



復旦大學

Fudan University



復旦大學物理系物質科學報告

Physics Department Colloquium

Extreme nonlinear photonics:

from lasing in air to 3D nanofluidics in glass

Professor Ya Cheng

Shanghai Institute of Optics and Fine Mechanics (SIOM)

Abstract: Interaction of neutral atoms or molecules with light of sufficient intensity can naturally lead to perturbative nonlinear optical effects. One may expect that enhancement of nonlinear optical effects could be achieved simply by increasing the laser intensity, which, however, is not always true because ionization will occur in intense laser field. Interestingly, for ultrashort laser pulses, there exists a critical intensity at which the neutral atoms and molecules are only weakly ionized whereas their nonlinear responses to the laser field can no longer be described in a perturbative manner. Herein, we report on our recent findings in the framework of extreme nonlinear photonics, including generation of a free-space laser in air based on tunnel ionization of nitrogen molecules and formation of 3D nanostructures in a porous glass with femtosecond laser irradiation. We also demonstrate applications of the findings in remote sensing and nanofluidic technology.

Time: 2:00 pm, Tuesday, 2014.3.25

Location: Physics Building, Room 221B

(Cookies and coffee are served from 1:30 pm)