**The William Tisdale Group**

**Presents**

**Wednesday, July 27, 2016**

**Room 66-144, 2:00 – 3:00pm**

**Oleg V. Koslov, University of Groningen, The Netherlands**

**“Watching molecular excitons move”**

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Organic electronic devices are based on organic semiconductors, which combine attractive properties of organic materials with semiconducting behavior. The elementary excitation in these materials is a so-called “Frenkel exciton” – a strongly bound pair of negative (electron) and positive (hole) charges. As a result, organic electronics essentially rely on exciton diffusive dynamics that have to be controlled and observed to ensure the development of high-efficient organic devices.

Here we watch the exciton diffusion process in real time with a new technique based on ultrafast photoinduced absorption spectroscopy with ~100 fs time resolution. Using vacuum-deposited C70 layers as a model system, we demonstrate an extremely high diffusion coefficient of *D* ≈ 3.5·10‑3 cm2/s that originates from surprisingly low energetic disorder of <5 meV. The experimental results are well-described by the analytical model and supported by extensive Monte-Carlo simulations. The proposed technique is deemed as a powerful tool for further development of organic opto-electronic components, such as simple layered solar cells, light-emitting diodes, and electrically pumped lasers.

**Biography**

**Oleg V. (Viktorovich) Kozlov** received his Masters in Physics degree from Moscow State University, Faculty of Physics, in 2013.

In 2009, he joined the research group of Professor Dmitry Paraschuk at Moscow State University, where he worked on device physics of organic solar cells and light emitting diodes. In 2012, he started a collaboration with Dr. Maxim Pshenichnikov (Zernike Institute for Advanced Materials, University of Groningen, the Netherlands) on ultrafast spectroscopy of novel organic molecules. In 2013, he moved to the same group as a PhD candidate, where he studies ultrafast charge and exciton dynamics (charge generation and recombination, exciton diffusion, singlet-to-triplet conversion, etc) in organic solids.