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War II. He received an ScD in meteorology from MIT in 1948. He then joined the staff of the meteorology department there, and in 1955 he became a professor of meteorology. From 1977 to 1981 he headed the department, which by then had become the department of meteorology and physical oceanography. He became professor emeritus in 1987, and he is still a senior lecturer at MIT.

ZAPAS RECEIVES 1991 BINGHAM MEDAL FROM SOR

Louis J. Zapas of the National Institute of Standards and Technology, in Gaithersburg, Maryland, is the 1991 recipient of the Bingham Medal, presented by the Society of Rheology. Zapas was selected for his "extraordinary contributions to the field of rheology, especially in the development and experimental testing of the BKZ constitutive equation."

In 1963 at the National Bureau of Standards (now NIST), Zapas, Barry Bernstein and Elliot A. Kearsley formulated a phenomenological model of nonlinear viscoelastic behavior based on physical principles. This model came to be known as the BKZ model. In subsequent work he has tested the model's validity for a wide range of materials, from fluid polymer solutions to solid-like cross-linked rubbers. Zapas also has developed numerous experimental methods and practices that have benefited rheology, the award citation said.

After receiving an MS in chemical engineering from the University of Pittsburgh in 1949, Zapas worked at the Mellon Institute (now a part of

Louis Zapas



Carnegie-Mellon University). From 1957 to 1961 he was at the Washington Research Center of W. R. Grace and Co. In 1961 he joined NIST, from which he retired this past January.

OBITUARIES

Valentine Bargmann

Valentine Bargmann, professor emeritus of mathematical physics at Princeton University, died of heart failure on 20 July 1989. Together with his other expatriate colleagues at Princeton—including Hermann Weyl, John von Neumann and Eugene Wigner—Bargmann exemplified the great European tradition in mathematical physics.

Born in Berlin on 6 April 1908, Bargmann studied at the University of Berlin from 1926 to 1933. When Hitler rose to power he moved to Zürich, where he wrote his doctoral thesis under Gregor Wentzel at the University of Zürich. When he completed his degree, Bargmann still held the German passport issued to him in 1931. The German government under Hitler had since withdrawn the citizenship of persons of the "wrong race" and thus would have invalidated Bargmann's passport if he had been found. But Bargmann managed to use the document to reach the US in 1937, two days before its stated expiration.

In the US Bargmann was hired as an assistant at the Institute for Advanced Study in Princeton. For several years he worked, along with Peter Bergmann, as a scientific assistant to Albert Einstein in his study of unified field theories of gravitation and electromagnetism. In 1943 Bargmann undertook war work on shockwaves with John von Neumann. After the war he joined von Neumann's computer project and worked with von Neumann and Dean Montgomery on the inversion of matrices of large dimension. On the nearby Princeton campus Bargmann lectured, and worked with Wigner on relativistic wave equations. In 1948 their work culminated in the well-known Bargmann-Wigner equations for elementary particles of arbitrary spin. In 1946 Bargmann finally received an appointment as a visiting lecturer at Princeton University.

He remained a member of the Princeton faculty until his death. Generations of undergraduate and graduate students benefited from his lectures, which were noted for their clarity and polish. But the real gems were the sets of specialized lectures he