The Meinel Partnership and the Founding of the National Observatory

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As we begin to mark the 50th anniversary of the creation of a national observatory for optical astronomy (see related article in June 2008 NOAO/NSO Newsletter), we are saddened by the loss of one of the key early figures in the founding of Kitt Peak National Observatory.

Marjorie Pettit Meinel, professional colleague and life partner of Aden Meinel, the first director of Kitt Peak National Observatory, passed away on June 24 in Henderson, Nevada, at age 86. An accomplished scientist and researcher, Marjorie Pettit Meinel was an essential component of the partnership that realized an optical observatory open to all astronomers based on the merit of their scientific ideas.

Marjorie was the daughter of astronomers Hanna Bard Steele Pettit and Edison Pettit, one of the early staff astronomers of Mount Wilson known for his movies and measurements of solar prominences. Marjorie and Aden were born and attended school in Pasadena, CA, where Aden eventually worked for Don Hendrix, chief optician for the Palomar 200-inch and Lick 120-inch telescopes. They first met at Pasadena Junior College in a special 11th grade high school class for gifted students. Majorie received her BA in astronomy at Pomona College and her MA in astronomy from Claremont College in 1944. During World War II, Marjorie edited manuscripts and reports for the Navy Rocket Project at Caltech, and Aden became a specialist under Willy Fowler in designing and testing rockets. Near the end of the war, he traveled to Europe with others to learn about German developments in rocketry.

After the war, Aden completed a PhD at Berkeley by building a fast high-dispersion spectrograph and showing that the aurorae were due to incoming protons from the Sun through the identification of the airglow lines. Marjorie suspended her own professional career to raise a family that would grow to include seven children, while continuing to support Aden’s professional activities.

In the early 1950s, the Meinels were based at Yerkes Observatory and the University of Chicago, where Aden served as associate director for both the Yerkes and McDonald observatories until 1956. In 1957, Aden was tapped by the NSF to lead the effort to determine the site of the new national optical observatory.

Aden led the scientific search to identify a first-class site for astronomy and worked with the Tohono O’odham Nation (known then as the Papago Tribe) to secure a lease for the observatory. Kitt Peak, known as Iolkam Duag to the O’odham and part of a range of mountains sacred to the O’odham people, was selected in 1958. The Meinels, who had moved to Phoenix from Illinois during the start of the site-testing program, relocated to Tucson and became involved in all the many aspects of launching the new national observatory, with Aden becoming its first director.

Though Aden left Kitt Peak National Observatory in 1961 for the University of Arizona (where he later served as the third director of Steward Observatory and founded the Optical Sciences Center, now the College of Optical Sciences) and the Jet Propulsion Laboratory (where he and Marjorie were Distinguished Visiting Scientists throughout the 1980s and 90s), he left a lasting imprint on what has evolved into the National Optical Astronomy Observatory.

As was the case throughout his professional career, the strength and support of his partner, Majorie, was a critical part of Aden’s success. The Meinels retired from JPL to Santa Barbara and then to Henderson, where Aden has recently been studying cosmic rays that come from somewhere in the northern sky, as evidenced from elements such as 10Be and 14C in Greenland and Antarctic ice cores.

Marjorie’s ashes were distributed in Red Rock Canyon. Her legacy includes her accomplished children, her books with Aden on solar energy, and her multifaceted help to Aden throughout their 64-year marriage. Seldom has a pair of scientists worked together so closely and so well for so long.

We acknowledge the following online articles about the Meinels at SPIE as valuable sources of information for this article: spie.org/x25747.xml and spie.org/x25772.xml?pf=true.
Pierre Martin, previously director of science operations at the Canada-France-Hawaii Telescope (CFHT), will succeed George Jacoby as director of the WIYN Observatory on September 22. The WIYN Observatory includes 3.5-meter and 0.9-meter telescopes on Kitt Peak. The University of Wisconsin, Indiana University, Yale University and NOAO are the member institutions of the WIYN Board.

