Center for Advancing Electronics Dresden

The Junior Research Group “Biological Algorithms” headed by PD Dr. Benjamin M. Friedrich, affiliated with the Cluster of Excellence ‘Physics of Life’ (PoL), and funded by the Heisenberg Programme of the DFG, offers, subject to resources being available, a position as

**Research Associate / PhD Student**

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

which entails 65 % of the fulltime weekly hours. The position starts **as soon as possible** and is limited for 36 months. 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.

**About the project:** Regrowing a lost limb is still a dream in regenerative medicine, yet common in salamanders like axolotl. The mechanism by which an unstructured wound blastema repatterns itself into a functional limb is only partly understood. New quantitative imaging of morphogen dynamics can allow us to decipher these mechanisms in a theory-experiment collaboration.

**Tasks:** You will develop mathematical models of morphogen dynamics during limb regeneration, in close collaboration with world-leading experimental partners, to test and refine two alternate biological hypotheses. We will start with one-dimensional reaction-diffusion-kinetics coupled to local tissue growth and refine these step-by-step. In parallel, we will develop image analysis algorithms to quantify spatio-temporal patterns of gene expression and key signaling factors, thereby providing exactly those parameters needed in the mathematical models to be developed. Within our theory-experiment collaboration with Elly Tanaka (Vienna) and Tatiana Sandoval-Guzman (Dresden), we will have the unique opportunity to suggest new experiments guided by theory and thus to test our theoretical ideas.

**Requirements:** We are looking for a **theoretical physicist** (or applied mathematician), who is intrigued to discover algorithms of life, and meets the following requirements:

- outstanding university degree in physics, or closely related field
- experience in computational physics and strong programming skills (e.g. Matlab, Python, C)
- strong interest in applying physics to understand life, willingness to learn some biology *en route*
- strong analytic and problem-solving skills, creativity
- strong communication skills, especially in cross-disciplinary communication
- fluency in English – oral and written
- experience in statistical physics, nonlinear dynamics, stochastic processes; information theory is a plus.

**About us:** You will join a friendly group of enthusiastic theoretical biological physicists, who aim to decipher the biological algorithms that drive the spatio-temporal nonlinear dynamics of biological systems at the cell and tissue level, interacting closely with experimentalists. [https://cfaed.tu-dresden.de/friedrich-home](https://cfaed.tu-dresden.de/friedrich-home)

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

Please submit your application **(in English only)** containing a concise motivation letter (max. 2 pages), CV with publication list, link to your Master thesis, names and contact details of at least two references, copy of degree certificate and proof of English language skills preferably via the TU Dresden SecureMail Portal [https://securemail.tu-dresden.de](https://securemail.tu-dresden.de) by sending it as a single pdf document quoting the reference number **PhD-Bio 0720** in the subject header to
recruiting.cfaed@tu-dresden.de or by mail to TU Dresden, cfaed, Nachwuchsforschungsgruppe “Biological Algorithms”, Herrn PD Dr. Benjamin Friedrich, Helmholtzstr. 10, 01069 Dresden, Germany. The closing date for applications is **31.08.2020** (stamped arrival date of the university central mail service applies). Please submit copies only, as your application will not be returned to you.

**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](https://tu-dresden.de/karriere/datenschutzhinweis)

**About cfaed**

cfaed is a Central Academic Unit at TU Dresden. It brings together more than 100 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. [www.cfaed.tu.dresden.de](http://www.cfaed.tu.dresden.de)

**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 18 faculties it offers a wide academic range making it one of a very few in Germany.