Our in-house facilities:

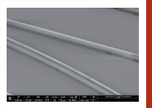
Nanofabrication

- Laser ablation / Laser writing with Femtosecond Laser excitation
- Inductively Coupled Reactive Ion Etching (ICP-RIE)
- Pulsed Laser Deposition (PLD) with Reflection high energy electron diffraction (RHEED)
- (templated) Electrodeposition
- Electrospinning

Plume in PLD during thin film growth.

Surface and structural Characterisation

- Secondary Electron Microscopy (SEM) combined with Energy Dispersive X-ray spectroscopy (EDX)
- Temperature-resolved powder X-Ray Diffraction (XRD)
- Atomic Force Microscopy (AFM)



SEM image of the coupling region between a 100nm-slot-waveguide ring resonator and a solid bus waveguide.

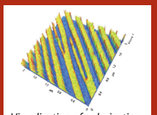
Optics

- Spectrally and time-resolved Photoluminescence for temperatures down to 10 K in the visible and near IR (400 nm to 1600 nm)
- Raman microscopy at λ_{exc} = 532 nm, 633 nm, 785 nm and 1064 nm
- Nonlinear optical spectroscopy with wavelength-tunable Femtosecond – Laser excitation (650 nm - 2400 nm)
- Transmission, Reflexion and Dark-field spectroscopy in the visible and near IR

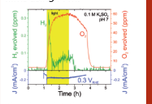
Excitation laser path in our Photoluminescence setup for spectrally and timeresolved emission measurements.

Functional Characterisation

- Piezo Force Microscopy (PFM) and Magnetic Force Microscopy (MFM)
- Conductive Force Microscopy (CFM) combined with Photo-AFM
- Temperature-resolved photo-electrical measurements (3.5 K to 600 K) with an option for magnetic fields
- (photo)-electrochemical characterisation combined with in-situ gas chromatography (ppb range)



Visualization of polarization components in $BiFeO_3$ thin films using PFM.



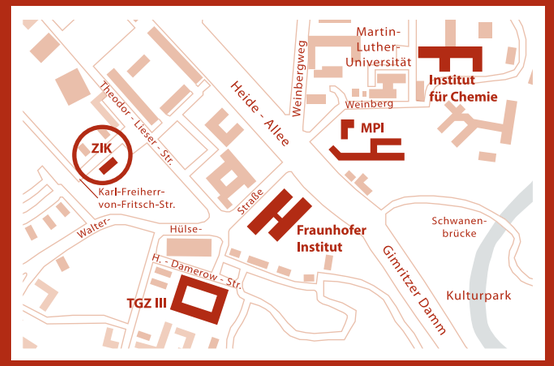
Combined PEC/GC measurement of Cu_2O film with RuO_2 passivation.

We welcome ideas for collaborative initiatives. Please contact us, if you are interested!

Contact

Martin-Luther-Universität Halle-Wittenberg
Zentrum für Innovationskompetenz SiLi-nano®
Karl-Freiherr-von-Fritsch-Str. 3
D - 06120 Halle (Saale)
Tel.: +49 (0) 345 / 55 28 - 650
Fax: +49 (0) 345 / 55 27 - 411
info@sili-nano.de
www.sili-nano.de

Where you can find us:



GEFÖRDERT VON:

Bundesministerium für Bildung und Forschung

ZENTREN FÜR INNOVATIONSKOMPETENZ UNTERNEHMEN REGION

IN KOOPERATION MIT:

MARTIN-LUTHER-UNIVERSITÄT HALLE-WITTENBERG

Fraunhofer CSP

Fraunhofer IMWS

MAX-PLANCK-INSTITUT FÜR MIKROSTRUKTURPHYSIK

Silicon and Light ...

... from Macro to Nano

ZIK SiLi-nano
Materials and Nanostructures for Photonics and Energy harvesting

In 2009, the Centre for Innovation Competence (ZIK: Zentrum für Innovationskompetenz) SiLi-nano ("Silicon and Light: from macro to nano") startet with the two junior research groups „Light to Silicon“ and „Silicon to Light“. During the first period, our research focused on the interaction of light with silicon; especially the generation of electricity by silicon-based photovoltaics, and the control of light emission, transformation and propagation in silicon photonic circuits. In 2016, we adapted our focus to new research challenges with the addition of the two new groups „Light for High-Voltage Photovoltaics“ and „Light for Hydrogen“, which also broadened the range of investigated material systems. However, the focus of our research remained on light-matter interaction in nanostructures for technologically relevant processes and applications. Today, the research at the ZIK SiLi-nano includes topics ranging from laser ablation and hybrid photonics to ferroelectric photovoltaics and photocatalytic water splitting.

The ZIK was established as a joint venture by the Martin Luther University Halle-Wittenberg, the Fraunhofer Institute for the Mechanics of Materials, the Fraunhofer Center for Silicon Photovoltaics, and the Max Planck Institute of Microstructure Physics. Our research profits from the combined expertise of several institutes and research facilities at the “Weinberg Campus” in Halle (Saale) in the area of materials science and our close collaboration with university and non-university research groups.

Currently, the ZIK SiLi-nano is organised as an interdisciplinary scientific facility at the Martin Luther University Halle-Wittenberg and is mainly funded by the German Ministry of Education and Research (BMBF: Bundesministerium für Bildung und Forschung) within the program “Unternehmen Region”.