2005 OSA Awards

OSA is proud to announce the winners of its 2005 awards and medals. OSA has chosen to honor these distinguished individuals because they have exhibited dedication, ingenuity and perseverance in attaining the highest level of scientific achievement in their chosen fields. The OSA Board of Directors approved the awards at its meeting in February. Most of the awards will be presented at Frontiers in Optics, the 89th OSA Annual Meeting, in Tucson, Ariz., in October.

Overall Distinction In Optics

Frederic Ives Medal/Jarus W. Quinn Endowment
The highest award of the Society, the Ives Medal recognizes overall distinction in optics

*To **Theodor W. Hänsch** for seminal contributions and landmark advances in optical science and atomic physics, including narrow-band dye lasers, Doppler-free laser spectroscopy, laser cooling of atomic gases, precision spectroscopy of atomic hydrogen, frequency metrology with optical combs and new physics with cold atoms in optical lattices*

Theodor W. Hänsch received his Ph.D. from the University of Heidelberg, Germany, in 1969. In 1970, he came to the United States to work as a postdoctoral student with Arthur L. Schawlow at Stanford University. Two years later, he joined the Stanford physics faculty as an associate professor; he became a full professor in 1975. Since 1986, he has been a professor of physics at the Ludwig-Maxmilians-University in Munich and director at the Max-Planck-Institute for Quantum Optics in Garching, Germany.

His current research interests are focused on the quantum physics of ultracold atoms and the exploration of novel techniques for ultra-precise laser spectroscopy and optical frequency metrology. His early work includes the first narrowband tunable dye laser, the invention of commonly used techniques of Doppler-free spectroscopy, precise laser spectroscopy of the hydrogen atom for accurate measurements of fundamental constants and the first proposal for laser cooling of atomic gases.

Esther Hoffman Beller Medal
In recognition of outstanding contributions to optical science and engineering education

*To **Thomas K. Gaylord** for innovative teaching that has brought the latest research results alive for students for 30 years, and for his significant contributions to establishing Georgia Tech's optics and photonics programs*

Thomas K. Gaylord is the Julius Brown Chair and Regents' Professor of Electrical and Computer Engineering at the Georgia Institute of Technology. He received his Ph.D. from Rice University.

He is the author of some 350 technical publications and 25 patents in the areas of diffractive optics, optical interconnects, optoelectronics and semiconductor devices. Dr. Gaylord received the Curtis W. McGraw Research Award from the American Society for Engineering Education, the IEEE Graduate Teaching Award and the Georgia Tech Distinguished Professor Award. He is a Fellow of the OSA, the IEEE and the American Association for the Advancement of Science.

Dr. Gaylord has been a key contributor to the founding and development of the optics and photonics program at Georgia Tech. He is co-developer, with M. G. Moharam, of the rigorous coupled-wave analysis for the exact analysis of grating diffraction.

He has developed exact analogies between electromagnetic optics in dielectrics and electron wave optics in semiconductors.

Dr. Gaylord has also contributed to the development of holographic data storage, fiber gratings, semiconductor quantum optoelectronic devices, birefringence measurements, photonic crystals and chip-level optical interconnects.

Max Born Award
In recognition of contributions to physical optics

*To **Alexander E. Kaplan** for seminal contributions to nonlinear interface and optical bistability effects, hysteretic resonances of a single electron and physics of sub-femtosecond pulses*

Alexander E. Kaplan received his master's degree in physics from the Moscow Institute of Physics and Technology in 1961, and his Ph.D. in physics and math from the U.S.S.R. Academy of Sciences, Moscow, and Gorkii State University in 1967; he was a research staff member there until 1979. That year, he immigrated to the United States, where he started almost immediately as a research staff member at the Massachusetts Institute of Technology, Francis Bitter National Magnet Lab. In August 1982, he joined Purdue University as a professor with the Electrical and Computer Engineering School. In January 1987, he joined the faculty of Johns Hopkins University as a professor with the electrical and computer engineering department.

In 1996, Dr. Kaplan received the Alexander von Humboldt Award for Senior U.S. Scientists by the Alexander von Humboldt Foundation of Germany, and went on sabbatical leave at the Univerity of Ulm's quantum physics department. He has consulted for Bell Labs, Honeywell and others. He is an OSA Fellow.

