

CTIO/CERRO TOLOLO

INTER-AMERICAN OBSERVATORY

Enhancing Excellence

Alistair Walker

The past few years have been a period of rapid change at CTIO. We have welcomed new projects—Gemini South and, more recently, the Southern Astrophysical Research Telescope (SOAR). Elsewhere in Chile, the Very Large Telescope (VLT) and Magellan have commenced operations, and earlier this month the groundbreaking ceremony for the Atacama Large Millimeter Array (ALMA) took place. The way astronomers are doing their science is changing too: large collaborative efforts involving many facilities, on the ground and in space, are increasingly the norm. The rapid growth in communications bandwidth is permitting easier access to archives storing astronomical data from many facilities, and allowing educational, technical, and astronomical interactions between colleagues separated by thousands of kilometers. These are exciting times, and CTIO will be playing a very full and active part in 21st century astronomy.

Support of US astronomers using Gemini is a vital duty of the NOAO Gemini Science Center (NGSC), which has staff stationed in both Tucson and La Serena,

and we are looking forward to the imminent appointment of an NGSC Deputy Director, who will be stationed in La Serena. The Blanco wide-field telescope is also a crucial element of the US system of telescopes, and over the next few years its performance will be enhanced with new instruments. CTIO will soon be operating the high-performance SOAR 4-meter, with a suite of state-of-the-art instruments, and will later install an innovative Adaptive Optics system that will be a precursor to the type required for the next generation of extremely large telescopes. Indeed, CTIO staff are fully engaged in both the Thirty-Meter Telescope (TMT) and Large Synoptic Survey Telescope (LSST) projects, along with our Tucson colleagues and other partners. The NOAO Major Instrumentation Program and Data Products Program are essential to the optimum utilization of the present facilities, and will also serve the future telescopes. Again, the skills of CTIO personnel play an important role in these programs. Finally, innovative ways to keep small telescopes operating at low cost have been developed, with the SMARTS consortium rejuvenating the small-telescope science at CTIO and

providing new opportunities for NOAO users. In 2004, the consortium will deliver new instrumentation and move from a three- to a four-telescope system.

I am proud to have been appointed director of Cerro Tololo Inter-American Observatory, and thus have the opportunity to lead its scientific and technical staff in these exciting and challenging efforts. I see the primary function of the CTIO Director as providing the scientific leadership necessary to enhance the capabilities of CTIO as an observatory, plus working together with associate directors and other managers of NOAO programs to ensure efficient and integrated operation of NOAO in developing new facilities and capabilities.

A notable feature of CTIO, and one that is directly responsible for its enviable international reputation, is the cohesiveness and motivation of its highly dedicated staff. This has been a feature of CTIO for 40 years, and as the new CTIO director, I will strive to preserve and enhance these vital characteristics.

A Tribute to Malcolm Smith

Nicholas Suntzeff

Malcolm Smith has stepped down as the director of the Cerro Tololo Inter-American Observatory (CTIO) after a ten-year tenure in the position. Fortunately, he will continue as the AURA Observatories Director in Chile and as an astronomer at NOAO.

Malcolm has been a long-time member of the NOAO staff and a tireless supporter of the US national observatories. He was a postdoctoral research associate at Kitt Peak National Observatory (KPNO) from 1967–69, and an astronomer at CTIO from 1969–76, where he participated in the inauguration of the Blanco 4-meter Telescope. From there he went to the Anglo-Australian Observatory (AAO) as a Research Scientist, then to the Royal Observatory Edinburgh as Head of Technology, finally moving to Hawaii as the Director of the Joint Astronomy Center (JAC).

Malcolm has led CTIO through ten years of remarkable change, and is leaving it a significantly stronger observatory. Through his leadership, he has integrated the Gemini South 8-meter telescope into the umbrella of AURA Observatories in Chile, merging the service aspect of both CTIO and Gemini into



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Tribute to Malcolm Smith continued

a coordinated support operation, much as he did at the JAC. Perhaps his most important achievement as CTIO Director and AURA representative in Chile was working with the Chilean Executive Branch and Chilean Congress to craft a law allowing foreign observatories like CTIO and Gemini to operate in Chile under important guarantees. I have heard some of my Chilean colleagues state that it was Malcolm's quiet and reasoned diplomacy that was the single key in getting the Astronomy Law passed through Chilean Congress.

