Citation

For pioneering research and leading contributions in the field of lasers and nonlinear optics

Dr. Robert L. Byer

Position and Organization :
William R. Kenan, Jr., Professor Emeritus of Applied Physics, Stanford University

Date of Birth : May 9, 1942

Degree : Ph.D. (1969, Stanford University)

Biography and Achievements :

Robert L. Byer is the William R. Kenan, Jr. Professor of Applied Physics at Stanford University. He has conducted research and taught classes in lasers and nonlinear optics at Stanford University since 1969. He has made numerous contributions to laser science and technology including the demonstration of the first tunable visible parametric oscillator, remote sensing using tunable infrared sources, and precision spectroscopy using Coherent Anti Stokes Raman Scattering (CARS). Current research solid state laser sources with applications to LIGO - gravitational wave detection, and to laser particle acceleration.

He served Chair of the Applied Physics Department from 1980 to 1983; 1999 – 2002 Associate Dean of Humanities and Sciences from 1984 to 1986 and served as Vice Provost and Dean of Research at Stanford University from 1987 through 1992. Professor Byer is a Fellow of the Optical Society of America, the Institute of Electrical and Electronics Engineers (IEEE), the American Physical Society and the American Association for the Advancement of Science and the Laser Institute of America. In 1985 Professor Byer served as president of the IEEE Lasers and Electro-optics Society. He was elected President of the Optical Society of America in 1994. He served as President of the American Physical Society in 2012. In 1996 Professor Byer received the Quantum Electronics Award from the Lasers and Electro-optics Society of the IEEE. In 1998 he received the R. W. Wood prize of the Optical Society of America and the A. L. Schawlow Award from the Laser Institute of America. In 2000 he was the recipient of the IEEE Third Millennium Medal and in 2009 he received the IEEE Photonics Award. He was honored with the Ives Medal and Prize by the OSA in 2009. He shared the Special Breakthrough Prize and the Gruber Prize in 2016 (shared with LIGO Scientific Collaboration). The LIGO collaboration achievement was recognized in 2017 through the award of the Nobel Prize to Rai Weiss, Kip Thorne and Barry Barish. In 2020 Prof. Byer was the inaugural awardee of the SPIE Maiman prize in recognition of his contributions to lasers. He was elected Honorary Member of OPTICA in 2022.

Professor Byer has published more than 500 scientific papers and holds 54 patents in the fields of lasers and nonlinear optics. His Google Scholar lifetime citations are more than 93,000 (h ~140). Professor Byer was elected to the National Academy of Engineering in 1987 and to the National Academy of Science in 2000 and charter member of the National Academy of Inventors in 2012.

Statement of Nomination :

In his primary research area of high-power lasers and optical amplifiers, Dr. Robert L. Byer has contributed to the success of laser fusion experiments at Lawrence Livermore National Laboratory (LLNL) through the development of light sources, and he continues to engage in the establishment of long-term goals from the perspective of light source development as a member of the advisory board. Additionally, Dr. Byer has contributed to the successful detection of gravitational waves at the Laser Interferometric Gravitational Wave Detection Observatory (LIGO) through light source development and is a co-author on many related papers.

In another research area, nonlinear optics, the long-standing challenge of weak optical nonlinearity has been resolved through the new technology of thin-film lithium niobate (TFLN), which is prompting major transformations in the fields of optical measurement, optical communications, and optical computing. In this research area, Dr. Byer serves as a Distinguished Scientist at NTT Research (Sunnyvale, California), where he is a research advisor to younger researchers.

Thus, he has the busy responsibility of simultaneously overseeing advances in these three important research fields.

For pioneering research and leading contributions in the field of lasers and nonlinear optics , Dr. Robert L. Byer is hereby awarded the Okawa Prize.