



RegioneLombardia

**DALLA SCIENZA DEI MATERIALI ALLA BIOMEDICINA  
MOLECOLARE**

**Percorsi scientifico-formativi per giovani ricercatori**

Lunedì 24 Novembre 2008, ore 15.00

**Dipartimento di Chimica Fisica “M. Rolla”  
Via Taramelli 16  
Aula 1**

**Alberto Diaspro**

*Dipartimento di Fisica, Università di Genova*

**Advances in Multiphoton Microscopy towards  
Nanoscopy**

**Valentina Caorsi**

*Dipartimento di Fisica, Università di Genova*

**The fluorophore and its surroundings: a study of  
molecular landscapes**

A cura di Ilaria Cristiani,  
Dipartimento di Elettronica, Università degli Studi di Pavia

## Abstract

The time a fluorescent molecule remains in the excited state ( $10^{-9}s$ ) provides an opportunity for interactions between the fluorophore and its immediate environment. Rigidity of the local environment, charge transfers, probe-probe interactions, conformational changes are all processes that affect the fluorophore emission properties and hence that can be revealed through fluorescence spectroscopy. Among the interactions fluorophore-surroundings, a wide variety of molecular processes presents the macroscopic effect of a decrease of fluorescence intensity. In particular *Quenching* and *Resonance energy transfer*, are two phenomena both associated to a decrease of fluorescence, but related to different molecular processes. Quenching represents a powerful tool to study molecular binding, fluorophore accessibility, membrane permeability and, of course, for sensing applications. Forster Resonance Energy Transfer, FRET, is seen as a nanometric ruler able to reveal distances in a range of 1 - 10nm, allowing to investigate protein-protein interactions, measure distances between two sites on a macromolecule, follow conformational changes, protein folding and unfolding