

Eric Heller, Prof. of Physics at Harvard, will speak on:

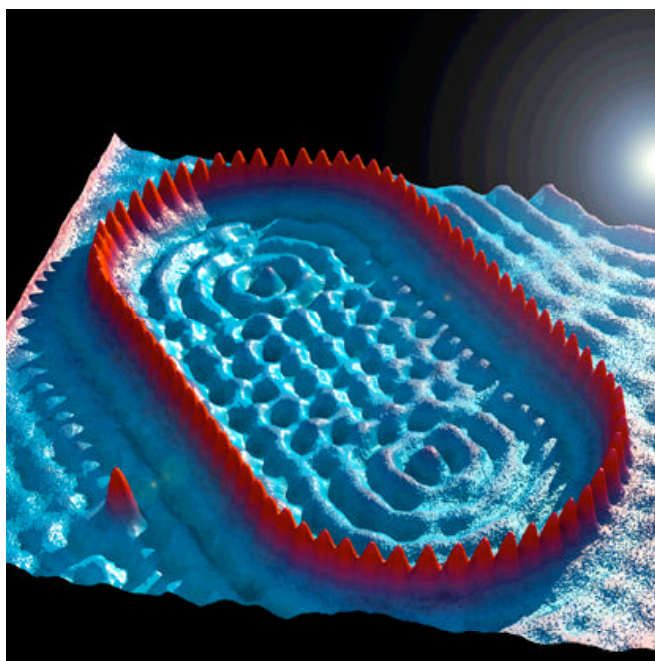
***The Scanning Tunneling Microscope: how it works,
what the images mean***

Monday, Feb. 12th, 2:30 pm in BRK 2001

The images generated by a scanning tunneling microscope are iconic. Some of the most famous are Don Eigler's quantum corrals, which reveal not only the guest atoms on a surface but especially the interference patterns of electrons shuttling back and forth along the surface. To understand the images, we first discuss the middle name in STM - tunneling. But the real story behind Eigler's images is a profound confirmation of quantum interference and the wave nature of matter. We will discuss the special surface dwelling electrons and the scattering of them off atoms and defects on the surface, making analogies with sound wave scattering. We will listen to atoms being moved one at a time, and come to understand the new physics they reveal.

Biography

Prof. Eric Heller is coming to Purdue as a Phi Beta Kappa Visiting Scholar. He has been a member of the physics faculty at Harvard since 1993 and, during 1993-1998, was director of the Institute for Theoretical Atomic, Molecular and Optical Physics at the Harvard-Smithsonian Center for Astrophysics. Since 1998 he has also been a member of the chemistry faculty. He previously taught at UCLA and the University of Washington, and was a staff scientist at the Los Alamos National Laboratory. A fellow of the American Academy of Arts and Sciences, the AAAS, and the American Physical Society, he is the recipient of the 2005 American Chemical Society Award in Theoretical Chemistry. Professor Heller's current research involves theoretical investigation of wave behavior, chaos and quantum mechanics, and collision theory. He is also interested in science based art as a way to convey insights about complex subject matter. He was elected a member of the International Academy of Quantum Molecular Science and served as a fellow at *Wissenschaftskolleg du Berlin* this past academic year.



Individuals wishing to meet with Prof. Heller may set up a time by contacting John Nyenhuis, nyenhuis@purdue.edu; 43524.