Malcolm has also worked to get a new 4-meter facility installed at CTIO, the Southern Astrophysical Research Telescope (SOAR). Following the previous Decadal Survey recommendations for the funding and building of 4-meter-class telescopes, CTIO will have a new state-of-the-art 4-meter telescope on Cerro Pachón, in collaboration with the SOAR partners at the University of North Carolina, Michigan State University, and Brazil. Through the SMARTS partnership, CTIO has also added a 1.3-meter telescope (the 2MASS telescope) to the suite of small telescopes available to the US community. Malcolm leaves an observatory that offers more telescope aperture than when he began, and a bright future for further telescope projects.

Malcolm has also been a strong supporter of public outreach in Chile and internationally. He has helped bring in funding for an educational planetarium for the area, and has worked to fund a municipal observatory in Vicuna. Both of these efforts have greatly raised interest in astronomy in the La Serena area and have stimulated students to pursue science

careers in Chilean universities. Malcolm and his wife, Anamaria, worked hard to make La Serena a sister city to Hilo, HI, forming a very beneficial and active teacher exchange program between the two cities. Right now, a number of La Serena teachers are in Hilo, giving classes and learning new educational technologies to bring back to Chile.

During Malcolm's tenure, it became evident that the remarkable growth of Chile would bring about one downside—light pollution. Malcolm consequently organized an effort to study the effects of light pollution, and helped Chilean authorities draft a light pollution law that should minimize the effects of light pollution on the observatories, not only in the La Serena region, but across the whole country.

Malcolm is the second famous native of Tavistock, England to leave his mark on the La Serena area. The previous one sacked and burned our neighboring city, Coquimbo. Fortunately, with such a strong light pollution law in place, it is fair to say that such heinous behavior by the likes of Sir Francis Drake would not be tolerated by the authorities now.

Frankly though, I can't say I will miss Malcolm. After all, he is not going anywhere! I look forward to being his colleague on the CTIO staff, where he will once again be able to fully pursue his scientific interests in QSO and AGN research. Malcolm was a pioneer in the 70s and 80s in the field of emission line galaxies. He has kept up an active interest in the field, and he will now have more time to do the science he loves with the facilities that he was instrumental in building.

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SOAR AOS Passes Acceptance Testing

Steve Heathcote & Victor Krabbendam

The SOAR project passed a major milestone during October with the successful completion of acceptance testing of the telescope's Active Optics System (AOS), marking the culmination of more than four years of design and optical fabrication efforts by contractor Goodrich Aerospace. This series of tests, carried out over a three-month period, establishes that the completed AOS is functioning properly and fully meets SOAR's exacting requirements.

In one especially crucial set of tests, interferometric measurements were used to demonstrate that the active

support system for the primary mirror can precisely and reproducibly control the mirror's figure. By properly adjusting the forces on the 120 electromechanical actuators it was possible to optimize the shape of the mirror, achieving a surface quality of better than 22 nanometers RMS, (easily surpassing the 26 nanometers RMS requirement) or alternatively "dial-in" predictable amounts of various optical aberrations.

Another set of tests established that the servo control system for the tertiary fast-steering mirror meets strict requirements

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SOAR AOS Passes Testing continued

on closed-loop bandwidth and residual jitter. A final system level test verified that all the AOS components function properly together under the command of the SOAR telescope control system.

With testing complete, the AOS is being disassembled and packed carefully for its long journey to Chile. The components of the AOS will be trucked from the Goodrich plant in Danbury, CT, to the Port of New York, where they will be loaded aboard a freighter that will carry them through the Panama Canal to the Port of San Antonio, Chile. From there, according to the current schedule, a truck will deliver the optics to Cerro Pachón during the first week of January.

Once on site, the primary mirror will be aluminized in the Gemini South coating chamber, the components of the AOS will be integrated with the telescope mount, and everything will be readied for first light. We hope that this will be achieved in early April, *just* in time for the formal dedication of the SOAR telescope on Saturday, 17 April 2004, six years to the day after the laying of the first stone at the SOAR site.



The SOAR primary mirror, mounted on its support structure, is seen with members of Goodrich Aerospace staff and the SOAR project team following the successful completion of acceptance testing of the active optics system.

