

Super-Resolution Soft X-Ray Microscope based on Laser-produced plasma

Explore and advance state-of-the-art optical technologies for semiconductor and biomedical applications

The Department of Electronics and Informatics ([ETRO](#)), an [imec research group](#) at the Vrije Universiteit Brussel ([VUB](#)), has an open research position for a talented and motivated researcher.

Project

In optical chip metrology and health diagnostics, conventional microscopes face increasing challenges in achieving nanometer-scale resolution, as industrial demands push for patterns with ever-smaller critical dimensions. There is also a growing need for non-destructive, sub-100 nm resolution metrology techniques suitable for wide-field imaging, particularly given the increasing structural complexity and the introduction of new materials in semiconductor and biomedical applications.

In soft X-ray imaging systems, performance is limited because conventional optics do not function effectively. To address this, we employ diffraction- and reflection-based optics to achieve the highest efficiency. This project explores soft X-ray radiation based on laser-produced plasma, innovative optical system designs, and applications that extend beyond ultraviolet, hard X-ray, and EUV technologies. The research focuses on developing cost-effective and versatile solutions, with an emphasis on both the radiation source and optical components. The ultimate goal is to expand the range of semiconductor inspection and healthcare imaging applications.

Who you are: Master's degree in Photonics, Electronics, Physics, or Computer Science

Who we are: A university research group at imec-VUB in Brussels, with expertise in optical imaging systems and signal processing

Responsibilities:

- Design of optical setup
- Optical system analysis and simulation
- Material characterization
- Developing AI/ML algorithms
- Literature review and preparation of journal publications

Required background: Engineering Technology, Optical Engineering, Computer Engineering

Type of work: 40% setup and experiments, 40% modeling/simulation, 20% literature review and design

Supervisor: David Blinder

Co-supervisor: Peter Schelkens

Daily advisor: Hyun-su Kim

Interested? You can apply here on the VUB website: <https://jobs.vub.be/job/Elsene-Super-Resolution-Soft-X-Ray-Microscope-based-on-Laser-produced-plasma/1266245901/>

This PhD is funded by **imec**, a global leader in nanoelectronics and digital technologies. **Please make sure to also apply on the imec website** for this position: <https://www.imec-int.com/en/work-at-imec/job-opportunities/super-resolution-soft-x-ray-microscope-based-laser-produced-plasma>