Chair for Computational Analysis of Technical Systems

RWTH AACHEN UNIVERSITY

Doctoral Position

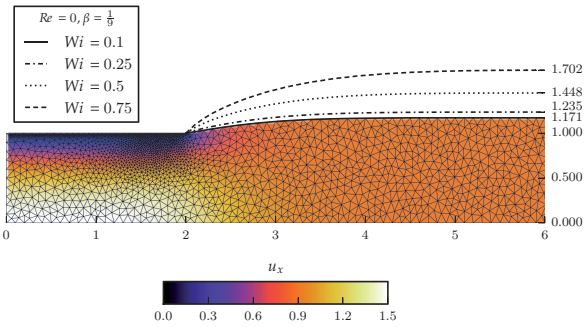
in DFG International Research Training Group 2379 “Modern Inverse Problems”

The new DFG International Research Training Group (IRTG) 2379 builds on a unique consortium, at RWTH Aachen University with its Aachen Institute of Advanced Study in Computational Engineering Science, and at the **University of Texas at Austin** with its **Institute for Computational Engineering and Sciences**. The projects are embedded in the field of modern inverse problems and introduce a new innovative perspective into the education of future scientists and engineers.

The advertised position is associated with the project “P1 Novel stabilized finite-element methods for microstructured and complex fluids,” and advised jointly by Prof. Marek Behr at RWTH Aachen and Prof. Leszek Demkowicz at UT Austin. The project will advance the state of the art in the computational treatment of viscoelastic (VE) constitutive equations and similar model equations arising elsewhere. The applications of this research range from production engineering and melt-based forming processes (die swell of VE fluid shown in figure), to biomedical device design, to aerospace technology.

The research goals of this project are:

- Understanding of the **stability and accuracy** properties of two alternate finite element discretization approaches;
- Transfer of **Discontinuous Petrov-Galerkin** stability and accuracy advantages to low-order **stabilized FE** formulations;
- Insight into numerical behavior of **sensitivities and adjoints** required for design tasks in both approaches.



Your profile: Requirement for this position is a master’s degree in computational or mechanical engineering, applied mathematics, or a similar subject with a superior academic record. Practical programming experience in Fortran, C, or C++ as well as with parallelization (MPI or OpenMP) are of advantage. Familiarity with UNIX operating systems would be ideal. We expect you to contribute to general tasks at the institute, such as teaching and advising master or project theses. Language skills in German are not required.

Our offer: The candidate will be employed as a regular employee and must meet required personal qualifications. This is a full-time position with salary according to German civil service pay scale TV-L E 13 (roughly 3600 euros/month before taxes). The expected appointment period is **three years**. Full involvement in the IRTG activities, including joint RWTH-UT colloquia, annual workshops and schools, and short courses is expected. A **six-month** research stay at University of Texas in Austin is part of the training program.

At our chair, we consider serious and reliable research an important task. At the same time, we can offer you to become part of a very social and well-functioning team of currently roughly 20 members. Especially for international students, open doors and regular social events help become acquainted with the German culture quickly. Furthermore, we can assure you that we will support your personal development in all ways possible, thus giving you a good starting point for a future career in both academia or industry. Feel free to contact us for further information!

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