GEMINI OBSERVATORY NEWSLETTER

Issue 22 June 2001

Adolfo Araya Cleans the Gemini South Mirror

In this Issue:

Sodium Laser Tests Over Cerro Tololo

Taken by Maxime Boccas (CTIO), these images capture an ongoing experiment by Gemini, CTIO, and ESO to study the temporal characteristics of our atmosphere's sodium layer. Gemini's Celine d'Orgeville is the Principal Investigator for this program, which is critical to the development of laser guide star systems for adaptive optics like Gemini's Altair and the planned Multi Conjugate Adaptive Optics system.

The experiment's first run was conducted February 12–20, 2001 at CTIO. Four more runs are scheduled through February 2002, which will provide data at different months so that we can better understand seasonal variations in the sodium layer. More details about this experiment will follow in a future newsletter article, but for now, enjoy the beautiful images.

An inside view of the laser room showing the 0.4 mW dye laser and 7W Argon-ion pump laser that is tuned to the Na D2 line for this experiment. The exit hole can be seen on the room's ceiling.

A view down the custom cut exit hole for the dye laser used in this experiment. The laser is located in a utility building below the Blanco Telescope on Cerro Tololo

The Gemini Observatory Newsletter

Published twice annually in June and December and distributed to staff, organizations, and others involved in the Gemini 8-meter telescopes project.
Worldwide Circulation 3,400

Dr. Fred Gillett
February 1937–April 2001

It is with great sadness that we announce the passing of Dr. Fred Gillett, a pioneer in infrared astronomy who served as the Gemini Project Scientist since 1994. Everyone involved in Gemini loved and respected Fred, and the Gemini staff and his family appreciate all of the kind words and memories we have received since his passing on Sunday, April 22nd.

See page 23 for a selection of memories of Fred.

Early Commissioning of Gemini South

Bryan W. Miller

The last few months have been very productive at Gemini South. In early November 2000, the primary mirror was washed and coated with aluminum for the first time. While the coating process will be improved, the work went smoothly and the results were very good, giving a reflectivity of 90% in the visible. The telescope was then reassembled with the secondary mirror and the acquisition and guiding (A&G) unit for the first time. Routine nighttime commissioning then began. Early examples of image quality were very encouraging; a short U-band exposure with only passive mirror support gave an image with a FWHM of less than 0.6 arcseconds. Putting the enclosure under computer control saved the astronomers from many cold nights of dome-driving and allowed the work to proceed much more efficiently.

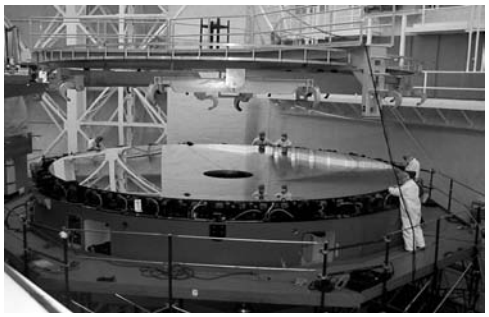


Figure 1: The freshly coated Gemini South primary mirror with engineers and technicians working on the lateral actuators and the air support system.

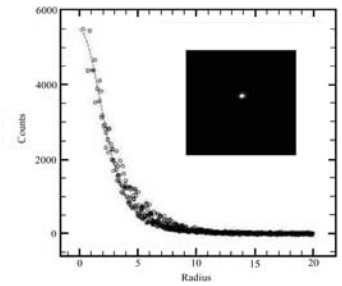


Figure 2: The Gemini South first light image of Epsilon2 Eridani taken on November 24, 2000 with the acquisition camera. This image was obtained with only passive mirror support, that is, without active control of the primary mirror figure. The FWHM of the radial profile is 4.6 pixels or about 0.6 arcseconds. While very encouraging, the wings of the PSF indicate that the mirror shape has not been corrected.

All aspects of telescope performance have improved in the first three months of 2001. Optical tape encoders have been installed on both axes, and the mount movement and pointing continue to be fine-tuned. The current pointing accuracy is a few arc seconds and will improve. Many elevation tests have been conducted to establish an open-loop active optics model, and the closed-loop active optics system has been successfully tested using both on- and off-axis guide stars. The guide-probe arms have been physically adjusted to ensure that the probes are confocal with the acquisition camera, and the automatic focus loop now works correctly. The first simultaneous fast tip-tilt, guiding, and chopping tests have also been performed in preparation for the arrival of OSCIR and T-ReCS later this year.

We are now preparing for the arrival of the first instruments and the start of science operations. The closed-cycle helium system has been tested with a dewar borrowed from CTIO, and the ABU near-infrared camera is due to arrive from Kitt Peak in May 2001. New control room consoles similar to the Mauna Kea units were installed in March 2001. We are also excited by the completion of the first call for proposals to use Gemini South in semester 2001B. The first instruments will be the Acquisition Camera optical imager, the Flamingos near-IR camera, and the OSCIR mid-IR camera and spectrograph. Instruments in 2002A will include our first facility instrument, T-ReCS, as well as Phoenix and Flamingos in multi-object spectroscopy mode. The Gemini South science staff is also heavily involved in software development for the GMOS spectrographs.

Figure 3: Gemini SSAs Dolores Walther, Jeff Cox, and Gelys Trancho after they helped install the telescope control consoles on Cerro Pachón.

Gemini Multi-Object Spectrograph

Inger Jørgensen

The Gemini Multi-Object Spectrograph (GMOS) for Gemini North is rapidly approaching its first science use. A multi-object spectrograph for observations at optical wavelengths, GMOS was designed and built through a collaboration between the U.K. (Astronomy Technology Center in Edinburgh and Durham University) and Canada (Hertzberg Institute of Astrophysics). GMOS's custom-cut masks provide an observer with the full flexibility to design the best possible masks to accomplish their science goals.

During two busy weeks in March 2001, a Gemini test team put GMOS through acceptance tests at the Astronomy Technology Center. Finding only minimal problems that needed to be fixed, GMOS was packaged and shipped to Hilo, Hawaii soon after the testing period. The 12 wooden crates containing the instrument arrived in Hilo on April 4, 2001.

For the next three months GMOS will be reassembled in the laboratory at the Mauna Kea summit. During this period the optics, detectors, and electronics will be reinstalled and tested in order to make sure that nothing was damaged during shipping. Because the large optical elements of GMOS are sensitive to pressure and temperature differences, most of this work has to be done at the summit. The work during the next three months will also ensure that the GMOS systems communicate correctly with other Gemini systems such as the Data Handling System, which handles all science data from Gemini instruments, and the Telescope Control System.

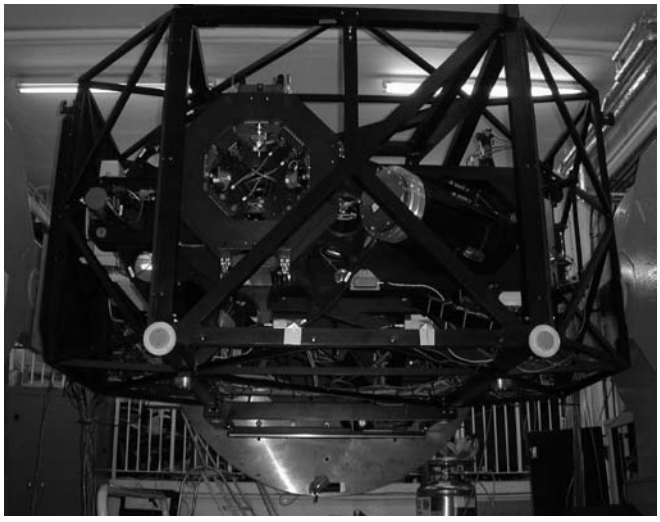


Figure 1: GMOS on the flexure rig during testing at ATC in Edinburgh, U.K. The instrument is seen from the back relative to the light-entrance from the telescope. All the panels that normally would be mounted to make the instrument light tight have been taken off. The camera assembly is on the right. The octagonal ring to the left of the center is the grating turret. Three gratings and a mirror for direct imaging may be mounted simultaneously. Behind the grating turret are the two filter wheels.

A team of engineers and technical staff from Canada, the U.K., and Gemini will reassemble GMOS and integrate it with the Gemini systems. If the current plan holds, GMOS should see first light at Gemini North in early August 2001.

Once GMOS is on the telescope, we will take about three months to characterize and commission the instrument. We will need approximately 30 clear nights at the telescope for this purpose. Gemini science staff, in collaboration with the science team that designed and built GMOS, will commission the instrument. One member of the GMOS science team, Isobel Hook from the U.K., will be in Hawaii for a full year to provide assistance with GMOS and user support. We will also have shorter visits from David Crampton of Canada, and Jeremy Allington-Smith and Roger Davies from the U.K.

Before GMOS is available to the community, we will conduct a number of System Verification programs to demonstrate the science capabilities of GMOS and carry out observations using the full system, including planning observation sequences, obtaining observations, and performing pipeline data reductions to assess the quality of data. We are still planning the details of the System Verification observations. When these plans have been finalized, they will be available on the GMOS web pages. All data acquired from the System Verification programs will be available to the community within a few months after observations have been conducted.

