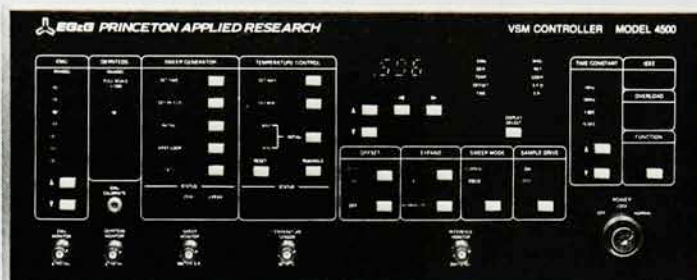


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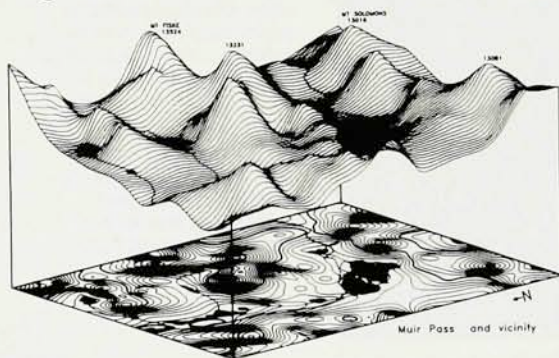


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the faculty in 1953. He came to Fermilab in 1977.

OSA AWARDS GIVEN FOR OUTSTANDING WORK IN OPTICS

The Optical Society of America each year recognizes individuals who have made noteworthy contributions to optics. The following people won awards in 1989 and 1990.

The 1990 Frederic Ives Medal, OSA's oldest and most prestigious award, will go to Joseph W. Goodman, a professor of electrical engineering at Stanford University, "for his outstanding technical contributions to the field of coherent optics and for his equally important and continuing contributions to modern optics education and to scientific communication." Goodman specializes in optical signal and image processing and has also worked in holography, theory and applications of laser speckle, design of novel imaging systems, and optical interconnections and switching.

Goodman received his PhD in electrical engineering from Stanford University in 1963. Shortly thereafter he joined the faculty as a research associate, and in 1972 he became a professor of electrical engineering. In 1988 he became department chair and the William E. Ayer Professor of Electrical Engineering.

The 1989 Ives Medal recipient was C. Kumar N. Patel, executive director of research, materials science, engineering and academic affairs at AT&T Bell Laboratories in Murray Hill, New Jersey. Patel was awarded the medal "in recognition of his illustrious career in optics and materials sciences and his exemplary service in scientific management." In 1964 Patel invented the carbon dioxide laser, and in the late 1960s he and his colleagues invented the spin-flip Raman laser. Recently he applied an optoacoustic method that he had developed in the 1970s to measure small optical absorptions in liquids, solids, thin films and powders.

Patel earned his PhD in electrical engineering from Stanford University in 1961, after which he joined the technical staff at Bell Labs. He has held a number of research management positions there (see *PHYSICS TODAY*, March 1988, page 53). Patel assumed his current position in 1987.

Samuel L. McCall, also of AT&T Bell Labs in Murray Hill, is the 1990 winner of the Max Born Award, which recognizes achievements in physical optics. McCall is cited for



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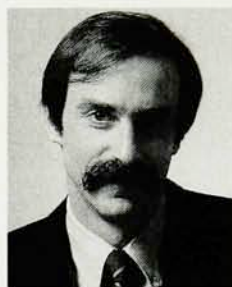
Thomas I. Harris



P. Hariharan



Andrew M. Weiner



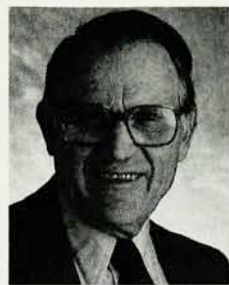
David J. Wineland



Ugo Fano



Jean M. Bennett



Erik W. Anthon



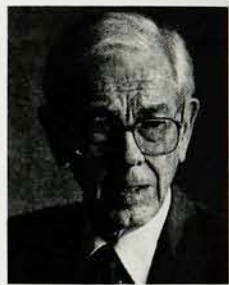
Joel Pokorny



Vivianne C. Smith



Thomas G. Giallorenzi



Stewart E. Miller



Rogers H. Stolen



Daniel Grischkowsky



Kenneth M. Baird

"his pioneering theoretical and experimental contributions to self-induced transparency and optical bistability." These discoveries have led to developments in optical signaling and information processing.

