2012 OSA AWARDS

OSA proudly announces the recipients of its 2012 awards and medals. The society has chosen to honor these distinguished individuals because they have exhibited dedication, ingenuity and perseverance in attaining the highest level of achievement in their chosen fields. The OSA Board of Directors approved the awards at its meeting in February. Most of these awards will be presented at Frontiers in Optics, the 96th OSA Annual Meeting, in Rochester, N.Y., U.S.A., in October 2012.

Frederic Ives Medal/ Jarus W. Quinn Prize

The highest award of the Society, the Ives Medal recognizes overall distinction in optics

To Marlan O. Scully, Texas A&M University and Princeton University, U.S.A.

For lifetime achievement in groundbreaking research in all aspects of quantum optics including the quantum theory of the laser, quantum coherence effects, quantum thermodynamics and the foundations of quantum mechanics

Marlan Scully, a pioneer in quantum optics, developed critical aspects of the field, including the Scully-Lamb quantum laser theory and the laser phase transition analogy with special application to Bose-Einstein condensation. He also provided the first classical theory of the free electron laser and researched novel coherence effects such as the correlated emission laser. In addition, he was the first to demonstrate lasing without inversion and real-time detection of anthrax-type spores.

Scully serves on the faculty at Baylor University, the Max-Planck Institute for Quantum Optics, Princeton University and Texas A&M University. He has received numerous awards for his research, including the OSA and Deutsche Physikalische Gesellschaft Herbert Walther Award, the APS Schawlow Prize, the IEEE Quantum Electronics Award, the Franklin Institute’s Elliott Cresson Medal, OSA’s Charles H. Townes Award and Lomb Medal, and Humboldt and Guggenheim fellowships. He has been a Harvard Loeb lecturer, and he is a member of the U.S. National Academy of Sciences, Academia Europaea and AAAS. His many students have gone on to successful research careers in academia, industry and government.

Esther Hoffman Beller Medal

In recognition of outstanding contributions to optical science and engineering education

To Judith Franzosa Donnelly, Three Rivers Community College, U.S.A.

For outstanding dedication to engaging middle school, high school and college students in optical science and engineering education

Judith Donnelly has been a professor of physics and technology at Three Rivers Community College for over 30 years. Assisted by an industry advisory committee, she developed the Laser and Fiber Optic Technology A.S. program in 1997 and currently serves as program coordinator. With NSF and state funding, she developed Three Rivers’ laboratories for optics, lasers and lightwave communications. She has facilitated optical science and technology workshops for K-12 students and teachers for more than 25 years.

Donnelly served as co-principal investigator on three NSF-funded PHOTON projects granted to the New England Board of Higher Education. These projects produced a wealth of field-tested instructional materials for teaching optics and photonics, including an online “home lab” course for teachers; a laboratory kit, manual and videos to support an introductory optics course; inexpensive “exploration” experiments for middle school science labs; eight industry-based real-world, problem-based learning challenges; and a textbook, LIGHT: Introduction to Optics and Photonics.

Max Born Award

In recognition of contributions to physical optics

To Jean Dalibard, École Normale Supérieure, France

For groundbreaking theoretical work on atom-light interactions—including the elucidation of new laser cooling mechanisms—and for seminal experimental work on the optical manipulation of cold atoms and quantum gases

Jean Dalibard is a director of research at the Centre National de la Recherche Scientifique, leading a group at École Normale Supérieure. He is also a professor at École Polytechnique. His current research focuses on matter wave interferometry, stochastic processes in quantum optics and the physics of quantum gases, such as the dynamics of vortices in Bose-Einstein condensates.

Dalibard began his career with Alain Aspect’s team working on the violation of Bell’s inequality. During his doctoral study, he developed various methods for cooling and trapping atoms with laser light, with contributions from experimental and theoretical sides. This research was supervised by Claude Cohen-Tannoudji. In 1991, he was an invited scientist at the U.S. National Institute of Standards and Technology in William D. Phillips’s group and in 2010, he was a visiting fellow at Trinity College in Cambridge, U.K. Dalibard is a member of the French Academy of Sciences.
Distinguished Service Award
In recognition of service to the optics community

To Joseph H. Eberly,
University of Rochester, U.S.A.