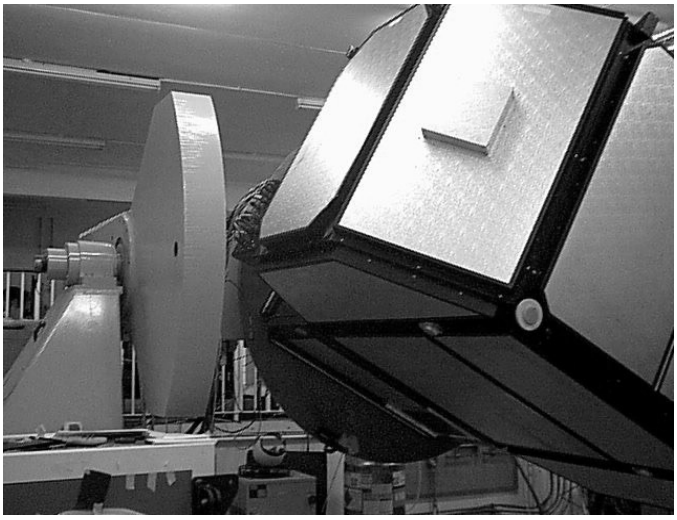


Figure 2: GMOS on the flexure rig. The panels are mounted, as they will be on the telescope.

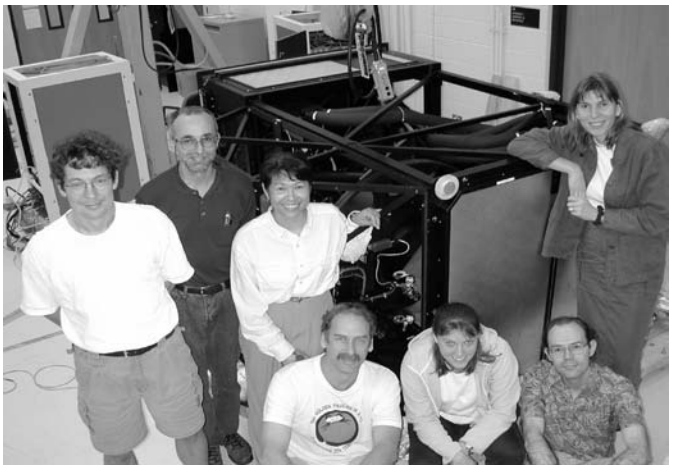


Figure 4: Members of, GMOS commissioning team in Hawai`i taking delivery. (left to right): Rick Murowinski, Pedro Gigoux, Wendy Mays, John Hamilton, Isobel Hook, Steven Beard, and Corinne Boyer.

We plan to make GMOS available to the community in November 2001. Judging from the proposals that have been submitted for semester 2001B, we expect GMOS to be a popular instrument within the community. About one third of the time applications for time at Gemini North request GMOS. A second GMOS for Gemini South is being built. Integrating and testing of the second GMOS is expected to start later this year.

For further information about the capabilities of GMOS, see the web pages at the following url: http://www.gemini.edu/sciops/instruments/gmos/gmosIndex.html.

Figure 3: GMOS being packed for shipping at ATC. Two of the 19 crates are loaded on the truck.

Project Update

Jim Oschmann

We achieved a major milestone at Gemini South — first light. We have achieved half arc second imaging at Gemini South with much less effort than that needed the first time, at Gemini North. Though we expected to be more efficient at Gemini South, almost every aspect of the integration and commissioning effort exceeded our expectations. The team at Gemini South should be commended for their effective work.

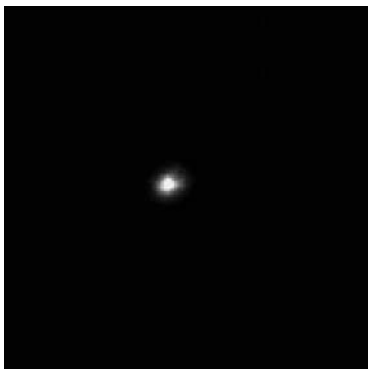


Figure 1. Gemini South first light image

Overall, Gemini South is performing similarly to Gemini North. We are repeatedly making changes and improvements on the southern telescope before implementing these changes in the North. The first priority for engineering at both sites is full implementation of closed-loop active optics. We are testing and improving closed-loop active optics at both sites, coordinating efforts and taking advantage of whichever site has better weather, while avoiding conflicts with instrument commissioning on Gemini North. In the North, we have increased the fraction of scientific operations to 50%, and we are now focusing on improving operational efficiency. We have had successful runs with Hokupa'a and OSCIR, but have had problems with NIRI that have prevented its science use.

Gemini North

Last fall, the primary commissioning activity in the North was improving the fast tip-tilt and chopping performance of the secondary system. Fast tip-tilt and chopping are required for OSCIR, a visiting instrument from the University of Florida. We worked out the difficulties with the performance of the tip-tilt and chopping secondary system, with the help of the team from Florida, when OSCIR was on the telescope in November 2000. Since then, the chopping and guiding performance has consistently delivered diffraction-or near diffraction-limited images.

Once the chopping and guiding system worked, we tuned it for good performance. Through tuning, we found a coordinate system problem that resulted in the closed loop tip-tilt corrections spiraling towards a zero point. This effectively lowered the bandwidth of the system. Once we found and corrected the problem, not only did chopping and guiding perform better, but fast tip-tilt performance for non-chopping applications also improved. The plots in figure 2 show the tip-tilt loop performance before and after modification.

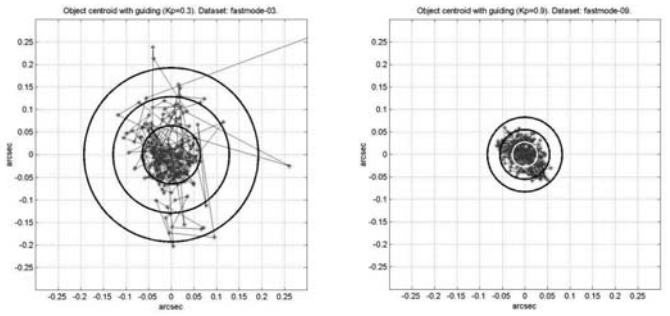


Figure 2. Fast tip-tilt performance in arc seconds on the sky. Both plots are presented with the same scale. The plot on the right was made after the coordinate system correction and further tuning of the servo loop.

Over the past six months, we have worked on many other areas of the facility in order to provide a more reliable system. Tables 1 and 2 (page 6) provide a summary of overall science versus downtime. Of the 16% reported telescope downtime, table 3 (page 6) presents a further breakdown by subsystem.

As previously reported, we have had problems with cables bunching up in the azimuth cable wrap. This was one of the leading causes of

Loss	Hours	Fraction
Science & Eng.	420.0	51%
Weather	183.0	22%
Telescope	133.5	16%
Instruments	88.5	11%

Table 1. A summary of overall science versus downtime during a single observing block.

Loss	Hours	Fraction
Science & Eng.	85.5	86%
Weather	1.0	1%
Telescope	9.5	10%
Instruments	3.0	3%

Table 2. Lost time during last observing block.

downtime during the first semester of science use. We tried a new arrangement for the wrap in Chile, which has been successful, and we waited to schedule a period of 5-6 weeks to perform this rework on Mauna Kea. The rework began at Gemini North at the end of December 2000 and continued in January 2001, resulting in the much improved arrangement pictured in figure 3. This work involved a large group of people taking all of the cables and services out of the wrap, making changes to the wrap mechanisms, and re-installing the services in a twisted configuration. Since this rework, we have had no faults or lost time because of the cable wrap.

Figure 3: Azimuth cable wrap showing new twisted configuration.

Other areas that greatly contributed to downtime included the primary support system, the cassegrain rotator cable wrap mechanism, and the Mauna Kea summit computers and network. Each of these systems has been worked on extensively. We are collecting statistics on downtime and expect to see a noticeable improvement. We are currently working on areas that impact reliability significantly, including the secondary positioning and tip/tilt mechanisms.

Primary Mirror	Secondary Mirror	Mount	Enclosure	Cassegrain Rotator	Acquisition & Guiding	Other
29.2	10.3	35.6	1.8	25.2	5.9	25.5
22%	8%	27%	1%	19%	4%	19%

Table 3. Breakdown of telescope lost time.

At this point, we could make the most effective use of science time by increasing the efficiency of operations, primarily through automating observing set-up and tuning. Operational efficiency is now a high priority within our high-level software group as they automate critical areas of our real time systems.

For instrument commissioning, we are working with the University of Hawaii to solve lingering flexure problems with NIRI, and GMOS has just arrived in Hilo.

Gemini South

As stated, Gemini South has now seen first light, and we are quickly completing a list of integration tasks that will allow us to conclude the construction phase of Gemini. Gemini South performs approximately as well as Gemini North, and we can now use the southern facility to test changes, upgrades, and software bug fixes without impacting current science efforts in the North. The telescope pointing has met specifications of approximately 3 arc seconds, with further improvements on the way with larger pointing tests. Open-loop active optics is delivering performance compatible with 0.5 arc seconds imaging or better, similar to the performance in the North without adaptive optics. The guide probes and wavefront sensor acquisition have been calibrated. Closed-loop tip-tilt, focus, and astigmatism control have been demonstrated on- and

off-axis, and we are now completing the calibration of the astigmatism control. We have also verified readiness, to the extent possible, for chopping and guiding when OSCIR arrives later in the year.

The Gemini South primary mirror, which was uncoated as of the last newsletter, has been successfully coated with aluminum. See figure 4.

We are now getting ready to test coating mirror samples with silver. These tests will begin in Chile later this year.

Conclusion

During the next six months, we will be finishing our second semester of science operations in the North and beginning initial science operations in the South. Though we have made much progress, we still have much to accomplish, including an exciting list of future enhancements such as adaptive optics on both telescopes. A team effort of science and engineering staff accomplished these achievements, and soon our priorities will shift primarily to science use. The Gemini partnership is still required, and we look forward to more extensive use of the telescopes we have worked so long to produce. Thank you to all staff and partners for all of your help. We need to keep up the good work as we progress through the coming shift into science operations.

