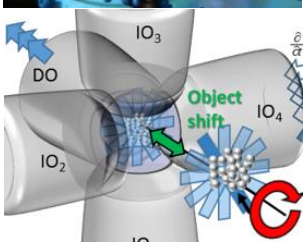
Prof. Dr. Alexander Rohrbach
Lab for Bio- and Nano-Photonics
University of Freiburg
Georges-Koehler-Allee 102 ,79110 Freiburg
Tel. +49 761 203 7536
Fax. +49 761 203 7537
Email: rohrbach@imtek.de

Open PhD or Post-Doc Position

Topic:

Coherent light-sheet microscopy for resolution and speed enhanced imaging without fluorescence

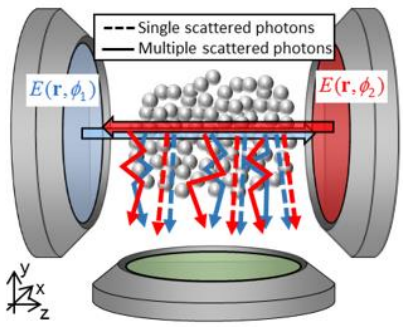


In a project funded by the DFG, we will continue our research on light-sheet microscopy using scan beams which are modulated dynamically by computer holograms.

Goal: The proposal concentrates mainly on novel illumination concepts in space and time and only secondarily on novel detection schemes. The goal is to further improve spatial resolution and contrast of 3D imaging in scattering media. In the current part B of the DFG project we use fluorescence only as a control, but concentrate on label-free imaging, i.e. coherent scattering.

In this DFG Project we will transfer the concept of Rotating Coherent Scattering (ROCS) to light-sheet microscopy and explore the limits of 3D image formation with purely scattered light.

B-WP1. Training with light-sheet microscopy and setting up.
B-WP2. Generate ROCS-Light-sheets with variable coherence.
B-WP3. Develop a fast ROCS-Light-sheet microscopy with four illumination lenses.
B-WP4. ROCS-Light-sheets with multiple lasers, static and scanning.
B-WP5. Develop intensity correlation methods to achieve sectioning.



Qualifications and Requirements: We seek motivated physicists/engineers with a good background in experiments and theory in microscopy & optics. The candidate should speak German fluently and should have an excellent MSc in physics or engineering, English language proficiency at level B2.

The candidates (salary: PhD 3.5 yrs 66% E13, Post-Doc 2.5 yrs 100% E13) will design novel instrumentation, perform advanced experiments, theoretical calculations and computer simulations to better understand complex paths of correlated and uncorrelated photons propagating through scattering media and thereby to improve 3D image formation. The candidate will give tutorials and will participate at several scientific conferences.