Quantum Approaches
Speaker Series

Science enabled by 4th generation synchrotron light sources

STEPHEN KEVAN
Lawrence Berkeley Nat'l Lab

Abstract

I will describe ongoing accelerator upgrades that are increasing the x-ray brightness of synchrotron light sources by a factor of 100-1000, and elaborate examples of new science opportunities enabled by this ultrahigh brightness. The small size of the source and collimation of the photon beams from undulators will produce nearly diffraction-limited soft x-ray beams, allowing to large improvements in x-ray microscopy, x-ray photon correlation spectroscopy, and experiments with shaped x-ray wavefronts. I will illustrate how the improved spectral, spatial, and temporal sensitivity of these beams will provide new probes of functioning mesoscale structures, thereby bridging the nanoscale and mesoscale in various contexts.

Prof. Kevan earned his B.A. in chemistry from Wesleyan University in 1976 and Ph.D. in physical chemistry from the University of California, Berkeley. He worked at Bell Laboratories before he joined the faculty at the University of Oregon (UO) as an associate professor of physics. Since 1991 he has held a full professorship. He served as Deputy Division Director for Science and Director of the Advanced Light Source at Lawrence Berkeley National Laboratory (LBNL) until he retired in 2022. He is now emeritus at the University of Oregon and a retired affiliate at LBNL.

Prof. Kevan's research has focused on assuring the health and vitality of synchrotron light sources in the United States and abroad. He has contributed to condensed matter physics and physical chemistry through understanding how microscopic interactions and fluctuations produce novel material properties, particularly in the context of surface and thin film physics and exotic magnetism.

He has earned numerous honors, including Davisson–Germer Prize in Atomic or Surface Physics in 2017, Fellow of the American Association for the Advancement of Science in 2001, and Fellow of the American Physical Society in 1995.

Thursday
Sept. 19, 4 PM

136 Jorgensen Hall

Acknowledgement:
This talk is supported by the UNL Grand Challenges catalyst awards entitled Quantum Approaches addressing Global Threats