

The Richard C. Lord Lecture is an annual event sponsored by the MIT Department of Chemistry and the G.R. Harrison Spectroscopy Laboratory to honor a scientist who has made important contributions to the field of spectroscopy. We thank the many friends and colleagues of Dr. Lord for their generous contributions to the endowment fund.

Past Awardees:

Takeshi Oka 1992  
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Richard Zare 1995  
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William Klemperer 1997  
William Phillips 1998  
Theodor Hänsch 1999  
Daniel Kleppner 2000  
Steven Chu 2001  
Norman Ramsey 2002  
Britton Chance 2003  
Watt Webb 2004  
Robert Field 2005  
John Hall 2006  
Graham Fleming 2007  
Mildred Dresselhaus 2008  
Michael Feld 2009  
Wolfgang Ketterle 2010  
Stefan Hell 2011

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The Department of Chemistry and  
The George R. Harrison Spectroscopy Laboratory  
cordially invite you to attend the

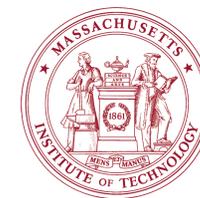
**2012 Richard C. Lord Lecture**

by

**Erich Ippen**

on

**Clocks, Combs, and OAWG**



Tuesday, March 13, 2012, 12 Noon  
MIT, Grier Room (34-401)

Refreshments served following the lecture

Erich Ippen received his PhD at the University of California, Berkeley in 1968 and then worked at AT&T Bell Laboratories where he conducted research on lasers, fiber optics and ultrafast optics for twelve years. In 1980 he moved to the Massachusetts Institute of Technology as professor of Electrical Engineering. He became the Elihu Thomson Professor of Electrical Engineering in 1987 and in 1996 also Professor of Physics. He is a member of the National Academy of Sciences and the National Academy of Engineering. He is a Fellow of the American Academy of Arts and Sciences, the Institute of Electrical and Electronic Engineers (IEEE), the American Physical Society (APS) and the Optical Society of America (OSA). He has received the Longstreth Medal of the Franklin Institute; the Leeds Award of the IEEE; the Edgerton Award of the SPIE; the Wood Prize, the Townes Award and the Ives Medal of the OSA; the Quantum Electronics Award of the IEEE/LEOS, and the Shawlow Prize of the APS. He will never get any awards for his golf game.

In early work at Bell Laboratories, Erich initiated studies of nonlinear optical effects in fibers. He and co-workers were the first to observe stimulated Raman scattering, stimulated Brillouin scattering, and self-phase modulation in fibers; to predict the future importance of these nonlinearities in long, low-loss optical fiber systems; and to patent the fiber Raman amplifier. Following the invention of the cw dye laser, he became interested in its possibilities for short pulse generation and began a collaboration with Charles Shank. This led to the first modelocking of that laser, the first pulses shorter than a picosecond, the development of a variety of femtosecond measurement techniques, and demonstrations of their importance with experiments in chemistry and biology as well as physics. On leave at MIT in 1977, Erich worked with Hermann Haus and students to produce the first picosecond pulses from a semiconductor diode laser by active modelocking. This led to the first passive modelocking of a diode laser upon his return to Bell.

Since joining the faculty of MIT in 1980, Erich has continued to pursue his interests in ultrafast optics with colleagues and students. His MIT laboratory is known for the first demonstrations of additive-pulse-modelocking for solid-state lasers and fiber lasers, for seminal studies of ultrafast processes in metals and semiconductor devices, for new methods of all-optical signal processing with fiber optics and integrated photonics, for advancing the femtosecond art to pulse durations shorter than two optical cycles and for developing femtosecond technology for optical clocks and arbitrary waveform generation. He teaches undergraduate courses in electromagnetics and graduate courses in optical devices and nonlinear optics. He has supervised more than 38 PhD graduates, has published more than 360 journal articles and has received more than 18 patents. In addition to ultrafast optics, he is addicted to tennis, skiing golf and sailing.

Erich and Dee, happily married for more than 45 years, have two sons, both married, and the four best looking and smartest grandchildren in the world.

*Richard C. Lord* was born in Louisville, Kentucky in 1910. He was graduated from Kenyon College, Ohio in 1931. He received the Ph.D. degree in physical chemistry from Johns Hopkins University in 1936, where he began a long and distinguished career as a scientist and educator. In 1942 Dr. Lord came to MIT. He was appointed Professor of Chemistry in 1954 and was Director of the Spectroscopy Laboratory from 1946 to 1976. He died in 1989.

Lord's research contributions were in the infrared and Raman spectroscopy of polyatomic molecules. His achievements include the observation and interpretation of Coriolis-activated forbidden vibrational transitions, the synthesis and complete vibrational analysis of a large number of deuterated molecules, and the discovery and exploitation of the anomalous far infrared spectra of ring molecules. Toward the end of his career he became interested in biomolecules. His studies of the laser Raman spectra of proteins and nucleic acids opened a new field of research.

Lord was also a dedicated teacher and an inspired supervisor of graduate students. His summer course in spectroscopy, held first at MIT and then at Bowdoin College, attracted more than 2000 scientists.

Lord had a major impact on the development of the Spectroscopy Laboratory. During his thirty year tenure as Director, the Laboratory became an Interdepartmental Laboratory of the School of Science, with broadened faculty participation. Research activities expanded from the study of atomic spectra using visible light and large gratings to include visible-UV electronic molecular spectra, molecular vibrational spectra using classical infrared and far infrared sources, and then to the use of lasers. During this period the Laboratory pioneered in a wide variety of vibrational studies of molecules and Raman studies of biomolecules, some of them mentioned above, as well as in seminal laser studies of the stimulated Raman and Brillouin effects and the use of lasers for precision measurements and ultra-high resolution spectroscopy.

Lord received the Presidential Certificate of Merit in 1948, and the Award in Spectroscopy from the Pittsburgh Spectroscopy Society in 1966. He served as president of the Commission of Molecular Spectroscopy of the International Union of Pure and Applied Chemistry, and was president of the Optical Society of America, and received the Lippincott Medal from them in 1976. He was also a fellow of the American Academy of Arts and Sciences.

The annual Richard C. Lord Lecture has been established as a tribute to the memory of Dr. Lord.