McCall received his PhD in physics from the University of California, Berkeley, in 1968. Since then he has been a member of the technical staff at Bell Labs.

The recipient of the 1989 Max Born Award was Dietrich Marcuse of Bell Labs in Holmdel, New Jersey. Marcuse was recognized for his "outstanding contributions in developing the theoretical framework for light propagation in dielectric waveguides, com-

plemented by his textbooks," which have had a significant impact on education and training in optical science and engineering, according to the award citation. Marcuse has done research in fiberoptic communications, including work on light propagation through systems of periodic gas lenses and through optical fibers.

Marcuse received his doctoral degree from the Technical University in Karlsruhe, West Germany, in 1962. He has been a member of the technical staff at Bell Labs since 1957.

Thomas I. Harris, president of Optical Research Associates in Pasadena, California, is this year's recipient of the 1990 Joseph Fraunhofer Award

for distinguished contributions to optical engineering. OSA recognized Harris "for his fundamental contributions to the development of automated optical design tools," in particular, his work in creating computer software for optical design. Among his most noted achievements was the development of the CODE V computer program, which facilitates lens design and analysis.

Harris worked at the Bell and Howell Company in Illinois and California from 1953 to 1963. During that time he received a master's degree in physics and optics from the University of Rochester. He left Bell and Howell to found Optical Research Associates in 1963.

The 1989 Fraunhofer Award winner was Parameswaran Hariharan of the Commonwealth Scientific and Industrial Research Organization's applied physics division in Lindfield, Australia. He was cited for "his pioneering scientific and engineering contributions to interferometry, laser speckle and holography." Hariharan has developed several new types of interferometers, as well as techniques for producing multicolor holographic

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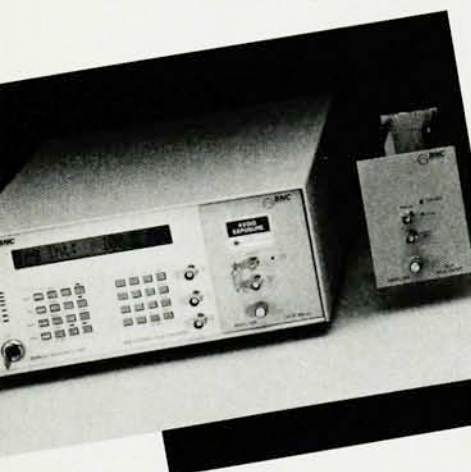
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Hariharan earned his PhD in physics from the University of Kerala in India in 1958. He has been with CSIRO since 1973.

Andrew M. Weiner, a member of the technical staff at Bell Communications Research, is the winner of the 1990 Adolph Lomb Medal, presented biennially for noteworthy contributions to optics by individuals under the age of 30. Weiner received the medal for his "pioneering contributions to the technique of femtosecond optical pulse shaping and its application to nonlinear optics, ultrafast spectroscopy and optical communications." In 1984 Weiner and colleagues at MIT generated optical pulses as short as 16 femtoseconds, at that time the shortest ever achieved. He is also inventor of a means of optical pulse shaping using Fourier synthesis techniques.

Weiner received his PhD in electrical engineering from MIT in 1984, after which he joined Bellcore's guided-wave and optoelectronics research group. In 1989 he became district manager of ultrafast optics and optical signal processing research.

The 1990 William F. Meggers Award for outstanding work in spectroscopy will be given to David J. Wineland, a physicist at the National Institute of Standards and Technology. Wineland is recognized for "his conception of novel, high-sensitivity, high-accuracy spectroscopic techniques, their realization and their application to fundamental measurements." Wineland's work exploits the technique of laser cooling of ions, which he helped develop in the 1970s.