Figure 5: Part of several kilometers of the new (and much appreciated) guardrail installed on the road to Cerro Pachón.

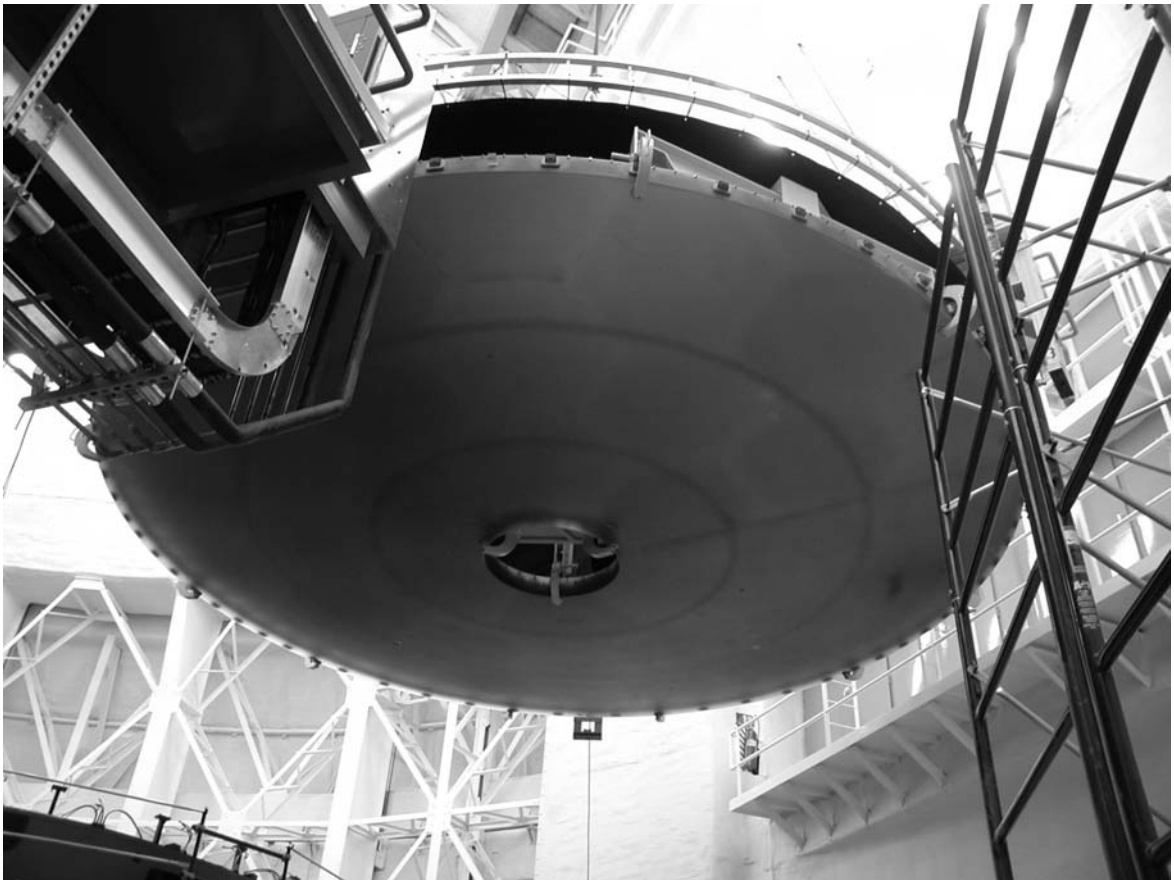


Figure 4: Gemini South Primary mirror being lifted after receiving its first coating.

The Previous Semester at Gemini North

Jean-René Roy

The QuickStart Program

The QuickStart Program based on the use of two visitor instruments, the University of Hawai'i Adaptive Optics System (Hokupa'a/QUIRC) and the University of Florida mid-infrared imager, OSCIR, was completed with the end of semester 2000B. Although we did not finish as many programs as we would have wished, we learned a tremendous amount about the operation of various telescope systems with the execution of the science programs submitted by the community. The observing runs with Hokupa`a/QUIRC went relatively smoothly, under the skillful operation of the Institute of Astronomy's Adaptive Optics Group (Dan Potter, Pierre Baudoz, and Olivier Guyon) and the support of Gemini astronomers (Kathy Roth, Mark Chun, and François Rigaut). Integrating OSCIR with the Gemini telescope proved to be more challenging, mainly because operating OSCIR requires the perfect tuning and *servoing* of several complex telescope sub-systems in order to allow a full efficient sequence of fast guiding, close-loop focusing while chopping, nodding, and reading the detector. Moreover, severe weather hampered the December 2000 and February 2001 OSCIR runs. Nevertheless, both the Florida mid-IR group and Gemini believe that major progress has been achieved. The coming runs in 2001A should go more smoothly, and the lessons learned on Gemini North will be applied to Gemini South for OSCIR in 2001B and T-RECS in 2002A. The members of the OSCIR team supporting the Gemini programs are Charlie Telesco (PI), Robert Pina, Scott Fisher, James Radomski, Chris Packham, and David Ciardi. Patrice Bouchet (CTIO/U.S. Gemini Project Office), Eline Tolstoy and Isobel Hook (Oxford University and ATC/U.K. Gemini Project Office), and Stephanie Cote (HIA/Canada Gemini Project Office) spent time at Gemini North to help support and execute the December 2000 Hokupa'a and OSCIR runs.

Thirty-six QuickStart programs with Hokupa'a (26) and OSCIR (10) obtained data, with 53 CDs of science data and 68 CDs of calibration data sent to the principal investigators. Some system verification data judged as having sufficient scientific potential were made publicly available; four Hokupa'a/QUIRC data sets and one from OSCIR can be retrieved from the Gemini web site (http://www.gemini.edu/sciops/data/dataSV.html). We are fully aware that some of these data sets may not be very useful, because exposure time or number of observed bands were often reduced by insufficient time. Nevertheless, we believe that the QuickStart Program was a huge benefit to the Gemini communities. In particular, because we were offering an AO system and a mid-infrared camera on a very large telescope, many astronomers had to find new ways to pursue their science with these new tools. Most users of Hokupa'a had never applied adaptive optics to their science, and a majority of the OSCIR programs were from optical, near-infrared, and sub-mm/mm astronomers. We believe that this venture into new domains will turn out to be extremely beneficial to the science performed with the Gemini telescopes.

Classical Programs:
The First Visiting Astronomers

We also had several visiting astronomers from all the Gemini communities conducting their programs on the Gemini North telescope. These visitors were not only pleased by the new Gemini environment, but happily, some obtained good data. Those who did not, for technical reasons or bad weather, showed a good understanding of what "shared risk" observations may mean. Despite receiving complimentary comments, no doubt we must deliver more in the future. Nevertheless, we are pleased to see the first Gemini data being analyzed, reduced, and prepared for submission.

The Status of NIRI

Despite progress with the acceptance tests of the University of Hawai`i's Near-Infrared Imager (NIRI), continuing problems with mechanical slips in the steering mechanism of a key entrance mirror, and electronic noise in the detector have plagued NIRI in significant ways. Unfortunately, these problems interrupted the commissioning work and postponed the execution of the first round of System Verification programs. Hence, many NIRI programs scheduled to be executed in the queue mode during March, April, and May 2000 have been cancelled. Work continues to identify the cause of the sudden jump (~20 pixels at f/6) affecting the steering mirror #1, which directs the beam into either the f/6, f/14, or f/32 channels. This mechanism may be redesigned, a process that will take time and resources. Once a NIRI repair plan is in place, we will reconsider operating NIRI in its most robust available modes in order to execute some of the System Verification programs scheduled for the rest of the 2001A queue.

The Demo Science Program on the Galactic Center

Several groups are exploiting and analyzing the Hokupa'a/QUIRC images obtained during the Demonstration Science Program on the Galactic Center executed in July and August 2000. We expect many publications to come from these studies during the coming year. François Rigaut (Gemini Observatory) has explored in detail the photometric accuracy of the HQ data set on the Galactic Center. He demonstrated that photometry in the K and CO bands can be performed to better than +/- 2%, and he confirmed the earlier analysis by Bob Blum (CTIO) that the Gemini data reach at least 2 magnitudes deeper than those of HST/NICMOS, because of the efficiency of the Gemini AO imaging at discriminating stars in crowded fields. Preliminary interpretation of the reduced data clearly reveals a complex set of stellar populations right at the Galactic Center, some of which may be very young.

Bob Joseph, Chair of the Gemini Science Committee

Matt Mountain, Director of the Gemini Observatory, is pleased to announce the nomination of Bob Joseph (Institute for Astronomy, University of Hawai`i) as the new Chair of the Gemini Science Committee. Bob is succeeding the late Fred Gillett and is the first external chair of the committee. Bob is very well known in the international and American astronomical communities. He obtained his Ph.D. from Washington University, St Louis, in 1971 and has been at the Institute for Astronomy in Honolulu since 1973. Bob has extensive experience running observatories and was the Director of the NASA-Infrared Telescope Facility on Mauna Kea from 1989 to 2000. He also serves on many U.S. and U.K. science committees and advisory boards, including the SOFIA Science Council since 1997, and is a member of the Editorial Board of "Contemporary Physics." Bob is very familiar with Gemini, having been a member of the U.S. Gemini Science Advisory Committee, the Gemini Science Committee since 1997 and serves as Chair of the Gemini Staff Time Allocation Committee. See http:www.ifa.hawaii.edu/~joseph/ for more information.