Dr. Kaplan's research has been in physical and theoretical optics, especially nonlinear optics and quantum electronics. He made pioneering contributions to the fields of very-high order subharmonics generation, the self-bending effect, nonlinear interfaces and optical bistability, hysteretic and multi-photon resonances of a single trapped electron, light-induced non-reciprocity, soliton physics, X-ray nonlinear optics and the physics of sub-femtosecond to zepto-second pulses. His most recent efforts are in the X-ray transition radiation sources and shock-waves in laser-induced Coulomb explosions.

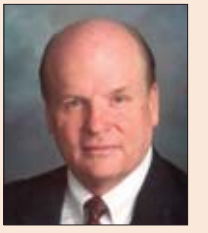
Joseph Fraunhofer Award/ Robert M. Burley Prize
In recognition of significant accomplishments in optical engineering

*To **G. Michael Morris** for innovation in the design, theory and application of diffractive and hybrid optical elements to solve a wide range of problems*

G. Michael Morris received his bachelor's degree in engineering physics from the University of Oklahoma, and his master's and Ph.D. in electrical engineering from the California Institute of Technology. From 1982 to 2001, Morris was a professor at the Institute of Optics. In 1989, he co-founded the Rochester Photonics Corporation (RPC). A decade later, RPC was acquired by Corning and functioned as a wholly owned subsidiary, where Dr. Morris served as CEO. In 2003, he founded Apollo Optical Systems, which develops novel lenses for the vision-care industry, and co-founded RPC Photonics, which develops optical components for the display and solid-state lighting industries.

Dr. Morris's research has spanned a wide variety of topics in statistical optics, optical information processing, automatic pattern recognition and diffractive and micro-optics technology. His current research and development interests include the design and fabrication of optical components, devices and systems that use diffractive and micro-optical elements. He holds 17 U.S. patents and has published more than 70 refereed journal articles, three book chapters and numerous conference proceedings. As a professor at the Institute of Optics, he supervised 22 doctoral and five master's dissertations.

Nick Holonyak Jr. Award
In recognition of significant contributions to optics based on semiconductor-based devices and optical materials, including basic science and technological applications



*To **Paul Daniel Dapkus** for seminal contributions to the development of metalorganic chemical vapor deposition and its application to quantum well laser devices*

Paul Daniel Dapkus received his bachelor's degree, master's degree and Ph.D. at the University of Illinois. He worked on LEDs at Bell Laboratories from 1970 to 1976, and on

electronic materials and photonics at Rockwell International from 1976 to 1982. Since 1982, he has been on the faculty of the University of Southern California, where he is the W. M. Keck Professor of Engineering.

Dr. Dapkus' research at Rockwell included leading the development of the MOCVD (metal organic chemical vapor deposition) process and applying it to demonstrate quantum well (QW) lasers in collaboration with Professor Nick Holonyak Jr.

He and his students at USC have since developed ultralow threshold QW lasers, strained layer 1.3 and 1.55 μm QW lasers, high efficiency vertical cavity surface emitting lasers and integrated QW photonic devices.

Dr. Dapkus is a member of the National Academy of Engineering, a Fellow of the OSA, IEEE, American Physical Society and the American Association for the Advancement of Science. He was awarded the IEEE David Sarnoff Award, the Engineering Achievement Award and Distinguished Lecturer of IEEE LEOS.

Edwin H. Land Medal
(cosponsored with IS&T)
In recognition of an individual who has demonstrated pioneering entrepreneurial creativity that has had major public impact

*To **Stephen A. Benton**, posthumously, for seminal research and innovation in three-dimensional imaging, including the famed rainbow hologram*

Stephen A. Benton received his undergraduate degree from the Massachusetts Institute of Technology in electrical engineering in 1963. He received his master's degree in 1964 and his Ph.D. in 1968, both from Harvard University.

Dr. Benton worked as a scientist at the Polaroid Research Laboratories, where he reported directly to Edwin Land. He investigated media for three-dimensional imaging, invented white-light-viewable holograms and developed additional applications of lasers in photography. While working at Polaroid, he became a visiting scientist at MIT, presenting courses in stereoscopic imaging techniques. In 1982, he joined the faculty of MIT as a founding member of the Media Lab, where he established a teaching and research program in three-dimensional imaging.

