment, e.g. an ob-

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serving instrument, is intended to verify that the equipment performs as anticipated, to characterize all of its available modes of operation and their performances, and demonstrate its capability to do science at the level for which it was designed. SV is intended to demonstrate that the entire observing system is in place, that scientific observations with the commissioned instrument can be planned and performed, and that resulting data are of the quality expected and can be handled in the manner specified for use by the Gemini user community.

II. Telescope Verification

Telescope verification is an integral part of System Verification. Much of the telescope verification for the Gemini North Telescope will be accomplished with the assistance of the Near Infrared Imager (NIRI), which currently is being completed at the University of Hawai´i as the first facility instrument to be delivered to Gemini. For Gemini South, the Cryogenic Optical Bench (COB), an existing near infrared imager and low-resolution spectrometer on loan from NOAO, will be used to support telescope verification. Some aspects of telescope verification will be achieved with other instruments. For example, chopping will be verified with the mid-infrared imager/spectrometers MICHELLE (Gemini North) and MIRI (Gemini South) and the definition, generation, and use of multi-slit masks with the optical multi-object spectrometer GMOS (Gemini North and South).

> ***"System Verification activities can be classified into three broad areas: Observation Definition, Observation Execution, and Observation Assessment."***

III. The Three Phases of System Verification

System Verification activities can be classified into three broad areas: Observation Definition, Observation Execution, and Observation Assessment.

The **Observation Definition** phase includes verifying the tools that the Gemini community will use to define observations on the Gemini Telescopes, the Image Quality Estimator (IQE), the Integration Time Calculator (ITC), and the Observing Tool (OT).

The IQE estimates the delivered image size based on the assumed atmospheric seeing, target airmass, wind speed, angular distance between the target and reference stars used by the peripheral wavefront sensors and/or on-instrument wavefront sensors, and brightness of the reference stars. Extensions to the IQE or separate IQEs will be developed for each Gemini instrument and to support the use of the Gemini North adaptive optics system, ALTAIR, with the Gemini instruments.

The ITC calculates the integration time required to achieve the specified signal-to-noise ratio from the instrument performance and the seeing as well as other weather conditions specified by the science program. The performance of the IQE and ITC will be verified by comparison of their predictions with the results of the SV observations.

The OT will be used to define the SV observations. The observations will be chosen to demonstrate that the OT has the flexibility and scope to specify observation types of interest, that the process for selection of reference stars for the wavefront sensors functions properly, and that appropriate calibration observations can be defined. In addition, integration of the OT with scheduling tools, schedule reporting, and communications with telescope users will be verified.

The **Observation Execution** phase will verify the execution of the observations defined by the OT and will exercise the range of observing options to be supported by Gemini. These options include queue and classically scheduled measurements, remote observations, from the base facilities and some partner countries. Calibration observations, quality checking, and data distribution will all be verified.

The **Observation Assessment** phase will demonstrate that the data processing pipeline works properly for each instrument and that data distribution takes place as designed. It also will verify that the instrument capabilities are as advertised, that the contents of the users' manuals are correct and complete, and that baseline calibration procedures produce the information necessary to calibrate the SV data so that scientifically useful measurements result. In addition, it will exercise the user support documentation and support procedures. After verification of their quality during this internal assessment, the SV observational data will be made available to the Gemini community for further assessment and utilization, providing additional feedback to Gemini on issues such as data quality, instrument capabilities, and telescope performance.

IV. The System Verification Teams

System Verification activities will be performed by teams led by Gemini scientific staff who will define the SV observations, assure that all preparations are in place, carry out the observations, and provide the assessment of data quality and system performance. The SV teams will be made up of Gemini Scientific staff, Gemini Instrument Scientists, Gemini National Project Scientists, and two additional scientists, one each from Brazil and Chile. The teams will thus include scientists who are the most knowledgeable in the Gemini Observatory and its instrumentation, and who represent the Gemini partner perspectives. They include individuals who are in the best position to implement any needed modifications to the telescope and instrument procedures and/or observing tools, if shortcomings are uncovered during the SV process.

"System Verification tests will serve as valuable trial runs for Gemini staff and will train staff in instrument and telescope control, data reduction, and interacting with the Gemini community."

System Verification tests will serve as valuable trial runs for Gemini staff and will train staff in instrument and telescope control, data reduction, and interacting with the Gemini community. They will also provide the Gemini National Office Scientists with firsthand experience in interacting with the Gemini Observatory, a role they will be responsible for supporting in their communities.

V. Observing Modes

System Verification will be performed for each observing mode of an instrument and telescope combination. "Observing mode" is a somewhat loose term describing a discrete type of observation where instrumental parameters such as spectral resolution and field of view, telescope parameters such as chopping and nodding, and/or external parameters such as background radiation, lead to significantly different types of observations. For example, imaging and grism spectroscopy with NIRI constitute two modes of the instrument. SV for each of these modes need not include every filter or wavelength, but surely will include observations in both the thermal ($\lambda > 2.5\mu m$) and non-thermal ($\lambda < 2.5\mu m$) infrared. Likewise, for GMOS long slit spectroscopy and multi-slit spectroscopy are two different modes requiring two sets of SV observations; one would not assume that because one of them works that the other does as well.

At the present time the observing modes of each Gemini facility instrument under development are being specified by the SV teams, led by the Gemini staff. Information on most of these instruments is available via the Gemini Web pages, starting at http://www.gemini.edu/sciops2/instruments/instrumentsIndex.html.

VI. Timing of SV and Availability of SV data

For each mode of each instrument, planned observations for system verification will be published prior to their execution, as part of the announcement for the first semester of availability with that mode of

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Looking down on Gemini North's primary mirror shortly after installation in December, 1998.

