PONDICHERRY UNIVERSITY

School of Physical, Chemical & Applied Sciences

Department of Physics

Invited Lecture

On

Laser interaction with semiconductor and metal surfaces: surface modifications and generation of particles in nanoscale

By

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Venue : Raman Seminar Hall, Department of Physics
Pondicherry University
Puducherry – 605014

ALL ARE WELCOME

Dr. K.V.P. Lata
(Guest lecture Co-ordinator)

Dr. G. Chandrasekaran
(H.O.D Physics)

Dr.G.CHANDRASEKARAN
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Abstract

Synthesis of desired nanoparticles (NPs) by laser ablation in liquids from their bulk targets is a simple, cheap and green procedure with sizes tuned to desired optical and electronic properties. This method is relatively inexpensive and has an advantage that the synthesis can be done at room temperatures and control on the properties of the nanoparticles can be achieved by varying the liquid properties and laser ablation parameters. This technique is therefore considered as effective for the synthesis of colloidal solutions of nanoparticles of various kinds of materials ranging from semiconductors to various classes of metals. Here we present our recent results on the synthesis and characterization of semiconductor NPs such as Si, Ge and metal NPs such as Al, Cu, Ag and Au for photonic applications. I am also going to present our recent results on fabrication of laser induced sub-wavelength periodic structures (LIPSS) also known as ripples on various materials like diamond, SiC, GaAs, Si, Ge, Ti, Al, Cu and Ag by fs laser direct writing technique. Formation of sub-wavelength features is explained by the interference between the incident laser light and the excited surface waves, and this interference causes a periodic intensity variation in the surface and gives rise to LIPSS. Spatial periodicity (Λ) of LIPSS is significantly smaller than laser wavelength and two different kind of periodic gratings have been detected for the range of laser fluences, irradiated number of pulses and surrounding medium tested on different materials.