



The DFG-funded **Collaborative Research Center SFB 1294 “Data Assimilation – The Seamless Integration of Data and Models”**, hosted at the University of Potsdam jointly with its partner Institutions HU Berlin, TU Berlin, WIAS Berlin and GFZ Potsdam, invites applications for a **doctoral researcher position** starting as soon as possible.

Our vision. The assimilation of time-dependent data sets into complex evolution models leads to unique mathematical and computational challenges. These challenges which provide the central theme of the SFB 1294. Data assimilation constitutes a rapidly expanding field at the confluence of several established research areas in mathematics, statistics and machine learning, on the one hand and applications from the natural sciences and other disciplines. Our vision is to establish a rigorous mathematical underpinning of data assimilation, to develop principled computational methodologies, and to apply these methodologies to newly emerging application fields in the geosciences, neuro-sciences, pharmacology and biophysics.

The SFB 1294 provides an excellent research infrastructure including a large interdisciplinary net-work of researchers and its own graduate school, as well as funding opportunities for conference visits, summer schools, and hosting international experts etc.

The position. We seek applicants for a doctoral position (TVL - E13 75%) within **Project A07 “Model order reduction for Bayesian inference”**

(PIs: Freitag/Lie)

The aim of this project is to tackle the challenge of analysing and designing computationally efficient algorithms for Bayesian inference, by using ideas and approaches from dimension reduction and model order reduction (MOR). We will consider both linear and nonlinear inverse problems, and address both theoretical and algorithmic problems. In doing so, we aim to strengthen the bridge between Bayesian inference and MOR. This will make a wider range of computationally efficient algorithms available for Bayesian inference, and thus improve the applicability of Bayesian methods for inverse problems.

The researcher will develop the mathematical theory of Bayesian inference with dimension reduction, in the context of inverse problems. They will analyse the effect of low-rank approximations and projection-based dimension reduction on the posterior measure for infinite-dimensional parameter spaces, and develop and analyse algorithms for Bayesian inference using model order reduction.

We expect a doctoral candidate with strong mathematical expertise in at least two of the following areas: Bayesian inference, inverse problems, numerical linear algebra and model order reduction. Very good programming skills in either Matlab or Python are required. We expect ability to work effectively both in a team and on their own. The candidate must be able to communicate effectively in both written and spoken English.

The candidate will work at the Institute of Mathematics at the University of Potsdam under the supervision of Prof. M. Freitag. They will closely collaborate with the group of Prof. H.C. Lie (Institute of Mathematics, University of Potsdam).

The salary is determined by the collective bargaining agreement for public employees in Germany (TV-L 13). All positions are temporary in accordance with Section 2 subsection 1 of the Academic Fixed-Term Contract Law (WissZeitVG). The position(s) require completed academic studies at an institute of higher learning (Master degree or equivalent).

The salary is determined by the collective bargaining agreement for public employees in Germany (TV-L 13). All positions are temporary in accordance with Section 2 subsection 1 of the Academic Fixed-Term Contract Law (WissZeitVG). Under the laws of the federal state of Brandenburg, employees under this contract are permitted to dedicate at least 33% of their contract time for their scientific qualification. The SFB 1294 seeks to promote diversity in research, and encourages qualified applicants of any gender and from any background to apply.

Applications to the SFB should be submitted via <https://www.geo-x.net/sfb-1294/> and should include (1) a statement of research interests and motivation, (2) a full CV, (3) the names, e-mail addresses and/or reference letters of at least two referees, (4) academic transcripts and (5) link to electronic copy of your Master/Diploma thesis (6) list of publications/talks/presentations in a single PDF file. Applications will be considered until the position has been filled. Please indicate clearly which of the projects/positions you are applying for (e.g. "A04") and state your motivation accordingly.

See the website www.sfb1294.de for further information or contact melina.freitag@uni-potsdam.de.