



CONSIGLIO NAZIONALE DELLE RICERCHE
ISTITUTO NAZIONALE DI OTTICA

AVVISO DI SEMINARIO

Il giorno giovedì 21 marzo 2013 alle ore 11,00
presso l'Area della Ricerca di Pisa
Aula 27, piano terra, Edificio "A"

Il Dr. Yann A. Gauduel

*LOA-CNRS UMR 7639, Ecole Polytechnique - ENS Techniques Avancées ParisTech,
91761 Palaiseau (France) and Radiation Biology MELUSYN Network (France)*

yann.gauduel@ensta-paristech.fr

terrà un seminario sul tema:

Laser-plasma accelerators based spatio-temporal radiation chemical physics and biomedicine

The complex links existing between the chemical physics of radiations and biomedical applications such as radiation oncology need the complete understanding of early events triggered by an initial energy deposition in confined spaces of living matter. Recent advances of powerful TW laser sources ($\sim 10^{19}$ W cm⁻²) and laser plasma interactions providing ultra-short relativistic particle beams (electron, proton) in the MeV domain open exciting opportunities for the development of high energy radiation femtochemistry (HERF), typically in the temporal range 10^{-14} - 10^{-11} s. The lecture will deal with the concept of tenuous borderline that exists between direct and indirect molecular damage, considering the probing of short-lived quantum states and caging effects in the prethermal regime of secondary electrons. We will explain how this breakthrough would permit the innovating development of real-time nanodosimetry and open new perspectives for the emerging domain of spatio-temporal radiation biomedicine. This transdisciplinary field concerns the nano-scale insights into early radiation damages in biologically relevant environments or the selective control of pulsed cancerous tumor radiotherapy.