Dr. Benton founded and became director of the MIT Media Laboratory's Spatial Imaging Group, as well as director of the Center for Advanced Visual Studies. He was instrumental in establishing the Museum of Holography in New York, serving as a member of its board and as curator. When the Museum closed, he spearheaded its acquisition by the MIT Museum, where he was curator of the holography collection—the largest such collection in the world.

He was a Fellow and former vice president of the Society for Imaging Science & Technology; a Fellow and former director of OSA and SPIE; and a member of IEEE, the Society for Information Display and the Holographic Display Engineers & Artists Club of Japan. He published more than 55 papers and holds 18 patents. He died in November 2003.

OSA Leadership Award-New Focus/Bookham Prize
In recognition of an individual or group of optics professionals who has made a significant impact on the field of optics and/or made a significant contribution to society

*To **Ravindra A. Athale** for visionary leadership within the optics community through research contributions, innovations in teaching and ground-breaking technology programs that have brought together optoelectronics manufacturers and researchers*

Ravindra Athale received his bachelor's and master's degrees in physics from the University of Bombay and the Indian Institute of Technology, respectively, and his Ph.D. in electrical engineering from the University of California at San Diego in 1980. He worked as a research physicist at Naval Research Labs, as a senior principal staff member at BDM Corporation and as associate professor in the electrical and computer engineering department at George Mason University. Currently, he is a photonics program manager in the microsystems technology office in the Defense Advanced Research Projects Agency.

Dr. Athale's research has been in the area of optical information processing. Specific topics include numerical digital optical computing; analog optical signal and image processing; analog optical matrix processing and optical interconnects for high speed electronic systems. On the consumer side, he cofounded with Joe van der Gracht HoloSpex, Inc.—a company devoted to developing and marketing a novelty product based on far-field computer generated holography. HoloSpex aims to bring the beauty of optics to everybody regardless of age or education.

Ellis R. Lippincott Award
In recognition of contributions to vibrational spectroscopy (co-sponsored with the Coblentz Society and the Society for Applied Spectroscopy)

*To **Jaan Laane** for innovative use of vibrational spectroscopy to determine molecular structure and to unravel complex intramolecular dynamics*

Jaan Laane received his bachelor's degree in chemistry, with highest distinction, from the University of Illinois, Urbana, and his Ph.D. from the Massachusetts Institute of Technology in 1967; at MIT, he received the Kodak Award as the top graduate student in chemistry. He has been a professor of chemistry at Texas A&M University (TAMU) since 1968. He has received a number of awards, including the Alexander von Humboldt U.S. Senior Scientist Award and a TAMU teaching award. He holds an honorary doctorate from the University of Tartu, Estonia, and is a member of the Estonian Academy of Science.

Dr. Laane's research is concentrated on molecular spectroscopy, including infrared, Raman, jet-cooled fluorescence and ultraviolet-visible absorption methods. He has published more than 250 papers and two books, with an emphasis on experimentally determining potential energy surfaces for non-rigid molecules in ground and excited electronic states. He has organized and chaired several conferences and symposia and serves on a number of international scientific advisory boards. Since 1994, Dr. Laane has been editor of the *Journal of Molecular Structure*.

Adolph Lomb Medal
In recognition of noteworthy contributions made to optics before reaching the age of 35

*To **Marin Soljačić** for the discovery of novel soliton phenomena, and for seminal and innovative work in nonlinear and time-dependent photonic crystals*

Marin Soljačić received his undergraduate degrees in physics and in electrical engineering from the Massachusetts Institute of Technology in 1996, and a Ph.D. in physics from Princeton in 2000; his thesis topic was nonlinear optics. After graduating, he joined MIT's physics department as a Pappalardo Fellow, and is currently a principal research scientist. His main interests are in photonic crystals and nonlinear optics. He has co-authored more than 50 scientific articles, and is a co-inventor on four patents (10 more are pending).

