this prize for research done at one of the telescopes on Mauna Kea, which, at nearly 14 000 feet above sea level, is one of the premier observing sites in the world.

The Spites, who are based at the Paris Observatory, were honored for their pioneering work on the abundance of the element lithium in old dwarf stars in the halo of the Milky Way. Using the 3.6-meter Canada–France–Hawaii telescope, they were able to take high-resolution spectra of these dim stars. Because there is evidence that the lithium in these ancient stars has not been affected by their subsequent evolution, the Spites' data provide information on the amount of lithium produced in the Big Bang. The primordial lithium abundance is an important parameter in cosmological models; the value derived from the Spites' observation implies that there may not be enough matter in the universe to close it and stop its expansion.

Gunter, a retired pathologist living in Durham, North Carolina, receives the Amateur Achievement Award for his 12-year effort to popularize asteroid hunting among amateurs and especially for his bimonthly newsletter, *Tonight's Asteroids*, which keeps amateur observers around the world abreast of news about asteroids. The exact details of the occultation of a star or other object by an asteroid can provide new information about both the asteroid and the occulted object.

Physicists honored by Franklin Institute

At a ceremony on 17 January, the Franklin Institute presented medals to 11 researchers. Among those honored were several physicists: Herbert B. Callen (University of Pennsylvania), who received the Elliott Cresson Medal; Paul C. Lauterbur (SUNY at Stony Brook), who received the Howard N. Potts Medal; and Hyatt M. Gibbs (University of Arizona), who received the Albert A. Michelson Medal.

The Cresson Medal is given to Callen for "his contributions to the statistical theory of irreversible processes and thermodynamic fluctuation theory, and especially for his formulation and proof of the general fluctuation–dissipation theorem."

Callen received his BA and MS degrees from Temple University in 1941 and 1942, respectively. He received his PhD from MIT in 1947 and has been at Penn since 1948. His research has involved solid-state physics, statistical mechanics and spin systems.

Lauterbur receives the Potts Medal for "his conception and description of using controlled field gradients with nmr to obtain internal images of physical objects and for his continued contribution to the development and application of nmr imaging both in research and clinical diagnosis."

Lauterbur received his BS from Case Institute of Technology in 1951 and his PhD from the University of Pittsburgh in 1962. In 1963 he joined the faculty at Stony Brook, becoming professor of chemistry in 1969. By using gradients of the magnetic field to modulate nmr frequencies, Lauterbur showed how to recover information about the spatial distribution of materials from nmr data. This insight may prove very useful in clinical diagnosis, as a noninvasive and non-damaging diagnostic tool. (See the article by Paul Moran, R. Jerome Nickles and James A. Zagzebski, July, page 37.)

The Michelson Medal honors Gibbs for his "outstanding contributions to the field of quantum optics and especially for his definitive experiments on self-induced transparency, superfluorescence and optical bistability."

Gibbs received his BS from North Carolina State University in 1960 and his PhD from Berkeley in 1965. After two years at Berkeley he moved to Bell Labs, working there from 1967 to 1980. In 1980 he joined the Optical Sciences Center at the University of Arizona. Gibbs's research has ranged broadly through quantum optics and has included, in addition to the cited work, investigations of pulse propagation, laser spectroscopy, Faraday rotation, optical turbulence and coherent optics.

In addition to these awards, metallurgists Louis F. Coffin (G. E. Research and Development Center) and S. Stanford Manson (Case–Western Reserve) received Francis J. Clamer Medals for their contributions to the understanding of metal fatigue; meteorologist Verner E. Suomi (Wisconsin) received the Franklin Medal for his contributions to the development of satellite meteorology; and meteorologist Robert M. White (National Academy of Engineering) received the Delmer S. Fahrney medal for his leadership in the development of an operational weather-satellite network and his contributions to oceanography and meteorology.

Royal Society presents Hughes Medal to Ward

Among its awards for 1983, the Royal Society presented the Hughes Medal to John C. Ward (Macquarie University, Australia) for his "highly influential and original contributions to quantum field theory, particularly the Ward Identity and the Salam–Ward theory of weak interactions."