Bob Joseph, new Gemini Science Committee Chair.

Engineering Shutdowns Improve Telescope Performance

Jacques Sebag, Steve Hardash, Kent Tsutsui, and Chas Cavedoni

During the last three months, we performed two major shutdowns in order to improve the reliability of the telescope. For the first one, we upgraded the azimuth wrap to the same configuration as the azimuth wrap at Gemini South. During the second shutdown, we improved the primary mirror covers and worked on the A&G. Thanks to all those involved, both shutdowns were a success: they finished on schedule and produced a better working telescope.

Azimuth Wrap Shutdown:
December 18, 2000–January 24, 2001

For about six weeks beginning on December 18, 2000, we reworked the Mauna Kea azimuth cable wrap to install a spiraling configuration proven at Cerro Pachón to eliminate crossing and bunching cables in the cable wrap (See figure 1). Everything went according to schedule even with the additional task of cleaning up the computer room cabling. On January 18, 2001, we moved the telescope in azimuth several degrees to test the cable installation and found the cables behaving as expected.

After verifying that part of the operation, all systems were shut down until the following Monday, January 22, when all systems were brought up for standard operational checks in preparation for regular operations. The azimuth wrap was rotated about a dozen times with some slight shifting of the cables (~1" shift) in the first couple rotations, but then it stabilized. By Wednesday, January 24, although we encountered a few minor problems, all telescope sub-systems were accepted as operational and ready for normal use.

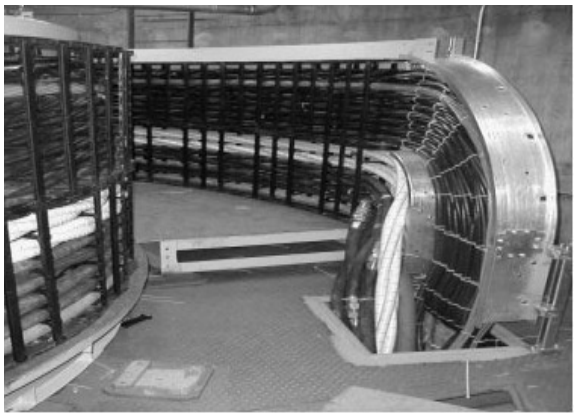


Figure 1: Cable Wrap on Gemini North after modification.

In support of the cable rework, we completed the following mechanical tasks. We cut a new services floor opening closer to the electrical panels to avoid cutting and splicing in longer conductors. We replaced the original 1/8" thick polyethylene floor panels with 1/4" thick, better grade polyethylene sheets that allowed the rivets to be counterbored beneath the top surface. Then we installed track sweeps under the wrap center drum to prevent debris accumulation under the wheels. After testing the wrap motion, we determined that the positive limit could be increased from 355 degrees to 360 degrees, because of better IGUS chain behavior. Finally, we installed a higher capacity encoder coupling to replace the previous one that would loosen up over time. To aid access to the inner drum area, we fabricated a portable access ladder to hook over the inner drum wall, and installed interior steps at the vertical post locations.

The following Gemini personnel provided significant effort with recabling and mechanical work: Clayton Ah Hee, Gustavo Alarcon, Laurie Bass, Chas Cavedoni, Billy Delmer, Randy Grashius, Steve Hardash, Mark Hunten, Manuel Lazo, Joe Le Blanc, Dave Logan, David Moe, Chip Michels, James Patao, Perry Purcell, Clyde Shimooka, Dean Simao, Kent Tsutsui, and Harlan Uehara. Special recognition goes to James Patao, Mark Hunten, Laurie Bass, and Randy Grashius who took on the additional horrendous task of cleaning up and reorganizing the tangled mess of the computer room cabling. Also, *muchas gracias* to Manuel Lazo and Gustavo Alarcon for coming to Hawaii and providing much needed expertise from the CP azimuth wrap cable spiraling work,

and to Gustavo for also filling in for our unfilled electrician position. *Trabajo excellente*!

Mirror Covers Shutdown:
February 26–March 16, 2001

In November 2000, the Gemini North M1 cover assembly failed, preventing all M1 cover movements and telescope observations. Emergency response that night by the Day Crew revealed that 1 of 4 drive screws had cracked at the very end of the 4-m long screw. The failure may have been caused by the misalignment of the drive assembly hardware. The Day Crew executed the emergency work with the M1 and telescope fully assembled.

We scheduled a telescope shutdown in late February 2001 to replace the short screw and systematically align the drive assembly hardware. To reduce risk to the M1 during this work, the M1 cell and mirror were removed from the telescope and located on the platform lift away from the M1 covers. During the initial days of the late February shutdown, we discovered that an additional lead screw had failed near its end similar to the November 2000 failure and that all eight linear bearings supporting the closure beam had also failed. Fortunately, all required spare parts were on-site! The Day Crew immediately replaced all of the damaged hardware and more precisely aligned the system. Closer inspection of the alignment revealed a 2.75-mm systematic misalignment of the lead screw with respect to the closure beam support shafts. During initial construction, it appears that shims were added between the support shafts and closure beams to avoid interference from manufacturing errors; however, additional compensating shims were not added at the screw bearing blocks. This misalignment caused the damage to the two screws and eight linear bearings. Working into the planned contingency time, we replaced the two damaged screws and all of the damaged linear bearings, and more precisely aligned the drive train assembly. With the system reassembled, the Day Crew measured the drive torques and motor currents necessary to open and close the covers. These values were consistent with original design calculations. The system also performed noticeably smoother.

Many thanks go to the entire mechanical Day Crew that worked many extended days to accomplish more than expected! In particular thanks to Clayton Ah Hee for the initial late night trip to the summit to investigate the failure, Harlan Uehara and Dean Simao for the detailed alignment and repair work, Clyde Shimooka for on-site machining, Joe Leblanc for general late-day support, and Chas Cavedoni for leading the overall effort.

Acquisition & Guiding System (A&G) Work

The A&G is located inside the Instrument Support Structure (ISS) and is not easily accessible for maintenance. Because already nine months had passed since the A&G had been removed from the telescope, it was time to inspect it and perform some maintenance tasks. We also have a list of upgrades we try to implement on the A&G each time it is out of the telescope. The maintenance consists mainly of inspecting all of the systems, testing the functionality of all the mechanisms, checking the cooling lines, and cleaning the optical surfaces. The upgrade list contains various items ranging from optics to electronics. Because each modification must be tested, we progress very carefully, knowing that the time available is limited. For this upgrade, we changed items first implemented and tested in Chile.

What did we find when we removed the A&G from the telescope? Basically, all of the systems

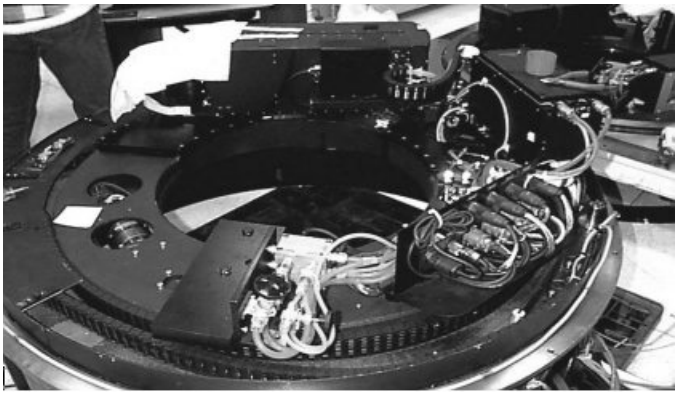


Figure 2: Module 4 dismounted on the Mauna Kea summit lab during maintenance.

performed well, but we found loose screws in the unit and one mechanism jerking. No damage occurred, but it was time to perform some maintenance. Once the maintenance was finished, the time left was used on the improvement list. The main items on the list were upgrading the computer system to a Power PC, installing air hoses to keep the CCD's window dry, upgrading the controller, scanning filters, and installing the PWFS filters. With lots of dedication and some long days, we finished most of this work in time for remounting. Many thanks go to Clyde Shimooka, James Patao, Corinne Boyer, and Joe Leblanc for helping with this work.

Gemini South Base Facility Takes Shape

Paul Gillett

As this newsletter went to press, the Gemini South Base Facility moved into the late planning stages, with a design and building layout taking shape. Specifics in several areas are still lacking, but preliminary sketches are reproduced here to provide a sense of how the new building will look.

The building will have at least 1,200 square meters of floor space with the possibility of a shipping and receiving area, that would add 220 square meters, and an auditorium that could add an additional 100 square meters to the building. The location of the building will be at the site of the old CTIO/Gemini offices near the eastern edge of the CTIO office complex. The land has already been cleared and is prepared for construction once the plans are fully developed.

The building will be two stories high and share similar aesthetic characteristics with Gemini North's Hilo Base Facility. A copper roof is planned to represent a major Chilean product, and a partial stone exterior will match stone work on the existing CTIO main building and other buildings on the compound.

As of mid-April 2001 the architect has nearly completed the 95% submittal, which will include our comments from the 50% submittal returned to the architect in February 2001. Upon completion, we will have another review period in which we will return comments to the architect. The architect will then submit the 100% submittal, followed by another review period. Subsequently, the construction drawings will be made available, and we will issue requests for bids, receive the bids, evaluate the bids, and place a contract. Construction is anticipated to start in the Southern hemisphere spring, approximately in September of this year.

