The Center for Advancing Electronics Dresden (cfaed) offers the position as

**Research Associate / PhD Student**

(subject to personal qualification employees are remunerated according to salary group E 13 TV-L)

**Research area:** Organic devices for nonvolatile memory and neuromorphic computing applications

**cfaed Investigators:** Prof. Stefan Mannsfeld

**Terms:** 65% of the fulltime weekly hours, the position is a 3 years appointment (with the option to be extended) and starts **as soon as possible**. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz – WissZeitVG). The position offers the chance to obtain further academic qualification (e.g. PhD).

**Position and Requirements**

Due to the way conventional CMOS-based architectures operate, they are ultimately limited by the Neumann bottleneck which makes them slow and energy-inefficient at certain tasks (vectorizable, highly parallel information processing). On the other hand, the human brain is an example for an architecture capable of massively parallel processing of information through each synaptic event only consumes about 1–100 fJ. Recent developments have shown that organic devices can be very competitive in this new field. We have also recently developed a novel memory devices that can be read out and written to both electrically and by light. **With this research projects we want to:** i) explore novel device architectures that enable neuromorphic circuit architectures, but also ii) develop nonvolatile, multi-bit organic memory devices that can be read and written both electrically and optically.

The successful candidates will:

- work in a multidisciplinary environment with access to state-of-the-art equipment and be part of a team of several other PhD candidates and postdocs
- explore different fabrication conditions and parameters in order to optimize the device layout for electrical functionality, data retention, storage density, synaptic properties etc.
- fabricate organic multilayer devices and small circuits that contain these devices
- characterize the resulting devices both morphologically and electrically, the latter including I-V, C-V, C-f, and optical measurements.

We aim at attracting the best talent in the respective research fields and look for:

- an outstanding university master degree (or equivalent) in chemistry, physics, electronics, materials science or related field of physical sciences,
- strong knowledge in device physics/semiconductor physics,
- previous experience in fabrication of organic or inorganic thin film electronic devices
- ideally also prior experience with thin film deposition from vacuum
very good interpersonal and communication skills; in particular, the ability to effectively work in collaborative research efforts,

- an independent, target- and solution-driven work attitude,
- inter- and multidisciplinary thinking,
- strong motivation and interest to join one of the most ambitious interdisciplinary research clusters,
- fluency in English - written and oral.

What we offer
You will join a team of enthusiastic scientists who pursue creatively their individual research agenda inspired by the cluster’s innovative approach and support. Your PhD research will be fostered by the cfaed philosophy to promote young researchers which includes:

- access to state of the art research of leading academic institutes.
- International doctoral program
- promotion of gender equality and family-friendly work environment.

Applications from women are particularly welcome. The same applies to persons with disabilities.

Application Procedure
Your application (in English only) should include: motivation letter, CV, copy of degree certificate, transcript of grades (i.e. the official list of coursework including your grades) and proof of English language skills. Complete applications should be submitted preferably via the TU Dresden Secure-Mail Portal https://securemail.tu-dresden.de by sending it as a single pdf-document quoting the reference number PhD2010_Memory in the subject header to recruiting.cfaed@tu-dresden.de.

Contact: TU Dresden, cfaed, Anne Schulze, Helmholtzstr. 10, 01069 Dresden, Germany. The closing date for applications is March 2, 2021. Please submit copies only, as your application will not be returned to you. Expenses incurred in attending interviews cannot be reimbursed.

Reference to data protection: Your data protection rights, the purpose for which your data will be processed, as well as further information about data protection is available to you on the website: https://tu-dresden.de/karriere/datenschutzhinweis

About cfaed

cfaed is a research cluster at Technische Universität Dresden. As a central scientific unit it brings together 300 researchers from the university and 10 other research institutes in the areas of Electrical and Computer Engineering, Computer Science, Materials Science, Physics, Chemistry, Biology, and Mathematics. cfaed addresses the advancement of electronic information processing systems through exploring new technologies which overcome the limits of today’s predominant CMOS technology. For more information please see www.cfaed.tu-dresden.de

About TU Dresden

The TU Dresden is among the top universities in Germany and Europe and one of the eleven German universities that were identified as an ‘elite university’ in June 2012. As a modern full-status university with 17 faculties it offers a wide academic range making it one of a very few in Germany.