

**Are you looking for a new professional challenge?
Then this is the place to be!
Become part of our international team!**



14.07.2022

The Zuse Institute Berlin (ZIB) is a non-university research institute under public law of the State of Berlin. We conduct research and development in applied mathematics and computer science as well as the analysis and processing of complex data in conjunction with high-performance computing.

For the *Bioinformatics in Medicine* research group, which is part of the department *Visual and data-centric computing*, we offer a fixed-term contract at the next possible date until 31 December 2023 (end of project), with the option of extension, for a

**Scientific Employee (f/m/d)
Reference Code WA 30/22
Pay Grade 100 % - E13 TV-L Berlin.**

The Project

Agent-based models (ABMs) have been proposed for modelling the spread of Covid-19 under implemented and candidate counter-measures. Since they are computationally very expensive, we want to develop a faster approach based on a coupled system of full ABMs and reduced sub-models that still allows to sample quantities of interest, such as infection numbers.

The project "Modeling Infection Spreading and Counter-Measures in a Pandemic Situation Using Coupled Models" is funded by the DGF within the excellence cluster Math+. We are seeking a new member for our research team for the development and implementation of these methods that can be used for modelling and simulating infection dynamics. Further, analyzing the relevant data is also a large part of the project to allow e.g. for calibration and evaluation of the newly developed approach.

The main goals of this project are:

- extend our established ABM model to allow integration of various counter-measures, vaccination strategies and virus mutations in the context of the SARS-CoV19-pandemic (and beyond) and fit it to real-world data for various regions in Germany,
- generation and evaluation of several reduced and surrogate model types based on the specific full ABM for a particular region, including optimal parameter sets for different counter-measure combinations and including better understanding of the approximation errors involved,
- development of a coupled model consisting of ABMs and reduced sub-models that allow to represent a larger region with significantly smaller computational costs, compared to a full ABM for the same region.

The project is conducted in collaboration with TU Berlin (Prof. Kai Nagel).

Working towards a PhD within this project is possible.

Your Tasks

- contribution to the project and close cooperation with other project partners,
- analysis and integration of several data sources to adapt the modelling to actual observed data,
- simulation of new data using our established model on our HPC facilities,
- development of new methods for modelling and simulation of infection dynamics, based on compartment models, metapopulation-type models and ODE/SDE-based models,
- development of coupling strategies for the developed models,
- implementation of the algorithms,
- visualization and validation of the results.

Your Profile

- above average Master's degree in Mathematics (or related fields),
- significant experience in mathematical modelling that are required for the listed goals and tasks (see above), programming skills in C/C++, Java or Python and hands-on experience with real-world data analysis; experience in HPC and machine learning is a plus,
- excellent communications skills (writing, speaking) and working proficiency in English,
- strong team player with affinity for research and a focus to see things working in practice; methodical and conceptual strength and creativity.

We offer a family-friendly working environment through flexible working and meeting times, excellent equipment and a challenging professional environment.

Additionally, we offer

- comprehensive training in a competent and cooperative team,
- an additional pension scheme (VBL),
- 30 days annual leave, flexible working hours (flexitime),
- a salary in accordance with TV-L (Collective Agreement for the Public Service of the Federal States), taking into account the relevant professional experience,
- an end-of-year bonus,
- discounted BVG (public transport) ticket as part of the capital city allowance,
- and the use of canteens and sports programs of the Freie Universität Berlin at reduced rates.

Female applicants are highly encouraged to apply. Since women are underrepresented in information technology, the ZIB is trying to increase the proportion of women in this research area.

Disabled persons are given preference in the event of equal suitability.

Please send your application, quoting the reference code **WA 30/22**, including a cover letter containing a statement of your research interests, your CV and the standard supporting documents, by **15 August 2022** (date of receipt) as **one PDF file** to jobs@zib.de

Our private policy statement regarding application data is available at www.zib.de/impressum.

For further information on the area of responsibility, please contact PD Dr. Tim Conrad (conrad@zib.de).

For further job offers please visit our website at www.zib.de/jobads.