As the temporary Gemini offices bustle—and often burst—with activity, it is with great anticipation that the Gemini South staff await this new base facility for Gemini South operations.

Figure 1: Architect's drawing of the Gemini South Base Facility.

Hilo Hosts Successful Conference on Astrophysical Ages and Time Scales

Ted von Hippel

Early in February of this year, over 160 astronomers and physicists converged on the town of Hilo as participants in a conference sponsored by Gemini, Subaru, many of the other Mauna Kea Observatories, and the University of Hawai`i. The week-long conference was entitled "Astrophysical Ages and Time Scales" and was graced by luminaries in a wide range of astronomical and astrophysical disciplines ranging from the solar system to cosmology.

The conference opened on February 8th with welcoming statements by Hawai`i Governor Benjamin Cayetano, Big Island Mayor Harry Kim, and an inspiring walk through cosmic time-fields by Gemini Director Matt Mountain. For those interested in Dr. Mountain's intriguing space-time sojourn across the Pacific, the text of his statements can be found at: http://www.gemini.edu/science/timescales/mountain.html.

Figure 1: Conference participants enjoy some Hilo sun during a group photo.

During the conference, participants were treated to excellent invited reviews by Tim Beers, Stephane Courteau, Douglas Gough, Fabio Governato, Alan Guth, Guinevere Kauffmann, Steven Savitt, Frank Shu, James Truran, Michael Turner, and Bill Unruh. Douglas Gough determined the Sun's age to nearly a precision of one part in a thousand via oscillation determinations of the core's helium composition. Alan Guth explained his cosmic inflationary theory. Frank Shu presented the wide range of star and stellar disk formation time scales. Michael Turner taught us that the expansion rate of the Universe can be measured at very early epochs, far before the Universe became transparent to light.

Other highlights included Wendy Freedman's summary of the HST Cepheid distance scale key project, Roger Cayrel's announcement of the first detection of uranium in a stellar atmosphere, and the presentation and interpretation of the BOOMERANG and Maxima Cosmic Microwave Background data by Naoshi Sugiyama and Michael Turner.

All totaled, 165 astronomers and physicists presented 50 invited and contributing talks as well as 50 posters on a range of topics from planetary disk formation time scales to Cosmic Microwave Background constraints on cosmological parameters. Despite the wide range of topics, the excellent presentations and strong interest from the participants wove a strong thematic age and time scales thread throughout the conference.

In addition to the daytime activities, Douglas Gough, Alan Guth, and Typhoon Lee presented public lectures at the University of Hawai`i at Hilo Theatre, which attracted 150-200 people on three successive evenings. We were also pleased that approximately one dozen Big Island science teachers attended at least one day of the conference and were able to spend time with the speakers. All of the teachers agreed that it was an extremely positive experience for them and would do it again the next time we provide such an opportunity.

Nadine Manset (CFHT), Chris Simpson (Subaru), and I are now in the process of editing written versions of all the talks and posters for our conference proceedings. These proceedings will be published with the Astronomical Society of the Pacific.

Finally, I want to thank the Scientific Organizing Committee (Robert Carswell, Stephane Charlot, Pierre Demarque, Arjun Dey, Tim de Zeeuw, Douglas Gough, Steve Kawaler, Ofer Lahav, Typhoon Lee, Joan Najita, Jean-Rene Roy, François Schweizer, Kazuhiro Sekiguchi, and Jim Truran) for helping me develop the conference theme, and the Local Organizing Committee (Nancy Bucy, Tom Geballe, Janice Harvey, Martin Houde, Nadine Manset, Peter Michaud, Andrew Pickles, Antony Schinckel, Ian Shelton, Chris Simpson, Marianne Takamiya, Remo Tilanus, and Michael West) for bringing nearly all of the island observatories and UH together to put on an excellent conference.

Figure 2: Conference Chair Ted von Hippel (right) with Douglas Gough.

Meet Gemini's New Associate Director Jean-René Roy

Peter Michaud

How many conversations have you had that include the statement, "If you kick a galaxy it will ring!" Ideas like these make a conversation with Gemini's new Associate Director for Gemini North, Jean-René Roy, so memorable. From ringing galaxies to the impact of science on society, as I spoke recently with Jean-René, I realized that I was listening to someone who had thought deeply about many subjects. Fortunately for astronomy, much of his thinking has focused on the stars, and happily for Gemini, he now concentrates his energy at Gemini's Hilo Base Facility!

Figure 1: Jean-René Roy in front of the Gemini North mirror.

"It is because the attraction for astronomy is too powerful," says Jean-René that he is where he is today. His journey started at nine years of age as he walked home from his father's general store in Québec. "I looked up at the stars—there was a lot less light pollution back then—and I was hooked." After completing the seven years of compulsory education available in the small town of Acton Vale, Québec, Jean-René continued as a "Pensioner" at a secondary school where he "studied too much Latin." While Latin was not his calling, languages almost steered Jean-René toward a different career path, and in the process left him fluent in French, English, Spanish, and Portuguese. Though oceanography also tugged at his curiosity, physics, mathematics, and astronomy led to a Bachelor of Science Degree in Physics from the Université de Montréal and then a Master's and Ph.D. in Astronomy from the University of Western Ontario in 1973.

It could be said that Jean-René's scientific career started with a "flare," since much of his early scientific work dealt with the study of eruptive phenomena in the solar atmosphere. His early days included work at the Sacramento Peak Observatory and a postdoc on X-ray flares with the CalTech Solar Group in the early 1970's. Of course that reveals only one dimension of the budding multi-dimensional scientist. "One of my most memorable—and anxiety laden—experiences was a trip to the Moscow of Leonid Brezhnev to meet dissident Jewish physicists" he says with his characteristic enthusiasm that I am sure could not have been much greater even as he boarded the plane to Moscow back in late 1973.

After one year at the Laboratory for Space Research of Utrecht in the Netherlands, Jean-René went back to Canada in 1975 as a Research Associate at the newly established Herzberg Institute of Astrophysics. While at the Herzberg Institute, he performed optical, radio, and X-ray solar work, and even organized a workshop on the possible causes of the Cretaceous-Tertiary Extinctions in 1976, well before it became a popular topic. In 1977 Jean-René accepted the position he held prior to coming to Gemini, as Professor of Astronomy at Université Laval, and played a major role in permanently establishing astronomy in Québec. While at Université Laval, Jean-René slewed his stellar interests toward galaxies and interstellar medium astronomy and collaborated to build a Fabry-Perot interferometer as well as fast imagers (the latest

being PANORAMIX) for faint spectrophotometric observations at Mont Mégantic Observatory. Jean-René also spent sabbatical and extended research leaves at the Anglo-Australian Observatory, the Canada-France-Hawai`i Telescope, Observatoire de Paris-Meudon, and ESO.

"Looking back over almost 30 years of work," says Jean-René, "I'm somewhat surprised to find that my greatest accomplishments and influence [have] been in teaching." While it might surprise Jean-René, it comes as no surprise to his students and colleagues. His years of teaching, research, and management have endowed Jean-René with uncommon insights into the process of science and how it applies to a large project like Gemini. "It is important for me to impart on Gemini a style and enthusiasm that creates a productive and vibrant science life for our staff." However, Jean-René balances his enthusiasm with a healthy sense of pragmatism as well. "Staff may get discouraged by day-to-day problems and challenges in any project of this caliber, but it is my duty to keep the staff's energy level high and focused on the big picture and the remarkable science that Gemini is doing" he adds.

As many readers undoubtedly realize, Jean-René has a deep understanding of the Gemini Observatory that has been fostered by years of experience with the Gemini Project. After starting on the Gemini Board in 1997, in 1998–99 he served as the Board Chair and helped steer the project through some difficult decisions and priority-setting. "I have always believed in the approach that Gemini is taking, and [I] think that by sticking to our core goals and visions, we have a unique chance to really effect a quantum leap in the science of astronomy and in particular the way ground-based astronomy is done." For an ambitious project like Gemini, Jean-René's clear vision is the perfect analogue to the more literal "clear vision" provided by Gemini's advanced optics technologies and engineering.

Since assuming the role of Associate Director of Gemini North on October 15, 2000, Jean-René immediately began shaping the observatory's scientific operations. Starting most days with a bicycle ride up to his Hilo office, Jean-René states, "The reason I jump on my bike and go up the hill each day is to be a part of this incredible team that's preparing Gemini so that scientists of all Gemini communities can do great science!"

Perhaps what is most amazing about Jean-René is his ability to accomplish all of his ambitious professional goals while juggling other interests and passions. One such passion is his relationship with Helene Allard, his wife of 21 years. Before moving to Hilo, Helene sold her successful dental practice in Québec to move to Hilo and "pursue other interests." One of Helene's interests—and talents—is painting. An early piece from her "Hilo Period" is reproduced in figure 2 and reveals her favorite subject! "People often say we are like honeymooners when they see us together and that's the way I feel, and I guess being here in Hawai`i makes it even more so!" says Jean-René with his characteristic smile.

"When I accepted this job at Gemini, some of my friends and colleagues said that I was crazy," Jean-René continues. "At a point in my career when most university professors start to ease up on their workload, I decided to take on one of the biggest challenges in my career!"

Fig. 2: Portrait of Jean-René by his wife Helene Allard

Gemini is fortunate that Jean-René made the decision to accept the challenge, and our service to the astronomy community will be that much greater thanks to the skills and experience he brings to our observatory.