For outstanding service as founding editor of the groundbreaking journal, Optics Express, leadership while serving as OSA President and his deep commitment in serving the Society in many other ways

Joseph Eberly has maintained a strong connection with the OSA for almost four decades. He has served as OSA President and took an active role in numerous projects, including the organization of JOSA B and the development of Optics Express—the world’s first open-access journal. He was a member of the CLEOS, CLEO and LS program committees, the NSF Triennial Visitor Committee, the Soros Foundation Panel and the Fachbeirat of Max Planck Institute for Quantum Optics in Garching, Germany.

Eberly has also served the optics and photonics community through leadership positions with APS, AIP and as a member of various physics advisory boards at Harvard University. He teaches graduate and undergraduate classes in the University of Rochester’s department of physics and astronomy, where he received the Goergen Award for Creative Undergraduate Teaching.

Eberly has mentored more than 35 Ph.D. graduates, published more than 350 research papers, and published three graduate textbooks. He is a Fellow of OSA and APS, and he is an elected foreign member of the Polish Academy of Science.

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

To Hiroo Kinoshita,
University of Hyogo, Japan

For pioneering research in the development of extreme ultraviolet reduction lithography with a multilayer-coated reflective imaging system and a reflective mask for use in the fabrication of semiconductor integrated circuits

Hiroo Kinoshita proposed the world’s first extreme ultraviolet lithographic (EUVL) technology in 1986. Since then, he has made significant contributions to developing this technology by pioneering research and practical applications of EUVL. Kinoshita has demonstrated various element technologies or systems-related technologies, such as a reduction exposure system, an optical system comprising an aspheric reflection mirror, a method for oblique-incidence to mask, a reflection-type mask using a Mo/Si multilayer, inspection, and various resists processing.

At Nippon Telegraph and Telephone, Kinoshita developed the step and repeat X-ray lithography system and an EUVL experimental system. In 1995, he moved to the Himeji Institute of Technology (now the University of Hyogo), and since then he has been responsible for the industrial application of EUVL. Kinoshita has authored over 150 technical papers and is a Fellow of the Japan Society of Applied Physics.

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

To Kent D. Choquette,
University of Illinois, U.S.A.

For contributions to the development of vertical cavity surface-emitting lasers

Kent Choquette leads the Photonic Device Research Group at the University of Illinois, which focuses on the design, fabrication, characterization and application of vertical cavity surface-emitting lasers, photonic crystal light sources, nanofabrication technologies and integration techniques for photonic devices. In 2000, he was named a professor in the electrical and computer engineering department at the University of Illinois. Choquette has served on the technical staffs at AT&T Bell Laboratories and Sandia National Laboratories.

Choquette has authored more than 200 technical publications and four book chapters, and has presented numerous invited talks and tutorials. He has served as an associate editor of the Journal of Quantum Electronics, Photonic Technology Letters and the Journal of Lightwave Technology. He is a Fellow of OSA, IEEE and SPIE. Choquette received a B.S. in engineering physics and applied mathematics from the University of Colorado-Boulder and M.S. and Ph.D. degrees in materials science from the University of Wisconsin-Madison.

Robert E. Hopkins Leadership Award
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 Thomas M. Baer,
Stanford Photonics Research Center, U.S.A.

For initiating the idea of LaserFest and his leadership in making LaserFest an extremely successful worldwide celebration of the 50th anniversary of the first demonstration of the laser

Thomas Baer is the executive director of the Stanford Photonics Research Center, a consulting professor in the applied physics department and an associate member of the Stem Cell Institute at Stanford University. His research focuses on developing imaging and biochemical analysis technology for exploring the molecular basis of human developmental biology and neuroscience.

Throughout his career, Baer has been extensively involved with startup companies in Silicon Valley. He was vice president of research and senior research fellow at Spectra-Physics, Inc.; vice president of research at Biometric Imaging; CEO, chairman and founder of Arcturus Bioscience; and co-founder of Auxogyn, Inc., a diagnostic company devoted to advancing women’s health by developing technology for assisted reproduction and in vitro fertilization.

