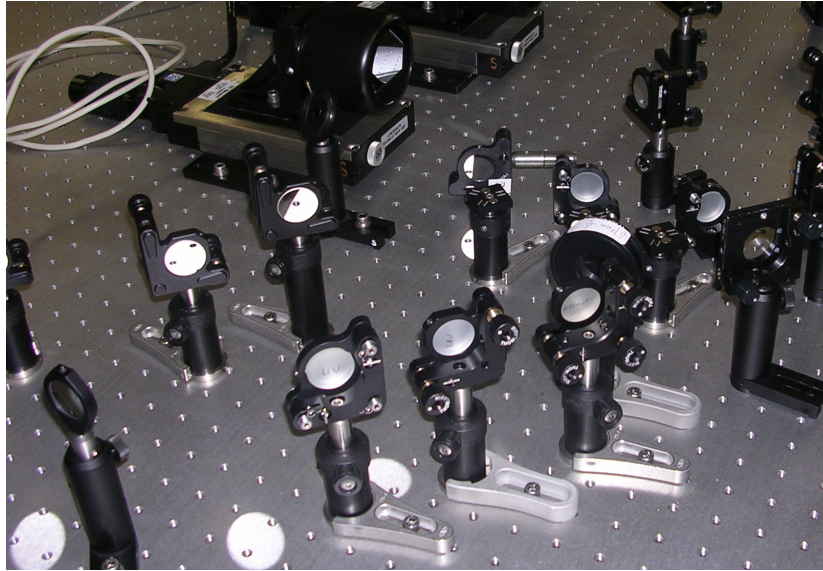


AMO Seminar



Friday, October 31, 2008

2:00 pm

Physics conference room (Small Hall 123)

Toward XUV Raman Superradiance: Breaking of Adiabaticity

George R. Welch

Texas A&M University

A new mechanism for producing a bright source of extreme ultraviolet light is proposed and experimentally investigated. The method involves ultra-short laser pulses interacting with atoms in such a way that the atomic system cannot precisely follow the pulse envelope. In some situations, this implies that the ubiquitous rotating-wave approximation is invalid. Two different experiments exhibit the promise of this technique. The first uses two femtosecond laser pulses with wavelengths of 778 nm (two photons) and 1482 nm (one photon) to excite rubidium atoms to the 12p state and instantly release the absorbed energy in a beam of light at 308 nm. The second employs short radio frequency pulses, some containing only a few oscillations, driving transitions among magnetically-split Zeeman sublevels of the rubidium-87 ground state. The second experiment possesses features analogous to those expected for optical pulses of attosecond duration.