SOAR Optical Imager Integrated on Cerro Pachón

Hugo E. Schwarz

The first-light instrument for SOAR, the SOAR Optical Imager (SOI) has been successfully integrated in the SOAR building on Cerro Pachón. After the first trial run in August, some minor modifications had been made to make the mounting and dismounting of the instrument easier, and a test with the instrument without its optics was successfully performed on October 30.

Installation of the ADCs, optics, rotator, filter slides, guide probe, guide camera, cable wrap, CCD controllers, and

the dewar with the science CCDs proceeded without complications, and the guide probe was aligned with the optical axis of the SOI. Preliminary flexure tests show that everything is within specified limits, both using the guide probe and straight through the optics. Images were taken with the science CCD, and the complete instrument went on the telescope on November 3 for more extensive flexure and other tests.

Congratulations to the SOI team for a job very well done!

New Arrivals

Chris Smith

Sean Points joined the NOAO South scientific staff in La Serena in October. He arrived from Northwestern University, where he has been a postdoctoral fellow for the past two years working on studies of the interstellar medium with the Far Ultraviolet Spectroscopic Explorer (FUSE). Sean has a PhD from the University of Illinois, where he worked with You-Hua Chu on a study of the large-scale structure of the interstellar medium in the Large Magellanic Cloud at optical, radio, and X-ray wavelengths. Sean was a frequent visitor to CTIO for his thesis and related observations.

Sean is joining the NOAO staff as a postdoctoral fellow working with Chris Smith on the Magellanic Cloud Emission-line Survey and related science. He has also joined the Data Products South group (about one-third of his time) to provide scientific input and guidance to their projects. We are very pleased to have him back on site.



Announcement of Opportunity for a Blanco Instrumentation Partnership

Alistair Walker

NOAO announces a partnership opportunity to develop a major new instrument for the Blanco 4-meter Telescope at Cerro Tololo Inter-American Observatory (CTIO). Although there are no restrictions on the type of instrument that can be proposed, we see a special opportunity to exploit the wide-field capability of the prime or RC foci of the telescope. Additionally, any proposed instrument should be consistent with a system-wide view of facilities available to the US community, in particular those in the southern hemisphere. Guidance on the US system can be obtained from the report on the first workshop on the ground-based optical/infrared (O/IR) system, at www.noao.edu/gateway/oir_workshop/.

The full Announcement of Opportunity, and links to descriptions of the Blanco telescope and its instrumentation, can be found at www.ctio.noao.edu/telescopes/TheFuture/Blanco_prop.html. By the likely time of the commissioning of the new instrument solicited here, we expect to have retired the RC and Echelle spectrographs, since their capabilities will have been replaced by new instrumentation on SOAR and Gemini. We plan to begin sharing the wide-field infrared imager NEWFIRM with the Mayall 4-meter Telescope on Kitt Peak in 2006. NEWFIRM is described at www.noao.edu/ets/newfirm/.

Proposers will need to submit a science plan, a technical plan, and a management plan. The science plan should include a description of compelling science to be undertaken by the proposing team, which may be in partnership with NOAO, and also an outline of anticipated astronomy community use of the instrument through merit-based proposals. The technical plan should present a conceptual design of the

instrument in sufficient depth for peer reviewers to assess the feasibility of the project with the resources to be committed. The management plan should outline the proposed sharing of responsibilities for work packages covering optomechanical and focal plane design and development, data acquisition, and data management between the proposer and NOAO. A general management structure, along with a schedule of project reviews and acceptance testing, should be included. The management plan should also include a basic plan for educational and public outreach, and explain the broader impacts of the project.



Up to 30 percent of Blanco telescope time for five years commencing in 2007 or 2008 is available for the science project. NOAO will contribute the operation of the telescope and an upgraded control system with a combined nominal annual value of \$4 million at real-year prices. NOAO would expect to partner with the successful proposer in developing a data management system, including data acquisition, that is compatible with the National Virtual Observatory. The successful proposer can expect to work with an engineering interface at NOAO with optomechanical and other expertise.

Letters of intent are due at NOAO on 15 March 2004. At that time, an NOAO contact person will be appointed to answer proposers' technical inquiries, and to give guidance on the form and scope of the proposal. Instructions and technical information will also be available at www.ctio.noao.edu/telescopes/TheFuture/Blanco_prop.html. Full proposals are due 15 August 2004.

Potential proposers are encouraged to contact Alistair Walker at awalker@ctio.noao.edu. We look forward to working with you.