

Four physicists win honors for work in acoustics

The Acoustical Society of America has presented its annual awards for 1983 and has also elected Maurice A. Biot to honorary fellowship in the Society. The Silver Medal in Speech Communication has been given to Kenneth N. Stevens of MIT, the Silver Medal in Theoretical and Applied Acoustics has been awarded to Eugene J. Skudrzyk of Pennsylvania State University, and the Trent-Crede Award has been presented to Eric E. Ungar of Bolt Beranek and Newman Inc.

From time to time, ASA may elect "an individual who has attained eminence in acoustics or who has rendered outstanding service to acoustics" to honorary fellowship in the Society. Biot is the tenth person elected since 1929, when Thomas A. Edison became the first ASA honorary fellow. The Society cited Biot "for fifty years of extensive and widely diversified research, which includes acoustics, aeronautics, applied mathematics, chemistry, geophysics thermodynamics, vibrations, and viscoelasticity."

He received a DSc in mathematical physics in 1931 from Louvain University, and his PhD in 1932 from the California Institute of Technology. During his long career, he has taught at Harvard University, Louvain, Columbia University, Brown University and Delft University. He pursued his diverse research interests as a research

BIOT



UNGAR

associate and technical adviser to the National Defense Research Committee at Caltech (1940-43), as a consultant for Shell (1946-65), and as a researcher and consultant for the Aeronautics Lab at Cornell University (1946-68). Since 1969 he has acted as a consultant for Mobil. He has published about 170 papers throughout his career, including many in the *Journal of Applied Physics* and the *Journal of the Acoustical Society of America*. He is the author, along with Thomas von Karman, of the text *Mathematical Methods in Engineering*, which was later translated into nine languages; he also wrote *Mechanics of Incremental Deformations* and *Variational Principles in Heat Transfer*. His extensive contributions led the *Journal of Mathematical and Physical Sciences* to dedicate the entire February 1980 issue to Biot on his 75th birthday.

The Silver Medal in Speech Communications is given to Kenneth N. Stevens "for his contributions to our understanding of the production, acoustic-phonetic properties, and the perception of speech and how we may join speech and technology in ways useful to man."

Stevens remained at MIT after obtaining his doctorate in electrical engineering in 1952. He is now head of the Speech Group in the Research Laboratory of Electronics, and since 1976 he

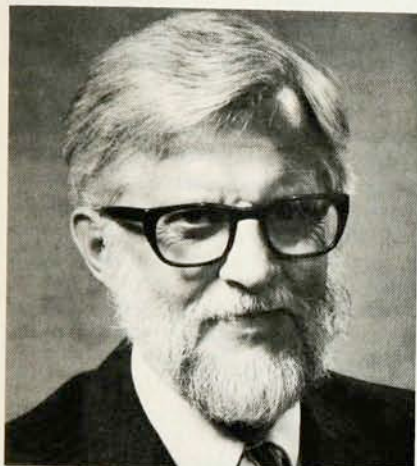
has been Clarence Joseph Lebel Professor of Electrical Engineering.

He has done pioneering research in the areas of speech production, analysis, synthesis, perception and recognition. A major early contribution (with Arthur House) was the development of a quantitative description of vowel articulation and the resulting acoustic output. He followed this work with studies of the perturbations to vowel articulation by consonantal context, and with acoustic analyses of English fricatives; these early papers are considered classics in the field. More recently, Stevens has proposed the view that speech has a quantal nature that is inherent in the way it is produced as well as in the way it is perceived. He has worked with Morris Halle and others to refine a universal phonetic framework, and much of his current theoretical work concerns the extent to which perceptual invariance exists in this realm. Stevens has also trained numerous speech researchers and supervised more than 70 graduate students, including James Flanagan, Hiruya Fujisaki, Doug Hogan, Larry Rabiner and Victor Zue. He has also found time to serve the Society in many roles—for example, as its President and Vice-President and on the Executive Council.

