



# — Optics Colloquium SS 2016

Prof. Buse, Prof. Rohrbach & Prof. Zappe, Microsystems Engineering

**Thursday, July, 14th 2016 at 16:00**  
**Faculty of Engineering, Building 101, Lecture Hall**

## “Deep-tissue imaging with time-reversed light”

Recent advances in resolution, speed, labelling and the advent of optogenetics have greatly extended the use of optical techniques and enabled many biomedical breakthroughs. Yet, when light propagates through thick biological tissues, refractive index inhomogeneities cause diffuse scattering that increases with depth. This poses a major challenge to optical techniques, limiting their biomedical usefulness in vivo to superficial layers of tissue (in rodents) or to larval stages (in zebrafish). In this talk I will describe several strategies to address this key challenge using techniques based on wavefront engineering and optical time reversal, in order to enable optical imaging at unprecedented depths in biological tissues.



**Prof. Benjamin Judkewitz** is head of the Bioimaging and Neurophotonics lab within the Cluster of Excellence NeuroCure at Charité Berlin. Working across several disciplines, Benjamin got his PhD in Neuroscience from University College London and spent his Sir Henry Wellcome Postdoctoral fellowship at the California Institute of Technology in the Departments of Electrical Engineering and Bioengineering. His research group in Berlin develops and applies new techniques that overcome optical scattering – with the goal to study circuits of the brain that have thus far been inaccessible to noninvasive optical methods.

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