Gemini North Dedication

June 25-27, 1999

The Glass of Gemini

The Story of Gemini North's Optics

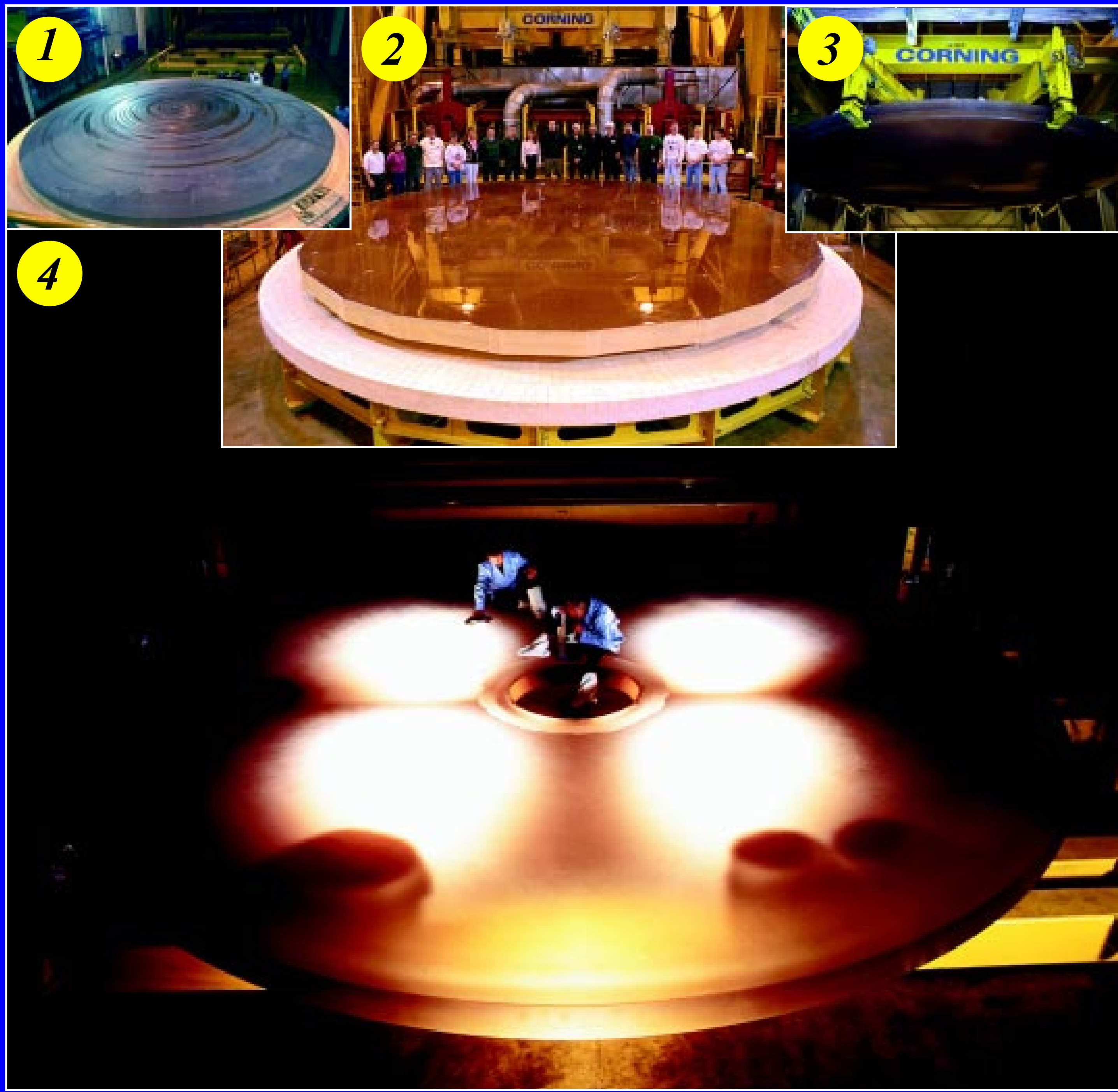
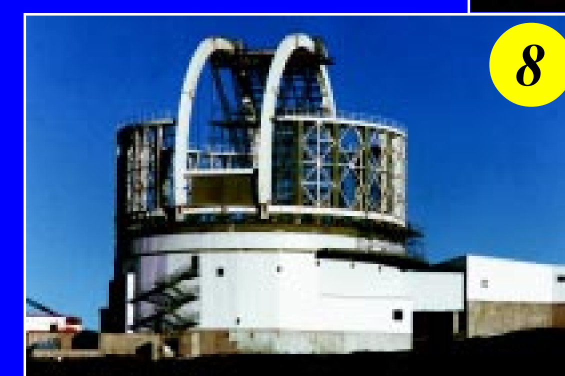
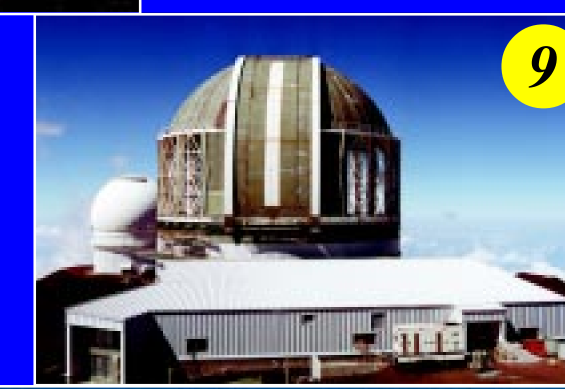
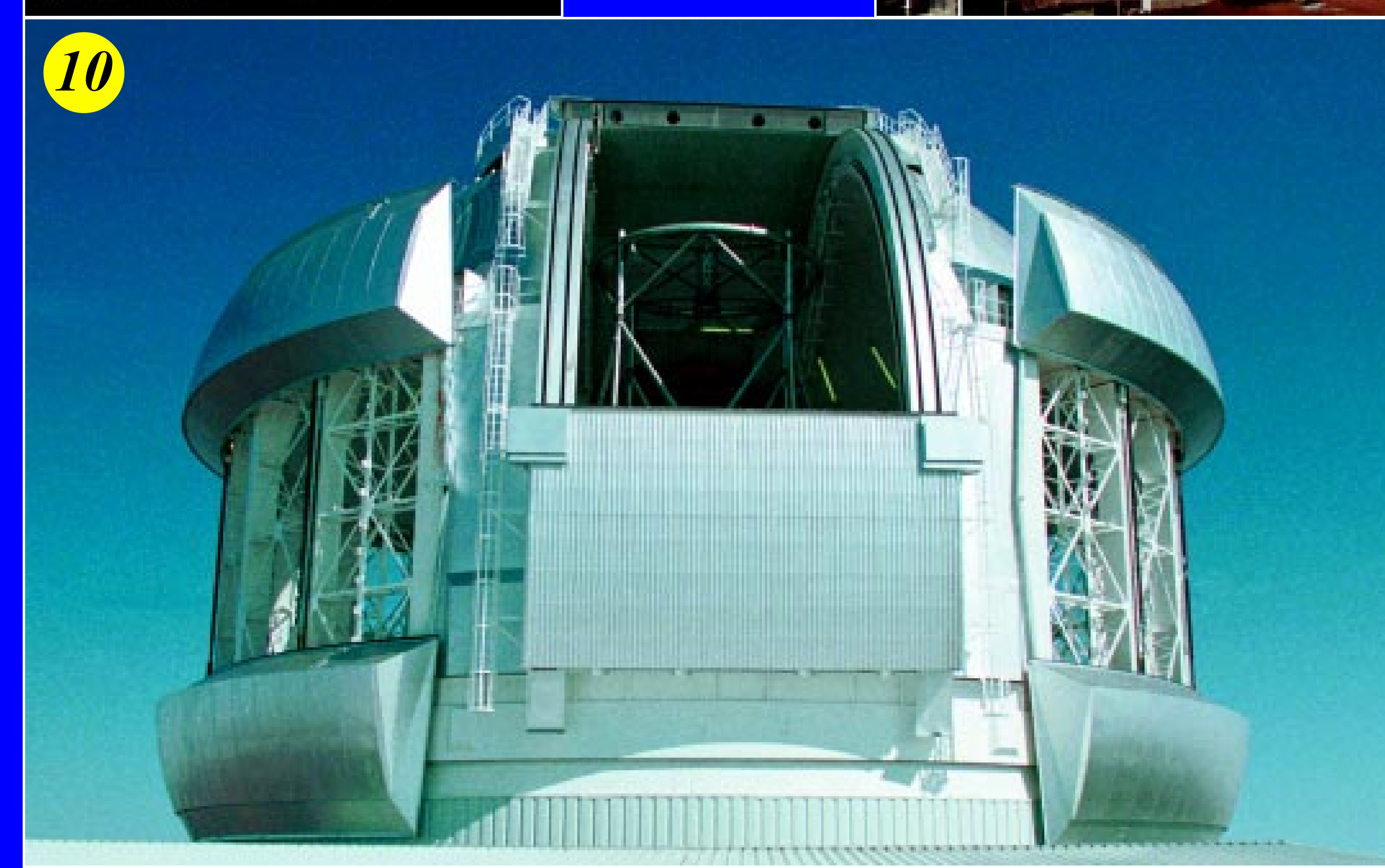


Image 1 - The Gemini mirror blank after "slumping" at Corning (March, 1995)
Image 2 - The Gemini mirror blank with Gemini and Corning staff (October, 1994)
Image 3 - Gemini mirror blank being lifted after "slumping" (January, 1996)
Image 4 - Gemini mirror blank being inspected prior to shipment to REOSC in France for polishing (November, 1995)
Image 5 - Secondary mirror at Zeiss Optical in Germany (January, 1998)
Image 6 - The primary mirror on polishing machine at REOSC (September, 1996)
Image 7 - Test screen being placed on mirror at REOSC in France (January, 1998)
Image 8 - Primary mirror during transportation up Mauna Kea (June, 1998)
Image 9 - Freshly aluminized mirror exiting coating chamber (December, 1998)
Image 10 - Myung Cho attaches laterial actuators to primary mirror (December, 1998)

