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IN BRIEF

Caroline Herzenberg, a physicist at Argonne National Laboratory, in January began a two-year term as president of the Association for Women in Science.

Steven F. Clifford, a physicist at the National Oceanic and Atmospheric Administration, has been named director of that agency's Wave Propagation Laboratory in Boulder, Colorado.

Joseph H. Eberly, professor of physics and optics at the University of Rochester, in October received the Marian Smoluchowski Medal, the highest award of the Polish Physical Society, for his work in quantum optics and laser physics as well as his collaborations with Polish physicists on the coherence theory of laser spectroscopy, atomic relaxation in strong laser fields and multiphoton processes.

Emmanuel P. Papadakis, formerly supervisor of quality systems concepts at Ford Motor Company, has joined the Center for Nondestructive Evaluation at Iowa State University as an associate director of the center and an adjunct professor in the electrical engineering and computer science department.

OBITUARIES

Bengt Strömgren

Bengt Strömgren died of a heart attack on 4 July 1987. He was 79 years old.

Strömgren was born in Göteborg, Sweden, on 21 January 1908, but spent his youth and many of his later years in Copenhagen, where his father, Elis Strömgren, was director of the Copenhagen University Observatory until retiring in 1940. Starting at age 13, the younger Strömgren became engaged in a variety of astronomical projects in the fields of his father's interest, including positional astronomy and celestial mechanics. By the time of his graduation from the University of Copenhagen at age 19, his interest had shifted primarily to theoretical astrophysics, and during his long career he made many outstanding contributions to this new field. In addition, he retained a keen interest in observational programs, especially in photoelectric stellar observations, which had already attracted his enthusiastic participation in his pre-college years and to which he

subsequently made fundamental contributions.

Strömgren's early professional life at Copenhagen was interspersed with visits to the US in 1936-37, 1947-48 and 1950. Then, beginning in 1951, he remained for 17 years in this country. From 1951 to 1957 he was director of the Yerkes and McDonald Observatories of the University of Chicago, and from 1957 to 1967 he served as professor of astronomy at the Institute for Advanced Study (Princeton, New Jersey), where he was in charge of an active program of visiting astronomers. He returned to the University of Copenhagen in 1967. Under the Royal Danish Academy of Sciences and Letters, he had a uniquely prestigious honorary position (first occupied by Niels Bohr), which he held until his death.

Strömgren's widely ranging work is characterized by two central features, a perceptive choice of central problems to attack and a keen ability to analyze physical situations in terms that can be compared with observational data. His breadth was remarkable; he obtained important and pioneering results in the three areas that constituted much of theoretical astrophysics in his day: the structure and composition of stellar interiors, stellar atmospheres as interpreted from the observed spectra, and the structure and composition of the interstellar gas.

His early work on stellar structure was devoted to the problem of the "opacity discrepancy," which, as Arthur Eddington had pointed out, arose on the assumption that the contribution of hydrogen to the total stellar mass was relatively small. To analyze this problem Strömgren, with his customary thoroughness, computed detailed tables of atomic opacities; he used these together with simplified models of stellar interiors to show that there is no escape from a high abundance of hydrogen relative to other elements. In 1938 he obtained values for the relative abundances of hydrogen and the heavy elements that are in reasonable agreement with modern values.

In his interpretation of the solar spectrum in 1940 he analyzed only a few absorption lines. His detailed consideration of the relevant atomic constants and his computation of the solar atmospheric structure constituted one of the first attempts to construct a detailed numerical model of stellar absorption-line formation. His results for the relative abundances of hydrogen, magnesium, calcium, sodium and potassium are again in rough

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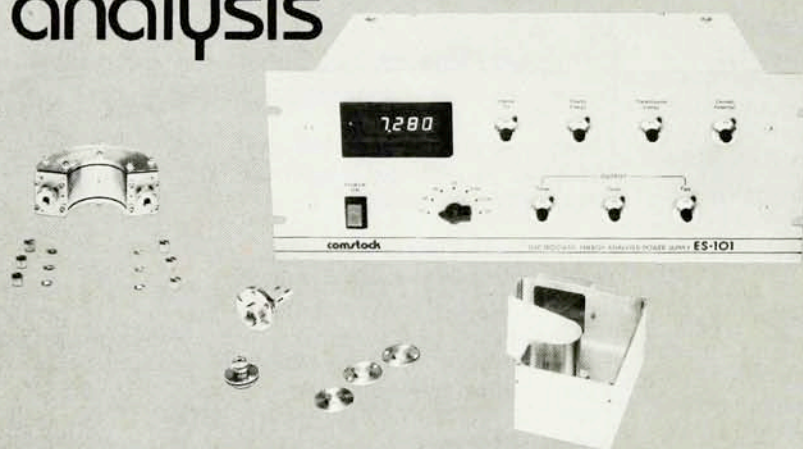
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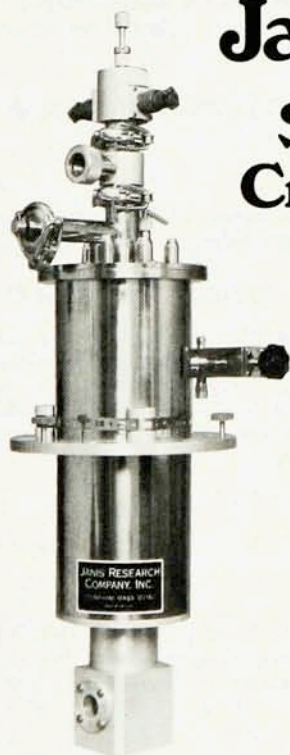
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agreement with modern values. Combined with his results on stellar interiors, his research on the solar atmosphere led to the important result that the composition of the Sun is nearly the same at the surface as in the deep interior.

In interstellar studies, one of his best known results concerned the structure of the ionized hydrogen regions surrounding a star of high surface temperature (spectral type O or B). He showed in 1939 that the ultraviolet photons from such a star maintain almost complete ionization of the hydrogen atoms within most of this zone. Outside a narrow transition region where the ultraviolet radiation is fully absorbed, the hydrogen atoms are almost entirely neutral. The luminous regions of ionized hydrogen, which are spherical if the gas density is reasonably uniform, are seen in other galaxies as well as in our own, and are now often referred to as Strömgren spheres.

During his later years Strömgren devoted much effort to photoelectric stellar photometry. Some of the wavelength bands he selected for this program were sufficiently narrow that one could measure the strength of certain absorption lines without detailed spectra. Among the important goals of this program were the systematic determination of chemical composition and age for individual stars and the measurement of color excesses for stars of spectral type F. The lower-mass F-type stars are generally more common than are the B-type stars for which color excesses are usually measured, and thus provide more detailed information on the distribution of absorbing dust particles. The work that Strömgren and several collaborators carried out has basic importance for many statistical studies of the Galaxy and has greatly increased our astronomical knowledge.

In recognition of his distinguished contributions to astronomy Strömgren received numerous awards and was chosen as president of the American Astronomical Society (1966-67) and the International Astronomical Union (1970-73). Astronomers will remember him with great affection as well as with enormous respect.

LYMAN SPITZER JR
Princeton University
Princeton, New Jersey

Joseph T. Massimo

Joseph Thomas Massimo, professor of physics at Brown University, died on 20 May 1987 at his home in Providence.