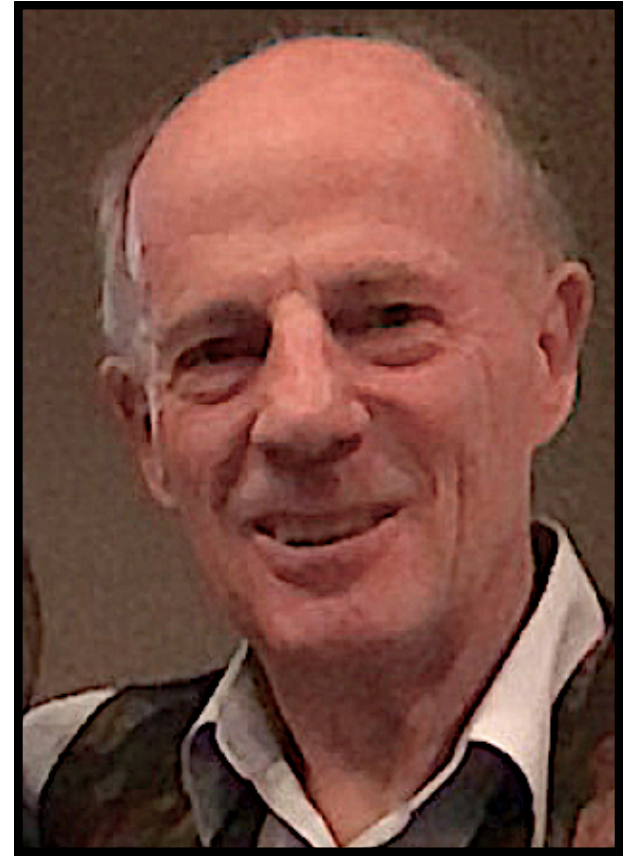


Thursday, October 19, 2023

Refreshments at 3:15pm outside PSF 101
Colloquium from 3:30pm - 4:30pm in PSF 101

Leveraging de Broglie: Pursuing Atomic Resolution in the Electron Microscope

Dave Smith
ASU Physics



Abstract:

One hundred years have passed since the famous wave-particle equation proposed by de Broglie shook the foundations of the physics world. Unprecedented point resolution using the fast-moving, high-energy electron was soon proposed based on its picometer-scale wavelength. This tantalizing prospect proved to be a moving target for many generations of scientists and engineers who struggled for more than half a century to design and build better and more stable electron microscopes aiming to achieve the best possible practical performance. The emergence of aberration-correction methods finally pushed resolving power to beyond the 1-Å resolution barrier, once considered to be insurmountable. Nowadays, there are more than a thousand aberration-corrected electron microscopes worldwide, and ASU is fortunate to have three of these cutting-edge instruments. These are undoubtedly exciting times, not only for electron microscopists, but also for the much broader scientific community interested in understanding, manipulating and controlling the atomic structure of materials.

Biography:

Dave Smith received his Ph.D. in Physics (1978) and D.Sc. (1988) from the University of Melbourne. He was Director, Cambridge University High Resolution Electron Microscope (1980 to 1984), Director, ASU Center for High Resolution Electron Microscopy (1991 to 2006), and President, Microscopy Society of America (2009). His long-term research interests have centered on the development and applications of atomic-resolution electron microscopy, with recent interests in oxide and semiconductor heterostructures and ultrawide bandgap semiconductors. He is the author/co-author of 25 book chapters and over 650 refereed journal publications, and he is a Fellow of American Physical Society, Materials Research Society, Microscopy Society of America, and Institute of Physics (UK).