Baer holds over 60 patents and his commercial products have received many industry
awards for design innovation. In 2000, he was named Entrepreneur of the Year for Emerging Companies. He is an OSA and AAAS Fellow and has served as OSA President. He is a visiting professor at the University of Strathclyde in Glasgow, Scotland, and holds an honorary doctorate from Heriot-Watt University in Edinburgh.

Edwin H. Land Medal
In recognition of pioneering work empowered by scientific research to create inventions, technologies and products (co-sponsored with the Society for Imaging Science and Technology)

Yoichi Miyake, Chiba University (emeritus), Japan
For his work in medical image processing

Yoichi Miyake is a leader in multispectral imaging research. His endoscopic spectrophotometer was developed into a spectral endoscope in cooperation with Fuji Film, Co., and has been used in hospitals around the world. Miyake also organized the first International Conference of Multispectral Imaging to provide a forum for multispectral research. He has contributed to the fundamentals of color management research, improvements in image quality and surgical training through virtual reality.

Miyake conducted his research at the Swiss Federal Institute of Technology and the Kyoto Institute of Technology. He went on to become a professor at Chiba University and the Tokyo Institute of Technology. Miyake has supervised 40 doctoral students, published 40 books, and authored more than 200 original papers on medical image processing, color science and image analysis.

He has served as president of the Society of Photographic Science and Technology of Japan and the Japanese Association of Forensic Science and Technology. He also served as a vice president of the Society for Imaging Science and Technology (IS&T). At Chiba University, he was a board member and director of the Research Center for Frontier Medical Engineering.

Miyake has received numerous awards for his research, including IS&T’s Charles E. Ives Award, the International Color Association’s President’s Award and the Color Association of Taiwan’s CAT Award. He was named a SPIE/IS&T Electronic Imaging Honoree of the Year. He is an IS&T Fellow.

Emmett Leith Medal
In recognition of seminal contributions to the field of optical information processing

Demetri Psaltis’ research career has centered on holography. From his Ph.D. thesis work to research on optical neural networks, Psaltis has provided critical insights to the field. His efforts with holographic memories in the late 1980s and early 1990s spearheaded the birth of holography. Recent work on holographic filters for telecommunications and lasers has led to the commercialization of this technology. His research has recently moved toward nonlinear optics and biophotonics with a primary focus on optofluidics—the realization of optical devices in fluidic materials.

Psaltis is dean of the school of engineering and directs the optics laboratory at the École Polytechnique Fédérale de Lausanne. Previously, he spent many years at the California Institute of Technology where he served on the faculty and held administrative positions, including executive officer for the computation and neural systems department; director of the NSF Research Center on Neuromorphic Systems Engineering; and director of the Center for Optofluidic Integration. He received his B.S., M.S. and Ph.D. degrees from Carnegie-Mellon University.

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

Hatice Altug’s research focuses on nanoplasmonics, nanofluidics and novel nanofabrication technologies based on integrated optical nanobiosensor and nanospectroscopy technologies.

For breakthrough contributions in integrated optical nanobiosensor and nanospectroscopy technologies based on nanoplasmonics, nanofluidics and novel nanofabrication

Hatice Altug’s research focuses on nanoplasmonics and photonic metamaterials for the development of ultrasensitive bio-nano sensors, ultrasensitive vibrational nanospectroscopy tools and on-chip nanophotonic devices. She works on novel integration of nanophotonics with nano/microfluidic systems for efficient analyte delivery, manipulation and trapping. Her research also involves the introduction of new
William F. Meggers Award
In recognition of outstanding work in spectroscopy

To Xi-Cheng Zhang, University of Rochester, U.S.A.

