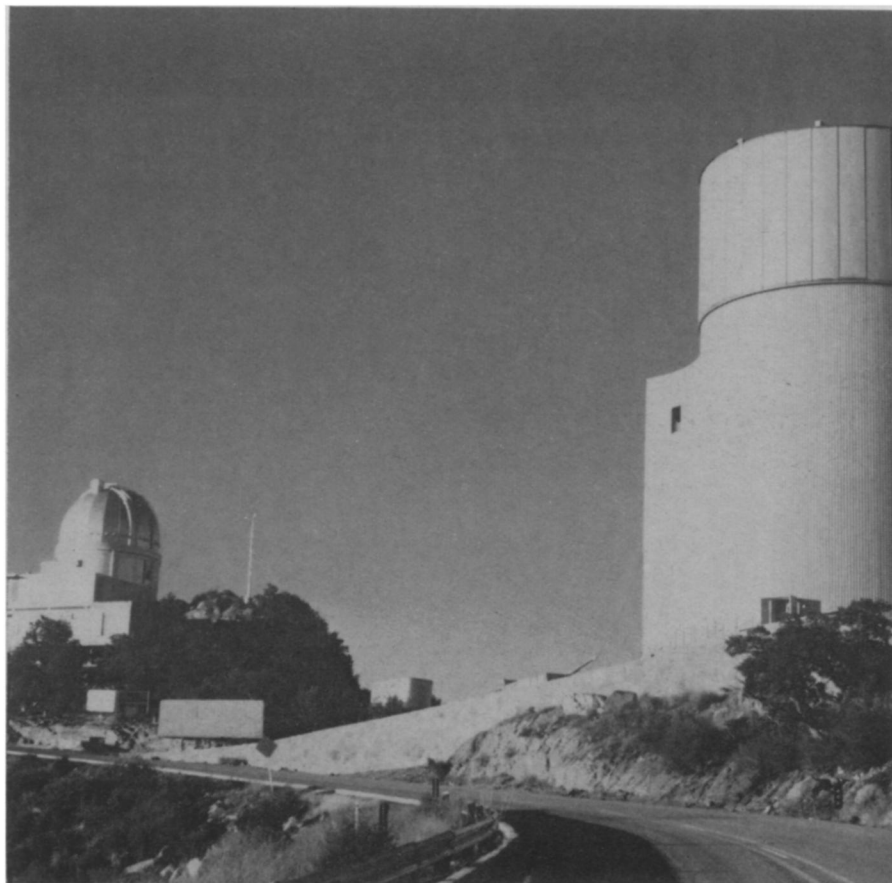


Telescopes cluster on an Arizona mountaintop

Three institutions manage nine instruments on Kitt Peak

by Ann Ewing



Steward Observatory

New dome design for 90-inch contrasts with older 36-inch on left.

A mountaintop in southern Arizona, barren only 10 years ago, now has the highest density of astronomical domes of any observatory site in the United States, if not in the world.

In 1958 Kitt Peak could be reached only by packhorse, on foot or by parachute. Today a couple of hundred astronomers and thousands of visitors a year drive up a winding access road that crosses the Papago Indian Reservation, in which the mountain is located. Kitt Peak is the legendary home of ancient Papago gods.

Since signing a lease with the U. S. Government in 1958 permitting use of 2,400 acres of their reservation "for astronomical studies and research," the Papago Indians have learned to take both scientists and tourists in their stride. Indeed, part of the agreement was that the Papagos could display—and sell—their intricately woven baskets and other products on Kitt Peak.

The mountaintop has nine telescopes, including a solar scope that projects an image a yard across, and by 1970 will have a tenth—a 150-inch instrument occupying the last available site for a large telescope.

Of the three institutions operating Kitt Peak, one is the Association of Universities for Research in Astronomy, Inc., a consortium of 10 universities which is supported by the National

Science Foundation.

AURA has six astronomical telescopes—two 16-inchers, three 36-inch instruments and one 84-inch—on the 85-acre summit, and an assignment that requires it to operate its Kitt Peak facilities in the interests of all astronomers; they come in droves.

The University of Arizona's Steward Observatory operates two others, a 36-inch telescope that dates from 1921 and was recently moved to the mountain, and a 90-inch instrument that will be taking photographs by fall. It will be the fourth largest in the United States, ranking behind the 200-inch on Mt. Palomar, the 120-inch Lick Observatory instrument and the 100-inch on Mt. Wilson.

Larger telescopes in the world are a 104-inch reflector at Russia's Crimean Astrophysical Observatory and the 98-inch at the Royal Greenwich Observatory, Herstmonceux, England.