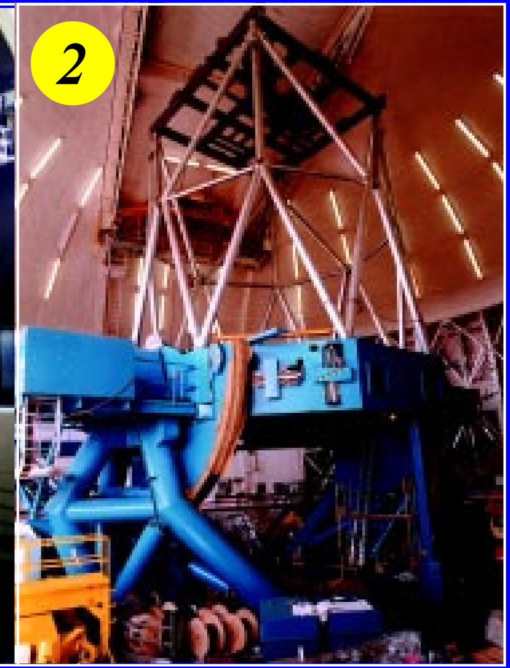






The Steel of Gemini

The Story of Gemini North's Construction



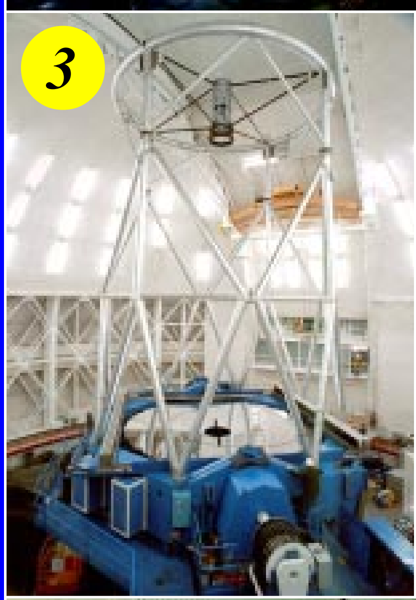
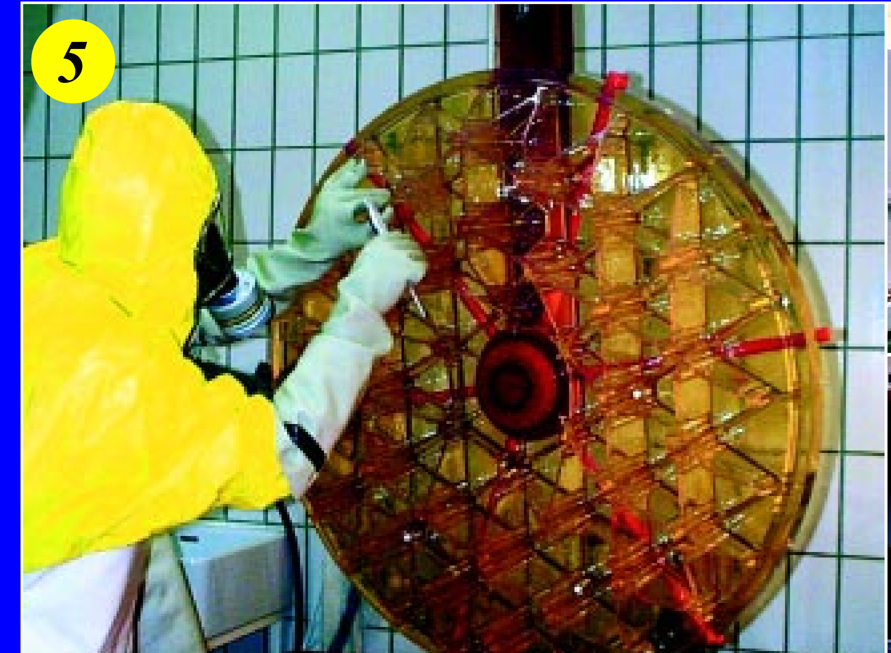
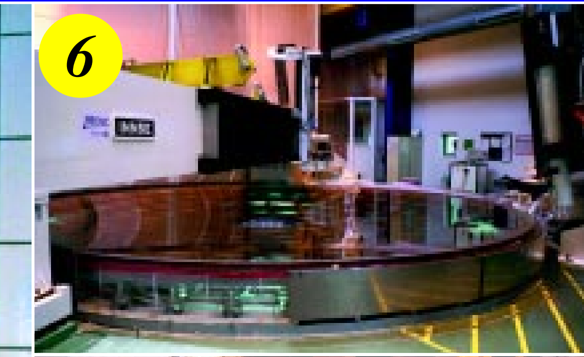


Image 1 - Telescope mount structure (February, 1998)
Image 2 - Telescope structure without top-end (May, 1998)
Image 3 - Complete telescope structure with mirror installed (December, 1998)
Image 4 - Panoramic view of interior with completed telescope looking down at mirror (December, 1998)
Image 5 - Ground-breaking on Mauna Kea (October, 7, 1994)
Images 6 - 9 - One year's progress on the Gemini North enclosure (August, 1996 - August, 1997)
Image 10 - The finished Gemini North enclosure with vents fully opened and observing slit partially opened (March, 1999)





Startrails over Gemini and Kilauea Volcano

Photo Courtesy of Dr. Richard Wainscoat the instrument. This announcement will also include the expected (but not yet verified) performance of the instrument within the Gemini system. For NIRI, the first Gemini instrument to be delivered, SV plans will be published as part of the first semester of observing announcement for the Gemini Telescope on Mauna Kea.

For each mode of an instrument, the SV tests will be undertaken in the final months prior to availability of that mode to the community. Thus, the modes of NIRI advertised at the end of 1999 will be system-verified in the spring of 2000. SV for each mode of each instrument will be accomplished in no more than two clear nights. Note that as a result of the SV tests, the earlier description of the instrument's performance may require modification.

In general not every mode of an instrument will be offered initially. Only those modes that have been system-verified successfully will be made available to the Gemini communities.

In summary, the SV observations will be selected by SV team members and approved by the Gemini Director. They will span a wide range of targets and perspectives and the SV teams will be responsible for providing written, in depth assessments of SV observations and mode verification within two months of data acquisition. The data obtained during SV will be made available by ftp to the international Gemini community and the assessments will be published on the Gemini SV web pages. Community participation in the further evaluation and assessment of the SV observations will help ensure that Gemini is a success from the first date of scheduled observations.

HUMAN RESOURCES UPDATE

Melissa Welborn

The strategic vision and science initiatives of Gemini continue to make their mark upon the human resources efforts in recruiting "the best and brightest." We are pleased to note that Dr. François Rigaut (formerly of ESO) has joined the Gemini team as the Associate Project Scientist for Adaptive Optics. New additions to the scientific staff include former head of UKIRT Operations, Dr. Tom Geballe, Dr. Inger Jørgensen from the University of Texas at Austin and Dr. Ted von Hippel from the University of Wisconsin. We were very fortunate to find internal sources to meet some of our promotional and replacement needs. Dr. Doug Simons was promoted to Head of Instrumentation as we looked to the needs of our instrument program. Eric Hansen was promoted to Systems Engineering Manager, after the departure of John Filhaber in January, 1999. The Human Resources Department is constantly responding to the on-going an changing work environments of Gemini, in order to have a positive impact on the organization's mission.

Please look for our booth at the AAS meeting in Chicago in May where new opportunities to work on the Gemini team will be announced, or visit our Web site at http://www.gemini.edu/project/announcements/jobs.html

GEMINI NORTH DEDICATION SUPPLEMENT

Produced by Peter Michaud

The following pages celebrate the dedication of the Gemini North Observatory on June 25th-27th, 1999. For those unable to attend, look for images from the dedication on the Gemini WWW site (www.gemini.edu) and enjoy this special commemorative supplement.

THE GEMINI FACILITY CALIBRATION UNIT

Suzanne Ramsay Howat
GCAL Project Scientist

Reliable characterisation of the instruments on Gemini is essential to achieve the best performance from the complete system of telescope plus instrument. The need for efficient, reproducible calibrations is reinforced by the adoption of queue scheduled observing as a primary mode of operation, and the growth of the use of archive observations to increase the scientific productivity of an observatory.

