

**Are you looking for a new professional challenge?  
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19.12.2019

The Zuse Institute Berlin (ZIB) is a non-university research institute under public law of the state of Berlin. Together with its partners from academia and industry, ZIB contributes to the solution of highly complex problems in science, technology, environment and society by developing mathematical models and efficient algorithms.

The department of “Numerical Mathematics” is offering a PostDoc-position within the research group „Computational Medicine”:

**research position (PostDoc) (m/f/d)**  
**reference Code: WA 43/19**  
**pay grade E13 TV-L Berlin (100%)**

The position is offered at the earliest possible date until December 31st, 2020 (An extension until December 31, 2021 is possible subject to the approval of funds, end of project).

#### **Job description:**

The project “Biological validation of mathematically predicted algebraic conditional expectation structures arising in Gene Regulatory Networks” is funded through an incubator program for interdisciplinary research in the Berlin’s Cluster of Excellence (Math+). The main goal is to apply the theory of algebraic conditional expectations, which was newly developed in our lab, to unravel causation information in single cell transcriptomics data. The aim is to give a decisive proof for the new theory by cross-validating the dry-lab predictions with wet-lab experiments. As a proof-of-concept, the applicant will build a causal pathway of the real-world problem of T-cell overactivation in autoimmune diseases. The project will be in collaboration with Deutsches Rheuma-Forschungszentrum (DRFZ), who will perform the biological experiments and the cross-validation studies. We are looking for individuals who are passionate about data, mathematical structures, and biology.

#### **Tasks:**

The tasks related to the position include:

- develop pipelines (in Python or R) to incorporate large data sets to build graphs.
- implement algorithms for building Trajectories and Bayesian Networks.
- extend the current Algebraic Conditional Expectation theory to higher dimensions.
- apply the implemented pipelines to experimental data to build causal graphs.
- make predictions of key causal genes, which will be targets for knockdown in the cross-validation experiments.

## Requirements:

- University Ph.D in bioinformatics, mathematics, computer science, or related disciplines
- experience in big data analysis and data driven methods
- good programming skills (preferably Python and R)
- applicants are expected to be highly motivated, self-reliant, and open-minded to interdisciplinary collaboration
- good command of written and spoken English is a must

We also expect creativity and commitment to the project.

Excellent scientific support, current research topics and involvement in national and international cooperation projects are granted in our institute.

**Furthermore, we are offering** a friendly working atmosphere, excellent equipment and a challenging professional environment, opportunities for further qualification for scientists in all career stages, top-level research with international visibility, and the opportunity to work in an inter- and transdisciplinary context through the cooperation with the DRFZ. We also offer flat hierarchies with short decision paths as well as a friendly work environment with flexible work and meeting times,

## as well as

- a comprehensive training in a competent and cooperative team,
- additional pension scheme (VBL),
- 30 days annual leave, flexible working hours (flexitime),
- payment in accordance with TV-L (Collective Agreement for the Public Service of the federal states), taking into account the relevant professional experience and annual special payment
- as well as the discounted use of canteens and the sports program of Freie Universität Berlin.

The candidature of women is encouraged. Since women are underrepresented in information technology, ZIB is trying to increase the proportion of women in this research area.

Persons with disabilities will be given preference when equally qualified.

Please send your application, quoting the reference code **WA 43/19**, including CV in tabular form and all relevant documents, by **January 12<sup>th</sup>, 2020** (date of receipt) to

## **Zuse Institute Berlin (ZIB)**

- Administration -  
Takustr. 7  
14195 Berlin

or electronically as pdf-form to: [jobs@zib.de](mailto:jobs@zib.de).

Our private policy statement regarding application data can be found at [www.zib.de/impressum](http://www.zib.de/impressum).

Further information about the position can be obtained on our website [www.zib.de](http://www.zib.de) or from Dr. Vikram Sunkara ([sunkara@zib.de](mailto:sunkara@zib.de)).

For further job offers please visit our website at [www.zib.de](http://www.zib.de).