Advertisement for PhD position

The Metamorphic Processes Research Group (MPRG) at JGU Mainz invites applications for a PhD position in the field of Metamorphic Processes. This is a unique opportunity to contribute to cutting-edge research at the intersection of computational methods and geological sciences.

Understanding natural processes involves the ability to solve complex systems of equations (partial differential equations – PDEs) in order to predict the time evolution of highly interacting systems. Nowadays, modern programming languages, like Julia, allow the development of fast, high-level algorithms. The successful candidate will focus on the development and application of computational methods related to PDE-constrained optimization in relation to porous fluid flow and metamorphic reactions. This approach allows the integration of geological/petrological/geophysical data in a unified framework.

You will work within a dynamic and interdisciplinary team, utilizing state-of-the-art computational tools to model and simulate the complex phenomena driving metamorphic transformations.

Key Responsibilities:

- Develop and implement tools for the solution of PDEs using the finite difference (FD) and the finite element method (FEM) in julia.
- Develop and implement advanced computational methods for PDE constrained optimization.
- Analyze geological data to inform and validate models.
- Collaborate with experts in geology, mathematics, and computer science.
- Contribute to academic publications and present findings at international conferences.

The position is supported for 4 years (50% E13 Level) and it is funded by the Institute of Geosciences. The starting date is planned for October 2024 but this can be negotiated. Assistantships in courses and laboratory work is expected.

We seek a highly motivated individual with a strong background in Earth Sciences. Proficiency in programming and numerical methods is essential but not a prerequisite. Previous experience with PDEs and optimization techniques is highly desirable.

Join us at the University of Mainz and be part of a research community that values innovation, collaboration, and academic excellence. To apply, please submit your CV (2 pages maximum), a cover letter (2 pages maximum), a publication list (if applicable), and two letters of references by 31st of July 2024. All the documents should be in pdf form and sent in a compressed (zip) folder to evmoulas@uni-mainz.de .

For more information about our current research directions please visit:
https://metamorphism.de/current-research-projects/

Prof. Dr. Evangelos Moulas
Junior.-Prof. of Metamorphic Processes
Johannes Gutenberg-Universität Mainz
Institute of Geosciences
Mainz Institute of Multiscale Modeling
J.-J.-Becher-Weg 21
D-55128 Mainz
email: evmoulas@uni-mainz.de
webpage: https://metamorphism.de/
https://model.uni-mainz.de/