The Gemini telescopes will each be equipped with a Facility Calibration Unit (GCAL), located on one port of the Instrument Support Structure (ISS) and capable of providing calibration frames (flat-fields and arc spectra) for UV/optical and near infrared instruments. The scientific goals of the telescope and instrumentation (for example moderate field imaging and spectroscopy; observations from the atmospheric cut-off at 300nm to the near-infrared and beyond) place tight constraints on the GCAL design. GMOS and NIRI drive the need for wavelength calibration and flat-field observations over fields from the largest science field (7' diameter, 3' used by NIRI) but also with high spatial resolution. This requires efficient diffusion and transmission of the beams from the continuum sources. Correction of sky emission in the near-infrared, where the sky lines are ~100 times brighter than the object, requires signal to noise ratios of at least 10^3 on the flat field. One of the strengths of an 8m telescope is the ability to produce high-resolution spectra of faint objects. Gemini provides this facility across a wavelength range from the UV to the infrared. Specific provision is made in the Phase I programme with HROS (R~50000) and GNIRS (R~18000). The calunit will be capable of providing wavelength calibrations that do not significantly reduce the observing efficiency. This requires high throughput, since the faintest arc lines may be the only ones available in the observed spectrum. In taking this advantage to its limit, frequent wavelength calibration will be required to monitor the effects of flexure.

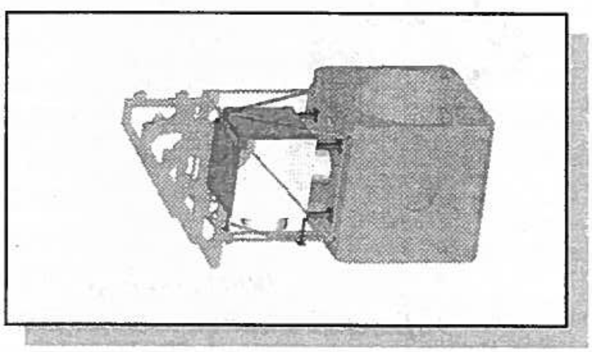


Figure 1: *GCAL mounted on the ISS*

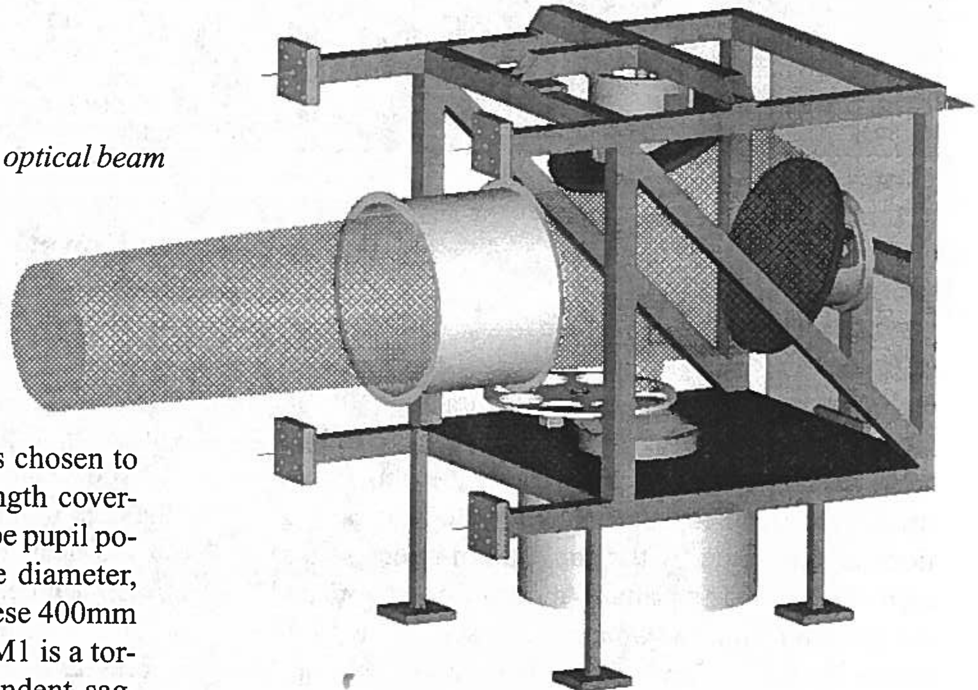
The GCAL design

Figure 1 shows GCAL mounted on the instrument support structure. GCAL is mounted inside the support frame for the Acquisition and Guidance system electronics cabinets and shares those cabinets with the A&G.

Figure 2 shows more detail of internal layout of the calunit. The two mirrors shown pass the beam from the calibration lamps (not shown, but housed in the 'drum' at bottom of the picture) to the science fold mirror, which then directs the beam into the instrument to be calibrated. The GCAL optics reproduce the f/16 telescope beam so that the instrument sees the calibration beam as if it came from an astronomi-

Continued...

Figure 2: GCAL without the covers. The optical beam is directed to the science fold mirror.



cal source. A reflective optical train was chosen to meet the requirements on broad wavelength coverage. These mirrors reproduce the telescope pupil position to within a tolerance of 1% of the diameter, and with less than 2% blur. To do this, these 400mm diameter mirrors have complex figures; M1 is a toroid, M2 has an additional radially dependent sag. Also seen in Figure 2 is the filter wheel which contains neutral density and colour filters as required to modify the lamp output for certain instrument configurations.

The illumination system contained in the drum in Figure 2 is expanded in Figure 3. The essential purpose of the illumination system is to match the étendue of the sources (typically 1mm^{2}sr) to the étendue of the 7arcmin field (164mm^{2}sr). Each lamp source must be diffused to fill the larger beam. It is this matching of the étendue which gives GCAL its largest advantage in throughput over more traditional calibration systems. Typically, an integrating sphere distributes the diffused beam into a hemisphere. Some fraction of the diffused beam (of order 1%) is transmitted into the instrument. With GCAL, the throughput is predicted to be up to 40%. The system of diffuser plus reflector shown in Figure 3 replaces the function of an integrating sphere. Light from the lamp is directed to the diffuser via a small fold mirror on the surface of the reflector. The beam is then scattered on either of two diffusing surfaces (for the infrared or optical). Some fraction passes out through the field lens and is imaged into the instrument; the remainder is reflected back to the diffusing surface. The reflectivity and surface finish of the reflector are important in achieving the predicted throughput. The finished surface will be aluminum, with a required rms surface roughness of 7nm.

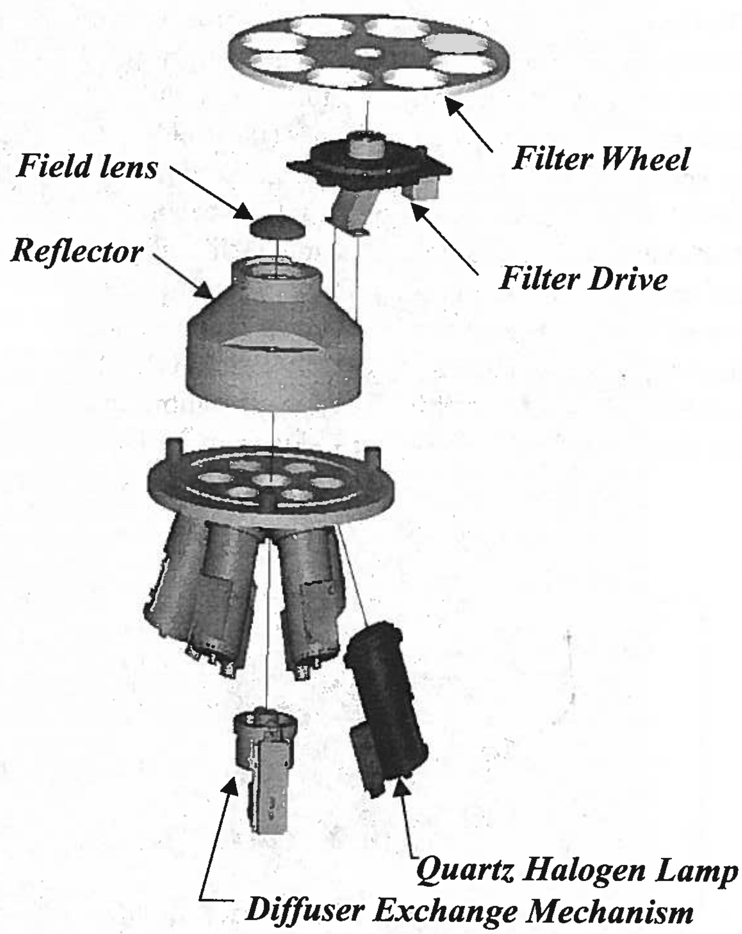


***Figure 3:** An exploded view of the illumination system. The six lamps are detailed in Table 1. The diffuser exchange mechanism allows the observer to swap between diffusers suitable for the near-infrared or optical wavelength regions.*

There are six lamps in the calibration unit, two continuum sources and four spectral lamps. These are shown in Table 1 along with the instruments that are expected to use them. There are no hardware restrictions on which pairings are used. The performance of the calunit has been modeled for various configurations of each of the Phase I instruments. Table 2 shows the predicted exposure times, along with the science requirement, for the most challenging configurations.

