4 year PhD Studentship

School of Chemistry, Trinity College Dublin

Photoinduced charge separation at the organic/inorganic interface in hybrid polymeric solar cell devices

A funded 4-year PhD position on "*Photoinduced charge separation at the organic/inorganic interface in hybrid polymeric solar cell devices*" is currently available within the Thin Film Device group led by Dr Rachel C. Evans, based within the School of Chemistry at Trinity College Dublin.

Organic, polymeric or hybrid systems for photovoltaic devices have attracted considerable attention in recent years as low-cost alternatives to conventional silicon solar cells. Organic solar cells differ from their inorganic counterparts in that light absorption does not lead directly and quantitatively to free charge carriers, but instead results in the formation of bound electron-hole pairs (excitons). Due to the considerable binding energy (~0.4 eV), exciton dissociation only occurs at the interface between two materials of different electron affinities, which provides a driving force for charge separation. Understanding the fundamental electronic interactions at this interface, as well as the role of the interfacial nanostructure, film morphology, and device architecture is crucial to achieve high efficiencies of solar energy conversion. This research project will explore the role played by the physical interactions and nanostructure of the interface in conjugated organic polymer-inorganic hybrid thin films in determining the efficiency of photoinduced electron transfer. These concepts will be explored by combining a variety of organic and inorganic building blocks with different thin preparation techniques to yield different interfacial architectures for spectroscopic and morphological investigation.

The successful applicant will gain skills in thin film preparation techniques, advanced steady-state and time-resolved spectroscopy, and optical, electron and surface microscopies. The work may also include participation in the development and execution of small-angle x-ray and neutron scattering experiments at Large-Scale facilities. International mobility is strongly encouraged in the group and there will be opportunities for the successful applicant to undertake a short research placement (1-3 months) in the laboratory of one of our collaborators.

Applications are invited from candidates who hold (or expect to obtain before October 2011) first or upper second-class (2.1) degree (or equivalent) in chemistry, physics, materials science or a closely related discipline. The studentship is 4 years in duration and will carry a stipend of €16,000 p.a. together with EU academic fees. The funding is limited to candidates with EU citizenship. The student will automatically be enrolled in the Dublin Chemistry Graduate Programme and will be required to act as a demonstrator in undergraduate laboratories within the School of Chemistry as part of their duties. To apply please send your CV and a brief cover letter including details of any previous laboratory experience and the contact details of 2 scientific referees to Dr Rachel C. Evans at raevans@tcd.ie. Informal enquiries may also be directed to the same address.