

cfaed Seminar Series

DATE: September 6, 2017
TIME: 04:30 PM – 05:30 PM
LOC: Seminar room HEM 219 (second floor)
Walther-Hempel-Building, Mommsenstr. 4, 01069 Dresden



GUEST SPEAKER:

Prof. Emil List-Kratochvil

Institut für Physik, Institut für Chemie & IRIS Adlershof, Humboldt-Universität zu Berlin, Brook-Taylor-Straße 6, 12489 Berlin, Germany

TITLE:

“Hybrid Resistive Memory Elements: Fundamental Considerations and Emerging Device Applications”

ABSTRACT:

Electrically tunable resistors realized in two terminal structures seem to be one of the most versatile innovations in the semiconductor industry with many possible applications such as logic circuitry or neuromorphic systems. In particular, inorganic resistive switching devices utilized as non-volatile memory are close to commercialization. Also, resistive switching effects in organic and hybrid devices have been presented in a multitude of devices and novel materials. [1] Recently the fabrication of organic resistive switches using environmentally friendly inkjet-printing methods and their integration into fully functional hybrid crossbar array structures has been demonstrated. [2]

[1] S. Nau, C. Wolf, K. Popovic, A. Blümel, F. Santoni, A. Gagliardi, A di Carlo, S. Sax, E. J. W. List-Kratochvil, “Inkjet-printed Resistive Switching Memory based on Organic Dielectric Materials: From Single Elements to Array Technology”, *Adv. Electr. Mater.*, **1**, 1400003 (2015)

[2] S. Nau, C. Wolf, S. Sax, E. J. W. List-Kratochvil, “Organic Non-Volatile Resistive Photo-Switches for Flexible Image Detector Arrays”, *Adv. Mater.* **27**, 1048 (2015), also featured in *Nat. Mater.*, **14**, 134, (2015)

BIOGRAPHY:

Emil List-Kratochvil graduated from the Napier University Edinburgh with a first-class BSc (Hons) in Applied Physics in 1996, followed by a first-class Master Degree in 1998 and a first-class degree of a Doctor Technicae in 2000, both from Graz University of Technology (TU Graz). He qualified for his Habilitation (Venia Docendi) in Solid State Physics in 2003 at TU Graz. At that time, he was a Christian-Doppler-Society funded Research Associate (2000-2007), directing a laboratory for “Advanced Functional Materials” focusing on an applied research agenda in collaboration with Industry. In 2004 he was appointed Associate Professor in Solid State Physics at TU Graz. In 2004 Professor List-Kratochvil was awarded the Fritz Kohlrauschpreis (ÖPG) and the Basic Research Nanotechnology Award (Province of Styria). In 2006 he got the offer to found the NanoTecCetern Weiz Forschungsgesellschaft mbH, which he directed as Scientific

Managing Director until 2015, in parallel to his appointment at TU Graz. In October 2015, he accepted an offer for a Full Professorship from Humboldt-Universität zu Berlin in the field of Hybrid Devices.

Professor List-Kratochvil's research focuses on the physics and application of molecular and hybrid electronic materials. Over the past 15 years he has made important contributions towards a better fundamental understanding of the structure to property relations in conjugated polymers and light emitting dendrimers and their application in (printed) electronic and optoelectronic devices, where he has focused on the development of inkjet-printing processes, printed light emitting diodes, sensors and memory devices. Professor List-Kratochvil's contributions to the subject have led to wide-range publications and patent applications that address both fundamental and applied device related topics.