Function	Source
λ calibration for GMOS, HROS	ThAr and CuAr hollow cathode lamps
Flat-fields for GMOS, HROS	QH lamp
λ calibration for NIRS	Two pencil lamps: Ar, Kr
Flat-fielding GNIRS, NIRI	Infrared source - 1100K greybody (QH lamp avail. too)

***Table 1:** The expected use of the calibration sources by the initial instrument complement.*

Calibration	Requirement	Prediction
HROS Wavelenth calibration frame:	One line every 0.3nm	ThAr mean separation is 0.2nm (290nm to 1110nm)
	To be measured with a signal/noise of 10 in 5s	At 600nm, lines with flux~1% of the average bright line have S/N=10 in <~10s. (S/N = 8 in 5s)
HROS: Flat fields	Signal/noise = 300 in 5s at 600nm	S/N > 300 in 5s for λ>~400nm
	Signal/noise = 300 in < 60s at 310nm	S/N = 300 in 60s at 310nm (S/N = 300 in ~20s at 350nm)
GMOS: Wavelength	Signal/noise of 10 in 5s	At 600 nm, lines with flux~1% of the average bright line have S/N=10 in ~ 15s. (S/N=6 in 5s)
GMOS: Flat fields	Signal/noise = 300 in 5s at 600nm	S/N > 300 in 5s for λ > 350nm
NIRS wavelength	A limit of 10s for an arc spectrum	At 2μm, lines with flux~1% of the average bright line have S/N=30 in ~10s.
NIRS: Flat fields	10s for a flat-field with signal/noise=10^3 is adopted	Short camera, R=6000, met for λ>2μm Long camera, R=5400, s/n=500 in 10s at λ=2μm. Requirement can be met at short wavelengths with the QH lamp for all configurations
NIRI imaging: flat fields Assuming 1% filter.	S/N = 10^3 per pixel in 10s.	OK for λ>J with infrared source. S/N ~ 100 obtained for λ<J. QH lamp for S/N = 10^3 and λ<J.
NIRI spectroscopy: Wavelength calibration	A limit of 10s for an arc spectrum	At 2μm, lines with flux~1% of the average bright line have S/N=10 in ~ 10s.
NIRI spectroscopy: flat fields.	S/N = 10^3 per pixel in 10s.	Requirement met with the QH lamp.

***Table 2:** Predicted exposure times for various configurations of the Phase I Gemini instruments.*

Recent Progress on GCAL

The GCAL design has been developed at the UK Astronomy Technology Centre. A Critical Design Review was held in September 1998, and GCAL is now in the manufacturing and testing phase. In February, the reflectors were delivered. Initial tests of the uniformity and throughput of the system were carried out at the UK ATC. These tests indicate that both the uniformity and throughput of the final system will meet the science requirements. The pupil imaging mirrors are due to be delivered in May, by which time manufacture of the structural components will also be complete. The calunit for Gemini North is scheduled for delivery in September 1999, with the Cerro Pachón GCAL following in September 2000.

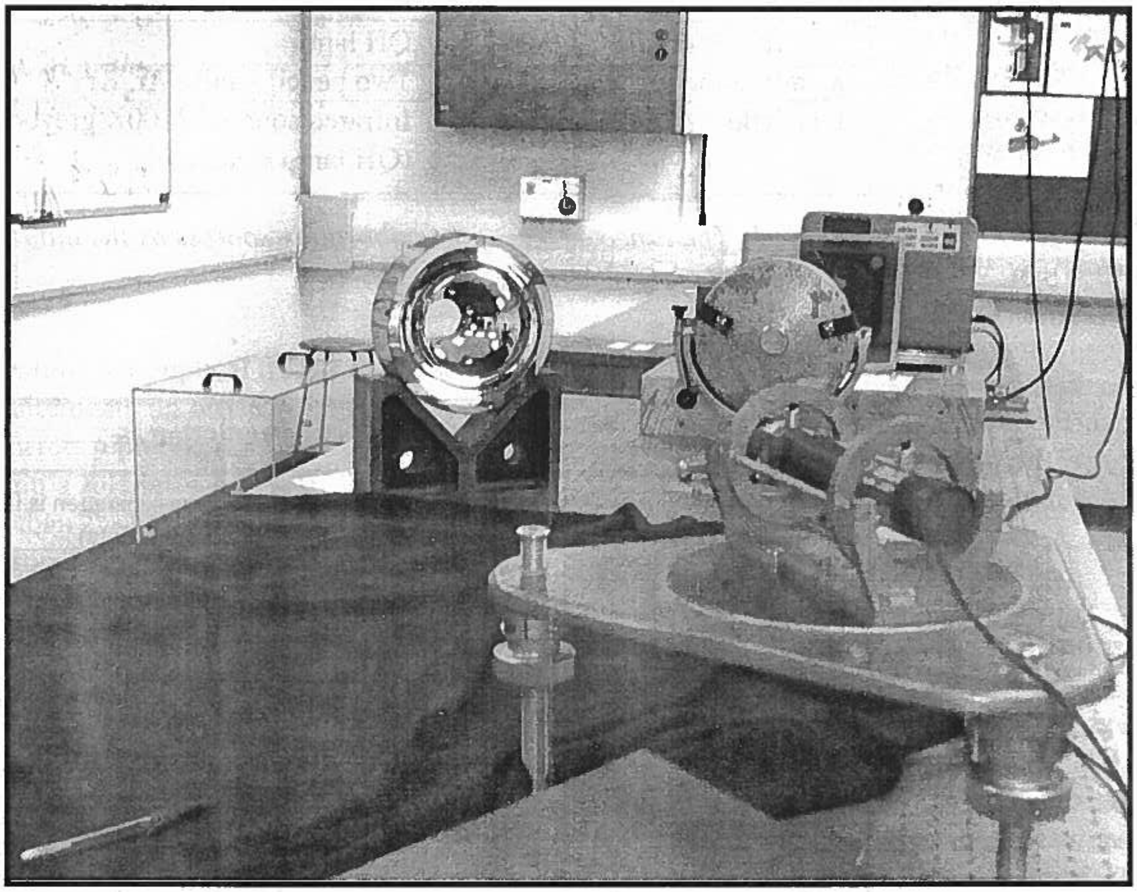


***Figure 4:** One of the GCAL reflectors undergoing tests in the ATC optics laboratory.*

GEMINI NORTH INTERNET UPGRADE

In April it was announced that Gemini will receive $600,000 from the National Science Foundation (NSF) to support a significant expansion of the Internet connection speed between Gemini North on Mauna Kea, the Hilo headquarters in University Park, and the rest of the world. By coordinating the Gemini grant with a similar but different NSF grant recently made to the University of Hawaii's (UH) Information Technology Services, all of the Big Island observatories will share in the benefits of this much improved connection.

The improvement is especially important to Gemini because of our dependency upon remote observing and the immediate transfer of data over the Internet. The expansion will allow Gemini to accomplish our goal of connecting astronomers around the world in real time to the Hilo control center and the telescope on Mauna Kea.

Interim Director of UH's Institute for Astronomy, Dr. Robert McLaren said this about the significance of this news, "With ever larger and more sophisticated cameras and instruments showing up on Mauna Kea telescopes, such as Gemini, the need for increased bandwidth had reached a critical point. In one stroke, this innovative solution has solved Mauna Kea's data rate problems for the foreseeable future."

