The Dwarf Moves to a New Home

Hugo Ochoa & Dara Norman

Long-time visitors to Cerro Tololo will notice that one of the smallest domes has left the summit. This three-meter diameter dome housed "El Enano" or "The Dwarf," as it was affectionately nicknamed: a commercial Cannon 50-millimeter camera lens (operated at *f*/1.6) mounted in front of a 1025 x 1025 Texas Instruments CCD with 12 micron pixels, for a field of view of 13 x 13 degrees.

The robotic telescope first appeared on Tololo in 1997 to begin observations for the Southern H-Alpha Sky Survey Atlas (SHASSA). The resulting atlas covers the entire southern sky south of +15 degrees declination to a brightness level of two Rayleighs (*PASP*, 113, 1326, 2001). For comparison, the faintest nebulosities visible on the Palomar Sky survey (POSS I) are about 100 Rayleighs. The atlas has also been used to confirm that the WMAP spacecraft survey of microwave background anisotropies was not being confused by foreground emission from Galactic hydrogen.

In 2002, a second phase of the project was begun to obtain images at the wavelength of [SII] emission lines for all those regions showing H-alpha emission. The brightness ratio of [SII]/H-alpha will differentiate between HII regions heated by ultraviolet light from stars and those heated by shock waves from supernovae.

In June of this year, El Enano was donated by John Gaustad (Swarthmore College) and Wayne Rosing (Las Cumbres Observatory Inc.) to the Centro de Apoyo a la Didáctica de la Astronomía (CADIAS, Center for the Support of Astronomy Education) and Colegio Seminario Conciliar (Conciliar Seminary School) in La Serena. CADIAS receives funding from NOAO and Gemini to conduct local astronomy outreach, and this group works closely with the seminary school.

The telescope currently resides at CADIAS in Altovalsol, a 15-minute drive from downtown La Serena, but it will eventually be moved to Cerro Mayu, 25 kilometers east of La Serena, where Colegio Seminario Conciliar is building their new observatory. With additional support from the University of La Serena, El Enano will be used by local educational institutions for several purposes: 1) to promote astronomical education and involve students in astronomical activities, 2) to develop high-level astronomy projects for Chilean students and amateur astronomers, and 3) to enhance awareness and protection of Chilean dark skies.

While El Enano begins new life as an educational tool, Tololo looks forward to its sequel, El Enano II, for which there are plans to begin a third phase of the survey by gathering images of [OIII], which should aid in temperature determinations.

Hands-On Optics Engages Local Boys & Girls Clubs

Stephen Pompea

This summer, the NOAO Hands-On Optics (HOO) program went on the road to the Boys & Girls Clubs in the city of South Tucson and in the town of Sells, on the Tohono O'odham Nation. The program introduced the science of optics to the kids through entertaining activities using lasers, mirrors, telescopes, infrared and ultraviolet light, and laser communications.

Figure 1. Focusing a telescope built using an activity from HOO Module 3.

Establishing the program at these Boys & Girls Clubs provided an ideal opportunity for effective local outreach, as well as a chance to further develop our materials in different informal education settings, and to aid us in adapting these materials for use with younger audiences. The HOO-based programs will continue through the next year at both locations. The project is also looking to expand in the next year to other Boys & Girls Club in Tucson, as well as to other southwestern clubs serving Native American students.

At the South Tucson Boys and Girls Club 73 children participated in some aspect of the program classes, which met twice a week with an average of 22 students participating each day. There were approximately equal numbers of boys and girls, and about twice as many seven-to-ten year olds as 11-14 year olds (the usual target audience for the program). On July 6, the 18 children who had the highest attendance record for the program over the first three weeks traveled to Kitt Peak National Observatory to participate in the Visitor Center's Nightly Observing Program.

The program at the Sells Boys & Girls Club was also well received. On the last day, the club program director asked for a show of hands among the three dozen children in attendance of how many kids had participated in the HOO program—about 90 percent of the children raised their hands. She then asked how many would be interested in having the program continue—likewise, 90 percent of the children raised their hands. In addition to conducting activities at the Boys & Girls Club in Sells, the NOAO HOO team participated in a special optics event at Pisinemo, in association with the "Tohono O'odham Truck of Love" summer day camp.

The Boys & Girls Club program team at NOAO consisted of four undergraduate students working in the outreach group at NOAO; University of Arizona science education Ph.D. candidate and NSF GK-12 Fellow Erin Dokter; and NOAO HOO project staff members Rob Sparks, Katy Garmany, and Connie Walker, who managed the team effort.

Figure 2. An HOO demonstration of how a polarization filter works.

Hands-On Optics is an NSF-sponsored informal education program for middle school students created by NOAO, the Optical Society of America, and SPIE–The International Society for Optical Engineering. HOO is being used in museums and science centers across the country, and in after-school classes in seven states. Hands-On Optics workshops for educators were offered this summer in Los Angeles and Livermore, CA, and will also be conducted this fall by the NOAO team in Tucson, Albuquerque, Longmont (CO), Baltimore, and Boston.

