



Update 1990-43

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NCAR's High Altitude Observatory Celebrates 50th Anniversary

The High Altitude Observatory (HAO), the nucleus around which NCAR was formed, will celebrate its 50th anniversary on October 30 by holding a day-long series of special presentations at the Mesa Laboratory in Boulder, Colorado.

Thomas Holzer, the present director of HAO, will chair a session on a scientific perspective of HAO. As part of the perspective, Eugene Parker, University of Chicago, will discuss HAO's impact on solar astrophysics; Arthur Hundhausen will discuss the observatory's role in studying the solar corona; and George Reid, NOAA Aeronomy Laboratory, will discuss solar-terrestrial relations.

The second major session, "HAO: A historical perspective," will be chaired by Peter Gilman, currently the associate director of NCAR, and director of HAO from 1987 to 1989. Robert MacQueen, a professor at Rhodes College and director of HAO from 1979 to 1986, will discuss experimental efforts at HAO from 1940 to 1990. John Firor, director of NCAR's Advanced Study Program and the second director of HAO, will present a short history of HAO.

A panel discussion on the future of solar physics will end the formal presentations. HAO staff will host an open house and show a film on Walter Orr Roberts, the observatory's founder. John Eddy, director of UCAR's Office of Interdisciplinary Earth Studies, will present a tribute to Roberts before the group adjourns for a special dinner at the Mesa Laboratory.

Established by Walter Orr Roberts, who later founded NCAR, and his doctoral adviser at Harvard University, Donald Menzel, HAO began its long tenure observing the sun with the Western Hemisphere's first coronagraph. The instrument was located at the Climax Observatory, straddling the nation's Continental Divide near Leadville, Colorado. HAO's coronagraphs—both the original with a 3-inch lens and a second, with a 5-inch lens, that joined it in 1942—were designed to block virtually all of the sun's rays and render the solar corona visible. The Climax Observatory was operated by Roberts throughout the war years from 1940 to 1946. At that time, HAO was incorporated with Roberts as its first director, and parts of its staff moved to its long-term home on the campus of the University of Colorado at Boulder. Since then HAO has designed, developed and deployed a number of telescopes to better understand the sun's actions. Among HAO's milestones are:

- 1952: HAO mounted the first of numerous solar eclipse field expeditions, in the Sudan, Africa.
- 1957: HAO was designated as the primary center for world solar data during the International Geophysical Year.
- 1960: HAO staff deployed the first balloon-borne coronagraph and other instruments to assess sky brightness and scattering of sunlight. Ascensions to 80,000 feet confirmed the presence of a stratospheric aerosol layer distinct from the lower atmosphere.
- 1964: HAO installed a magnetograph measuring the two-dimensional magnetic field across the sun's surface.
- 1965: The Mauna Loa Observing Station was built by HAO at an elevation of 11,400 feet on the Hawaiian volcano. In 1967, Mark II, an improved K-coronameter, was installed there.

1970: HAO mounted its biggest solar eclipse expedition yet at Oaxaca, Mexico.

1973 and 1974: Years of preparation culminated with the nine-month journey of Skylab, the world's first manned, orbiting solar observatory. More than 35,000 coronal pictures were collected by the coronagraph that confirmed many theories and spawned others.

1975: HAO, in collaboration with Sacramento Peak Observatory, completed a Stokes polarimeter, which measures four components of polarized light to deduce the three-dimensional solar magnetic field.

1980: The Solar Maximum Mission satellite was launched, carrying an HAO-designed coronagraph/polarimeter, which collected 30,000 images of the sun before it was disabled nine months later.

Between 1980 and 1984, HAO developed the first Fourier tachometer, designed to measure large-scale, small-amplitude oscillations on the solar surface.

1984: HAO developed tools that enabled two astronauts to complete the first-ever repair of a satellite while in space, and the Solar Max resumed data collection.

1986: The Terrestrial Interactions Section was formed at HAO to study the chain of events connecting solar energy to earth's environment.

1988: Observations began from HAO's solar-stellar spectrophotometer. The new instrument compares light output and magnetic cycles among the sun and 400 other stars.

1990: The prototype of the advanced Stokes polarimeter was deployed.

Update Contact: Joan Vandiver Frisch, NCAR Director's Office, (303) 497-8607.