Soljačić's main research interests are in nonlinear optics and photonic crystals. Notably, he pioneered the discoveries of so-called "necklace solitons"—the first stable self-trapped beams in (2+1)D Kerr media—and modulation instability of incoherent light. Moreover, he spearheaded the research on bistability in photonic crystal defects, which enables very low power ultrafast nonlinear optics phenomena in wavelength-size systems. Recently, he became interested in electromagnetically induced transparency in microcavities (which could enable nonlinear optics at single photon energy levels) and in time-dependent phenomena in photonic crystals (e.g., interaction of light with shock waves in photonic crystals).

C. E. K. Mees Medal
In recognition of interdisciplinary and international contributions

*To **Harrison H. Barrett** for outstanding contributions leading to widespread*

applications of optical imaging science in disciplines as diverse as medicine and astrophysics, including advances in gamma-ray imaging techniques in these and other fields

Harrison Barrett was educated at Virginia Polytechnic Institute, the Massachusetts Institute of Technology and Harvard. After working at the Raytheon Research Division, he joined the University of Arizona in 1974. He is Regents Professor of Optical Sciences, Radiology and Applied Mathematics, and he directs the Center for Gamma-ray Imaging. He is a fellow of several scientific societies and recipient of the Humboldt Prize, the IEEE Medical Imaging Scientist Award and the E. T. S. Walton Fellowship (Science Foundation Ireland). He has been acting director of the Optical Sciences Center and editor of the *Journal of the Optical Society of America A*.

Barrett's professional interests have included solid-state physics, ultrasonics, optical computing, interferometry, medical imaging, statistical decision theory and astronomy. His current medical research focuses on new detectors and imaging systems for molecular imaging, applications of parallel computers to tomography and objective assessment of image quality. His recent work in astronomy has related to wavefront sensing and adaptive optics. In a recent book he co-authored with Kyle Myers, Dr. Barrett expounds on his unifying belief that there really is a science of imaging.

William F. Meggers Award
In recognition of outstanding work in spectroscopy

*To **Daniel M. Neumark** for pioneering contributions to the molecular spectroscopy of transient species, including transition state spectroscopy by photo-detachment, the development of anion zero-electron-kinetic-energy spectroscopy and time-resolved photoelectron spectroscopy*

Daniel Neumark received his bachelor's degree in chemistry and physics and his master's in chemistry from Harvard University in 1977. He attended graduate school at the University of California, Berkeley, where he joined the research group of Yuan T. Lee.

He received his Ph.D. in physical chemistry in 1984, and then worked as postdoctoral researcher with Carl Lineberger at the University of Colorado, Boulder, from 1984 to 1986.

In 1986, he returned to Berkeley as a faculty member in the chemistry department, where he remains. He is a Fellow of the American Physical Society, the American Association for the Advancement of Science and the American Academy of Arts and Sciences.

Neumark's research interests focus on several areas in chemical dynamics and spectroscopy, including: 1) studies of reaction dynamics using transition-state spectroscopy, time-resolved photoelectron spectroscopy and state-resolved photodissociation experiments on stable molecules and reactive free radicals; 2) size-dependent spectroscopy and dynamics of clusters ranging from semiconductor clusters to He nanodroplets; and 3) the effects of clustering and solvation on fundamental chemical processes. These issues are addressed through a combination of novel negative ion and neutral beam experiments.

David Richardson Medal
In recognition of contributions to optical engineering, primarily in the commercial and industrial sector

*To **John R. Sandercock** for pioneering work in developing the multi-pass Tandem Fabry-Perot Spectrometer and for contributions to the Brillouin spectroscopy of surfaces, interfaces and thin films*

John Sandercock studied physics at Oxford University, obtaining a first class honors degree in 1964 and a Ph.D. in 1968. In 1969, he joined the research laboratory of RCA in Zürich, Switzerland, where he worked until 1987. That year he set up his own company, JRS Scientific Instruments, to develop products in the fields of interferometry and active vibration isolation.

Sandercock worked mainly on Brillouin scattering at RCA Laboratories. During this period, he developed the multipass tandem interferometer and successfully applied it to scattering from bulk and surface phonons and spinwaves in solid materials. To isolate the interferometer from building vibrations, he developed the first successful active vibration isolation system. His company, JRS Scientific Instruments, is now the leading manufacturer of active isolation systems.