Jacoby has led WIYN for eight years, successfully supervising a vigorous period of instrumentation upgrades and the initiation of a second generation of instruments for WIYN, including a new near-infrared imager (WHIRC) and a revolutionary new optical imager.

“The WIYN board, on behalf of the entire consortium, expresses its sincere gratitude for the contributions of George Jacoby since he became director in 2000," said WIYN Board President Charles Bailyn (Yale University). "George has led a talented team that has produced some of the best on-sky performance statistics of any telescope in the world, and he persuaded the partnership to embark on the most ambitious instrumentation project ever attempted by a 4-meter class facility, the One-Degree Imager. George has set an imposing standard for those who will follow.” Jacoby will be returning to NOAO as a member of the scientific staff.

“We’re delighted to have Pierre on board” Bailyn added. “He brings outstanding experience from CFHT, and great energy and enthusiasm for what we all hope to do at WIYN.”

“The WIYN consortium offers a modern 3.5-meter telescope with the capability of conducting world-class astrophysical research on a daily basis and a smaller wide-field telescope that is excellent for complementary observations and student training,” Martin said. “I am honored to have been selected for this challenging but quite exciting position.”

During his 11 years at CFHT, Martin has been the support scientist for several instruments.

He also served as manager of the astronomy group and as the project scientist/manager for CFHT queue observing. This mode, developed to optimize observing efficiency, science productivity and data quality, is now the only operational mode for the wide-field imaging and spectroscopy capabilities at CFHT. “Innovative observing modes are one key to the success of modern observatories—they offer scientists reliable, efficient and new possibilities for data acquisition, and they increase the value of the resulting data products,” Martin said.

Martin earned his PhD in astrophysics at the Université Laval (Quebec City) in 1992. He spent three years as a post-doc at the University of Arizona, followed by a two-year fellowship with the ESO New Technology Telescope in Chile. Martin's scientific interests include the chemical evolution of spiral galaxies, massive star formation, morphology and dynamics of barred spiral galaxies, galactic Cepheid variables, and planetary nebulae. Martin was born in St-Alexis de Matapédia, a small village in the eastern part of the Province of Québec. He is married to Patricia E. Pérez, a PhD graduate of the University of Arizona, and his hobbies include music, drumming, and history.
Commissioning Work on WHIRC Proceeding Well

Dick Joyce (NOAO), Heidi Schweiker (WIYN), & Margaret Meixner (STScI)

Commissioning of the WIYN High-Resolution Infrared Camera (WHIRC) is nearing completion. Following the January 2008 observing run, the operational readout mode and detector bias were established, and succeeding commissioning runs have been used to obtain sensitivity measurements, establish calibration and observing procedures, and complete the observing interface. In addition, WHIRC was used in April, May, and July for shared-risk science observing by scientists from all of the WIYN partner institutions. Initial reports indicate that the observers were pleased with both the instrument performance and relative ease of operation using the WHIRC observing interface.

During the May engineering run, significant progress was made in the integration of WHIRC with the WIYN Tip-Tilt Module (WTTM), and it is now possible to carry out WHIRC offsets while maintaining WTTM guiding. While the use of WHIRC with WTTM in active tip/tilt mode is not being supported for observations in 2008B, we will continue to characterize the performance and establish observing protocols during upcoming engineering and science verification runs. We plan to offer WHIRC with WTTM in shared-risk mode during 2009A, contingent on the availability of WIYN staff to support WTTM operation.

The combination of high spatial resolution and the large complement of narrowband filters make WHIRC a scientifically powerful instrument. Narrowband imaging is similar to optical CCD imaging in that the individual exposure times can be long and the performance is driven by long-term stability, read noise, and dark current. Initial observations through several of the WHIRC narrowband filters have been very encouraging.