"Adding Gemini's funding will permit a further increase to 45 megabits per second and provide enough capacity to meet Mauna Kea's expected requirements for several years."

The unique collaboration between Gemini and UH allows the Gemini grant to compliment a recent $350,000 NSF grant to UH's Information Technology Services to upgrade its Internet facilities, including a data-rate increase for the Mauna Kea observatories from 1.5 to 6 megabits per second. Adding Gemini's funding will permit a further increase to 45 megabits per second and provide enough capacity to meet Mauna Kea's expected requirements for several years. It is anticipated that the upgrades will be complete by late 1999.

Gemini Operations Manager, Dr. Jim Kennedy, who wrote the proposal said, "By pooling our efforts and our funding, Gemini and the University of Hawaii together are increasing the Big Island observatories' and UH-Hilo's Internet speed by a factor of 30." Dr. David Lassner director of UH Information Technology Services added, "This partnership shows what is possible when you combine resources to solve common problems. This would have been prohibitively expensive if we had worked independently."

The increased bandwidth will also allow Gemini to share more of its findings with the public and will eventually include an extensive virtual tour and live webcasts to museums, planetaria and classrooms once scientific operations begin.

PIO INITIATIVES

Peter Michaud

A new initiative by the Gemini Public Information and Outreach Office has been funded by the National Science Foundation and will allow for expanded documentation of the project and the production of media resources for future PR efforts. Funding of the $126,000 initiative was announced in April and development of materials will begin immediately. Some of the materials are planned for release at the Gemini North dedication in June with the remainder of the materials to be produced over the next 12 months. Products from this initiative will include:

- Extensive video documentation of the Gemini South mirror move from Paris, France to Cerro Pachón, Chile.
- Photographic documentation of Gemini North and South including aerials, key structural elements and dramatic creative images.
- Production of animations showing how light passes through the Gemini telescopes and specifically how adaptive optics (i.e. ALTAIR) alters star light to produce sharper images.
- Production of animation sequences that show generic astronomical processes such as stellar/planetary formation, active galactic nuclei, colliding galaxies and even how infrared radiation can reveal details through clouds of gas and dust.

In addition to these projects, the Public Information and Outreach office now has available several new products that include a new Gemini folder and conference display that were designed by the accomplished artist Jon Lomberg. Famous for his artwork

Continued...

on Carl Sagan's TV series "Cosmos," the Smithsonian's "Portrait of the Milky Way" and the opening scene from the movie "Contact", Mr. Lomberg designed these materials from his studio on the island of Hawai´i and they are now available for use by the partnership.

The display consists of 25 panels that create a mosaic which is assembled on a wall or standard conference display system. The main (82" X 52") graphic consists of a striking world map on a starry background with partner countries highlighted by starbursts. To keep the display useful for all partners, the limited text can be easily translated and additional information and images are attached to the display as needed for different audiences. Anyone who has not already arranged to have copies produced for them can contact the Public Information and Outreach Office for details.

"To keep the display useful for all partners, the limited text can be easily translated and additional information and images are attached to the display as needed for different audiences."

The new Gemini folder solves the age-old problem of providing a brochure that is timely and appropriate for all audiences - from scientists to journalists. Because of our diverse audiences and the dynamic nature of a project like Gemini, the folder approach was used so that materials could be updated, translated, customized and adapted as needs change. 10,000 of the folders have now been produced and have been made available throughout the partnership at cost (about $1.40 US each).

Finally, the Gemini Media Resource WWW Page has been in operation for some time now and includes some of the better images that are available for general media use. If you haven't seen it, take a look at: www.gemini.edu/media/media1.html

PARTNER OFFICE UPDATES

US Gemini Project Office

Preparations in the US for the operations phase of Gemini include efforts both in instrumentation and in user support and liaison activities. The first Gemini North facility instrument, NIRI, a near-IR imager, is in its assembly and integration phase at the IfA in Honolulu. Following tests there, it will be shipped to Hilo for more testing before it makes its way up to the telescope later this year. NIRI will contain one of the ALADDIN InSb detector arrays from Gemini's very successful foundry run at SBRC in Santa Barbara. NIRI will also contain an array controller from NOAO, developed in a separate project aimed at providing identical controllers for all Gemini near-IR instruments.

Following a difficult period, the work on GNIRS, the Gemini near-IR spectrograph, has resumed with a repackaging of the optical design in order to alleviate concerns about flexure and thermal performance. A formal restart review will be held in July.

The Gemini mid-IR imager, known as T-ReCS, for Thermal Region Camera System, is well along in its design phase and will undergo critical design review this summer. A spectroscopic capability has been added to this instrument, which is a product of a group at the University of Florida led by Charles Telesco.

Work will soon begin on the first of the next generation of Gemini instruments, the near-IR coronagraph/imager. This instrument will provide small to moderate field imaging capability with a coronagraph mode optimized for use with adaptive optics. Scientifically, it is expected to allow fundamental observations related to the search for extrasolar planetary systems and studies of their formation and evolution. A contract for the conceptual design of this instrument has been awarded to a group led by Douglas Toomey of Mauna Kea Infrared. Because of its relevance to NASA's Origins program, NASA has become interested in this instrument and may provide funds to support its construction.

"Because of its relevance to NASA's Origins program, NASA has become interested in [the Near-Infrared Coronagraph/Imager] and may provide funds to support its construction."

US proposals for the Gemini telescopes will be integrated with those for NOAO and other telescopes, and this semester marks a significant step in that direction with the merger of the KPNO and CTIO proposal and TAC processes. Over the next year, time on Gemini North, the 6.5-meter MMT and the Hobby-Eberly telescope will be added as well.

US support activities will be focussed in Tucson and will be handled using existing scientific and current NOAO staff. Because of the international nature of Gemini, much of the support for users will be set up in a distributed way, with expert input from many places around the world.

Dr. Todd Boroson

UK Gemini Project Office

This will be one of the final reports from the UK Gemini Project Office for the Newsletter - we will soon be handing over our central and coordinating UK role in Gemini to the UK Gemini Support Group, which, after a competitive exercise, will remain at its current home, the University of Oxford Astrophysics Group. Pat Roche, Colin Aspin and Isobel Hook (currently based at Edinburgh University where she is working on GMOS) are the current team, and more staff will be added soon. They will be the first point of contact for the UK community as we start to exploit Gemini. Find out more about the team, and the services they'll provide at http://www-astro.physics.ox.ac.uk/GEMINI/

"...the UK Gemini Support Group [...] will remain at it current home, the University of Oxford Astrophysics Group."

The UKGPO will retain responsibility for those UK Work Packages that remain to be completed, and we have been concentrating recently on the Acquisition and Guiding, Wave Front Sensing and Coating Plant Work Packages. On that subject, the UKGPO would like to thank the following UK staff for their commitment and hard work, in many cases, above and beyond the call of duty!

On the A&G/WFS: Andy Weise, Sue Worswick, and Malcolm Stewart, Steven Beard, Sean Prior, and Chris Mayer and on the coating plant: Ron Lambert, Ken Maris, Bob Doswell, Trevor Warby, Harry Bach, and Brian Mack.

We also wish to acknowledge the following Gemini staff for their invaluable help: John White, Clayton Ah Hee, Jacques Sebag, Andy Foster, John Wilkes, Richard Brink, John Filhaber, and Corrine Boyer.

Other UK work progresses well, including MICHELLE, which is well into integration and testing. GMOS and GCAL are also progressing - as reported elsewhere in this newsletter.

Alison Tonï & Simon Craig

By the end of this year, astronomers will be preparing the first proposals for shared-risk observing on Gemini, and the Canadian Gemini Office is now putting most of its efforts into preparing for operations. A big step in this preparation was the recent recruitment of two Canadian Gemini Astronomers, Tim Davidge and Stéphanie Côté. Tim is no stranger to the Gemini community as he has been part of "Gemini Canada" since 1992. Stéphanie is a newcomer to Gemini, but she brings very valuable experience to the project. Her career has included two years at ESO in the user support group, with responsibilities for the NTT queue observing program.

