

WANTED: Ph.D. student in

“Exciton Coupling and Diffusion in Molecular Crystals of Conjugated Molecules”

Short Work Description: Organic LEDs, solar cells and sensors are an intense field of research in material science. For their functionality, exciton coupling and diffusion is of outmost importance, since they drive efficiency and color of light absorption as well as excited state deactivation, e.g. light emission. While polymeric materials suffer from strong disorder, which makes targeted molecular design very difficult, molecular crystals provide highly ordered systems, where design rules can be established in a rational way. Within the next years, we will systematically explore crystals with different intermolecular architectures in a combined spectroscopic and computational approach. The PhD work will be mainly dedicated (75%) to the computational side, treating 3-dimensional macroscopic molecular arrangements by state-of-the-art quantum-chemical methods to calculate solid state optical spectra and deactivation pathways. Due to the multidisciplinary requirements of the work, the PhD student will get a thorough insight into the experimental techniques (25%), focusing on (polarized) steady-state and time-resolved fluorescence, and pump-probe spectroscopy.

A general understanding of basic physical concepts is essential; a profound knowledge of photophysics is desirable. Skills in optics and/or programming are highly welcome. The candidate must be fluent in English.

The PhD will be co-supervised between the group in Mons and Madrid; the PhD student will be located in both locations for 2 years each, and will be embedded in an international PhD program, short stays at partner groups in material science, characterization and device production are foreseen.

Location: **IMDEA Nanoscience, Madrid, Spain** [www.nanoscience.imdea.org]

Laboratory for Chemistry of Novel Materials [<http://morris.umh.ac.be/>]

Starting date: between 11/2011 and 02/2012

Duration: 4 years

Eligible Researcher: Master Degree in Chemistry, Materials Science, or Physics

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