namics division this month in Irvine, California, the Fluid Dynamics Prize will be presented to **Harry L. Swinney**, who was chosen for "his definitive characterizing [of] the onset of turbulence, his pioneering investigations of chaotic advection and fluid dynamics in rotating flows, and his discoveries and insights concerning pattern formation in chemical dynamics using novel experimental devices." The award citation also notes Swinney's efforts "to bridge the gap between nonlinear dynamical systems theory and laboratory investigations of flow phenomena." Swinney holds the Sid Richardson Foundation Regents Chair in the physics department at the University of Texas, Austin.

Also at the fluid dynamics meeting, **Katepalli R. Sreenivasan**, Harold W. Cheel Professor of Mechanical Engineering, Physics and Applied Physics at Yale University, will receive the Otto Laporte Award. APS is recognizing Sreenivasan for his "pivotal experimental studies on the statistical geometry of turbulent flows, for fundamental work on the multifractal description of turbulence and for services to the fluid dynamics community."

Joseph A. Johnson III will be presented with the Visiting Minority Lectureship Award at the fluid dynamics meeting. Johnson, who is Distinguished Professor of Science and Engineering at Florida A&M University and director of the NASA–FAMU Research Center for Nonlinear and Nonequilibrium Aeroscience, is being cited for his "outstanding research achievements in investigation of turbulent and nonequilibrium fluids and for contributions to the development of minority scientists and engineers."

At the APS division of plasma physics meeting, to be held this month in Louisville, Kentucky, the James Clerk Maxwell Prize will be presented to **Francis F. Chen**, professor emeritus and research professor of electrical engineering at the University of California, Los Angeles. APS is recognizing Chen for his "fundamental contributions to plasma physics in such diverse areas as magnetic confinement devices, laser–plasma interactions, novel plasma-based accelerators and sources for plasma processing." Chen is also recognized for his work on electrostatic probes, low-frequency fluctuations in magnetized plasma, parametric instabilities in laser–plasma interactions, and helicon plasma sources, and for his textbook *Introduction to Plasma Physics and Controlled Fusion*.

Also to be honored at the plasma physics meeting is a group of researchers from Lawrence Livermore National Laboratory and the University of Rochester. **S. Gail Glendinning, Steven W. Haan, Joseph D. Kilkenny, James P. Knauer, David H. Munro, Bruce A. Remington, Charles P. Verdon, Russell J. Wallace** and **Steven V. Weber** will receive the Award for Excellence in Plasma Physics Research for their "outstanding theoretical work, computational design and analysis and experimental work leading to quantitative and predictive understanding of the Rayleigh–Taylor instability in high-energy density plasmas." Glendinning, Haan, Kilkenny, Munro, Remington, Wallace and Weber are at Lawrence Livermore. Knauer and Verdon are with Rochester's laboratory for laser energetics.

The Simon Ramo Award, which recognizes outstanding doctoral thesis research in plasma physics, will also be given at the plasma physics meeting. This year's recipient is **Christopher D. Decker**, who was chosen for "advancing the understanding and predictive computer modeling of the interaction of short-pulse, high-intensity laser light with plasma, including the effects of Raman forward scattering, nonlinear group velocity, relativistic self-focusing and nonlinear collisional absorption at ultrahigh intensity." Decker received his doctorate under Warren B. Mori of the University of California, Los Angeles, and is now a postdoctoral fellow at Lawrence Livermore National Laboratory.

OSA Announces Recipients of Several Awards

The Optical Society of America recently announced the winners of several of its awards. This year's Edwin Land Prize, which recognizes scientific and technological creativity in industry, public policy or education, goes to **Ichiro Endo** and **John Vaught** for "their independent inventions of bubble-jet and thermal ink jet technology, which created a new $3 billion printer industry and enabled low-cost and color printers to be attached to every personal computer." Endo is managing director and chief executive of Canon's office imaging products operations, in Atsugi, Japan. Vaught, formerly with Hewlett–Packard Laboratories, now operates his own firm, Vaught Concepts, in Wellington, Nevada.