The newest telescope on Kitt Peak is the 36-foot radio dish of the National Radio Astronomy Observatory. This installation is so new that there are no published results from its multi-pronged research programs. NRAO is operated by Associated Universities Inc., an organization of nine universities formed to run such large and expensive scientific instruments as the 33 billion electron volt accelerator at Brookhaven

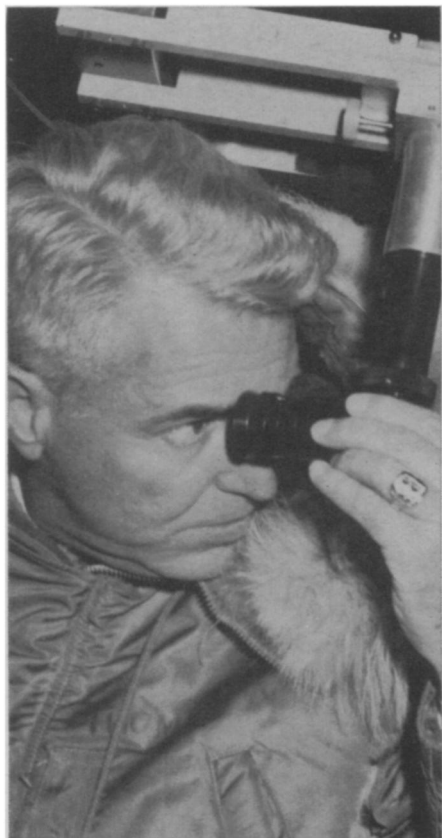
National Laboratory, and the large radio telescopes at Green Bank, W. Va.

Access to Kitt Peak during early construction days was by way of a tractor trail having some grades as high as 78 percent. The paved road that now winds to the top has no grade more than 10 percent. It is, however, occasionally closed to traffic so that construction on the summit can proceed—the easiest way of removing stones being to roll them down the mountain, then repair any damage done to the road.

Although functioning through three different agencies, the astronomical community on Kitt Peak is a harmonious one, isolated on the mountaintop 40 miles southwest of Tucson. Some of this is due to the personalities of the two directors, Dr. Nicholas U. Mayall of the Kitt Peak National Observatory and Dr. Bart J. Bok of Steward.

Dr. Mayall, who has been Kitt Peak's director since 1960, specializes in spectroscopic studies of extragalactic objects, from which the distances, velocities and masses of far-away galaxies can be determined. Dr. Mayall had served on the staff of Lick Observatory since 1934, and helped develop advanced methods of testing telescope mirrors, used successfully for the 120-inch now in operation at Lick.

Dr. Bok, after 27 years at Harvard



Kitt Peak National Observatory
Dr. Mayall at the 84-inch finder.

College Observatory, became director of Australia's Mount Stromlo Observatory in 1957. He returned to the United States nine years later to take over as director of Steward. Dr. Bok concentrates his research on the structure and composition of the Milky Way galaxy and of its nearby galactic neighbors, especially the Magellanic Clouds (SN: 4/11, p. 458).

Dr. Bok is ebullient about the research that can be done with reflectors having mirrors ranging from 80 to 110 inches. "Image tube converters," he says, "make them capable of doing now, for some observations, work that the 200-inch could not do 10 years ago."

Dr. Bok is strongly in favor of building a wide angle Schmidt telescope, like the 48-inch on Mt. Palomar, on Kitt Peak. This Schmidt would be used "to locate dense stellar fields in the Milky Way, and these would then be studied in more detail by the 84- and 90-inch telescopes."

The scientific contributions of Kitt Peak and Steward astronomers have ranged from nearby space to what many believe are the farthest known celestial objects—quasars. Dr. Aden B. Meinel, first director of the observatory, was author of the first scientific report from Kitt Peak, which dealt with the observa-

tions that could be made with a 40-inch telescope in orbit.

Dr. C. R. Lynds, using the 84-inch telescope, has cooperated with Lick and Palomar astronomers in charting the redshifts, optical magnitudes and spectra of quasars, particularly those for which radio observations are also available. Studies of these objects by the three observatories are continuing, since much more detailed observations are needed to identify additional objects and chart their energy distribution in order to explain its source.

Dr. Meinel was also one of those who negotiated the 1958 agreement for leasing part of the Papago Reservation, with conditions sealed by the smoke of a peace pipe. Included among the conditions was that any qualified Papago should be employed on Kitt Peak.

And as has happened at all Kitt Peak dedications, when the 90-inch instrument is dedicated next Sept. 19, the highest tribal official of the Papagos will make a speech in his native language.

The Papagos call astronomers "The Men with the Long Eyes." The astronomers try not to mention the name of the mountain as it is known to the Papagos—Ee-ee-toi, which translates as the god of clouds, or storms. Storms dim the sight of the Men with Long Eyes.

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