Spring 2018 Joint Colloquium
Materials Department & Materials Research Laboratory

Professor Natalie Stingelin
School of Materials Science & Engineering
School of Chemical & Biomolecular Engineering
Georgia Institute of Technology

Friday, May 18th, 2018
11:00 am, ESB 1001

Phase Diagrams of Complex Materials: From the Katana, Swiss Chocolates to Organic Semiconducting Devices

The physical organisation, from the molecular to the macro-scale, of essentially all macromolecular materials can profoundly affect the properties and features of the resulting architectures. I will discuss how rules that explain the mechanical properties of the Katana and distinguishes good from lesser tasty chocolates, can be applied to organic semiconductors to manipulate their properties and, hence, and their consequent performance when used as active layers in organic optoelectronic devices, including organic thin-film field-effect transistors, organic light-emitting diodes or organic photovoltaic cells. Here, we present a survey on the principles of structure development from the liquid phase of this interesting and broad class of materials with focus on how to manipulate their phase transformations and solid-state order to tailor and manipulate the final 'morphology' towards technological and practical applications. We will discuss blending, nucleation and use of processing aids to control the microstructure targeted for field-effect transistor applications.

Bio

Natalie Stingelin (Stutzmann) FRSC is a Full Professor of Functional Organic Materials at the Georgia Institute of Technology, with prior positions at Imperial College London, the Cavendish Laboratory, University of Cambridge; Queen Mary University of London, the Philips Research Laboratories, Eindhoven; and ETH Zürich. She was awarded a Chaire Internationale Associée by the Excellence Initiative of the Université de Bordeaux (2016), the Institute of Materials, Minerals & Mining's Rosenhain Medal and Prize (2014) and the Chinese Academy of Sciences (CAS) President's International Fellowship Initiative (PIFI) Award for Visiting Scientists (2015); she was the Chair of the 2016 Gordon Conference on 'Electronic Processes in Organic Materials' as well as the Zing conference on 'Organic Semiconductors'. She has published >160 papers in the area of organic electronics & photonics, bioelectronics, physical chemistry of organic functional materials, and smart inorganic/organic hybrid systems.

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Hosted by Rachel Segalman.