Human Resources Update

Melissa Welborn

The Human Resources Department at the Gemini Observatory faces unique challenges, among them an understanding of the importance of the Observatory's international dimension. Recognizing that talented people and their skills are the only true source of our achievements, we strive to attract, motivate, and retain a global workforce that can operate in a borderless environment and handle the complexities of communicating across cultures.

We are pleased to announce the following additions to our staff at Gemini North: Elizabeth Uyetake, Administrative Assistant; Kiley Alba, Electrician; Colin Aspin, Scientist; and Lorraine Callahan, High Level Software Engineer at Gemini's Tucson location.

We welcomed the following employees to Gemini South: Randy Grashuis, System Support Associate; Rodrigo Carrasco, Science Fellow; and Jorge Garcia, System Support Associate. For information about our current recruiting efforts, please visit us at www.gemini.edu/project/announcements/jobs.html.

Our thanks go to the following former employees who left the Gemini Observatory to find other challenges: Andrew Gushiken, Jim Wright, Dayle Kotturi, and Chris Boyter.

Special Award and Recognition This Period: David Logan received his certification as a Computer Repair Technician in March 2001.

Partner Office Updates

U.S. Gemini Project Office

The U.S. Gemini Project (USGP) hosted a two-day workshop in Tucson on February 26–27, 2001 concerning the analysis of images obtained with the Gemini North Hokupa'a adaptive optics camera. The primary goal of the meeting was to discuss and understand the diverse issues, problems, tactics, and algorithms required to produce research-quality results from Hokupa'a images. Approximately 40 people attended, with heavy representation from the NOAO staff, the Gemini Observatory, and NSF's Center for Adaptive Optics. A summary and electronic versions of most of the presentations can be found at http://www.noao.edu/usgp/ao_workshop.html.

During this semester the U.S. project office is running a mini-queue on Gemini North for a total of 8 proposals for the visitor instruments, 4 for OSCIR and 4 for Hokupa'a/QUIRC. The first night for the queue was in February 2001, and despite high winds and difficult conditions, significant observations were taken for two U.S. programs.

The USGP, in collaboration with the Canadian project office, has organized a special session at the June 2001 meeting of the American Astronomical Society on first science results with the Gemini telescopes. Speakers include Jean-René Roy, Charlie Telesco, D. Depoy and others. See http://www.aas.org/meetings/aas198/prelim/gemini.html.

The U.S. community proposals for semester 2001B have just been received in Tucson. We received 77 proposals (4 via the PIT, which was an option for the first time), with 54 for Gemini North and 25 for Gemini South. Two proposals requested both telescopes. The most popular instrument for Gemini North was NIRI (28 proposals for 42.1 nights), followed by GMOS (17 proposals for 32.9 nights) and Hokupa'a (10

proposals for 18.5 nights). OSCIR was the lead instrument for Gemini South (17 proposals for 23.35 nights), followed by Flamingos (4 proposals for 5.75 nights) and the Acquisition Camera (4 proposals for 3.4 nights). The U.S. TAC meets in May 2001.

Bob Schommer

U.K. Gemini Project Office

At the end of the year 2000, the Gemini North calibration unit was successfully installed and commissioned on the telescope. It will be joined shortly by the next major piece of hardware to be shipped from the U.K., the optical multi-object spectrograph for Gemini North, GMOS, which went through its acceptance tests at the Astronomy Technology Center (ATC) in March 2001. Work continues on the second GMOS for Gemini South, which is expected to be shipped next year.

Work on the polarization modulators continues at the ATC and the University of Hertfordshire, and we expect to install the first system in the base of the A&G system on Gemini South later this year.

The instrument group at University College London redesigned the high resolution optical spectrograph for Gemini South in order to provide a high resolving power (R~ 150,000) fiber-fed instrument instead of the cass-mounted UV-optimized R=50000 instrument. The decision to radically alter the instrument allows it to be rapidly deployed while providing community access to an important subset of the original HROS scientific capabilities.

The U.K. Gemini Support Group (UKGSG) at Oxford is undergoing changes in personnel. Colin Aspin, who played a pivotal role in most of the UKGSG activities, left in April 2001. Fortunately, he moved to a Gemini Observatory staff position in Hilo where he has been seconded for the last 18 months. Though Colin will be greatly missed, he will still play a key role in the development of many of the systems with which he has been working, including the proposal handling systems and NIRI commissioning. We wish him all the best, and we are currently recruiting replacement staff.

The U.K. government's decision to provide additional funds for us to join the European Southern Observatory has provided a great boost to U.K. astronomy. It also makes for interesting times, as we work through the requirements to support access to the major 8-m telescope facilities—Gemini and the VLT—to which we will have access beginning in 2002.

Pat Roche

Canadian Gemini Project Office

The Canadian Gemini Office (CGO) gave another series of webcasts to inform Canadians about Gemini's capabilities for semester 2001B. In order to participate, universities needed a PC connected to the Internet, running the latest version of the software package, NetMeeting. The CGO then shared a PowerPoint presentation with all those who ran NetMeeting with a video projector connected to their PC. All of the participating sites were also connected by a telecon that provided good quality audio. We gave four presentations over three days and reached sites from Victoria to Halifax. Gordon Walker, one of our committee members, participated from his home, and the U.S. Gemini Project Office also tuned in to see this approach of information dissemination in action!

Canada received a mixed response to the call for proposals for semester 2001B. We received a total of 28 proposals with one requesting two instruments. We received 21 proposals for

Gemini North and 7 for Gemini South. The following table outlines the breakdown by instrument. We found the oversubscription in time disappointing, with Gemini North time oversubscribed by only 2.1 and Gemini South time oversubscribed by only 1.0. While Canadians are interested in Gemini as evidenced by the number of proposals, nevertheless, they appear cautious in the amount of time they request.

Instrument	Number of Proposals
GMOS-N	8
NIRI	11
Hokupa'a	3
OSCIR	5
Flamingos 1	2

The Gemini Science Archive (GSA)

The Canadian and Chilean funding agencies, the National Research Council and CoNICyT respectively, are collaborating on the conceptual design for a Gemini Science Archive (GSA). The mission statement of the GSA states:

The Gemini Science Archive should provide the scientific community with tools for effective online access to all Gemini Science data and supporting information in order to promote further scientific exploitation of those data. The Gemini Science Archive should guarantee that the valuable datasets obtained with the Gemini Telescopes are usable by future generations for research and education.

The documents that have been completed and delivered for this project include the following:

- The Operational Concept Definition Document (OCDD) describes the science cases, which drive the design of the GSA, and the operational scenarios, which describe how an astronomer would locate and retrieve the data needed to do each of the science cases. This document was formally accepted by Gemini on July 7, 2000.

- The Functional and Performance Requirements Documents (FPRD) describes specific requirements for the GSA software. These documents were formally accepted by Gemini on November 30, 2000.

- The Gemini to GSA Interface Control Documents describe the interface between Gemini and the GSA. These documents were formally accepted by Gemini on March 22, 2001.

The current versions of the GSA documents can be found at the GSA web site http://www.hia.nrc.ca/pub/Gemini_HIA/GSA. The current focus of GSA development is the Conceptual Design Document (CDD), which will describe a conceptual design for the archive, as the GSA would be implemented at the archives supported at the Canadian Astronomy Data Centre (CADC). Felipe Richardson, a CoNICyT employee, returned to Chile after spending a year in Canada working on the GSA. Felipe's principal contribution was a prototype that demonstrates the basic operation of a Gemini archive and tests some of the aspects of the GSA design. The design will be submitted to Gemini, which will perform a formal review once the CDD document has been completed. Phase II and phase III proposals to implement and operate the designed system will be submitted with the design.

Dennis Crabtree

Australian Gemini Project Office

The contribution from Australia has a new author because our very first Gemini Project Scientist, Dr. Gary Da Costa, completed his term at the end of 2000. The Australian astronomy community is indebted to Gary for the superb job he did leading us through the first three years of membership in Gemini, establishing the Australian Gemini Office, and flying the flag for us so effectively at International Gemini Project (IGP) meetings. His contributions to the Instrument and Operations Forums as well as other Gemini committees were warmly appreciated and acknowledged when Gary attended his last Committee of Gemini Offices (CGO) in Chile in January 2001. He will be an extremely hard act for me to follow!

Along with the change in Project Scientist, the Australian Gemini Office has moved from Canberra, at Mt. Stromlo Observatory, to the University of New South Wales (UNSW) in Sydney. Although the office and Project Scientist will be located at UNSW, astronomers at other Sydney institutions will provide some assistance. In particular, Drs. Tim Bedding and Gordon Robertson at the University of Sydney will take on the HelpDesk assignments for AO/Hokupa'a/QUIRC and GMOS, respectively, and carry out the technical assessment of Australian proposals to use these instruments. The local Gemini web site is now located at UNSW, and readers are encouraged to visit it (www.ausgo.unsw.edu.au) and see our new "world at night" home page.

Over the last six months we have been very pleased to see Australian astronomers conducting science with Gemini either through data received from the Demonstration Science and QuickStart Service programs or by traveling to Gemini North for their own classical time. Michael Burton at UNSW is a member of the Galactic Centre Demonstration Science team and has been working with the superb high resolution images taken with Hokupa'a/QUIRC. Scott Croom and Brian Boyle at the Anglo Australian Observatory (AAO) have received Hokupa'a/QUIRC QuickStart Service data for three targets in their QSO host program. Analysis is well underway, with a FWHM as small as 0.1 arc second measured in some images. Brian will travel to Gemini North in late April 2001 for 5.5 nights of classical time on the QSO host program. Unfortunately, Matthew Whiting from Melbourne University, Australia's first classical observer on Gemini North, lost his half night in February 2001 because of a secondary mirror problem.