For more information about the project, go to *www.hands-on-optics.org* or contact Hands-On Optics project director Stephen Pompea (*spompea@noao.edu*).

The Gemini Virtual Tour - Version 4.0

Peter Michaud (Gemini Observatory)

The Gemini Observatory Public Information and Outreach (PIO) office recently completed a new version of its popular Virtual Tour CD-ROM. This new incarnation has several important additions, particularly the inclusion of Spanish language text and audio to make the tour entirely bilingual.

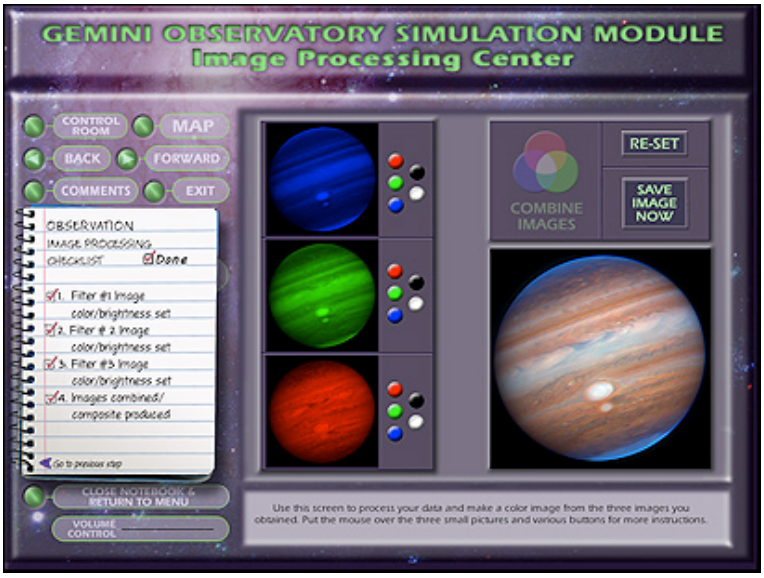
The new release (scheduled for duplication in September 2006) builds on the diverse educational content of the Virtual Tour, from simulated observations using actual Gemini data, to a Screen-Saver Maker that allows users to make a custom computer screen-saver from an assortment of spectacular Gemini images.

All of the elements of the previous tour have remained in this version. These include an interactive walking tour of a Gemini observatory (with hidden surprises), "news reports" updated from the Web, several games, and the Electromagnetic Radiation Explorer. As always, the tour can be installed on Mac or Windows computers, and is available in an entirely mouse-driven mode for bulletproof use in a public kiosk.

The addition of the Spanish translations was completed by Antonieta Garcia of the Gemini South PIO office, assisted by Guillermo Bosch of the Argentina Gemini Office, and Gemini Staff Astronomer Eleazar Rodrigo Carrasco Damele.

Plans are currently underway to produce a complete French translation of the program, in an effort led by Stephanie Coté of the Herzberg Institute of Astrophysics/National Research Council, Victoria, Canada.

To request a copy of the tour on CD-ROM, please send an email (including your postal mailing address) to *geminivt@gemini.edu*.



CTIO REU Program 2007

Cerro Tololo Inter-American Observatory (CTIO) anticipates offering six undergraduate research assistant positions from January to March 2007 under the Research Experiences for Undergraduates (REU) program funded by the National Science Foundation.

The CTIO REU program provides an exceptional opportunity for undergraduates considering a career in science to engage in substantive research activities with scientists working at the forefront of contemporary astrophysics. This research takes place in the stimulating environment of three major international observatories (CTIO, Gemini South, and SOAR). These REU students work alongside Chilean undergraduates participating in a parallel program.

Student participants will work on specific research projects, in close collaboration with members of the local scientific staff, on subjects such as galaxy clusters, gravitational lensing, supernovae, planetary nebulae, stellar populations, star formation, variable stars, and the interstellar medium. Additionally, the CTIO REU program emphasizes observational techniques, and provides opportunities for direct experience using CTIO's state-of-the-art telescopes and instrumentation.

Participants must be enrolled as full-time undergraduate students during the REU program, and must be citizens or permanent residents of the United States. The program will run for 10 weeks approximately January 15 to March 24, 2007. The positions are full-time, with roundtrip travel costs to La Serena covered, and furnished housing provided at the AURA/CTIO compound for an added cost. Complete applications, including all necessary applicant information, official transcripts, and two to three letters of recommendation, should be submitted no later than 2 October 2006.

Applications are online at *www.ctio.noao.edu/REU/ctioreu_2007/reuad2007.html*. For additional information, contact *ctioreu@noao.edu*.

REU students are not the only wildlife known to appear occasionally on Cerro Tololo!

Credit: M. Urzúa Zuñiga/Gemini Observatory