

many tasks normally performed by specialists in the shops.

Throughout his life Thompson maintained a great interest in classical music; he was an accomplished flutist and pianist. After he retired, he became a skilled ceramicist. He aimed for perfection—in and out of the laboratory—and he urged his associates, friends and family to do the same. He is missed.

**CHARLES STEVENS**  
*Argonne National Laboratory*  
*Argonne, Illinois*  
**NIELS THOMPSON**  
*Hughes Aircraft Co*  
*El Segundo, California*

## Arthur Adel

Arthur Adel died of cancer on 13 September 1994 in Flagstaff, Arizona, at age 85.

Adel received a bachelor's degree in 1931 at the University of Michigan, Ann Arbor, for a double major in mathematics and physics. In 1933 he earned his PhD at Michigan with a theoretical dissertation on the structure and infrared spectrum of the carbon dioxide molecule. That same year Adel's mentor, Harrison M. Randall, chairman of Michigan's physics department, authorized him to work jointly at the university and Lowell Observatory; it was a major turning point in his career. Earlier, Rupert Wildt had discovered the presence of ammonia and methane in the atmospheres of the major planets. In a series of papers from 1934 to 1935, Adel was able to show that the absorption bands were due to harmonics of the fundamental vibrations of the methane and ammonia molecules.

Adel moved to Flagstaff in 1936 to take residence at Lowell Observatory, where the high and dry climate was a major element in his successful study of the water-vapor-related parameters in Earth's atmosphere. Two of his major results were the discovery of the 20-micron atmospheric window and the measurement of the first definitive emission spectrum of the Moon, which provided evidence that it radiates as a simple blackbody.

From 1942 to 1946 Adel taught physics at the University of Michigan, and during 1946–48 he was an assistant professor of astronomy at the McMath-Hulburt Solar Observatory. In 1948 Adel accepted a professorship at Arizona State College, now Northern Arizona University, in Flagstaff.

With an Air Force contract he established the Atmospheric Research Observatory on campus there. With E. S. Epstein, Adel determined verti-

cal atmospheric ozone distributions and discovered 10- and 18-day temperature periodicities in the stratosphere, with a corresponding 18-day period in the troposphere.

Adel retired as professor emeritus in May 1976. A few weeks before his death we talked about the Comet Shoemaker-Levy impact with the planet Jupiter. He told me that in the 1930s he had mentioned to Vesto M. Slipher that the large white spots on Saturn might be the result of cometary impacts.

In retirement Art attended many of the numerous scientific lectures held in the Flagstaff community. Visitors were always impressed with the questions from the dapper gentleman with impeccable manners. Art's persistent, probing mind was a stimulation to his students, colleagues and vast number of friends. We miss him.

**RICHARD L. WALKER**  
*US Naval Observatory*  
*Flagstaff, Arizona*

## Adriano Gozzini

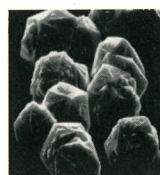
Adriano Gozzini died on 24 September 1994 at his home in Pisa, Italy, at the age of 77, after a brief illness. He was professor emeritus at Pisa University.

Gozzini was a student at the Scuola Normale Superiore in Pisa, and he received his PhD in 1940 at Pisa University. Five years of military service interrupted his otherwise lifelong dedication to physics. At the end of World War II he assisted in the reconstruction of the heavily damaged Institute of Physics in Pisa. He set up a laboratory of microwave spectroscopy that became the foremost research institute in that field in Italy. Gozzini demonstrated the Faraday effect in the microwave region and the Corbino effect on paramagnetic resonance absorption lines. He discovered two-photon transitions in the rotational spectrum of the molecule OCS and demonstrated the transfer of angular momentum to the sample in paramagnetic resonance absorption. His laboratory also introduced laser techniques that led to novel results. Then and later, I felt a kinship with his approach of studying basic physics problems with quite modest experimental equipment.

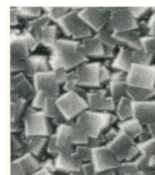
Gozzini was a gifted scientist with a modest and kind personality. He was a unique teacher, equally helpful to his students and to his colleagues. He had a strong influence on the development of microwave and optical spectroscopy in Europe, especially France. Those of us who had the

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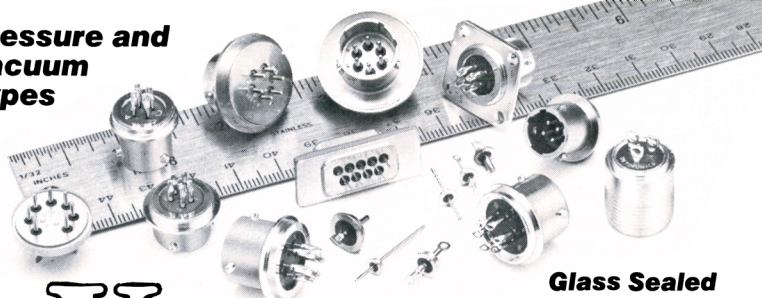
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## Paul L. Cowan

Paul L. Cowan, a physicist at Argonne National Laboratory, died in Chicago on 16 August 1994, at the age of 44, after a yearlong battle with cancer.

Cowan received his BS in physics in 1972 and his PhD in physics in 1977 from Pennsylvania State University. During a postdoctoral fellowship spent at AT&T Bell Laboratories, he became involved in the use of synchrotron radiation as a source of x rays. In collaboration with Jene Golovchenko, he developed the mechanism of the "boomerang" double-crystal monochromator. During this period they also developed the x-ray standing wave method for precise determination of the location of adsorbed atoms on surfaces.

In 1980 Cowan joined the quantum metrology division at the National Bureau of Standards (now the National Institute of Standards and Technology), where he led the design and construction of an all-vacuum soft-x-ray beam line (X-24A) for the yet-to-be-built x-ray ring of the National Synchrotron Light Source. His ultrahigh-vacuum version of the Cowan-Golovchenko monochromator set a standard for energy resolution, and NSLS adopted the design for use on other beam lines.

Cowan left NIST in 1991 to join the physics division at Argonne National Laboratory, where he led the atomic physics component of the Basic Energy Sciences Synchrotron Research Center. His philosophies are reflected throughout current beam-line designs, and he contributed to the theory of dynamical x-ray diffraction and its measurement. He played a leading role in the development of x-ray Raman scattering as a probe of detailed electronic structure in the gas phase.

Paul was regarded highly by his co-workers as much for the breadth of his interests in physics as for his creativity. Whether it was over new physics or a new brewing discovery—he was a connoisseur of rare beers—Paul's enthusiasm, generosity and quiet good humor were a pleasure to all who worked with him.

**TERRENCE JACH**

**RICHARD DESLATTES**

*National Institute of Standards  
and Technology  
Gaithersburg, Maryland*

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Argonne, Illinois* ■