Università degli Studi di Padova

DiSC

Thursday **3 October 2024** at **15:00** in **aula F**

Prof. Fabrizio Messina

Dipartimento di Fisica e Chimica "Emilio Segré"
Università degli Studi di Palermo (Italy)

will hold a seminar entitled:

Fundamental optical properties, non-trivial photophysics and photonic applications of nanographenes.

Nanographenes (NGs) are a family of two-dimensional carbon-based nanomaterials currently attracting a strong research interest in view of their fascinating optical properties, which can be fine-tuned with ultimate atomic precision though chemical design. The controlled deformation and engineering of the sp2 carbon network in atomically-precise NGs, and their substantially larger size as compared to typical optical dyes, opens new opportunities for the modulation of optical and electronic properties. Yet, the peculiar photophysics of NGs is still poorly understood, and their use in photonic applications remains poorly explored.

In this talk I will present some of our latest work on the fundamental photophysics and photonic applications of NGs. We showed that distorted NGs can display interesting photophysical features, such as triplet-triplet annihilation delayed fluorescence, ultra-slow excited state dynamics, excitation-wavelength memory effects on the nanosecond and sub-nanosecond relaxation cascades. Some of these behaviours are highly unexpected and strongly deviate from the archetypal behaviour of typical optical dyes. Besides, we recently demonstrated a straightforward route to load NGs onto the surface of polystyrene microbeads in order to obtain a functional light emitting microcomposite. The resulting, all-carbon-based, microbeads behave as optical microresonators displaying narrowband emission lines spread across the whole visible spectrum. The unique fluorescent pattern of individual microbeads enables applications in anticounterfeiting, metrology and information encoding.

Your presence will be much appreciated

Host
Agostino Migliore

The Head of the Department
Stefano Mammi