The Silver Medal in Theoretical and Applied Acoustics is awarded to Eugen

SKUDRZYK





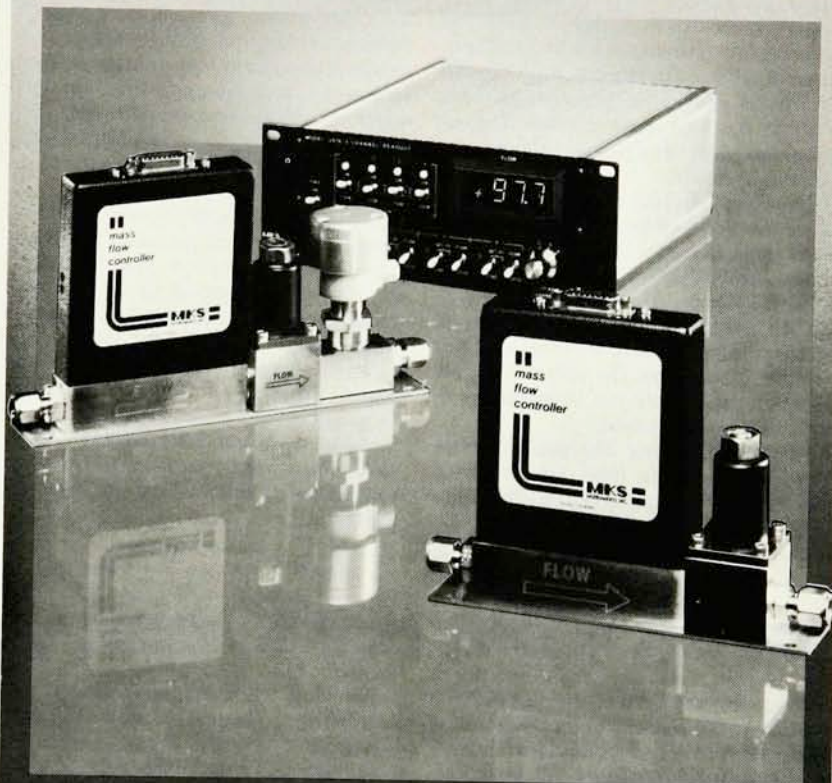
STEVENS

J. Skudrzyk "for his extensive contributions to the advancement of acoustics through his tireless multifaceted activities as author, researcher, and teacher."

Skudrzyk received his PhD from the University of Berlin in 1939, and stayed on to do graduate work under Erwin Meyer at the Heinrich Hertz Institute for Research in Electrical and Mechanical Vibrations in Berlin. From 1945 to 1947 he worked for the British Admiralty at Peizerhaken, Germany, in 1947 he began teaching at the Technical University of Vienna, and in 1955 he came to the Applied Research Laboratory and the Physics Department at Pennsylvania State University.

His earlier research involved audiology, room acoustics and musical acoustics. This work included the study of the influence of wall impedance on hearing in rooms, the quality of distance hearing in rooms, speech recognition, the secret of Stradivari's violins, and the influence of transients on the quality of music and sound transmission. Skudrzyk was responsible for the acoustical design, including developing the absorbents used in their construction, for the four Viennese "town halls," which are among the largest concert halls in Europe. For many years he was part of a team, headed by Meyer, that worked on the design and testing of underwater sound absorbers.

Advanced Interconnect Technology Presents Lots of Problems.



Accurate Mass Flow Control Doesn't Have To Be One of Them.

The low vapor pressure source gases you may be using with new interconnect techniques are easily handled by our new Model 1259 and 2259 Mass Flow Controllers. That's because our design results in a very low pressure drop from inlet to outlet. This reduces condensation, and resultant clogging. Also to reduce condensation, you can easily close-couple filters upstream, or shut-off valves if you wish. Close-coupling means modularity without adding fittings, reducing the chance of leaks.

To further insure that your gas system is sealed no matter what gas you're using, you can choose your O-ring material. Viton, Neoprene, Buna-N and Kalrez/Teflon are available.

One last thing. Performance. Your new mass flow controller from MKS is controlling at 98% of setpoint within 4 seconds. And it's accurate to 0.8% of full scale. The fastest, most accurate mass flow controller made.

Call us today. We're at 617-272-9255. Or write MKS, 34 Third Avenue, Burlington, MA 01803.

We'd like to help you reduce the mass flow problems that come with advanced interconnect techniques.

MKS
INSTRUMENTS, INC.



In the US he became more involved with hydroacoustics, underwater sound propagation, structural vibration and sound radiation. This work led to publication in the *Journal of the Acoustical Society of the classic paper "The Physics of Flow Noise."* A general theorem he developed on the response of complex structures to forced excitation was described in another JASA paper, "The Mean Value Theorem for Complex Vibrators." He is also the author of three books—*Die Grundlagen der Akustik, Vibrations and Sound Radiation of Simple and Complex Vibratory Systems, and Foundation of Acoustics, Volume I—Basic Mathematics and Acoustics.*

The Trent-Crede Medal is given to recognize outstanding contributions to the science of mechanical vibration and shock. Since 1969 only six others have won this honor; the ASA cited Eric E. Ungar "for his important contributions to our understanding of vibrations in complex structures, the effects of structural damping, and the propagation of structure-borne sound."