During the coming months, Tim and Stéphanie, together with Jean-René Roy, plan to conduct an extensive outreach program to the scientific community that will provide basic information regarding instrument and telescope performance. Key events will include the Canadian Astronomical Society meeting hosted by St. Mary's University in Halifax Nova Scotia in June 1999, and a series of visits to various universities in the fall.

NRC is currently developing a Web-based proposal preparation tool for Canadian Phase 1 applications. A Web-based system was adopted for a number of reasons. First, the central Gemini observing database requires that target information be supplied in a certain format, and this is easily implemented with a Web-based system. Second, a Web-based system will provide applicants with access to an arsenal of specialized tools in a common location to facilitate, for example, guide star selection. Finally, it is anticipated that Canadian astronomers may submit proposals that request time on both CFHT and Gemini, and this is most easily done if the Gemini and CFHT time application forms have a similar appearance and format. The Canadian Gemini Phase 1 observing tool will have a look and feel that is very similar to POOPSY - the Web-based observing tool developed for CFHT by Daniel Durand and David Bohlender of the CADC. The first release of POOPSY proved to be highly popular, and 55 of the 64 proposals requesting Canadian time on the CFHT were prepared using this system.

CGO staff have also been assigned specific instruments to serve as the first point of contact with the Canadian user community. Tim will handle queries regarding NIRI, MIRI, ALTAIR, and QUIRC + UHAO while Stéphanie will be responsible for GMOS, NIRS, and MICHELLE. Of course, most of these instruments will not be available during the first year or two of Gemini operations.

As part of the effort for setting up the infrastructure to support Canadian astronomers and publicize Gemini to the Canadian public, a major rework and expansion of the Canadian Gemini Office Webpages is now underway. A set of public pages were created and are now reachable at: http://gemini.hia.nrc.ca/brochure. This material includes a detailed description of the telescopes as well as the science goals at a layman's level, and can be copied or adapted by other partner countries should they wish to do so.

For the past several years, a large number of the NRC staff in Victoria have been involved in Gemini work. Our part of the Data Handling System has now been completed, and the Enclosure Control System was completed last year. The big projects — ALTAIR and GMOS — are still keeping us very busy, and we have a small amount of work still to do on the wavefront sensors. ALTAIR, the Gemini North adaptive optics system, successfully passed its Critical Design Review in February and we are very proud of the team for this success. We also wish to thank Peter Wizinowich of Keck for his able chairmanship of the review committee. Development of the two GMOS spectrographs is a collaborative effort with ATC and Durham University in the UK, and final integration of the first GMOS is scheduled to start this summer in Edinburgh.

Development of instrumentation of the size and complexity required for Gemini has been a learning experience for the Gemini partners who have been involved in this activity. It has proven very difficult for all of us to keep the costs and schedule under control and there have been common areas of technical problems, such as software. In an effort to draw upon our shared experience, Canada will host a workshop called "Lessons Learned" in Parkesville, BC this summer. The intent will be for all partners is to share their experiences so that we can all profit from the "lessons" and, we hope, avoid them in the future.

Dr. Andy Woodsworth, Dr. Tim Davidge, & Dr. Stéphanie Côté

Australian Gemini Project Office

In the six months since the last Newsletter, the interaction of the Australian community with the International Gemini Project has been given a formal structure. In particular, an Australian Gemini Steering Committee (AGSC) and an Australian Gemini Science Advisory Committee (AGSAC) were formed. The Steering Committee, which is chaired by the Australian IGP Board member, Prof. Lawrence Cram, provides oversight of all Australian Gemini activities. It also provides advice to the Australian Research Council (ARC) on Gemini related matters. The Science Advisory Committee, which is chaired by Dr. Gary Da Costa, Australian Project Scientist, is the primary means through which the wider Australian astronomy community is involved with Gemini activities. Both committees have memberships that are representative of the Australian community likely to use Gemini.

Other recent highlights include:

1) As part of the preparation for future Gemini telescope time proposals, a review of the policies and procedures of ATAC (Australian Time Allocation Committee) has been carried out. The ATAC currently allocates Australia's share of time on the Anglo-Australian Telescope, and will allocate Australian Gemini time as well. The review suggested no major changes for the "Gemini era" ATAC, but did emphasize that a broad distribution of scientific expertise among the committee members must be maintained. The Chair of ATAC will also serve as Australia's representative on the Gemini International Time Assignment Committee.

2) At the September, 1998 Instrument Forum meeting, an Australian proposal for a Concept Design Study of the Cerro Pachón Near-IR Coronagraph/Imager instrument was recommended for funding. However, given that this instrument may now be funded by NASA through the USGPO, this Concept Design Study will not proceed. At the same meeting, the Instrument Forum recommended that a development study, focussing on the testing of near-IR fibers and their use in fiber based deployable Integral Field Units, be funded at the Anglo-Australian Observatory. This study has now commenced and will involve close collaboration with similar Gemini Near-IR Multi Object Spectrograph development studies being carried out in the UK.

3) At the March, 1999 Instrument and Operations Forum meetings, an invitation to hold the September, 1999 round of meetings in Australia was accepted. This will allow these representatives of the Gemini partners to have a first-hand look at the astronomical facilities within Australia.

Dr. Gary Da Costa

Chilean Gemini Project Office

1. Because of many duties associated with her work in Chile, Dr. Maria Teresa Ruiz will no longer be able to help us as Project Scientist in Chile. Beginning on May 1st, Dr. Luis Campusano will start serving as the new Chilean Project Scientist. Dr. Campusano is associate professor of astronomy at Universidad de Chile and has been Acting Chilean Project Scientist with Gemini in the past. His main research interest is the study of the large-scale structure of the Universe, quasars and gravitational lensing. We welcome Dr. Campusano in the Gemini community and would like to thank Maria Teresa Ruiz for her valuable contribution to the project.

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2. The Gemini Board will be meeting in Santiago between May 17th – 18th. Conicyt and AURA are helping to organize the meeting. Prior to that, there will be a visit to Cerro Pachón together with some local authorities (Governor and House Representatives).

3. The agreement between Universidad de Chile - Yale and U. Catolica-Princeton to support an astronomy graduate program was signed last year and is working very well. This program has significantly increased the scientific activities as well as the number of postdoctoral fellows at those two university centers.

4. We are finishing the contents for a Chilean Web site. It will soon be available to the whole Gemini community.

Dr. Hugo Riveros

Brasilian Gemini Project Office

The Laboratorio Nacional de Astrofisica (GPO) has nominated the first Time Allocation Committee for Gemini. This committee consists of: Dr. Carlos Alberto Torres (LNA-president); Dr. Augusto Damineli Neto (IAG-USP); Dr. Franciso Jablonski (INPE); Dr. Claudia Mendes de Oliveira (IAG-USP); Dr. Marcio A. G. Maia (ON) and Dr. Miriani G. Pastoriza (IF- UFRGS). Members will serve for a maximum of two years, and each year half of the committee will be renewed.

The SOAR Project has been signed by all members as of January, 1999, and was incorporated by March 1999. Participants in the project include: 30% CTIO-NOAO, 31% Brazil, 17% University of North Carolina, 12% Michigan State University and 10% Chile. The final specifications include a 4.2m mirror, 0.18 arcsec image quality, f/16 focal ratio and the possibility of sharing instruments with Gemini. The SOAR project is also still interested in collaboration with Gemini for the Near-Infrared Spectrograph.

In spite of the economic difficulties Brazil has faced lately, the Minister of Science and Technology, Bresser Pereira, has recently reiterated full support for the international astronomical projects.

Dr. Thaisa Storchi Bergmann

Argentine Gemini Project Office

The Argentine Gemini Committee is organizing a workshop under the title of, "Argentine Astronomy and the Gemini Project" that will be held on May 27th and 28th, 1999, at the Astronomical and Geophysical Sciences Department, National University of La Plata. Astronomers from various astronomical institutions within Argentina will make presentations on the proposals they would submit when applying for observing time with Gemini. Beatriz Barbuy will represent Brazil at the meeting, and Miriani Pastoriza, from Brazil, who has cooperative projects with Argentine astronomers, will also attend. We will also have a representative from Chile. The representatives from Brazil and Chile will describe projects that their respective communities have in mind for Gemini and the possibilities of joint projects with Argentine astronomers. It is expected that the Gemini Project will be represented at the meeting and that there will be a lecture about Infrared Astronomy with Gemini. Hugo Levato will explain the procedure to be followed for submission of observing proposals. The meeting will be funded by the Faculty of Astronomical and Geophysical Sciences of the National University of La Plata and by the Argentine Astronomical Association.

