

we hear that

Franklin Institute honors seven physicists with 1987 awards

In May the Franklin Institute presented its 1987 awards.

Gerd Binnig and Heinrich Rohrer (both of the IBM Zurich Research Laboratory, Switzerland) received Elliott Cresson Medals "for their successful development of the ultrahigh-resolving-power scanning tunneling microscope capable of resolving atomic structure." Binnig received his diploma (1973) and PhD (1978) in physics from J. W. Goethe University (Frankfurt am Main, FRG). He joined IBM in 1978, becoming a group leader in 1984. Rohrer received his diploma (1955) and his PhD (1960) in physics from the Swiss Institute of Technology. In 1963 he joined IBM, becoming a group leader in 1974 and a section manager in 1984.

An early scanning instrument developed in 1972 by Russell Young, John Ward and Fred Scire at the National Bureau of Standards used a field emission source to achieve a vertical resolving power of 30 angstroms and a lateral resolving power of 4000 angstroms. At the end of 1978 Binnig and Rohrer began their program to develop a scanning tunneling microscope; their first instrument operated in 1981 with a vertical resolving power of 0.3 angstroms and a lateral resolving power of



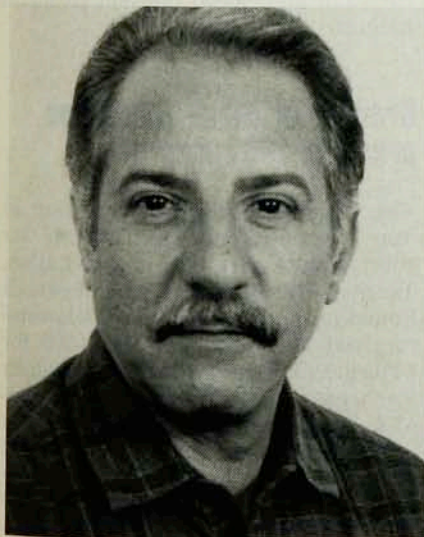
BINNIG AND ROHRER

about 10 angstroms. Present instruments achieve vertical and lateral resolutions better than 0.05 angstroms and 2 angstroms, respectively. (See *PHYSICS TODAY*, August 1986, page 26, and January 1987, page 17). They received the 1986 Nobel Prize in Physics for this work.

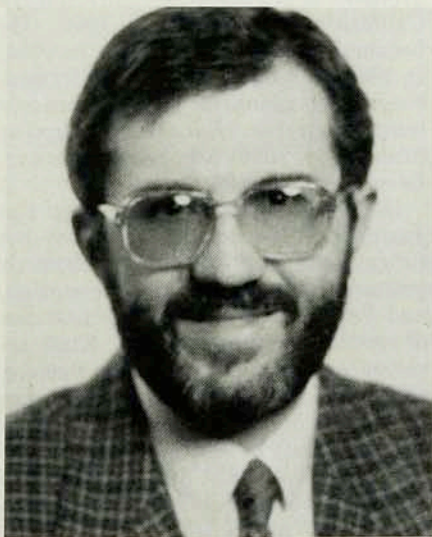
Rodolfo Bonifacio (University of Milan, Italy) and Luigi A. Lugiato (Polytechnic Institute of Torino, Italy) received Albert A. Michelson Medals "for

their theoretical studies of optical bistability and, in particular, for advancing an exact analytic understanding of all of the main principles that control the operation of the optical transistor and its instabilities." Both received their doctoral degrees in physics from the University of Milan, Bonifacio in 1940 and Lugiato in 1944. They are currently full professors of physics at their respective institutions. Bonifacio and Lugiato developed the first analyti-

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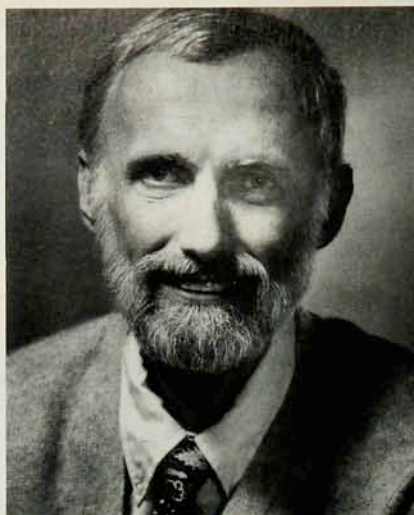
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cal theory of optical bistability that took into account the effects of light propagation through the nonlinear medium, of atomic saturation, and of the frequency mismatch between the incident light and the atomic resonance of the medium. In addition, they predicted the existence of spontaneous instabilities, leading to self-pulsing, in optically bistable systems—a prediction that led to a widespread resurgence in the subject of laser and optical instabilities.

William A. Nierenberg (Scripps Institution of Oceanography, La Jolla, California) received the Delmer S. Fahrney Medal "for his leadership in science administration, research and education, especially his major contributions to science in building and directing scientific institutions, and for the formulation and execution of national policies in science and technology." After receiving his PhD from Columbia University in 1947, Nierenberg taught physics at Columbia (1947-48) and at the University of Michigan (1948-50) before becoming an associate professor of physics at the University of California at Berkeley in 1950. He became a full professor there in 1954; in 1965 he became director of Scripps, overseeing many of the institution's major programs. Nierenberg retired as director in 1986 (see PHYSICS TODAY, December, page 91).

Dennis H. Klatt (MIT) received the John Price Wetherill Medal "for his fundamental contributions to research on speech production and perception, and for his practical implementations of text-to-speech synthesis." Klatt received his BS in electrical engineering (1960) and his MS (1961) from Purdue University, and his PhD (1964) from the University of Michigan. In 1965 he became an assistant professor in electrical engineering at MIT. He became a research associate in 1969 and a



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senior research scientist in 1978. He served as editor of the speech section of the *Journal of the Acoustical Society of America* from 1975 to 1979. In addition to developing DECTALK, a software system that turns text into speech using an extensive dictionary and a sophisticated set of pronunciation rules, Klatt has studied the sound processing systems of the human auditory and central nervous systems.

Joseph LeConte Smith Jr (MIT) received the Edward Longstreth Medal "for his contributions to the application of cryogenic techniques to rotating electrical machinery." Smith received his BME (1952) and MS (1954) from the Georgia Institute of Technology, and his ScD (1959) from MIT. After serving in the US Army Signal Corps and teaching at Georgia Tech, he went to MIT, where he has been a professor of mechanical engineering since 1969. Smith holds ten US patents on applications of cryogenic cooling in rotating electrical machinery, and he has studied such cryogenic phenomena as the effects of high-speed rotation on liquid helium.

Gravity Research Foundation presents 1987 awards

The Gravity Research Foundation in May presented its 1987 awards for short essays on topics in gravitation. Tanmay Vachaspati (Bartol Research Foundation, University of Delaware) received the first prize of \$1500 for "The gravity of cosmic loops," in which Vachaspati shows that the gravitational field of a looped cosmic string can repel particles. A. Krolak and Bernard F. Schutz (both of University College Cardiff, Wales) received the second prize of \$500 for "Coalescing binaries—