Australia's former Project Scientist, Dr. Gary Da Costa, standing by the newly received cryostat forging.

We continue to make good progress building the Near-infrared Integral-Field Spectrograph (NIFS) instrument at Mt. Stromlo Observatory, in collaboration with the University of Hawai`i. A test pupil mirror array has been manufactured, much of the cryostat and OIWFS have been constructed, procurement of the control system is well underway, and the detector multiplexer has been received from Rockwell. All is ready for the Critical Design Review (CDR), which will take place on April 19–20, 2001. The CDR documents are available at the NIFS web site (www.mso.anu.edu.au/nifs).

The 2001B proposal deadline has just passed. A total of 11 proposals were received from the Australian community, with 6 for Gemini North and 5 for Gemini South. The oversubscription factor was ~2 for time on Gemini South, with Flamingos 1 and OSCIR both in demand. For Gemini North, the oversubscription factor was ~1.2, with NIRI as the most commonly requested instrument (4 proposals); GMOS and Hokupa`a/QUIRC received one request each.

Warrick Couch

Chilean Gemini Project Office

In January 2001 our office was delighted to host the first day of the Committee of Gemini Offices (CGO) at CONICYT's headquarters in Santiago. This provided an excellent opportunity for the CGO members to meet astronomers of both the University of Chile and Catholic University, as well as the staff of the Chilean Office and the President of CONICYT, Dr. Eric Goles.

In anticipation of a possible status change inside the Gemini Partnership, starting with semester 2001B, CONICYT will be using only its guaranteed observing time on the Gemini South telescope. CONICYT is currently exploring ways to give new impetus to the development of Chilean astronomy, while also promoting a more effective use of the Gemini facilities and remaining involved in the development of the Gemini Observatory.

Felipe Richardson returned to Chile after a successful year working with the Canadian Astronomy Data Center on the Gemini Science Archive Phase I, where he made the first prototype of the archive. Felipe continues to work on the Chilean archive on a part-time basis.

Luis Campusano

Brazilian Gemini Project Office

The activities of the Brazilian Gemini Project Office during the past months centered on distributing Gemini-related information to the Brazilian astronomical community and streamlining the application submission process. The Brazilian National Time Allocation Committee (NTAC) website was reorganized, improving access to partner-specific information about proposal submission for investigators interested in observing time at Gemini. With the proposal process for semester 2001B successfully concluded, the NTAC members are currently reviewing the submitted projects.

Following a proposal emerging at the past meeting of the Committee of Gemini Offices, the Brazilian National Support Commission for the Gemini Project initiated a search for volunteers to support service observations at Gemini South in semester 2001B. With two suitable candidates identified and suggested to the Associate Director of Gemini South, we believe that one or both of them will work during four months in the second half of 2001 in La Serena and on Cerro Pachón.

Albert Bruch

Argentine Gemini Project Office

The Argentine Gemini Project Office received eight observing proposals for semester 2001B. Six proposals requested NIRI on Gemini North, with a required observing time of 21.6 hours. The other two proposals, totaling six hours of observing time, requested Flamingos 1 on Gemini South.

The Argentine Gemini Project Office will send two graduate students—Rubén Díaz, from the Córdoba Observatory, and Eduardo Fernández Lajús, from the La Plata Observatory—to collaborate with the QuickStart service observations in semester 2001B at Gemini South.

In early March 2001, one of the major Buenos Aires newspapers, *La Nación*, interviewed the Argentine Project Manager, Hugo Levato, about the Gemini Project. Roberto Aquilano, the representative of the University of Rosario on the Gemini Committee, has been appointed Undersecretary of Mathematical and Physical Sciences of the Secretary of Sciences of the Argentine Government.

Jorge Sahade

U.S. Gemini Instrument Program Update

Much work on Gemini instrumentation is underway in the U.S., both at NOAO and in the wider community. This article provides an update as of early April 2001, with an emphasis on milestones reached since the previous newsletter.

T-ReCS

The Thermal Region Camera and Spectrograph (T-ReCS) is a mid-infrared imager and spectrograph for the Gemini South telescope, under construction at the University of Florida by Charlie Telesco and his team. The T-ReCS optics have been mounted together and tested at room temperature, revealing good optical performance. Mechanical parts fabrication is essentially complete. The dewar has been vacuum tested, has undergone cold tests that have demonstrated good thermal performance, and has had its mechanisms installed. Software development for mechanism control is nearly complete, and electronics development is progressing well. The team is in the midst of system integration and testing, which will culminate in T-ReCS's Pre-Ship Acceptance Test.

The main optical bench of GNIRS undergoing machining at NOAO during the week of March 20, 2001.

GNIRS

The Gemini Near-Infrared Spectrograph (GNIRS) is a long-slit spectrograph for the Gemini South telescope that will operate from 1 to 5 microns and offer two plate scales and a range of dispersions. Neil Gaughan (Project Manager) and Jay Elias (Project Scientist) are leading the project at NOAO in Tucson. Fabrication of GNIRS parts is underway at NOAO and subcontractor facilities. In particular, the construction of the GNIRS optical benches, which provide support for the optics and mechanisms, is nearly complete. GNIRS held a Mid-Fabrication Review on March 7, 2001. The review committee examined the GNIRS team's progress on mechanical design, mechanical fabrication, electronics design, electronics fabrication, software, and procurement. The review committee delivered a positive report. The project team expects to begin subsystem integration late this summer, with delivery expected in autumn of 2002.

NICI

Funded by monies from the NASA Origins Program to NOAO, the Near-Infrared Coronagraphic Imager (NICI) will provide a 1-5 micron infrared coronagraphic imaging capability on the Gemini South telescope. Mauna Kea Infrared (MKIR) was the successful competitive bidder for the NICI conceptual design study and the only respondent to an RFP to build the instrument. NOAO awarded a contract to MKIR in March 2001 for the detailed design and fabrication of NICI. The U.S. Gemini Project (USGP) visited the contractor in February 2001 to review the development of a Management Plan consisting of a Project Plan, Work Breakdown, and a detailed schedule in Microsoft Project. The Preliminary Design Review is scheduled for delivery in March 2002.

Phoenix

Phoenix is a high-resolution near-infrared spectrograph that has been producing science on the KPNO 4-m and 2.1-m telescopes. Phoenix yields spectra with resolution up to R=70,000 in the wavelength range 1 to 5 microns. Offered as a Visitor Instrument on Gemini South, Phoenix will be shared equally between Gemini and CTIO/SOAR. The project team installed an IGP-provided ALADDIN InSb array in Phoenix, and after performing additional mechanical upgrades, Phoenix was used on the Kitt Peak 4-m telescope for twelve nights in March 2001.

The modified Phoenix performed well and the high quality of the new InSb array yielded a significant improvement in Phoenix's sensitivity. The fabrication of the interface unit and counterweights that will attach Phoenix to the Gemini Instrument Support Structure is underway at a subcontractor. Phoenix will be shipped to Gemini South during the northern summer of this year.

GMOS CCDs

For the two GMOS spectrographs, NOAO is responsible for procuring the CCDs and integrating them with (1) a dewar provided by the GMOS team, (2) Gemini-provided CCD controllers, and (3) other Gemini subsystems by providing software and systems integration services. For Gemini South's GMOS, NOAO shipped the CCD dewar for integration with the spectrograph in March 2001, completing the NOAO GMOS deliverables. Next, the NOAO team, including Richard Wolff and Rich Reed, plans to work on the CCD hardware and software for Bench HROS for Gemini South.

Taft Armandroff, Mark Trueblood

A Tribute to Fred Gillett

The Gemini team and the entire astronomical community have experienced a great loss with the passing of Fred Gillett on April 22, 2001.

All of us who have worked on Gemini have been at a place; at a point in time, where we have been privileged to have had Fred join us, for a while, as a companion on our own journey. Fred touched and left something with all of us who journeyed with him. As a tribute to our Project Scientist we have printed excerpts of what some of us have said:

"We will remember Fred as a sensitive guiding presence throughout the nascence of the Gemini project. He had a clear scientific vision and a personal perspective that enabled him to carry the whole team along with him. I knew him as a colleague at NOAO (his office was next to mine) but got to know him even better through the Gemini project where his national and international leadership were critical to the ultimate success of the telescopes.

"I am sure that I speak for the whole UK Gemini community in sending condolences to Fred's family. He was a man of remarkable professional and personal qualities who illuminated all our lives—and his many friends over here will feel his loss deeply."

Roger Davies, former U.K. Project Scientist

"Others will no doubt speak to Fred's outstanding contributions to the Gemini Project and to his scientific contributions over his long career. I will remember him personally for his fostering of Australian membership of Gemini and for his uncanny ability to forge unanimous consensus outcomes that were always in the best interests of the Gemini partnership. . . .He was also extremely fair in making sure all viewpoints, including those of the smaller partners, had the opportunity to be expressed. The International Gemini Partnership is poorer today because of his loss."

Dr. Gary Da Costa, Australian Gemini Project Scientist

"Fred was simply superb as the Project Scientist for Gemini. He possessed a remarkable understanding of the technology and of the science, and combined this with a warmth and integrity of spirit. He was able to bring diverse interests together into a common purpose.

Working with him on Gemini, I felt that we were all sharing something larger than the sum of our own small parts. He was a remarkable man, and we shall miss him greatly."

Simon Lilly, Director General
Herzberg Institute of Astrophysics
National Research Council of Canada

Continued...

A Tribute to Fred Gillett Continued...

