



CONSIGLIO NAZIONALE DELLE RICERCHE  
ISTITUTO NAZIONALE DI OTTICA

## Avviso di Seminario

Il giorno venerdì 11 marzo 2011 alle ore 16,00 presso l'area  
della ricerca del CNR di Pisa,  
Aula 44, primo piano, Edificio "A"

**il Dr. Gabriele Cristoforetti**

*Istituto Nazionale di Ottica, U.O.S. "Adriano Gozzini", CNR, Pisa*

terrà un seminario dal titolo:

### **Pulsed Laser Ablation in Liquid (PLAL) for Nanoparticle production**

**Abstract:** The interest in nanosized particles (NPs) has hugely grown because of their peculiar physical and chemical properties related to quantum size effects with respect to bulk samples and to the enhancement of surface properties due to the large surface/volume ratio. In the past decade, a large part of the scientific effort was focused on the setup of techniques and methodologies of NP synthesis that allow adequate control of particles size distribution, shape, and crystallinity, adequate temporal stability, and, at the same, a production rate sufficiently high for real applications and industrial scale-up. In recent years, Pulsed Laser Ablation in Liquid (PLAL) was introduced as a production technique and tested for different composition NPs, including metals, semiconductors, carbon-based nanomaterials and alloys. In the PLAL technique, a laser pulse is focused on a target immersed in a solvent generating a microplasma that rapidly expands, quenches, and decays in times on the order of microsecond. During such a process, the atomized material removed from the target, interacting with the species originated from the solvent, nucleates and begins to grow up to the formation of NPs. The talk will include an introduction to the technique, including a discussion about its advantages with respect to the most used chemical methods, its current drawbacks and limits, as well as possible research routes for improving the state of knowledge of the process and the control of produced NPs.

Antonio Giulietti