Wineland received his PhD in physics from Harvard University in 1970. In 1975, following postdoctoral research at the University of Washington, he joined the National Institute of Standards and Technology (at that time the National Bureau of Standards), where he is now project leader for the ion storage group.

Ugo Fano, professor emeritus of physics at the University of Chicago, received the Meggers Award last year for "his novel analyses of spectroscopic phenomena in the framework of collision dynamics." Fano is perhaps best known for developing the Fano profile formula, which has been used to parametrize autoionizing resonances and electron scattering resonances. In 1969 he predicted the mechanism (now known as the Fano effect) by which spin-orbit interactions produce polarized photoelectrons resulting from unpolarized

light.

Fano received his doctorate from the University of Turin, Italy, in 1934 and did postdoctoral research under Enrico Fermi at the University of Rome. He worked for the National Bureau of Standards from 1946 to 1966, when he joined the faculty of the University of Chicago.

Jean M. Bennett of the Naval Weapons Center in China Lake, California, is this year's recipient of the David Richardson Medal, which recognizes contributions to applied optics. Bennett was chosen for "her sustained contributions to the studies of optical surfaces that have provided the optics community with a more thorough understanding of optical surface phenomenology and a meticulous methodology for surface characterization." Bennett's work has included measurements of the optical constants of materials, light scattering measurements and theory, and the development of techniques for measuring surface roughness.

Bennett received her PhD in physics from Pennsylvania State University in 1955. She has been at the Naval Weapons Center since 1956, where she is currently a senior research scientist in the physics division of the research department.

Last year Erik W. Anthon, a senior research scientist with Optical Coating Laboratory in Santa Rosa, California, received the Richardson Medal for his designs of measuring instrumentation, including photometers, scatterometers and interferometers, which have "significantly advanced the state of the art of optical instrumentation." Among the instruments he has developed is the large optics photometer, which has an accuracy of $\pm 0.05\%$ and has set industry standards for photometric measurements.

Anthon received his MS in mechanical engineering from the Technical University in Copenhagen in 1944. He has been with Optical Coating Laboratory since 1969.

The Edgar D. Tillyer Award is given biennially for distinguished work in vision. This year the award is shared by Joel Pokorny and Vivianne C. Smith, both professors of ophthalmology at the University of Chicago, who are being honored for "their contributions to basic and applied vision research, particularly in the areas of cone fundamentals, defective color vision and flicker." Pokorny and Smith, who have worked as a research team for the past 25 years, have investigated numerous areas of visual science, including the spectral sensitivity of photopigments in both normal and anomalous trichromatic



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human observers.

Both Smith and Pokorny received their doctorates in psychology from Columbia University in 1967 and then joined the University of Chicago faculty.

Thomas G. Giallorenzi, director of the optical sciences division at the Naval Research Laboratory, is the recipient of the 1990 John Tyndall Award, given jointly by OSA and the Lasers and Electro-Optics Society of the Institute of Electrical and Electronics Engineers for contributions to fiberoptic technology. Giallorenzi is recognized "for significant technical, management and professional contributions to the development and applications of fiber optics and optical fiber sensor technology." As head of the Naval Research Lab's guided-wave section, he initiated most of the Navy's early programs in integrated optics and fiber optics, and his research has led to the development of numerous fiberoptic devices.

Giallorenzi earned his PhD in applied physics from Cornell University in 1969. He joined the Naval Research Lab in 1970 and assumed his present position in 1978.

The late Stewart E. Miller received the Tyndall Award last year for his "foresight, dedication, technical contributions and pioneering leadership in building the broad foundations for today's fiberoptic telecommunications systems." Miller's work led to the placement of several optical waveguide functions on a single substrate, for which he coined the phrase "integrated optics."

Miller received his master's degree in electrical engineering from MIT in 1941. He joined Bell Labs in 1940 and was director of lightwave telecommunications research there from 1958 to 1983. He was a consultant with Bell Communications Research from 1983 until his death in March.

The R. W. Wood Prize recognizes an outstanding discovery or invention in optics. In 1990 the Wood Prize will be given to Rogers H. Stolen of Bell Labs in Holmdel, New Jersey, for "contributions to polarization control and nonlinear optics in fibers." Stolen's invention of polarization-preserving fibers based on anisotropic internal stress is considered by those in the field to be one of the most significant advances in nonlinear optics in fibers.

