

ALLAN SANDAGE RECEIVES 1991 CRAFOORD PRIZE

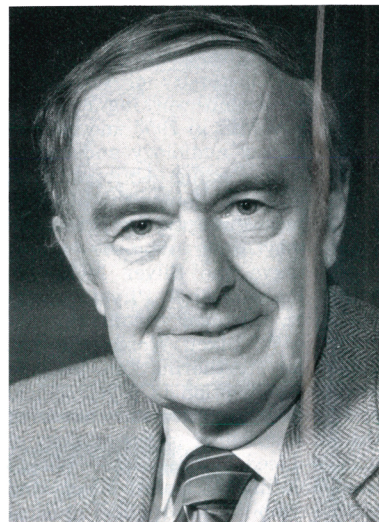
Astronomer Allan R. Sandage of the Observatories of the Carnegie Institution of Washington, in Pasadena, California, received the 1991 Crafoord Prize from the Royal Swedish Academy of Sciences on 25 September. The Crafoord Prize is awarded for work in fields not recognized by a Nobel Prize, including astronomy, mathematics, geoscience and the life sciences. Sandage was cited for "his very important contributions to the study of galaxies, their populations of stars, clusters and nebulae, their evolution, the velocity-distance relation (or Hubble constant) and its evolution with time."

In 1951 Sandage, along with Halton Arp and William Baum, discovered the main sequence termination point in the Hertzsprung-Russell diagram of globular clusters. This discovery, together with the theoretical explanation of this point by Martin Schwarzschild of Princeton University, enabled Sandage and Schwarzschild to determine the ages of globular clusters in the Milky Way to be about 10 billion years. Therefore the universe must be at least that old. Sandage and Gustav Tammann of the University of Basel, Switzerland, derived a distance scale for objects in

the universe using various yardsticks, including Cepheid variables in the Milky Way and in nearby galaxies, and supergiants, supernovae and hot gaseous regions around giant stars in more distant galaxies. Sandage also discovered that the brightest galaxies in a given rich galactic cluster tend to have about the same luminosity as those in any other cluster. This finding enabled observers to determine the distance to a cluster based on the luminosity of its brightest member.

Sandage and Tammann have refined estimates of the Hubble relation between the velocity of a galaxy's recession, as indicated by its spectral redshift, and its distance. Sandage has also studied the Hubble relation's change with time. Its rate of change is important in estimating the age of the universe, because the inverse of the Hubble relation is the time the universe has been expanding if no deceleration has occurred. In 1960 Sandage and Thomas Matthews of the University of Maryland were the first optical observers of objects that Maarten Schmidt later identified as quasars.

Sandage received his PhD in 1953 from Caltech, where he worked as a



Allan R. Sandage

research assistant for Edwin Hubble. In 1952 he was appointed a staff member of the Observatories of the Carnegie Institution. His observations have primarily been made with the Hale Telescope at Mount Palomar, the Hooker Telescope at Mount Wilson and the Du Pont Telescope at Las Campanas, Chile.

SEVERAL ACOUSTICS RESEARCHERS RECEIVE ASA MEDALS

At the November meeting of the Acoustical Society of America, held in Houston, four individuals were recognized for their contributions.

Gideon Maidanik accepted the Trent-Crede Medal for his "profound impact on structural acoustic analyses and measurements in the application of the concepts of structural wavenumbers and statistical energy analysis." In 1967 Maidanik and Donald Jorgensen developed the boundary wavevector filter, a device

for measuring the wavenumber spectral components of the pressure field generated by hydrodynamic flow over a boundary. Since the early 1970s Maidanik's research has concentrated on problems related to the acoustic signatures generated by ships.

Maidanik received a PhD in physics from Brown University in 1959. He began working as a senior scientist for Bolt Beranek & Newman in 1960. In 1966 he joined the David Taylor Model Basin, where he is now a

principal scientist.

The Silver Medal in Physical Acoustics was presented to Allan D. Pierce for his "many significant contributions to acoustics, its basic physical principles and applications." Pierce's wide-ranging interests have included atmospheric acoustics, nonlinear acoustics, underwater sound and physical acoustics. Among his contributions is the introduction of the adiabatic approximation, which is now one of the basic tools of research on sound propagation in the ocean.

After receiving a PhD in physics from MIT in 1962, Pierce worked briefly for the Rand Corp and the