For exceptional contributions to coherent generation and detection of ultra-broadband terahertz waves for far-infrared spectroscopy

Xi-Cheng Zhang is director and professor at the Institute of Optics, University of Rochester. His research activities focus on applied spectroscopy and imaging using terahertz waves, which exist within a frequency range between microwave and infrared. He studies the generation, detection and application of free-space broadband terahertz beams with ultrafast optics. Zhang developed a high-field, broadband terahertz spectrometer that uses air and selected gases as the terahertz wave emitter and sensor. Terahertz wave air photonics has many applications for 3-D scanning, non-destructive testing and spectroscopy.

Before joining the Institute of Optics, Zhang served at Rensselaer Polytechnic Institute for nearly 20 years as a professor, center director and acting head of the department of physics, applied physics and astronomy. He is a distinguished professor at Huazhong University of Science and Technology in China and the co-founder and president of Zomega Terahertz Corp. Zhang holds 26 U.S. patents and is an active researcher, author and speaker.

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

To Gregory William Forbes, QED Technologies Inc., Australia

For seminal contributions in the areas of aberration theory, asymmetric optical system design and manufacturing of aspheres

Greg Forbes has collaborated with graduate students and coworkers to develop efficient, influential schemes for system assessment that are also used within his group for seminal work on global optimization in design. His early fundamental work produced several new concepts in Hamiltonian optics, in part tailored for non-axially symmetric systems. Forbes also has collaborated on the development of unconventional asymptotic methods for wave modeling.

As senior scientist at QED, he works with a team on innovations ranging from manufacturing to metrology. He has developed concepts and processes that underpin QED’s sub-aperture polishing and stitched-interferometry systems, which have contributed to transforming the production of high-precision optics. Following his Ph.D. at the Australian National University, Forbes was a Fulbright Fellow at the University of Arizona College of Optical Sciences, a tenured faculty member of the Institute of Optics at the University of Rochester and a research professor at Macquarie University.

Edgar D. Tillyer Award
In recognition of distinguished work in the field of vision, including (but not limited to) the optics, physiology, anatomy or psychology of the visual system

To Gerald H. Jacobs, University of California, Santa Barbara, U.S.A.

For contributions to fundamental studies which have revealed the nature, variations and evolution of primate color vision

Gerald Jacobs has spent much of his career extending our understanding of the biology of color vision. His research program has employed a variety of electrophysiological, anatomical, behavioral and molecular-genetics techniques to reveal the limits between cone photopigments and visual performance. Among other accomplishments, the program has led to a detailed documentation of the variations in mammalian color vision and an understanding of how these arrangements have evolved.

Jacobs was an undergraduate at the University of Vermont. Following service in the U.S. Army, he studied at Indiana University, Bloomington, and received a Ph.D. in 1963. He then served on the faculty at the University of Texas, Austin. In 1969, he joined the University of California, Santa Barbara, where he currently serves as a research professor in the department of psychological and brain sciences. He is an OSA and AAAS Fellow.

Charles H. Townes Award
In recognition of outstanding contributions to quantum electronics

To Philippe Grangier, Institut d’Optique, France

For breakthroughs in fundamental quantum optics, based on the invention and development of experimental methods and techniques that led to groundbreaking applications in quantum information

Philippe Grangier is head of the quantum optics group at Institut d’Optique and a professor at École Polytechnique. He started his research in 1980 with experimental tests of Bell’s inequalities under the direction of Alain Aspect. He then worked on single-photon states and interferometry using squeezed light. After establishing his own group, he realized optical quantum non-demolition measurements and performed many experiments related to quantum information processing. These experiments included single atom tweezers, quantum cryptography using single photons or continuous variables and entanglement...
control in atomic and photonic quantum states.

Grangier has authored more than 180 publications, including 40 letters published in Physical Review Letters, Nature and Science; and his achievements have been recognized by national and international awards. Grangier has been the coordinator of several large European projects related to quantum optics and quantum information processing, including the Scalable Quantum Computing with Light and Atoms Integrated Project.

John Tyndall Award
In recognition of contributions to fiber optic technology.
(co-sponsored with IEEE Photonics Society)

To John Bowers, University of California, Santa Barbara, U.S.A.

