

TUD Dresden University of Technology, as a University of Excellence, is one of the leading and most dynamic research institutions in the country. Founded in 1828, today it is a globally oriented, regionally anchored top university as it focuses on the grand challenges of the 21st century. It develops innovative solutions for the world's most pressing issues. In research and academic programs, the university unites the natural and engineering sciences with the humanities, social sciences and medicine. This wide range of disciplines is a special feature, facilitating interdisciplinarity and transfer of science to society. As a modern employer, it offers attractive working conditions to all employees in teaching, research, technology and administration. The goal is to promote and develop their individual abilities while empowering everyone to reach their full potential. TUD embodies a university culture that is characterized by cosmopolitanism, mutual appreciation, thriving innovation and active participation. For TUD diversity is an essential feature and a quality criterion of an excellent university. Accordingly, we welcome all applicants who would like to commit themselves, their achievements and productivity to the success of the whole institution.

At the **Faculty of Mathematics, Institute of Scientific Computing**, within the **Dresden Center for Computational Materials Science (DCMS)** offers two positions as

Research Associate / PhD Student / Postdoc (m/f/x)

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

starting **as soon as possible**. The positions comprise once 75% up to 100% of the full-time weekly hours limited for 3 years and once 75% of the full-time weekly hours limited for 3 years or 100% of the full-time weekly hours limited until July 31, 2027 with the option of extension. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz - WissZeitVG). The positions offer the chance to obtain further academic qualification (usually PhD / habilitation thesis).

The positions are embedded in the activities of the project “Analyzing structure-property relations in equilibrium and non-equilibrium hyperuniform systems”, coordinated by Prof. Dr. Marco Salvalaglio and Prof. Dr. Axel Voigt and funded by the German Research Foundation (DFG). The core activities will focus on the investigation of disordered correlated systems using various tools and models, including: i) characterization of the emerging patterns in physical systems (solid state materials and active systems); ii) investigation of the mechanical properties and the effects of disordered correlated microstructures on diffusion; iii) development of energy-based models and numerical simulations of hyperuniform assemblies; iv) development and application of techniques for the analysis of topological data. Targeted activities in the field of public relations are also planned.

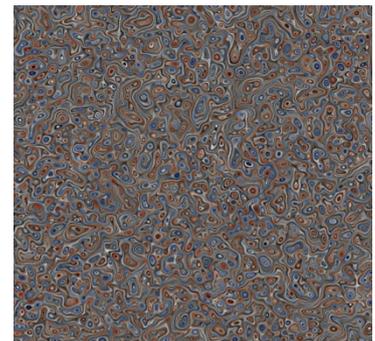


Figure 1: Active flow field exhibiting traits of hyperuniformity: PNAS 121 (24) e2320719121 (2024)

The activities will mainly be based at the Institute of Scientific Computing at the Faculty of Mathematics at TUD.

Tasks:

- generation of hyper uniform patterns (point, scalar and vector fields)
- application of topological data analysis tools such as persistent homology and graph statistics
- development of special phase field and phase field crystal models
- coupling newly developed approaches with established approaches for simulating e.g. mechanical properties and the flow of fluids
- implementation of models in existing simulation software
- conducting numerical studies, also on HPC systems
- Further specific tasks can be tailored to the attitude and interests of the PhD students/postdocs.

Requirements:

- university and, if applicable, PhD degree (e.g. Master/Diploma) in mathematics, physics, materials science or related subjects
- basic knowledge of computer programming (e.g. Python, Matlab and C++)
- excellent knowledge of the English language
- high problem-solving ability, motivation/interest in scientific research, willingness to learn and work in a group
- applications showing previous experience with numerical methods/simulations, state-of-the-art computational techniques (e.g. data-driven methods and/or FEM) and/or theoretical material modeling will be given preference

We offer:

- chance to collaborate with internationally renowned researchers in the field
- participation in exchange programs and short research stays abroad
- for applicants looking for a PhD student position: opportunity to choose the main topic of the doctorate within the framework of the DCMS (provided it is compatible with the project topic)
- extensive training and development opportunities
- flexible arrangement of working hours and remote work balancing work and private life
- financial support for the purchase of a so-called job ticket (for public transport in Dresden and the surrounding area)

TUD strives to employ more women in academia and research. We therefore expressly encourage women to apply. The University is a certified family-friendly university. We welcome applications from candidates with disabilities. If multiple candidates prove to be equally qualified, those with disabilities or with equivalent status pursuant to the German Social Code IX (SGB IX) will receive priority for employment.

Please submit your detailed application with the usual documents (incl. letter of motivation, CV, letter of recommendation and university certificates, i.e. list of academic achievements with grades) by **July 17, 2025** (stamped arrival date of the university central mail service or the time stamp on the email server of TUD applies), preferably via the TUD SecureMail Portal <https://securemail.tu-dresden.de> by sending it as a single pdf file to marco.salvalaglio@tu-dresden.de or to: **TU Dresden, Institute of Scientific Computing, Prof. Dr. Marco Salvalaglio, Helmholtzstr. 10, 01069 Dresden, Germany**. 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>.