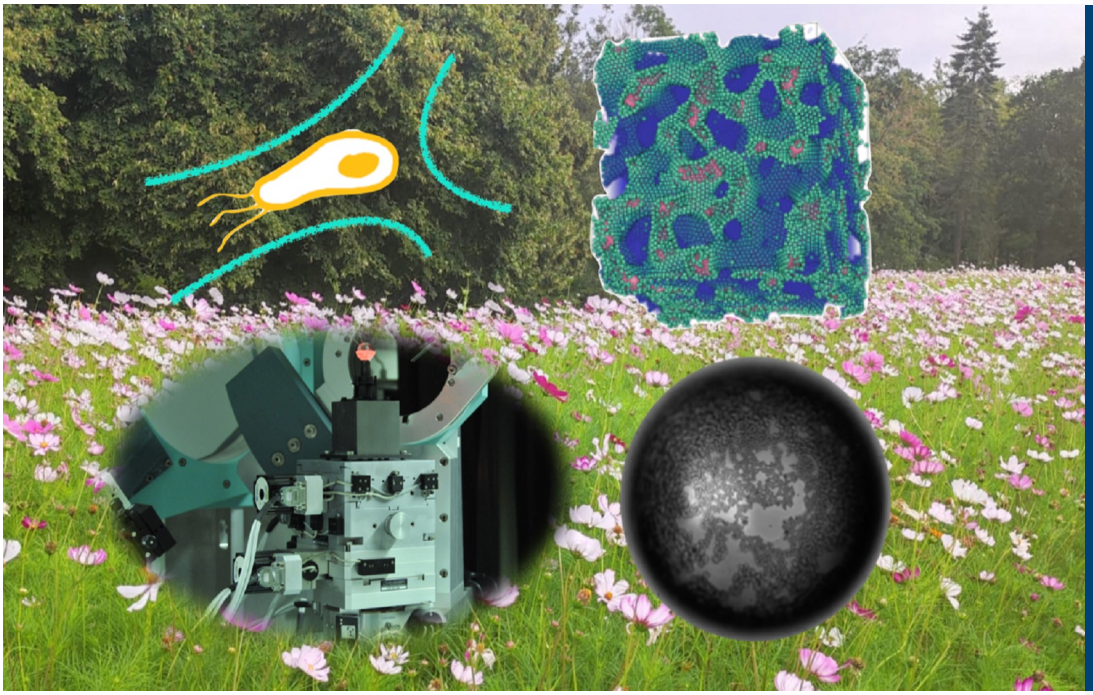
JÜLICH
Forschungszentrum



Conducting research for a changing society: This is what drives us at Forschungszentrum Jülich. As a member of the Helmholtz Association, we aim to tackle the grand societal challenges of our time and conduct research into the possibilities of a digitized society, a climate-friendly energy system, and a resource-efficient economy. Work together with around 7,400 employees in one of Europe's biggest research centres and help us to shape change!

The heavy use of pesticides and fertilizers in agriculture is nowadays still crucial for the food supply. However, this practice leads to significant environmental and health issues, including poisoning, environmental degradation, and the development of insecticide resistance. EU policies and the UN Sustainable Development Goals advocate for safer, more sustainable alternatives like biopesticides. The Marie-Sklodowska-Curie doctoral network BIOMAC-BP (Bio-Stabilized Multi-Phase Materials as Carriers for Biopesticides) sets out to address the issue of synthetic pesticide use by developing sustainable biopesticide formulations, bringing together experts from soft-matter physics, physical chemistry, chemical engineering, microbiology, biophysics and agricultural science, and combining industrial and academic perspectives. The project`s main objective is to develop and optimize novel bio-sourced materials to incorporate bacteria capable of producing biopesticides, enhancing the benefits and sustainability of the formulations. This effort aims to reduce synthetic pesticide emissions, improve agricultural practices, and support a greener future for the chemical industry. One of the doctoral projects within the BIOMAC-BP programme will be carried out at the Helmholtz Institute Erlangen-Nürnberg for Renewable Energy (IET-2) in Erlangen.

We are looking to recruit for a

PhD Position - Numerical simulation of bijel formation, stability and rheology

Your Job:
This computational doctoral project focuses on a theoretical understanding of emulsions stabilized by colloidal particles. Mesoscale simulation methods combining a lattice Boltzmann solver for the involved fluids and a Discrete Element solver for the suspended colloidal particles shall be developed and applied on state-of-the-art supercomputers. These simulations will be combined with systematic coarse-graining in order to resolve the dynamics and stability of bijels on all relevant timescales. We aim to understand how these emulsions form and which physical effects influence their stability and rheology. With the overall goal of using particle-stabilized emulsions as biopesticides, the

The job will be advertised until the position has been successfully filled. You should therefore submit your application as soon as possible. We look forward to receiving your application via our **Online-Recruitment-System!**

Questions about the vacancy?
Get in touch with us by using **our contact form.**
Please note that for technical reasons we cannot accept applications via email.
www.fz-juelich.de

candidate shall perform simulations of nutrient transport and the growth of bacteria in numerically optimized emulsion systems. The outcome of your work will be combined with the results of your peers in the doctoral network to improve the performance of bio-pesticide formulations.

- Develop and apply state-of-the-art hybrid simulation methods for particle-stabilized emulsions based on the Lattice Boltzmann and Discrete Element methods
- Perform large-scale simulations of bijel formation and investigate their rheological properties and stability
- Closely collaborate with experimental and theoretical partners in the consortium
- Analyze and interpret your results and publish them in international peer-reviewed journals and at conferences

Your Profile:

- Masters degree, finished within the last three years, in physics, chemistry, materials science, chemical engineering, or a related discipline
- Strong interest in soft matter, statistical physics and physical chemistry
- Experience in scientific programming and interest in high-performance computing
- Spoken and written proficiency in English
- Being communicative, enjoying to work in a team and to travel
- Good organizational skills and the ability to work independently
- According to the mobility regulations of Marie-Sklodowska-Curie actions, you must not have resided or carried out your main activity (work, studies, etc.) in Germany for more than 12 months during the last three years

Our Offer:

Being part of the Marie-Sklodowska-Curie doctoral network BIOMAC-BP, you will benefit from

- Work in an interdisciplinary and international team of 14 peers and their supervisors
- Interdisciplinary scientific training in all fields relevant to the network's scope
- Continuous scientific cross-disciplinary supervision by two scientific supervisors
- A broad variety of transferable skills training
- A four to six weeks secondment to an industrial BIOMAC-BP partner
- Excellent scientific networking opportunities
- Attendance at national and international conferences and workshops

Additionally, Helmholtz Institute Erlangen-Nürnberg / Forschungszentrum Jülich offers to all its PhD students:

- A vibrant international work environment in the vicinity of the south campus of Friedrich-Alexander-Universität Erlangen-Nürnberg and with a lively connection to the research campus of Forschungszentrum Jülich
- Exceptional research infrastructure
- Flexible working hours
- Extensive company health management
- Ideal conditions for balancing work and private life, as well as a family-friendly corporate policy
- Comprehensive training courses and individual opportunities for personal and professional further development
- Extensive company health management
- Targeted services for international employees, e.g. through our International Advisory Service
- Further development of your personal strengths, e.g. through an extensive range of training courses

The position is for a fixed term of 3 years. Pay will be in accordance with the rules of the

Horizon Europe Work Programme 2021-2022, 2. Marie Skłodowska-Curie Actions (https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-2-msca-actions_horizon-2021-2022_en.pdf) and German tax and social security regulations.

Place of employment: Erlangen

We welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.