"The Brazilian community would like to express condolences to the family of Fred Gillett and the Gemini Project. He always manifested his concern in being fair and supportive with the countries with the smallest shares in the Gemini consortium."

Thaisa Storchi Bergman, Brazilian Project Scientist

"On behalf of the Gemini Board, I would like to send my condolences to the people at Gemini and to Fred's friends and family. Fred worked from the beginning to make the Gemini telescopes superb instruments with superior images and outstanding infrared performance. He also was a steadfast advocate for the value of our partnership. We will miss his wide expertise, many insights, and good humor."

Jay Gallagher, Chairman of the Gemini Board

"We benefited from Fred's participation in our program for many years, and though we regretted his leaving the USGP, we understood that we had to share his expertise, his passion, and his warm personal style with others. He will be missed by all of us."

Todd Boroson and Bob Schommer, US Gemini Office

"We were all very happy to share with Fred so many meetings and enjoy his deep understanding and calm consideration of the different problems he had to deal with. we will all miss him very much!"

Professor Jorge Shade, on behalf of the Argentine Gemini Committees

"On behalf of the AURA Corporate Office, Board of Directors, and all of the AURA family, I want to express our sorrow over Fred's loss. Fred's contribution to astronomy and to AURA will be remembered."

Bill Smith, President of AURA

"Oftentimes the debates about large telescopes would get quite heated, especially in international meetings but Fred was always even-tempered and fair, concerned to achieve consensus and bring out the best in us all. It really is a sad loss, not only for his family but for all of us. Such individuals bring large teams together in a way everyone admires."

Richard Ellis
Director, Palomar Observatory

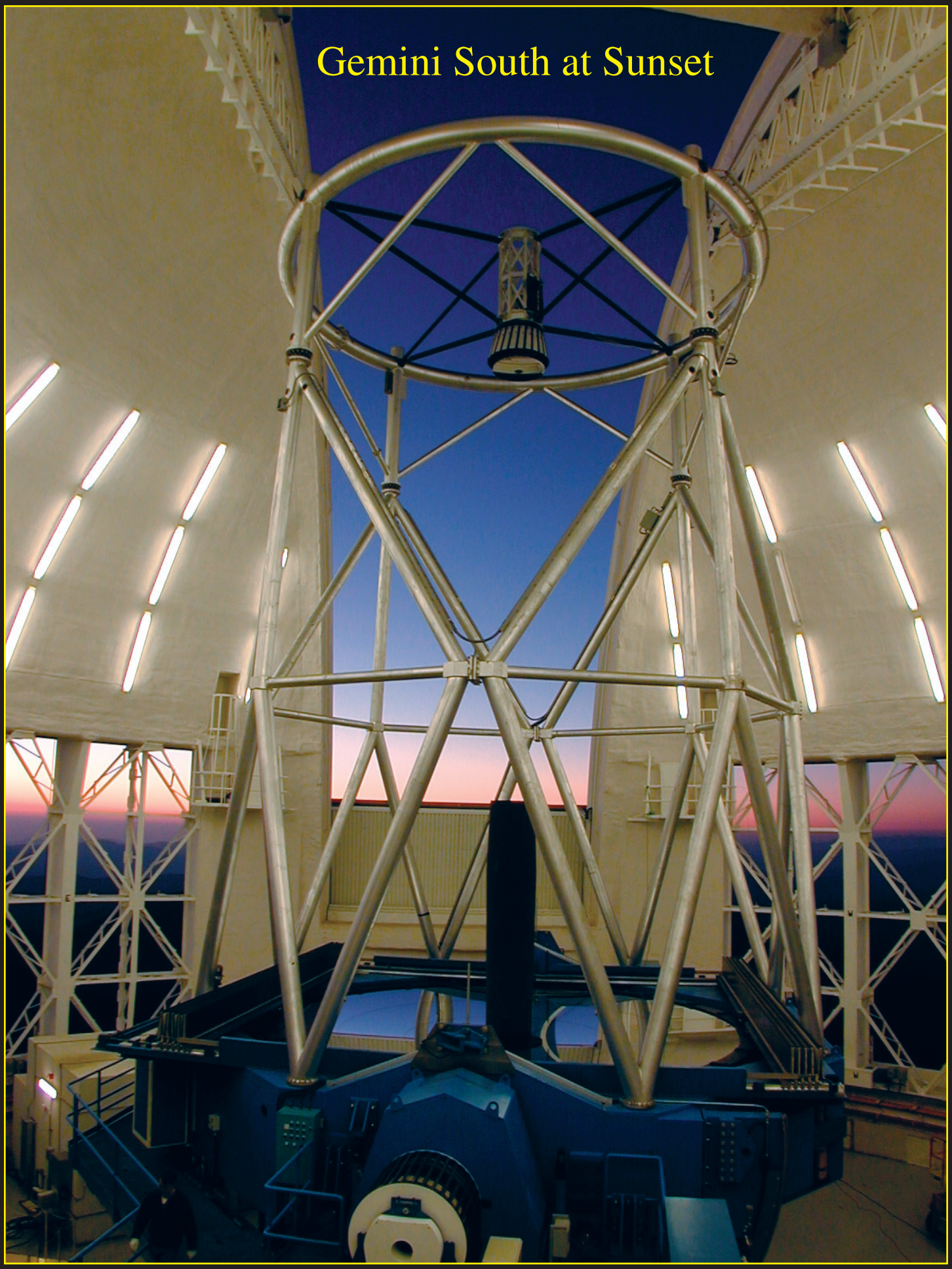
"Fred gave me my Mauna Kea tour when I visited Hilo for my Gemini interview, and his obvious enthusiasm for the project was a big reason I decided to join it."

Tom Hayward, Staff Scientist, Gemini South

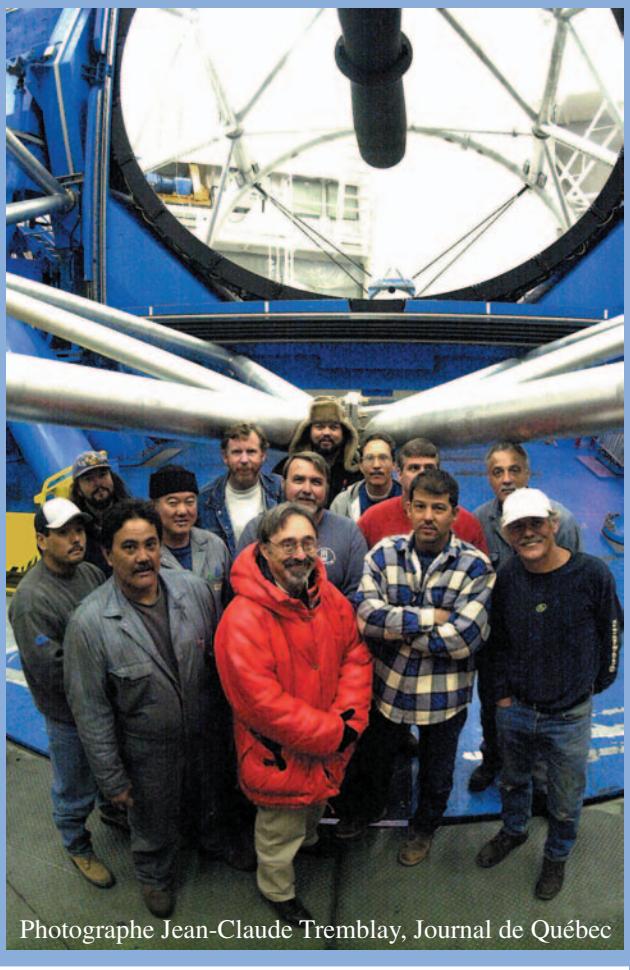
"Now our journeys have to continue but I will miss my friend, my teacher, my companion. I will miss those infuriating moments when Fred, in the midst of meetings would pause, to think, and hold the silence of the room in his hands, to be released only when he was sure we were doing the right thing. I will miss those moments, when in the heat of the argument, a quiet hand would touch my shoulder and Fred would whisper , 'I am not sure this is the right way.' I will miss those moments of joy and pride when Fred would pronounce, 'this really works!

Fred, your colleagues and friends of the Gemini `ohana miss you. We will not forget you."

Matt Mountain, Director Gemini Observatory


Gemini South at Sunset

Associate Director Jean-René Roy flanked by Gemini North staff (left to right) Kiley Alba, Chris Carter, Harlan Uehara, Clyde Shimooka, Mike Sheehan, Dave Logan, Chip Michels, Steve Hardash, Dean Simao, James Patao, Joe LeBlanc, Billy Delmer



Photographe Jean-Claude Tremblay, Journal de Québec

Gemini Observatory
Northern Operations Center
670 North A'ohoku Place
Hilo, Hawai'i 96720, USA
Phone (808) 974-2500 / Fax: (808) 935-9235

Gemini Observatory
Southern Operations Center
c/o AURA, Casilla 603
La Serena, Chile
Phone 011-5651-205-600 / Fax: 011-5651-205-650

Gemini Observatory - Tucson Project Office
950 N. Cherry Ave., P.O. Box 26732
Tucson, Arizona 85762-6732, USA
Phone: (520) 318-8545 / Fax: (520) 318-8590

e-mail: gemini@gemini.edu ***url:WWW: http://www.gemini.edu***

UNITED STATES • UNITED KINGDOM • CANADA • CHILE • AUSTRALIA • ARGENTINA • BRAZIL

THE GEMINI 8-METER TELESCOPES PROJECT is an international partnership managed by the Association of Universities for Research in Astronomy under a cooperative agreement with the National Science Foundation.