Charles Hard Townes Award
In recognition of outstanding contributions to quantum electronics

*To **Paul B. Corkum** for key contributions to the understanding of the physics of atoms and molecules in intense laser fields and the application of these ideas to ultrafast measurement techniques*

Paul Corkum received his bachelor's degree from Acadia University in Nova Scotia and his Ph.D. in theoretical physics from Lehigh University in Pennsylvania. He joined NRC as an experimental physicist in 1973. Dr. Corkum is best known for proposing how atomic and molecular gases can produce and measure attosecond optical and electron pulses.

He is a member of the Royal Society of Canada and a recipient of the Canadian Association of Physicists gold medal for lifetime achievement in physics, and the Royal Societies of Canada's 2003 Tory medal.

One of the world's experts on lasers (particularly short pulse lasers), Dr. Corkum contributes to atomic, molecular and solid-state physics. His work is characterized by a deep physical insight leading to simple, elegant models and

supported by highly original experiments. He is the father of attosecond science and of attosecond molecular imaging. His model of re-collision of an electron with its parent ion has become the organizing principle for most of the concepts in strong field science.

John Tyndall Award
In recognition of contributions to fiber optic technology (co-sponsored with IEEE/Lasers and Electro-Optics Society)

*To **Roger H. Stolen** for fundamental contributions to the understanding of optical fiber nonlinearities, including the identification and understanding of stimulated Raman scattering in fibers*

Roger Stolen received a bachelor's degree from St. Olaf College and a Ph.D. in solid-state physics from the University of California at Berkeley, followed by postdoctoral work at the University of Toronto, before joining Bell Labs in 1966.

Since 1971, he has been involved with most aspects of fiber optics research, especially fiber nonlinear optics, fiber measurements, polarization preserving fibers, harmonic generation, fiber components and microstructure fibers.

In 1990, Dr. Stolen was awarded the OSA's R.W. Wood Prize in recognition of pioneering studies of optical nonlinearities in fibers and the demonstration of polarization preserving fibers.

He is now a retired professor of electrical engineering and a member of the Fiber and Electro-Optics Center at Virginia Tech. Before coming to Virginia Tech in the fall of 1998, he was on the technical staff of AT&T Labs-Research in Red Bank, N.J. Until the trivestiture of AT&T, he had been with Bell Laboratories working in the field of fiber optics.

The Raman effect has played a central role throughout Dr. Stolen's investigations into optical nonlinearities. His early work demonstrated stimulated Raman scattering and Raman amplification in optical fibers and measured the Raman gain coefficient of a silica fiber.

Subsequent investigations involved fiber Raman lasers and the Raman response function. Finally, Dr. Stolen's recent work has addressed fundamental noise in Raman amplifiers and high-Raman-gain glasses.

R. W. Wood Prize
In recognition of an outstanding discovery, scientific or technological achievement or invention

*To **Masataka Nakazawa** for invention of the 1.48 μm InGaAsP laser-diode-pumped erbium-doped fiber amplifier and the development of its application to high-speed optical communications and short pulse lasers*

Masataka Nakazawa received his Ph.D. from the Tokyo Institute of Technology in 1980. His current interests are high-speed optical transmission, solitons, ultrashort pulse generation, optical metrology and photonic crystal fibers.

He is the author or co-author of more than 330 journal articles, and he holds more than 100 patents. He is a Fellow of the OSA, IEEE, and the Institute of Electronics, Information and Communication Engineers (IEICE). He is the president of the Electronics Society of IEICE, 2005.

In 1980, Dr. Nakazawa joined the Ibaraki Electrical Communication Laboratory of NTT, where he has been engaged in research on the transmission characteristics of optical fibers.

He was then a visiting scientist at the Massachusetts Institute of Technology from 1984 to 1985. In 1989, he led the High-speed Optical Transmission Research Group and became the first Distinguished

Technical Member of NTT Laboratories in 1994 and the first NTT Fellow in 1999. In 2001, he became a professor of the Research Institute of Electrical Communication of Tohoku University in Sendai, Japan.

About the 2006 Awards

For information on nominating candidates for next year's awards, please contact the OSA Executive Office Programs Department at 202-416-1960 or e-mail awards@osa.org.

To learn more, visit the OSA Web site: www.osa.org.