



Attosecond Physics with Sculptured Circular Light Fields

Date: January 24, 2024 (Wednesday)

Time: 5:00 p.m.

Venue: CYP2, LG1/F, Chong Yuet Ming Physics Building, Main Campus, HKU



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Abstract:

Laser-induced electron tunneling, triggering a broad range of ultrafast phenomena such as the generation of attosecond light pulses, photoelectron diffraction and holography, has laid the foundation of strong-field physics and attosecond science. Using the attoclock constructed by single-color elliptically polarized laser fields, previous experiments have measured the tunneling rates, exit positions, exit velocities and delay times for some specific electron trajectories, which are mostly born at the field peak instant where the laser electric field and the formed potential barrier are stationary in terms of the derivative versus time. From the view of the wave-particle dualism, the electron phase under a classically forbidden, tunneling barrier has not been measured, which is at the heart of quantum tunneling physics. Here we present a robust measurement of tunneling dynamics including the electron sub-barrier phase and amplitude. We combine attoclock technique with sculptured circular fields to accurately calibrate the angular streaking relation and to probe the non-stationary tunneling dynamics by manipulating a rapidly changing potential barrier. The sculptured attoclocks provides a general time-resolved approach to access the underlying quantum dynamics in intense-light-matter interactions.

Biography:

Prof. Yunquan Liu obtained his PhD from Institute of Physics, Chinese Academy of Science in 2006. In 2006-2008, he was postdoc in Max-Planck-Institute of Nuclear physics in Heidelberg. He Joined Peking University in 2009 and was promoted to be full tenure professor in 2015. His group has focused on the fundamental processes of atoms and molecules exposed to intense and ultrashort laser pulses, i.e., multi-photon ionization, tunneling ionization, nonsequential double (multiple) ionization, high harmonic generation and Coulomb explosion of molecules etc.

Anyone interested is welcome to attend!

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