

The Junior Research Group for Ultrafast Structural Dynamics at Julius-Maximilians-Universität Würzburg (JMU), Germany, is inviting applications for a

### **Doctoral Researcher Position (m/f/d)**

The position will be available to start **as soon as possible** and will be fixed term for an initial period of **three years**. The position is part time (65% of the regular weekly working hours). Remuneration will be based on the collective agreement for the public service of German federal states (*Tarifvertrag für den öffentlichen Dienst der Länder, TV-L*).

This position is part of a research project funded by the *Excellent Ideas II* programme of the JMU. A short description of the project can be found on the following page. The PhD project focuses on the development of experimental tools for ultrafast, all-optical probing and control of vibrational dynamics in functional materials and molecules. We offer a supportive and collaborative working environment with excellent working conditions and outstanding facilities, including state-of-the-art laser and cryostat systems, modern laboratories, and fully equipped mechanical and electrical workshops at the Hubland campus in Würzburg.

#### **Duties/responsibilities:**

- Development of experimental schemes for ultrafast vibrational imaging and spectroscopy
- Preparation of van der Waals (vdW) homo- and heterostructures
- Planning, implementation, automation, and execution of all-optical pump-probe experiments
- Data analysis and interpretation
- Publication of results in international peer-reviewed journals
- Presentation of research findings at national and international conferences

#### **Qualifications:**

- Master's degree in Chemistry, Physics, or a related field
- Experience with ultrafast laser systems and/or the fabrication of vdW devices is highly desirable
- Experience in data analysis using Python, MATLAB, or a comparable programming language
- Experience with laboratory automation using LabVIEW

#### **What we offer:**

- A unique opportunity to build and shape a new femtosecond laser laboratory from the ground up
- Close supervision and mentoring within a dynamic early-career research group
- Access to excellent research infrastructure and technical support
- Opportunities for international collaboration and conference participation

The JMU aims to reduce the underrepresentation of women and therefore explicitly encourages qualified women to apply. Severely handicapped applicants will be given preferential consideration in the case of broadly equal suitability, ability and professional achievements.

Please send your convincing application and supporting documents - preferably by email – to

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The closing date for applications is **22.05.2026**.

**Project description:**

The PhD project will focus on the ultrafast optical driving of lattice dynamics in vdW materials to control their functional properties, such as ferroelectricity, magnetism, and excitonic behavior. While early research on vdW materials primarily emphasized their semiconducting properties, recent advances have revealed a rich spectrum of phenomena, including (anti-)ferromagnetism, multiferroicity, and sliding ferroelectricity.

The goal of this project is to exploit the crystal lattice as an active control parameter to manipulate ferroic order and excitons in vdW materials on ultrafast timescales. In particular, the project aims to induce transient states with properties that are inaccessible under equilibrium conditions.

To this end, the PhD candidate will develop and implement experimental schemes for the selective excitation of infrared- and Raman-active lattice modes using intense mid-infrared femtosecond pulses. The resulting changes in material properties will be investigated using ultrafast linear and nonlinear optical spectroscopy.

**Required documents:**

- Letter of Motivation (max. 1 page): Please describe your interest in our research group and the topic of the PhD project in detail, and explain why you consider yourself a strong candidate.
- Curriculum Vitae (CV) (max. 2 pages)
- Transcript of Records (BSc and MSc): If your Master's certificate is not yet available, please submit your most recent official academic transcript (e.g., current record of studies).

Please do not send any original documents to us; only send photocopies. As we need to save costs, we will not be able to return your documents to you. They will be shredded shortly after a hiring decision has been made. If you enclose a postage-paid return envelope, we will return your application documents to you three months after a hiring decision has been made.