For pioneering research in hybrid-silicon lasers and photonic integrated circuits

John Bowers holds the Fred Kavli Chair in Nanotechnology. He is director of the Institute for Energy Efficiency and a professor in the departments of electrical and computer engineering and materials at the University of California, Santa Barbara (UCSB). His research centers on silicon photonic integrated circuits for the next generation of coherent optical systems. Before joining the faculty at UCSB, he worked at AT&T Bell Laboratories and Honeywell.

Bowers is a member of the U.S. National Academy of Engineering; an OSA, APS and IEEE Fellow; and a recipient of the OSA Holonyak Award, IEEE Photonics Society William Streifer Award and South Coast Business & Technology Entrepreneur of the Year Award. He and his coworkers received the ACE Award for Most Promising Technology for the hybrid silicon laser in 2007. Bowers has published eight book chapters, 450 journal papers and 700 conference papers. He has received 52 patents. He received his M.S. and Ph.D. degrees from Stanford University.

Herbert Walther Award
In recognition of distinguished contributions in quantum optics and atomic physics as well as leadership in the international scientific community.
(co-sponsored by OSA and Deutsche Physikalische Gesellschaft)

To Alain Aspect, Institut d’Optique, France

For pioneering experimental contributions to the fields of quantum entanglement and cold atom physics

Alain Aspect is a Centre National de la Recherche Scientifique (CNRS) distinguished scientist and head of the Atom Optics Group at the Laboratoire Charles Fabry, Institut d’Optique. Among his noteworthy accomplishments is his work with Bell test experiments: Aspect demonstrated the ability of a quantum event at one location to randomly influence an event at a separate location. His fundamental experiments on the wave-particle duality of light have contributed to the emergence of the field of quantum information. He has also worked with laser cooling of neutral atoms and experiments related to Bose-Einstein condensates.

Aspect is a member of the French Academy of Sciences, the French Academy of Technologies, and the U.S. National Academy of Sciences. He is an OSA, APS and European Optical Society Fellow. He has received several major awards, including the OSA Max Born Award, CNRS Gold Medal, European Physical Society Quantum Electronics and Optics Senior Prize and the Wolf Prize in Physics.

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

To Eric Van Stryland, University of Central Florida, U.S.A.; and Mansoor Sheik-Bahae, University of New Mexico, U.S.A.

For the invention, implementation and development of Z-scan: A simple and effective method to measure cubic and higher order optical nonlinearities

Eric Van Stryland’s current research involves the characterization of nonlinear optical properties and nonlinear optics (NLO) applications. Besides Z-scan, he also established the methodology for applying Kramers-Kronig relations to ultrastable nonlinearities and helped develop the field of cascaded second-order effects. His early work focused on optical coherent transients and photon statistics, femtosecond pulse production, multiphoton absorption and laser-induced damage.

After receiving a Ph.D. in physics from the University of Arizona College of Optical Sciences, Van Stryland did research at the University of Southern California and the University of North Texas. He then joined the newly formed Center for Research and Education in Optics and Lasers (CREOL) at the University of Central Florida (UCF). He became director of CREOL and the first dean of The College of Optics and Photonics. Van Stryland is a past OSA President; an OSA, APS, IEEE and SPIE Fellow; and a past board member of the Laser Institute of America. He has supervised 31 Ph.D. students, is on ISI’s “highly cited” list, and is a UCF Pegasus Professor.

Mansoor Sheik-Bahae’s research activities include NLO, ultrafast phenomena, terahertz photonics and laser cooling of solids. He and his colleagues have made substantial contributions to NLO, including formulation of the Kramers-Kronig dispersion relations, development of an analytical theory of bound-electronic nonlinear refraction and absorption in solids, and the discovery and analysis of the large second-order cascading nonlinearities. His group at the University of New Mexico (UNM) recently reported the first all-solid-state cryocooler based on laser cooling in rare-earth doped crystals. To date, his publications have been cited more than 7,000 times.

Sheik-Bahae received his Ph.D. in electrical engineering from the State University of New York at Buffalo. He was a research scientist at CREOL before joining the department of physics and astronomy at UNM, where he is currently a professor and the co-chair (and former general-chair) of the UNM’s optical science and engineering program. He is an OSA Fellow.