

2 PhD positions in multi-scale simulations of soft matter

Coupling fluid dynamics and molecular dynamics of open systems for applications to colloidal microswimmers and beyond

The interdisciplinary Collaborative Research Center [SFB 1114](#) „Scaling Cascades in Complex Systems“ is hosted at Freie Universität Berlin, Germany, and aims for methodological developments for the modeling and simulation of complex processes involving cascades of scales derived from prototypical challenges in the natural sciences. In three Research Areas, each focusing on a different characteristic problem class, scientists from Biochemistry, Physics, and the Geosciences join forces with mathematicians. They follow the two-fold goal of making sizeable progress on challenging applications and of laying generalisable methodological foundations on the way.

SFB 1114 invites talented and highly motivated candidates committed to basic research to apply for a position within project C01 as

PhD student (f/m).

The fixed-term contract starts as soon as possible and is limited to 30/06/2022. The position is part-time (75%) with salary according to the German payscale E13 TV-L FU.

Job description:

The goal of the project is the development of a simulation scheme for fluids that interpolates smoothly between a particle-based, open system and a continuum description. To accomplish this, a parallel and complementary effort of theoretical work and computational implementation is needed.

Together with our interdisciplinary team, you will push forward the framework of adaptive resolution simulations (AdResS) to the continuum scale and to non-equilibrium situations. You will devise a theoretically consistent and numerically efficient particle-continuum coupling and connect our GPU-accelerated molecular dynamics code (<http://halmd.org>) and a fluid dynamics solver. You will then apply the scheme to perform multi-scale simulations of a colloidal microswimmer, where large-scale hydrodynamic flows as well as molecular processes near surfaces matter.

Requirements:

Diploma/M.Sc. in Physics, Theoretical Chemistry, Applied Mathematics, or related fields

Desired qualifications:

Very good skills in scientific software development (modern C++, scripting), statistical and fluid mechanics, and written and spoken English.

The complete text of this job offer is published at [FU Stellenanzeiger](#). Please submit your application electronically as a single PDF document (including a detailed CV, list of publications, certificate copies, letter of motivation and research interests) no later than **11 June 2018** quoting the reference code **SFB1114-2018-C01** via jobs.sfb1114.de.

For more information contact one of the project leaders at the Institute of Mathematics: [Prof. Dr. Felix Höfling](#), [Prof. Dr.-Ing Rupert Klein](#), and [Prof. Dr. Luigi Delle Site](#)