

The biophysics research group at the **Faculty of Mathematics and Natural Sciences at the University of Cologne** invites applications for a

## PhD position (f/m) in Biological Physics

starting March 1st, 2018 with a weekly working time of 25,89 hours (65% position). The initial contract is limited to February 28th 2020. The salary is based on the German E13 TV-L scale if terms and conditions under collective bargaining law are fulfilled.

**Our research:** Horizontal gene transfer can speed up adaptive evolution of bacteria; in particular it is involved in acquisition of antibiotic resistance. At the molecular scale, our lab focuses both on the molecular mechanism of bacterial transformation (a form of horizontal gene transfer). At the population level, we develop methods for quantifying its costs and benefits during adaptive evolution. To this end, biologists and physicists work in close collaboration.

**The project:** The recently funded CRC 1310 of the German Science Foundation (DFG), will address *Predictability in Evolution*. The specific project will focus on the question how horizontal gene transfer affects the fitness of bacteria during adaptation to novel environments. In close collaboration with theorists (Lässig group), we aim at predicting effects of gene transfer on the rate of evolution. To this end, a massively parallel laboratory evolution setup will be developed.

Research techniques applied in this project will include, but are not limited to:

- experimental evolution
- developing high-throughput protocols for laboratory evolution (programming liquid-handling platform, FACS)
- whole genome sequencing and statistical analysis of genomes
- quantitative data analysis in collaboration with bioinformatics facility
- develop predictive models in collaboration with theoretical physics
- developing and planning research projects

**The position:** The PhD students will have the opportunity to join the Bonn-Cologne Graduate School of Physics and Astronomy ([www.gradschool.physics.uni-bonn.de/](http://www.gradschool.physics.uni-bonn.de/)).

**Your profile:** Required criteria are: M.Sc. in physics or comparable. Experience in biophysics or microbiology are beneficial but not essential. Applicants should be highly motivated, creative and independent individuals and have an excellent academic record.

Applications from disabled persons are welcome. Disabled persons with equal qualifications will be given priority. Applications from women are specifically encouraged. Women with comparable qualifications will receive particular consideration, unless another applicant displays compelling reasons to prefer this person.

The deadline for applications is **31 January 2018**. Applications received after this deadline can be considered until the position is filled.

Please send your application (cover letter, CV, list of publications, certificates, and two references) as a single PDF file by email to [berenike.maier@uni-koeln.de](mailto:berenike.maier@uni-koeln.de). It is mandatory that you visit Cologne for an interview.