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TU Wien, Institut für Angewandte Physik, E134
1040 Wien, Wiedner Hauptstraße 8-10
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Molecular membrane dynamics – a super-resolution microscopy approach

Abstract: Molecular interactions are key in cellular signaling. They are often ruled or rendered by the mobility of the involved molecules. We present different tools that are able to determine such mobility and potentially extract interaction dynamics. Specifically, the direct and non-invasive observation of the interactions in the living cell is often impeded by principle limitations of conventional far-field optical microscopes, for example with respect to limited spatio-temporal resolution. We depict how novel details of molecular membrane dynamics can be obtained by using advanced microscopy approaches such as the combination of super-resolution STED microscopy with fluorescence correlation spectroscopy (STED-FCS). We highlight how STED-FCS can reveal novel aspects of membrane bioactivity such as of the existence and function of potential lipid rafts.

Christian Eggeling holds a PhD in Physics from the University of Göttingen, Germany. From 2000 to 2003 he was a research scientist at the biotech company Evotec, Hamburg, Germany. In 2003, Christian Eggeling joined the Max-Planck-Institute for Biophysical Chemistry, Göttingen, Germany as a senior scientist in the department of Professor Stefan Hell (2014 Nobel Laureate in Chemistry). Since 2012, Christian Eggeling has been a principal investigator in the Human Immunology Unit and the scientific director of the newly established Wolfson Imaging Centre Oxford at the Weatherall Institute of Molecular Medicine, University of Oxford, United Kingdom, and in 2014 he has been appointed Professor of Molecular Immunology. From December 2017 on he started as a Professor of Super-Resolution Microscopy and director of the Institute of Applied Optics (and Biophysics) (IAOB) at the Friedrich Schiller-University Jena, and as the Head of the Department of Biophysical Imaging at the Leibniz Institute of Photonic Technologies in Jena, Germany. Christian Eggeling's research is focused on the development of advanced microscopy for the investigation of molecular organization and dynamics in cells, especially on the cellular plasma membrane.

All interested colleagues are welcome to this seminar lecture (45 min. presentation followed by discussion)

Friedrich Aumayr
(LVA-Leiter)

Gerhard Schütz
(Seminar Chair)