

Department für Mathematik

Chair of Applied Mathematics  
(Continuous Optimization)

Prof. Dr. Michael Stingl

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[en.www.math.fau.de/continuous-optimization/](http://en.www.math.fau.de/continuous-optimization/)

**PhD/postdoc position:**

**Mathematical modeling and analysis of a nonlocal material model in topology optimization**

The project is the mathematical part within an interdisciplinary transfer project of the Collaborative Research Centre 814 “Additive Manufacturing” at the FAU involving researchers from Mathematics, Engineering as well as Industry. In this interdisciplinary research project thin structures in 3D printed components are investigated. For this, we seek to establish and analyze a novel material model, taking geometrical effects in elastic behavior into. In contrast to classical linear elasticity models, the material coefficients are instantiated in a nonlinear and nonlocal way. By this, boundary effects (e.g. surface roughness) due to the printing process can be approximated. The model will be implemented in a topology optimization framework and software. As the presence of thin structures implies rather fine resolutions, also HPC aspects are involved.

**Our team:**

Chair of Applied Mathematics (Continuous Optimization) Prof. Dr. Michael Stingl. Currently 1 professor, 2 postdocs and 7 doctoral candidates. Focus in both, applied mathematics as well as computational engineering. Our division has many interdisciplinary collaborations inside FAU and beyond.

**What we expect:**

- M.Sc. or PhD in mathematics or a related subject with strong mathematical focus
- Profound knowledge in ideally all three fields optimization, PDE numerics and analysis
- Programming skills in MATLAB/ Python and ideally in C++
- Independent working practice, good communication skills in English and ideally German

**Additional Information:**

- Send your application including CV, academic transcripts, a letter of motivation for this opening and a letter of recommendation to [positions-co@math.fau.de](mailto:positions-co@math.fau.de) before February 15th 2021
- Project start: May 1st 2021 or earlier
- Duration: 3 years (can be extended)
- Funding: Deutsche Forschungsgemeinschaft (DFG) - Collaborative Research Centre 814