After completing his ScD at New York University in 1957, Ungar joined the staff at Bolt Beranek and Newman Inc. in Cambridge, Massachusetts. He has been a leader of the applied physics

department there and is now Principal Engineer, directing corporate training programs and coordinating the dynamics and structural analysis programs in two divisions.

His combined interest in mechanical engineering and the physics of acoustics has been fruitful. He helped to describe the structural damping induced by viscoelastic coatings; he demonstrated the importance of damping by "air-pumping" in the spaces between structural components; he developed the statistical energy analysis technique, and, by applying it to aerospace, building and machinery vibrational problems, he was able to solve problems that had been insoluble using boundary-value techniques.

He has contributed to the scientific community by continuing to teach and guide students at New York University. He has also served as an editor for the *Journal of the Acoustical Society of America*, the *Journal of Sound and Vibration* and the *Shock and Vibration Digest*; he revised and translated, from German, Cremer and Heckl's *Structure-Borne Sound*; and he has been a vital contributor to several of the main reference works on vibration and noise control.



PRIMAKOFF

picture are now classics.

During World War II, Primakoff worked at the Columbia University Division of War Research on submarine detection by sonar. In 1946, after a year at New York University, he went to Washington University in St. Louis as an assistant professor. There his research ranged from cosmic rays to tensor forces to the properties of solid He^3 . At Washington University, he published his paper on "The Photoproduction of Neutral Mesons in Nuclear Electric Fields and the Mean Life of the Neutral Meson," which first described the process later known as the Primakoff effect and ultimately led to precise measurement of the extremely short mean life of the neutral pion. Also, he and Eugene Feenberg were the first to suggest a possible collapsed state of nuclei. In the 1950's, Primakoff began to make the weak interaction the focus of his intellectual energies.

In 1960 he came to the University of Pennsylvania as the first Donner Professor of Physics. He continued to work on the weak interaction, in particular, on nuclear and particle phenomena that underlie the interaction. He became one of the world's leading authorities on muon capture, double beta decay, and the interaction of neutrinos with nuclei. He was always interested in fundamental symmetries and their breaking, and at the time of his death he was working, with Alfred K. Mann, on the possible relationship of parity violation in beta decay and the left-handed asymmetry of proteins.

Primakoff was noted as a teacher of physics to his colleagues as well as to his students. He had almost total recall and, with his wide interests and deep knowledge, was a living encyclopedia of physics. His lectures were an intellectual delight, interlaced with wit and apt analogies. To all who sought it he gave freely of his knowledge and of the time necessary to convey it clearly and fully. Unassuming and never in a hurry, he was always

New York Academy presents awards

Among the winners of annual awards given by the New York Academy of Sciences was Frank Press, President of the National Academy of Sciences. Press won the NYAS Presidential Award "in recognition of his accomplishments in the cause of science." Irwin Shapiro (director, Smithsonian Astrophysical Observatory) was given the Physical and Mathematical Sciences Award "in recognition of his studies which constituted the strongest experimental evidence for the validity of Einstein's theory of relativity." Riccardo Giacconi (director, Space Telescope Institute) was honored with the A. Cressy Morrison Award "for his

pioneering work in the field of x-ray astronomy." Bruce Murray (Caltech) was given the Boris Pregel Award for "his contributions to the field of planetary sciences and his outstanding leadership as Director of the Jet Propulsion Laboratory." Joel Levine (NASA Langley Research Center) received the Gregory and Freda Halpern Award for "his outstanding contributions to the photochemistry of atmosphere." Danielle Tanner, a graduate student working in nuclear physics at the Cyclotron Institute of Texas A&M University, won the Minoru and Ethel Tsutsui Distinguished Graduate Research Award in Science.

obituaries

Henry Primakoff

Henry Primakoff, Donner Professor of Physics at the University of Pennsylvania, died of cancer at his home on 25 July 1983, having continued to teach, to investigate, and to discuss physics until the very end of his life.

Primakoff was born in Odessa, Russia, in 1914 and came to New York in 1923. He did his undergraduate work

at Columbia and his graduate work at Princeton and New York University, where he completed his PhD. He taught in New York, first at the Polytechnic Institute in Brooklyn, and then at Queens College. Together with Theodore D. Holstein, he developed the theory of spin waves during this period. Both the physical picture that emerged from their work and the theoretical techniques they used to construct the