

## IFW Dresden e.V.



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>.

### **Postdoc position (m/f/div)**

on the following topic: Thermoelectric Energy Harvesters for IoT Wireless Sensor Networks

City: Dresden; Starting date (earliest): 01/10/25; Duration: 24 months; Remuneration: TV-L; Reference number: 045-25-2503; Closing date: 30/09/25

### **Working field**

We are looking for an outstanding Postdoctoral Researcher to join our ERC-funded project focused on solving one of the most pressing challenges in the Internet of Things (IoT): sustainable power supply. Conventional batterybased solutions are environmentally burdensome, costly to maintain, and impractical for large-scale deployment, especially in remote or harsh environments. To address this, our project explores Mg-based thermoelectric materials as a clean, maintenancefree alternative for energy harvesting. By converting ambient thermal gradients into electricity through innovative thermoelectric generators (TEGs) that perform efficiently even under small temperature differences ( $\Delta T \leq 30$  K), we aim to redefine how IoT devices are powered. This research has the potential to enable robust, scalable, and self-sustaining wireless sensor networks. This is an exciting opportunity to contribute to breakthrough research that could transform the scalability and sustainability of IoT ecosystems.

As a Postdoctoral Researcher, you will:

- Develop and Prototype advanced thermoelectric modules utilizing n-type  $\text{Mg}_3(\text{Bi,Sb})_2$  and p-type  $\text{MgAgSb}$  for efficient energy harvesting under small temperature gradients ( $\Delta T \leq 30$  K).
- Design and Optimize novel fabrication techniques to achieve high packing densities in thermoelectric generators (TEGs) for powering IoT sensor networks.
- Implement Advanced Characterization Techniques to evaluate material performance and device reliability, integrating electronic control systems including DC-DC voltage boosting and maximum power point tracking (MPPT).

### **Requirements**

We are looking for motivated individuals (m/f/div) with a Ph.D. degree in Electrical Engineering, Materials Science, Physics or a related field. Candidates should have a proven track record in thermoelectric energy conversion or a related area, along with familiarity with energy harvesting and power management systems. Practical experience

in device fabrication and characterization is essential, as is expertise in experimental design and iterative prototyping. Proficiency in operating laboratory equipment—such as Keithley instruments and data acquisition systems—is expected. Applicants should be able to work independently and collaboratively within multidisciplinary teams and possess strong written and verbal communication skills, particularly for scientific reporting and publications.

### **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.

We offer state-of-the-art facilities at IFW Dresden, providing advanced laboratories and equipment for materials synthesis, characterization, and prototype development, and an opportunity to join a dynamic, international team dedicated to sustainable IoT energy solutions. The position provides ample opportunities for professional growth through mentorship, interdisciplinary collaboration, and participation in international conferences. Additionally, the role comes with a competitive salary package (TV-L E13, full position) and a 24-month contract with a potential extension based on performance and project funding.

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 will be invited for an interview.

## Application

Please send your application with informative documents (detailed curriculum vitae highlighting relevant research experience, cover letter outlining your motivation and how your expertise aligns with the project, up to three publications that exemplify your work in thermoelectrics or related areas, contact Information for at least two professional references, other relevant documents) exclusively in electronic form and in a PDF file (other formats will not be considered), citing the reference number 045-25-2503, no later than September 30th 2025 to

[bewerbung@ifw-dresden.de](mailto:bewerbung@ifw-dresden.de)

If you have further questions on the position, please contact Dr. Ran He ([r.he@ifw-dresden.de](mailto:r.he@ifw-dresden.de)).

More information at <https://stellenticket.de/196559/LUH/>  
Offer visible until 23/08/25

