



GORDON ALLEN NEWKIRK, Jr.

(1928-1985)

OBITUARY

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Gordon Newkirk was born June 12, 1928 in West Orange, New Jersey, the only child of Mildred and G. A. Newkirk, Sr., who was an engineer. He was graduated from Harvard University in 1950 and in 1953 reached a Ph. D. in astrophysics from the University of Michigan. In 1955, following service in the Signal Corps of the U.S. Army, Dr Newkirk accepted a senior post on the staff of the High Altitude Observatory in Boulder, where he worked the remaining thirty years of his life. For eleven of those years, from 1968 through 1979, he served as director of the High Altitude Observatory and associate director of the National Center for Atmospheric Research. Between 1956 and 1985 he was also a teacher and then adjoint professor at the University of Colorado in the Department of Astro-Geophysics and the Department of Physics and Astrophysics.

His scientific life, as his private one, was guided by a lifelong fascination with nature and a skilled and deliberate approach in learning its secrets and mastering its ways. In the course of his career he gained world renown as a solar physicist, and will probably be most remembered, in science, for a series of pioneering achievements in designing and perfecting fundamental instruments for observing the solar corona, in and out of eclipse. One of these was the radially-graded coronal camera, taken first to Bolivia in 1966, and to seven subsequent total eclipses of the Sun. For nineteen years the Newkirk coronal camera has yielded some of the most spectacular and useful pictures ever taken of the white-light corona at eclipse. Another of his lasting accomplishments was the methodical perfection of the externally-occulted Lyot coronagraph. In a series of fundamental investigations, spanning twenty years, he perfected the instrument for its ultimate use as a spaceborne telescope, paving the way for important advances in our understanding of the outer corona of the Sun. Newkirk began this patient quest while in the U.S. Army, with a series of measurements of the brightness of the high altitude sky near the Sun, made from Colorado mountain tops that he sometimes reached by ski-lift. In 1959 and 1960 he and his colleagues extended these measurements from manned and unmanned balloons, at altitudes of first 40 000 and then 80 000 feet, in an era when scientific ballooning was a demanding and often disastrous venture. Based on data he had gathered on the radiance of the background sky, and following his own skillful development of an apodized, externally-occulted coronagraph, Newkirk's team succeeded, in 1965, in obtaining the first detailed observations of the outer corona outside of eclipse. These balloon observations laid the groundwork for successful spaceborne experiments by the High Altitude Observatory in 1973 and 1979. For the first of these, orbited on the Skylab spacecraft, he was the initial principal investigator.

Newkirk made contributions similarly lasting and fundamental with the groundbased K-coronameter, then at Climax, Colorado. In that case, as with the eclipse camera and

coronagraph development, he carefully interpreted the observations he had made. The Newkirk model of the electron corona, based on Climax coronal photometry and published in 1958, remains to this day a standard reference model.

Yet, in a world of specialization he remained, simply, a scientist: innately curious and intensely interested in a host of things. He published other enduring papers on the solar corona, including a benchmark depiction of coronal magnetic fields, derived analytically from magnetograph observations of the surface of the Sun. But he also was a codiscoverer of a comet and wrote about the atmosphere of Venus, the scattering of light and the distribution of small particles in the upper atmosphere, solar flares, the paradox of the faint, early Sun, the solar constant, the solar cycle and solar seismology, the interpretation of cosmogenic nuclides in polar ice cores, and the scattering of galactic cosmic rays. Because of these broad interests he was a frequent member, and often the chairman, of national and international scientific committees. Because of his wisdom, he was a sought-after member of scientific advisory groups. Because of his keen perception, his wonderful sense of humor and his marvelous way with words, he was frequently consulted in the less formal, day-to-day issues in the life of the Observatory.

As an administrator, he developed a collegial style of debate and decision-making which involved the entire Observatory staff. With characteristic innovation, he developed an advisory structure within the organization which permitted him to enlist the assistance of numerous staff members in dealing with administrative matters. And, he was the prime mover behind the development of the concept of the Skylab Solar Workshops and their implementation, designed as they were to properly exploit the rich harvest of data from that mission, and henceforth a model for succeeding efforts in other fields.

Newkirk was a longstanding member of many scientific societies, and was elected chairman, in 1972, of the Solar Physics Division of the American Astronomical Society; later he chaired the committee of that division that established the Hale Prize. In 1976, he was chosen President of the Commission on Solar Activity of the International Astronomical Union, and the same year he was made a member of the Geophysics Research Board of the National Academy of Sciences among numerous editorial roles. He was a member of the Editorial Board of the journal *Solar Physics* for many years.

Gordon Newkirk will be remembered for his scientific contributions, his administrative acumen and style, and for his unique personality. His death, on December 21, 1985, is a severe loss to the solar and astrophysical communities, and to his friends and associates.

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