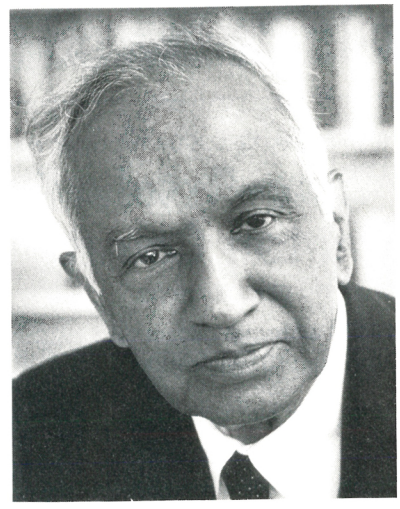
Joseph W. Goodman, chairman of the electrical engineering department at Stanford University, is this year's recipient of the Esther Hoff-

man Beller Medal from OSA. In the words of the award citation, "Goodman and his approximately 50 doctoral students have made major contributions in numerous areas of optical information processing, including synthetic aperture optics, volume holography, optical matrix processors, space-variant optical systems, speckle theory, optical interconnects and switching, integrated optics, digital optical computing and digital image processing."

There are six recipients of Engineering Excellence Awards from OSA: **Francisco J. Duarte, John D. Gonglewski, Gary Guenther, Melvyn H. Kreitzer, Frank Luecke** and **David G. Voelz**. Duarte, a business leader at Eastman Kodak in Rochester, New York, is recognized for "the invention of an electro-optic coherent interferometer for direct applications to imaging diagnostics of transparent surfaces, such as photographic film and film substrates." Gonglewski, a research optical physicist at the US Air Force Phillips Laboratory in New Mexico, is cited for "exceptionally creative optical engineering that produced the first high-resolution images of satellites passing over optical space surveillance sites during the daytime." Guenther is a general physical scientist at the National Oceanic and Atmospheric Administration; OSA recognizes him for "significant contributions to airborne lidar bathymetry and in particular development of the depth extraction algorithm." Kreitzer, an optical designer for Opcon Associates in Cincinnati, Ohio, is recognized for "contributions to the design of numerous photographic lenses and projection displays and for advancing the state of the art in these fields." Luecke, a vice president and founder of New Focus of Santa Clara, California, is cited for "achieving elegance in products that exemplify sound integration of mechanical, optical and electronic elements." Voelz, the active imaging program manager at the US Air Force Phillips Laboratory, is credited with "the development of the first optical synthetic aperture space object imaging system."

OBITUARIES

Subrahmanyan Chandrasekhar



SUBRAHMANYAN CHANDRASEKHAR

Subrahmanyan Chandrasekhar, who died on 21 August, appeared on the physics scene in 1929 with two papers written while an 18-year-old student at Presidency College, Madras, India. Chandrasekhar (Chandra to everyone) sent the first paper, "The Compton Scattering and the New Statistics," to Ralph H. Fowler of Cambridge University's Trinity College. Fowler was so pleased with it that he offered to communicate it to the Royal Society for publication in its *Proceedings*; the second paper appeared in *Philosophical Magazine*.

Chandra was born on 19 October 1910. He graduated from Presidency College with a bachelor's degree in theoretical physics. While there he won an Indian government scholarship to Trinity College. He left India by ship on 31 July 1930.

As is well known, on his two-and-a-half week journey to England Chandra occupied himself by reformulating the statistical mechanics of the degenerate electron gas, recognizing that the higher quantum states are relativistic under the conditions in white dwarf stars. Contrary to his expectations he found that the electron pressure is limited to something of the order of $\hbar c N^{4/3}$, where N is the number density. The equivalent temperature is $kT \sim \hbar c N^{1/3}$. On the other hand, supporting a self-gravitating sphere of mass m against contraction requires a mean equivalent temperature of the order GmM/R, where M is the ionic mass associated with each electron. Because $N \sim m/MR^3$ it follows that m must not exceed the order of $(\hbar c/G)^{3/2}/M^2$, which turns out to be about 1.4 solar masses, now known as the "Chandrasekhar mass limit."

Later in the 1930s he made another important discovery at Cambridge: Fowler, Edward A. Milne and others were not able to grasp the real-