

## Job opportunities: Junior research group

The Kurt-Schwabe-Institute for Measuring and Sensor Technology e.V. (KSI) Meinsberg has a longstanding expertise in the fields of basic and applied research on novel sensor materials, sensor devices and scientific instrumentation. Main competences are in the fields of physical chemistry, electrochemistry, solid-state electrolytes, biological and physical sensors as well as environmental monitoring. One important aspect of our work is the miniaturization of sensor devices. Accordingly, the institute is well equipped with modern lithographic and bottom-up methods for the synthesis of functional nanostructures as well as with state-of-the-art methods for their characterization. The KSI is located close to Dresden, in Saxony, Germany. As a so-called "Landesinstitut", the KSI is financially supported by the Federal State of Saxony.

Currently, the KSI Meinsberg is setting up a **junior research group** with a scientific focus on **micro- and nanostructured photonic sensors** for the detection of biomolecular interactions as well as for gas and environmental monitoring.

In relation to this, we offer three scientific positions:

### (1) Junior research group leader (m/f)

#### Description:

- the main objective of your work will be the understanding of photonic effects in nanostructured materials and their application to the development of novel sensor principles for the detection of biomolecular interactions as well as for gas sensing and/or environmental monitoring
- one focus of your work will be the study of structure-property relationships of plasmonic and/or non-plasmonic nanostructures to develop novel materials synthesis routes for optically active devices such as waveguides and antenna structures
- you will have the opportunity to establish and manage a junior research group with a seed grant of two further scientific positions (see below)
- you will identify novel research tasks in the field of miniaturized photonic (plasmonic/non-plasmonic) sensors
- you will be introduced into the acquisition of third-party funding for further fundamental and applied projects from local, national or European funding agencies

#### Requirements:

- doctoral degree in physics, chemistry, materials science or other relevant disciplines, including a solid base in theoretical and experimental skills
- your expertise is supposed to match **several** of the following fields:
  - synthesis and characterization of micro- and nano-patterned photonic, plasmonic or non-plasmonic sensor elements
  - practical skills in lithography-based top-down or bottom-up patterning techniques such as DNA-based methods for tailoring optically active sensor elements and their controlled assembly towards functional devices
  - development of optical spectral sensors (UV-Vis, NIR, IR)
  - practical skills in surface plasmon resonance (SPR) spectroscopy, ellipsometry, dark-field microscopy and electron energy loss spectroscopy (EELS)
  - biosensing with optical waveguides, fiber-optical SPR sensors, plasmonic waveguide biosensors
  - modeling of electromagnetic coupling in plasmonic/non-plasmonic systems
- the primary criteria for appointment will be a strong track record of innovative research and academic performance, including publications in leading journals, as well as high potential for establishing an ambitious, independent research program

- together with fruitful collaborations
- excellent skills in organization and communication, combined with a flexible attitude and the ability to work in a team
  - experience with the acquisition of third-party funding is welcome but not mandatory
  - good command on German and English in speech and writing

## (2) **Research assistant** (m/f)

### Description:

- the main task of your work will be the synthesis of plasmonic/non-plasmonic elements as well as studies on their local assembly into waveguides and antenna structures, and the development of methods for their controlled positioning on technical surfaces and in microfluidic systems
- application of biological self-organization principles for the synthesis and positioning of plasmonic/non-plasmonic-based sensor elements
- in-depth analysis of the coupling behavior of plasmonic/non-plasmonic nanoantennas and possible electromagnetic field enhancements
- characterization of the near- and far-field behavior of nanoantennas for the development of novel sensor principles

### Requirements:

- master, diploma or doctoral degree in physics, chemistry, engineering or other relevant disciplines with a solid theoretical and experimental skills base
- background in the following fields:
  - synthesis as well as structural and optical characterization of metallic and dielectric nanoparticles
  - integration of plasmonic structures into Lab-on-a-Chip systems
  - optical and electron-beam lithography
  - biomimetic materials synthesis
- high motivation to acquire new techniques and workflows
- good language skills in German and English, both in speech and writing
- above-average scientific interest and success-oriented personality

## (3) **Engineer** (m/f)

### Description:

- modeling of near- and far-field behavior of photonic (plasmonic/non-plasmonic) sensor systems with the objective to develop signal transducers for the read-out of characteristic sensor parameters
- studying the coupling modes of plasmonic films and nanostructures
- development of electronic circuits for opto-electronic signal transducer and analyzer systems

### Requirements:

- master degree in applied sciences (Hochschulabschluss) in electrical engineering or a comparable discipline
- profound knowledge and practical skills in the following fields:
  - opto-electronic circuit design
  - high-frequency technology

- modeling of opto-electronic systems
- near- and far-field characterization of plasmonic/non-plasmonic antennas
- optical and electron-beam lithography
- high motivation to acquire new techniques and workflows
- good language skills in German and English, both in speech and writing
- above-average scientific/engineering interest and success-oriented personality

We offer:

- the three positions offer an excellent scientific environment, access to state-of-the-art technologies and opportunities for scientific collaborations within and beyond the KSI
- the KSI cooperates closely with universities and other research facilities
- in case of higher eligibility, we offer the opportunity for further occupational qualification (doctoral degree (Ph.D.) or habilitation)
- employment, payment and social benefits are governed by the public sector collective agreement (Tarifvertrag für den Öffentlichen Dienst der Länder (TV-L))

All three positions are limited to a maximum duration of employment of five years.

The KSI is an equal opportunity employer and supports gender equality. The KSI is committed to employing disabled individuals and especially encourages them to apply.

Interested candidates should send their applications including a CV with a publication list, a summary of research achievements and interests (max. 2 pages), a list of three referees, and - for the group-leader position - a scientific concept for the development of the junior research group as a single pdf file to:

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The search will continue until the positions are filled. To ensure full consideration, applications should be received by **June 20th, 2017**.