Occasional clear intervals during the July observing run were used for deep imaging in the J and Ks bands. The figure shows the results of a one-hour on-source observation (12 × 300-second images) of an extragalactic field in the J band, reaching a 10σ limit of \( J = 21.4 \). The circles represent objects in the 2MASS point source catalog brighter than \( J = 16.5 \). Images are 0.5 arcsec FWHM. Image courtesy of Bethany Cobb, Héctor Arce, and Nitza Santiago (Yale University).

The two remaining commissioning issues are the excess read noise associated with the instrument rotator and demonstrating the required flat-fielding precision through all of the filters. NOAO/KPNO senior engineer Maureen Ellis leads the effort on the noise issue. Principal investigator Margaret Meixner and Ryan Doering at STScI are working on characterizing the flat-fielding.

Documentation on WHIRC, including a link to the current version of the User Manual, can be found at www.noao.edu/kpno/manuals/whirc/WHIRC.htm.
As recommended by the NSF Senior Review and as discussed in recent NOAO/NSO Newsletters, KPNO is working to modernize our telescopes, facilities, and instrumentation. We have just begun a multi-year program to significantly improve the quality of our facilities, and our ability to support the science and education programs scheduled on our telescopes. Our staff also continues to support the operations of numerous other observatories, particularly by assisting in the coating of large mirrors. Here’s a brief update on some of our recently completed projects.

4-meter Instrumentation Clean Room: To reduce the need for transporting NEWFIRM back and forth to Tucson for filter changes and minor repairs, a 20-foot by 12-foot portable clean room was installed in the former coudé room of the Mayall 4-meter telescope. The room will be used for the scheduled servicing of NEWFIRM in November.

4-meter Dome Rail Inspection/Repair: Fatigue cracks are beginning to appear in the main rail supporting the dome. A total of 10 cracks have been uncovered and the five most serious fractures were repaired during our summer shutdown of the telescope.

2.1-meter Cable Wrap Upgrade: The two main 118-conductor cables and pre-load system for the telescope’s electrical system has begun to fail due to conductor fatigue and overburdened mechanical supports. To provide a more robust system, the two large conductors are being replaced with eight 25-conductor cables and new cable tray designs. The new hardware will be installed during September.

Recent Mirror Coatings: We recently coated a spherical 3.75-meter mirror that will be used by the University of Arizona to test mirrors for the Giant Magellan Telescope. In the accompanying photo, you can see this mirror being removed from our 4-meter coating chamber. This was not a routine coating, due to the absence of a center hole in the mirror where the chamber coating monitors normally reside for controlling the film thickness. Modifications where made to the chamber control system and sensors to accommodate this unusual mirror, and in early June a successful coating was accomplished on the first firing attempt.

Kitt Peak annually coats between four to six large aperture mirrors for our own facilities, tenant observatories, and other observatories throughout the United States—and sometimes beyond. Fixed fees are charged for the services and the funds collected are used for maintenance and upgrades of the mirror-coating facility. Other mirrors coated during the last few months include the MDM Observatory 2.4-meter telescope primary mirror, the New Jersey Science & Technology University New Solar Telescope 1.6-meter primary mirror, the Sloan Digital Sky Survey 2.5-meter telescope primary mirror, and our own Mayall 4-meter primary mirror.

WIYN 0.9-meter Telescope Consortium Seeks New Partners

The WIYN 0.9-meter Telescope Consortium is seeking new partners for their next contract period. The contract term will run from 1 July 2009 through 30 June 2015. The WIYN 0.9-meter telescope, located on Kitt Peak, currently uses the NOAO S2KB and Mosaic imagers, and is building its own new Half-Degree Imager (HDI). HDI will utilize a monolithic 4Kx4K, high and flat U-response CCD with 30 arcmin x 30 arcmin field of view.

Beyond classical observing, partners have access to the WIYN 0.9-meter telescope’s special observing modes, which include synoptic, photometric, and opportunity queues.

Please visit www.noao.edu/0.9m/ to learn more about the WIYN 0.9-meter telescope and the consortium. Anyone interested in further information should contact Andy Layden (layden@baade.bgsu.edu) and Con Deliyannis (con@astro.indiana.edu).