Study of substrate-induced films by X-ray diffraction – "2Dto3D" project

Université Libre de Bruxelles - Free University of Brussels - (ULB) is a major academic institution with international recognition for scientific achievements. See http://www.ulb.ac.be

Geerts group works on crystal engineering and crystallization of molecular materials in specific conditions to control thin film structure and ultimately optoelectronic properties. See http://www.ulb.ac.be/sciences/chimpoly

Summary of "2Dto3D" research project: The occurrence of two or more crystal structures for a given molecule, a phenomenon, which is called polymorphism, is ubiquitous to various classes of synthetic and natural compounds. Examples of polymorphism are known in numerous application fields, such as food, explosives, pigments, semiconductors, fertilizers, and pharmaceutical drugs. Different crystal structures, so-called polymorphs, of the same compound exhibit sometimes very different physical properties, chemical reactivity, and biological functions. Understanding and controlling polymorphism is therefore very important. Simple questions, such as "How many polymorphs has a given compound?" or "What drives polymorph selection?" remain unanswered yet. In this scientific context, scientists have started to explore the occurrence of substrate-induced polymorphism, i.e. the formation of polymorphs that exist only near solid substrates. In particular, 2Dto3D has the ambition to elucidate how positional and orientational order of molecules propagate from the substrate to the upper crystal layers. In this manner, 2Dto3D will gain a fundamental understanding of polymorphism at the interface with solid substrates. For a recent review see: "Substrate-Induced and Thin-Film Phases: Polymorphism of Organic Materials on Surfaces" A. Jones et al. *Adv. Funct. Mater.* **2016**, *26*, 2233.

A talented highly motivated young chemist or physicist with a Ph.D. in the field of X-ray characterization of thin films is actively searched. The candidate must have a sound knowledge of crystal structures, and diffraction methods. He/she must be hard at work, easy-going, rigorous, and have strong laboratory skills. He/she must be fluent in English and be able to write high-quality publications.

The successful applicant is expected to develop an innovative research program in close collaboration with Resel group (http://www.if.tugraz.at/web.php?11) that is also part of the 2Dto3D project. He or she will get a monthly fellowship of around €2300, after tax.

The position is for an initial duration of one year and could be extended upon mutual agreement.

To apply, candidates must send to Prof. Yves Geerts, ygeerts@ulb.ac.be, his/her curriculum vitae, a letter explaining his/her motivations, a list of publications, and the name and email address of three reference persons.

The application deadline is March 16, 2018.