Stolen received his PhD in physics from the University of California, Berkeley, in 1965. He has been a member of the technical staff at Bell Labs since 1966.

Last year the Wood Prize went to Daniel R. Grischkowsky, a researcher at the IBM Thomas J. Watson Re-

search Center in Yorktown Heights, New York, for "his distinguished contributions to the field of optical pulse propagation," in particular, his use of optical fibers for generating ultrashort pulses of light. Grischkowsky's work in optical pulse compression led to a new generation of ultrashort-pulse laser instruments. He has also worked on coherent transient spectroscopy and optical pulse propagation in near-resonant vapors and optical fibers.

Grischkowsky received his PhD in physics from Columbia University in 1968. He joined IBM in 1969.

In 1989 Kenneth M. Baird, the former head of an optical physics research group at the National Research Council of Canada, was awarded the C. E. K. Mees Medal, given biennially to an individual who exemplifies the idea that optics transcends interdisciplinary and international boundaries. OSA cited Baird for "his contributions to standards research and optical metrology, particularly those measurements that led to a new definition of the international meter," and also for serving as president of OSA and of the International Commission for Optics. In the early 1970s Baird and his colleagues, in collaboration with researchers from the National Bureau of Standards, used electronic frequency techniques in the optical region to directly measure the frequency of visible light (see *PHYSICS TODAY*, January 1983, page 52).

Baird received his PhD in physics from Bristol University in England in 1953. He was with the National Research Council from 1943 to 1948 and 1950 to 1982.

At the 1990 Conference on Lasers and Electro-Optics, OSA will present the 1990 Charles Hard Townes Award to Herbert Walther of the Max Planck Institute for Quantum Optics (see page 61).

OBITUARIES

Willem Elenbaas

Willem Elenbaas died in February of last year in Eindhoven, the Netherlands, at the age of 82. His career in applied physics began at the University of Utrecht, where in 1930 he completed his thesis research on the intensities of the spectral lines of helium. Elenbaas retired in 1968 as head of the development department of the Philips Lighting Company.

Elenbaas's work included research in magnetism and the study of the physics of electrical-discharge light sources using both low-pressure-non-

equilibrium and high-pressure mercury discharges. His career was at the interface between science and technology. He was not only enormously productive in both but also effective in bringing the results of scientific research into practical application in commercial lamps.

His series of articles and book on the physics of high-pressure mercury-vapor discharge brought science to bear on the development of discharge lamps, which until then had been done empirically. *The High Pressure Mercury Vapour Discharge* (1951) not only served as a textbook for a generation of lamp-development engineers but also set the standard for later research into the complex physics of high-pressure sodium and metal-halide discharges. Elenbaas's name is also associated with the Elenbaas-Heller equation, used to calculate the radial temperature profile in an arc, assuming that the temperatures of the electrons are locally equal to the temperatures of the atoms, and that the arc is dissipating power both by radiation and by thermal conduction.

Since Elenbaas's retirement from Philips, the Dr. W. Elenbaas Award has been presented quadrennially in his name for outstanding research in the area of light and light sources. Above all, Elenbaas was a gentleman and a dedicated scientist. I was proud to have known him as a mentor and a friend, and I will miss him.

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James M. Gordon

The physics community lost one of its most promising and vital young experimenters when James Michael Gordon, aged 31, died of cancer on 13 September 1988 in Minneapolis. Gordon was a creative condensed-matter physicist who had the rare ability to approach complicated problems in a clear and simple way.

Gordon was born in Minneapolis, attended Beloit College in Wisconsin, received an MS in applied solid-state physics from Yale University and in 1984 completed his doctoral thesis at Harvard University in experimental low-temperature physics. In January 1985, after spending three months at the Oersted Institute at the University of Copenhagen, he joined the condensed-matter physics group at the University of Minnesota, where he remained until his death.

Gordon was a productive experimenter with deep insight into the theory of electron transport in disordered metals and the related field of