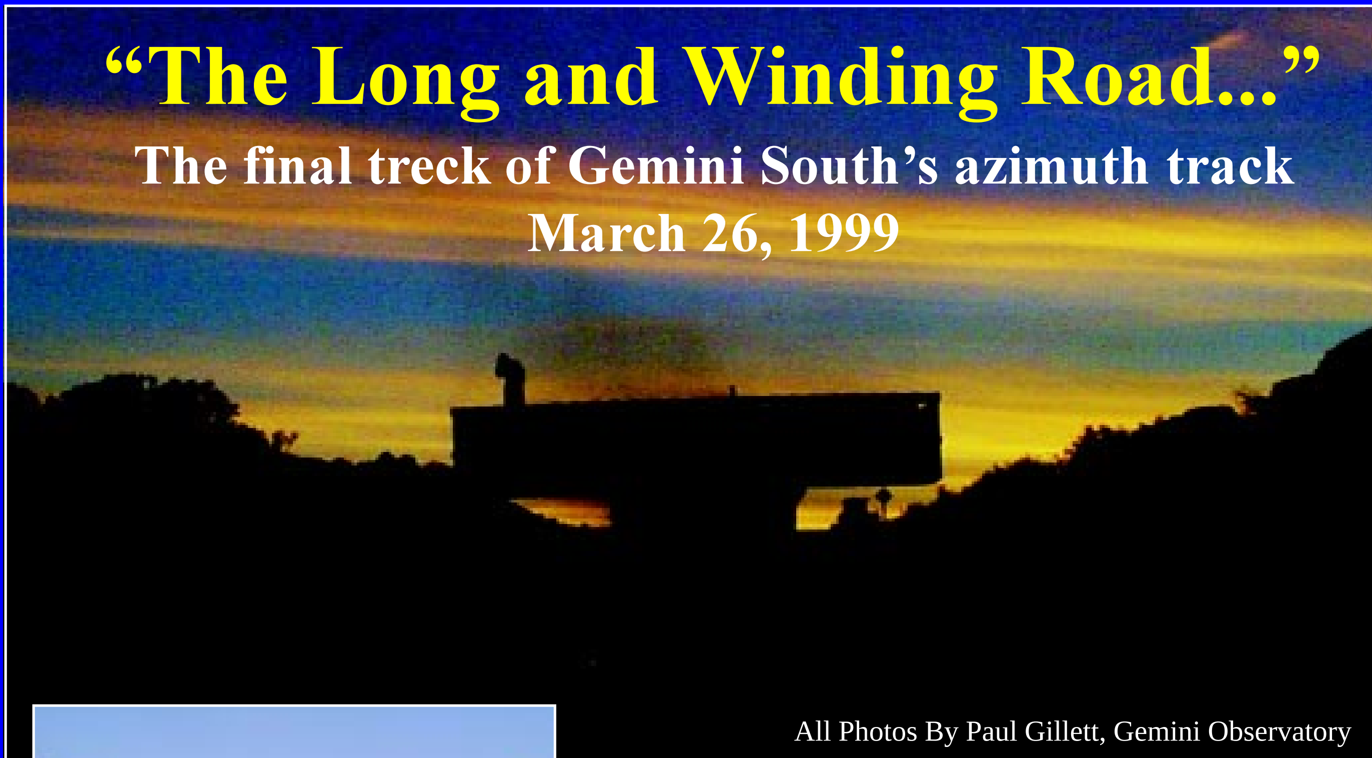
2. Our national observing facility (CASLEO) has already worked out an Application Form for submission of observing proposals via the WWW that will be adapted to the requirements of Gemini.

Dr. Jorge Sahade

“The Long and Winding Road...”

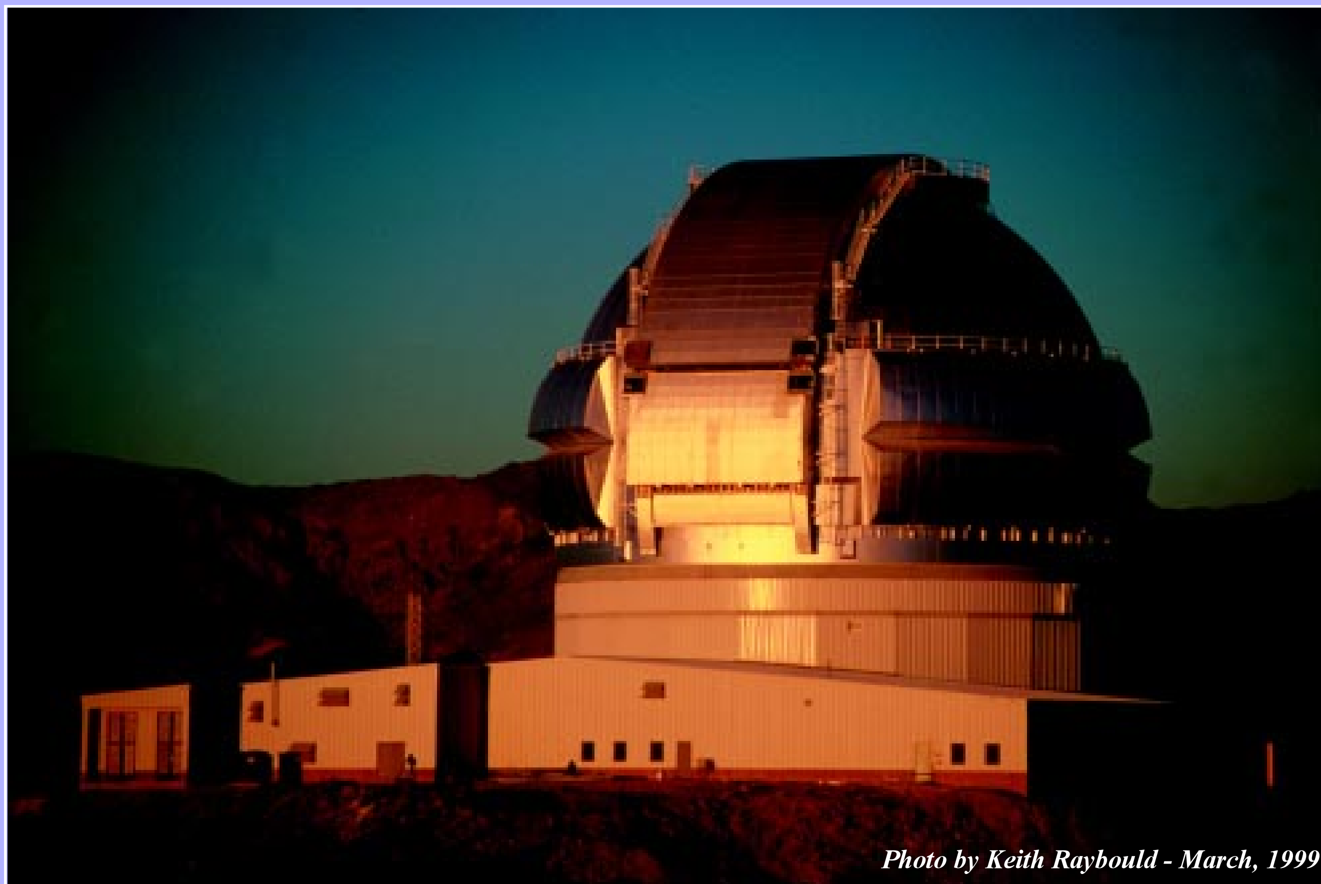
The final treck of Gemini South’s azimuth track

March 26, 1999



All Photos By Paul Gillett, Gemini Observatory

Often with only inches to spare, Gemini South’s widest load makes its way toward a dusk encounter with the summit of Chile’s Cerro Pachón.



Gemini South with recently painted dome at sunset

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