ASU Department of Physics
Arizona State University

COLLOQUIUM

Thursday, April 6th, 2023

Refreshments at 3:15pm in PSF 186
Colloquium from 3:30 PM – 4:30 PM in PSF 101

Controlling Attosecond Electron Dynamics with Light

Professor Arvinder Sandhu

University of Arizona

Abstract:

Attosecond science has opened to door to real-time probing and control of electron dynamics in atoms, molecules, and materials. In this talk, I will present new approaches for the coherent manipulation and control of continuum electron dynamics. The ability to modify the lifetime of entangled light-matter states, i.e., the autoionizing polaritons, is demonstrated. Using tunable attosecond transient absorption, we control the interferences between radiative and Auger paths to stabilize the autoionizing state, thus confirming a prediction made forty years ago. I will also discuss a Raman interferometry scheme to measure the electron wavepacket dynamics with high temporal and spectral resolution using velocity map imaging. Lastly, I will discuss how the application of attosecond spectroscopy is key to quantifying and controlling the fundamental electron-nuclear couplings and multielectron dynamics in complex systems. To enable these studies, my group is vested in the development of new attosecond x-ray sources, through table-top high-harmonic generation, and using the Compact XFEL approach.

Biography:

Arvinder Sandhu is Professor in the Department of Physics and College of Optical Science at the University of Arizona. He specializes in the ultrafast atomic, molecular, and optical physics. Sandhu Lab has playing a leading role in the application of attosecond and femtosecond light sources to quantify electron-nuclear couplings in molecules, the strong-field control of electron dynamics, and the development of new attosecond x-ray light sources. Prof. Sandhu is an APS Fellow and has received University of Arizona's Distinguished Scholar Award.

Host: Prof. Robert Kaindl

View our Spring 2023 Physics Colloquium schedule at https://physics.asu.edu/colloquia