



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** available from October 1st, 2021.

**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 A04: “Nonlinear statistical inverse problems with random observations”**

(PIs: Huisinga/Lie/Reiss)

This project studies non-parametric estimation of covariate effects on the parameters of a time-dependent process in a Bayesian statistical context. It is motivated by the problem of covariate modeling and estimation in analyzing clinical data. The functional relationship of the time-dependent process is assumed to be of known form and depends on an unknown parameter. Estimating from observed data the (non-parametric) functional relationship between an exogenous variable (covariate) and parameters, while the latter is only indirectly observed through the data, constitutes a non-linear inverse problem. The aim of the project is to develop the mathematical theory of nonparametric Bayesian inference for nonlinear inverse problems featuring random design. The focus will be on adaptive posterior concentration and frequentist coverage. The motivated example from pharmacology will serve as a test case for the developed methods.

The ideal candidate has mastered measure-theoretic probability, nonparametric statistics, and Bayesian nonparametric inference, and has a strong interest in rigorous mathematical statistics and its applications. They can provide evidence of these qualifications by coursework, research projects, and/or a master’s thesis. In addition, they have experience with scientific computing in R, Matlab, or Python, and strong 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. H. C. Lie and Prof. W. Huisinga. They will

collaborate with the group of Prof. M. Reiss (Institute of Mathematics, Humboldt University Berlin).

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](http://www.sfb1294.de) for further information or contact [huisinga@math.uni-potsdam.de](mailto:huisinga@math.uni-potsdam.de) and [hanlie@uni-potsdam.de](mailto:hanlie@uni-potsdam.de).