

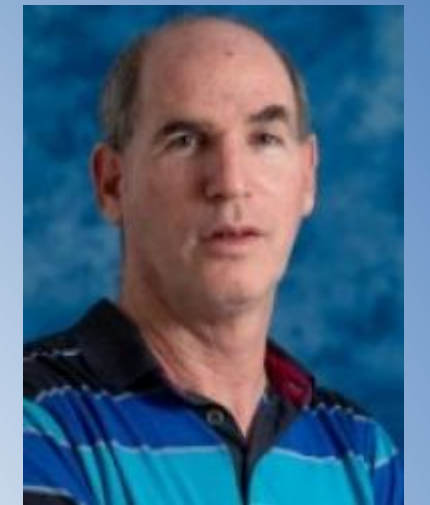


The Center for
Light Matter Interaction
Tel Aviv University

LMI Seminar:

Resonance High Harmonic Generation and Tunneling Ionization

Prof. Gilad Marcus
Institute of Applied Physics
The Hebrew University of Jerusalem



Wednesday April 29th, 2026, 13:00-14:00

Light refreshments and drinks will be served at 12:30

**Auditorium 011, Engineering Classroom Building,
Faculty of Engineering, Tel-Aviv University**

Abstract: Resonance HHG: The underlying physics of resonance high harmonic generation in plasma plumes is still not well understood. A simple model, which is an extension of the well-known three step model predict the capture of the re-colliding electron into an autoionization state and only then return to the ground state while emitting the HHG photon. Another explanation is a better phase matching due to strong variation of the refractive index near resonance. Here we first rule out the second option. Next, we theoretically study the physical mechanism of high-order harmonic generation (HHG) from chromium ions irradiated by intense laser pulses.

Tunneling Ionization: The problem of tunneling ionization and the associated questions of how long it takes for an electron to tunnel through the barrier, and what the tunneling rate has fascinated scientists for almost a century. In high-field physics, tunnel ionization plays an important role, and accurate knowledge of the time-dependent tunnel rate is of paramount importance. The Keldysh theory and other more advanced related theories are often used, but their accuracy is still controversial. In this work, we used a curved waveguide as a quantum simulator to simulate the tunnel ionization process.