

**Public Interest Lecture: 7:30 pm Tuesday July 13, 2010**  
**University of British Columbia**  
**Location: TBA**



## **Catching Electrons with Light?**

**Paul Corkum**

JASLab, University of Ottawa  
National Research Council  
Ottawa, Canada

In this, the 50<sup>th</sup> anniversary of the first laser, we are experiencing a revolution in one of the most important aspects of laser technology – the ability to make short flashes of light. Currently, the world's shortest light pulses are measured in attoseconds (1/1,000,000,000,000,000,000 of a second) – short enough to freeze the motion of valence electrons in atoms and molecules. Only 10 years ago, such an idea would have seemed like science fiction. This year too saw the first laser with a short enough wavelength to resolve the structure of complex biological molecules.

In our laboratory -- the Joint Attosecond Science Laboratory (JASLab) -- we have "photographed" a molecule's electrons and the position of its atoms – the first frame in a molecular movie which we plan to produce.

It was a century and a half ago that the very first movies were made. Containing only about a half dozen frames, the plots were boring -- but the images they contained were striking. It has taken us 150 years to refine the technology and the script to reach "Survivor". Today we stand on the verge of making *real* reality shows -- quantum movies that film chemical and biological processes as they occur. These films will give us unprecedented insight into the molecular world.