

PUSH THE FRONTIERS OF LIFE SCIENCES – MICROSCOPY ACROSS SCALES.

[The Group of Prof. Dr. Walter at the Centre of Optical Technologies \(ZOT\)](#) aims at developing novel correlative microscopy solutions to facilitate imaging across scales in life sciences – in close collaborations with regional industrial partners: We plan to combine advanced fluorescence microscopy with electron microscopy to visualize molecules within their subcellular context at high resolution using **Correlative Light and Electron Microscopy (CLEM)**. Specifically, we envision a unique advanced super-resolution and volume CLEM workflow under cryo-conditions (Correlative Cryo-Super-Resolution Light and Focused Ion Beam Scanning Electron Microscopy) that overcomes the current limitations, pushes correlative microscopy further and allows us, together with our collaboration partners, to tackle specific biomedical research questions that could not be answered before due to the lack of accessible solutions. This is a highly interdisciplinary project between physics, engineering, optics, life and computer sciences, and **we are looking for**

A PhD Student in Advanced Optical Microscopy Development (3 years)

To help us tackle several biomedical showcase projects (from nanoplastics to cell infections) by building and applying novel CLEM techniques.

Key responsibilities & Qualifications

For the implementation of the project, according to your skill set and interests, your main task is to **(1)** build a first cryo-super-resolution microscope (Structured Illumination Microscopy). You will also work on **(2)** establishing Focused Ion Beam Scanning Electron Microscopy (FIBSEM) for biological samples at Aalen University, and **(3)** setting up correlative (automated) workflows between the two imaging techniques.

Your primary responsibilities will include:

- Building a super-resolution microscope at room temperature, including hardware control and image analysis
- Implementation at cryogenic conditions
- Application to biomedical research questions
- FIBSEM data acquisition at a few nanometers' resolution
- Correlative imaging using light & electron microscopy
- Optimization of electron microscopy sample carriers by micropatterning
- Close collaboration with Carl Zeiss GmbH & Leibniz Institute of Photonic Technology
- Confocal microscopy
- Sample preparation and optimization
- Cell culture

Your qualifications should include:

- Master's degree in physics, biomedical engineering, or similar
- Proven experience in advanced fluorescence microscopy and optical alignment
- Proven experience in image processing and programming
- Highly proactive, driven, and independent team player

In addition, it would be beneficial to have experience in:

- Cell biology, cell culture, and tackling biomedical research using bioimaging
- Hardware control
- Electron microscopy
- Cryo-microscopy
- Correlative light and electron microscopy

How to apply

If you are interested in R&D in advanced microscopy with different radiations (from light to electrons), biophotonics, biomedicine, and image & data processing and want to help push the frontiers in cell biology, we look forward to receiving your application (motivation letter, CV, 2 reference letters or contact list of referees, and any other relevant information). Please send in one pdf file to **Andreas Walter** [andreas.walter@hs-aalen.de] by **September 16th, 2022**. For further information about the position please contact Prof. Dr. Andreas Walter.

