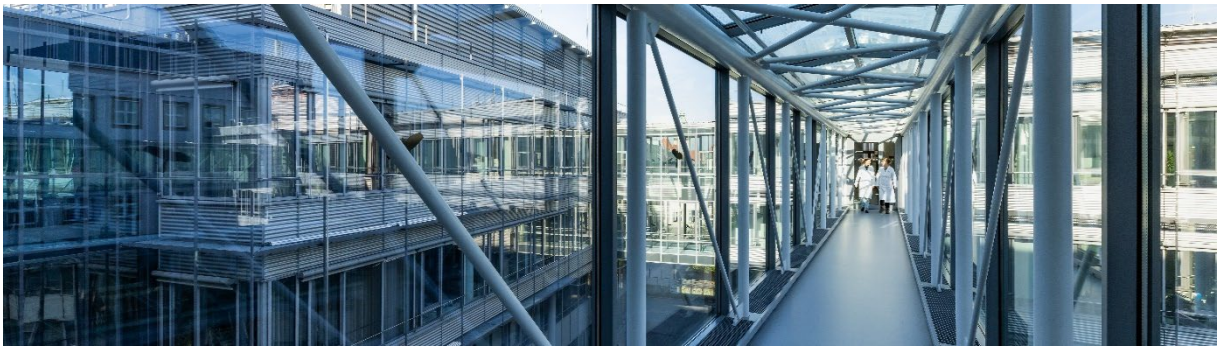
Leibniz Institute for Solid State and Materials Research Dresden

The Leibniz Institute for Solid State and Materials Research Dresden e. V. (IFW Dresden) conducts modern materials research on a scientific basis for the development of new and sustainable materials and technologies. The institute employs an average of 500 people from over 40 nations and, in addition to its scientific tasks, is dedicated to promoting young scientists and engineers. Further information at: http://www.ifw-dresden.de.



The Institute of Metallic Materials at the Leibniz Institute for Solid State and Materials Research Dresden (IFW Dresden) offers a

PhD-student-Position (m/f/div)

on the topic “Cuprate twisted heterostructures for superconducting quantum circuits”

Project Overview:

High temperature superconducting complex oxides ($La_{2-x}Sr_xCuO_4$, $YBa_2Cu_3O_{7-x}$, $Bi_2Sr_2CaCu_2O_{8+x}$) are oxygen rich and electronically heterogeneous, forming a landscape of “puddles.”, which make them quite challenging to control in modern electronics. Interest now centres less on nitrogen-range Tc and more on this unparalleled, still-mysterious electronic state. Three decades of materials progress have clarified both limitations and enormous potential of those superconducting quantum materials for emergent electronics. The student will work in Dresden at the fabrication facilities of the Superpuddles lab creating synergy with the measurement expertise in superconducting quantum circuits of the QTLab at the University of Naples Federico II. The student will advance the experimental control of cuprate 2.5-dimensional van der Waals heterostructure with innovative design and tackling key experimental challenges for novel superconducting quantum technologies (see Figure) by both exploring the realm of low-temperature electronics and non-linear photonics.

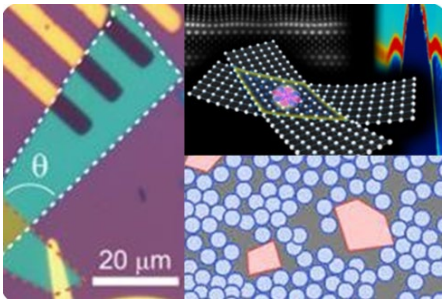


Figure: (left) An optical image of a cuprate twisted heterostructures. (upper right) A sketch of a resulting emerging new superconducting order parameter (bottom right). A sketch of the multicomponent electronic complexity of a high temperature cuprate superconductors.

Your profile:

We are looking for a highly motivated and team-oriented student (m/f/div), who holds a Master degree in physics, engineering or quantum science and technology. Successful candidate (m/f/div) is enthusiast about fundamental science, highly ambitious and a good team-player. Good communication skills in written and spoken English are required.

What we offer:
- employment in accordance with the collective agreement for the public service of the federal states (TV-L),
- A modern, well-equipped workplace on the campus of the Technische Universität Dresden,
- Flexible, family-friendly working hours,
- 30 days vacation,
- Company pension scheme (VBL),
- Benefits for job ticket/Germany ticket,
- Special annual payment,
- Capital-forming benefits,
- Company health management (back training, health day with various offers),
- discounted sports offers from the Dresden University Sports Center,
- job-related further training opportunities and language courses,
- Company restaurant with a variety of breakfast and lunch dishes.

The salary is based upon the TV-L rules (EG 13, 65%). The initial appointment is for one year. The contract will be extended by another 2 years upon a successful mid-term evaluation. The anticipated start date is January-February 2026.

In line with our commitment to diversity, we encourage qualified women to apply, as we aim to increase female representation in the field of science. Additionally, disabled applicants (m/f/div) will receive preferential consideration if they meet the requisite qualifications. Promising candidates (m/f/div) will be invited for an interview.

Please send your application with informative documents (letter of motivation, CV, Master certificate, training certificates) exclusively in electronic form and in a PDF file (other formats will not be considered), citing the reference number **052-25-2107**, no later than **November 16th 2025** to

bewerbung@ifw-dresden.de

If you have further questions about the position please contact Dr. Nicola Poccia (n.poccia@ifw-dresden.de) and/or Dr. Haider Golam (g.haider@ifw-dresden.de)