

The Hebrew University of Jerusalem , Nonlinear Physics Seminar

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Danciger B Building, Seminar room

"The extreme nonlinear optics of air and femtosecond optical filamentation"

Under certain conditions, powerful ultrashort laser pulses can form greatly extended filaments of concentrated high intensity in gases, leaving behind a very long trail of deposited energy, which can be stored in plasma and in excitation of atomic and molecular states.

Central to the phenomenon is the nonlinear response of atoms and molecules to very high fields, and I will describe ultrafast and absolute measurements of the response. This understanding leads to applications: I will discuss several of our recent filament-related experiments, including the development of air waveguides for remote transport of very high average power laser beams, and the quantum control of molecular gas hydrodynamics.