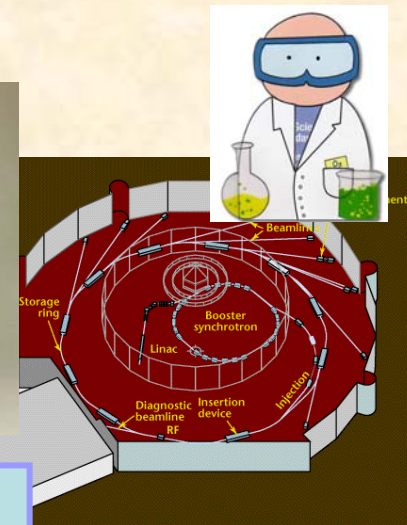


## Become a group member

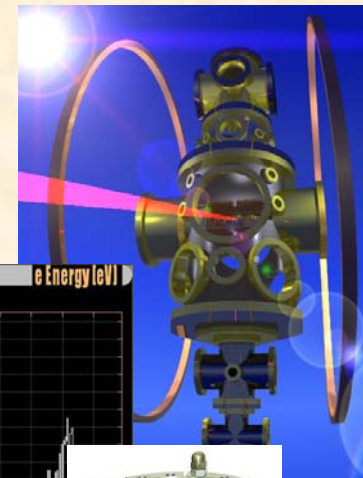
- Intern
- Summer Student
- Bachelor
- Masters
- PhD
- Postdoc
- Visiting Scientist



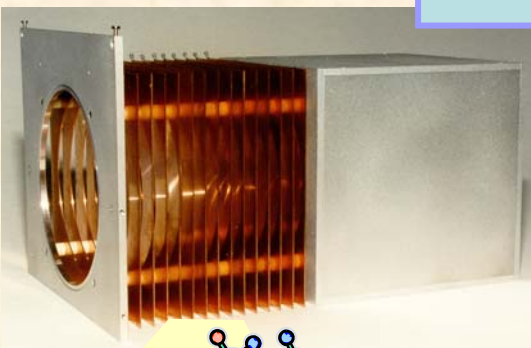
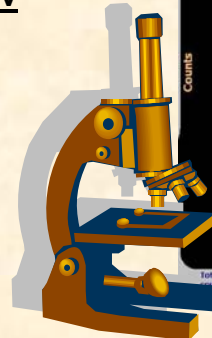
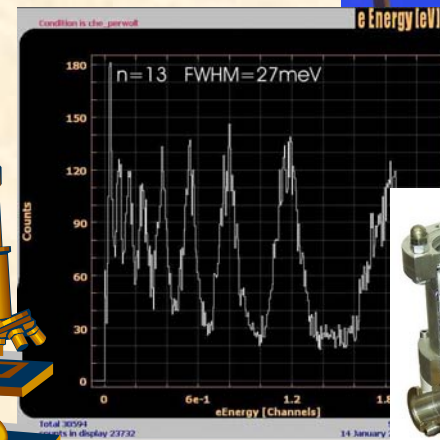
# AMOS

Atomic Molecular and Optical Sciences  
@ Lawrence Berkeley National Laboratory

do research at:



**Contact:** Thorsten Weber  
**Phone:** 1 510 486 5588  
**Email:** [TWeber@lbl.gov](mailto:TWeber@lbl.gov)  
**Web:** <http://amo-csd.lbl.gov>



# Atomic, Molecular and Optical Sciences at LBNL: Momentum Imaging Spectroscopy

## Working Group:

### Who:

2 Principal Investigators, 3 Staff Scientists (Retirees), 3 Postdoctoral Students, 3 PhD Students, 3 Master Students

### Where:

Lawrence Berkeley National Lab, building 2, labs 102-106 + 458 (Laser lab), with Experiments at the Advanced Light Source

### What:

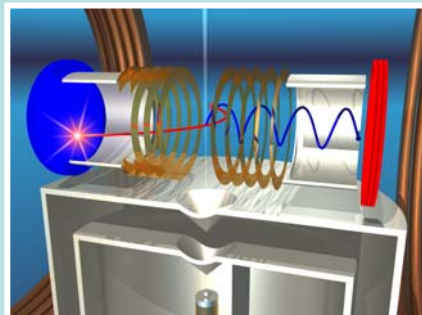
**investigation of** the dynamics of atoms and molecules and their ionization mechanisms

**by probing** the momentum phase space, looking for symmetry effects, diffraction and interference effects

**with** single and double photo ionization by single and many photons from synchrotron radiation and intense laser fields

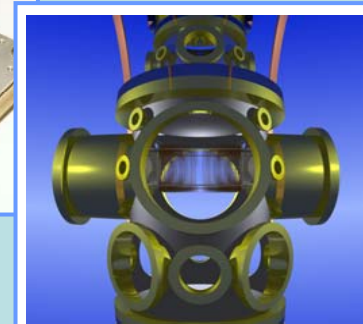
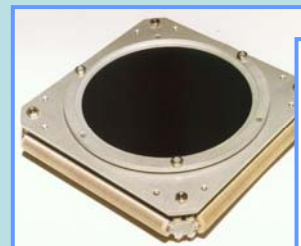
**using** an imaging system capable to measure the square of the wave-function in momentum space of 3 to 5 particles in coincidence

## Experimental Technique:

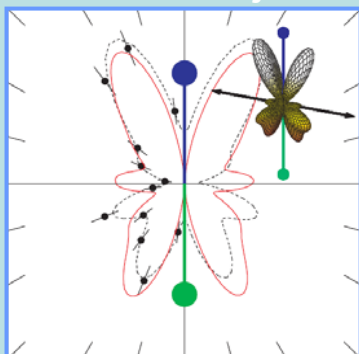


### COLTRIMS

- housing: high vacuum chamber
- detection: position and time sensitive detectors
- target: precooled supersonic gas jet
- spectrometer: combined electric and magnetic field
- readout: analog and digital electronics
- analysis: FORTRAN and C based software

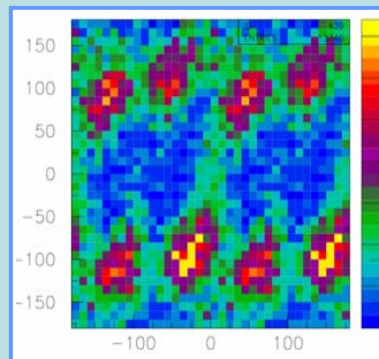


## Research Projects:



- Molecular Double Slit in  $H_2$  - interference and decoherence
- D. Akoury et al., *Science*, **949**, (2007), 318

- Break in symmetry of  $H_2$  due to molecular dynamics
- F. Martín, et al., *Science* **315**, (2007), 629



- entangled Photo electron and Auger electron emission in  $N_2$  - core hole localization in a homo nuclear molecule
- M. Schöffler et al., *Science*, **320**, (2008), 920

