PhD Position in Theoretical Biophysics of Protein Pattern Formation

Location: Ludwig-Maximilians-University Munich, Faculty of Physics, Frey Group, Munich, Germany.
Web: https://www.theorie.physik.uni-muenchen.de/lsfrey/group_frey/

Project description:

Protein-based pattern formation is essential for spatial organization in living cells. In this project, we develop theoretical models and computational methods to understand how reaction–diffusion dynamics, membrane binding, and cytoskeletal interactions give rise to self-organized protein patterns. A key focus is the Min system from E. coli and its reconstitution in vitro, which serves as a model for intracellular organization and symmetry breaking. The project combines analytical approaches (nonlinear dynamics, field theory) with simulations and close collaborations with experimental groups.

Requirements:

- Strong background in physics, applied mathematics, or related fields, and a keen interest in quantitative biology.
- Proficiency in English (both written and spoken).

What we offer:

- A dynamic and stimulating research environment
- Comprehensive training and support for professional development.
- Competitive salary and benefits in accordance with DFG guidelines (75% TV-L 13).
- Numerous LMU employee benefits, e.g. discounted fitness and cultural offers, job public transport ticket, Jobbike

This position is part of the Graduate School Quantitative and Molecular Biosciences Munich

The Graduate School prepares young life scientists for the emerging era of quantitative, systems-oriented bioscience. Its innovative, international PhD program bridges traditionally separate disciplines—ranging from biochemistry and medicine to bioinformatics, experimental and theoretical biophysics, and applied mathematics. While maintaining a strong foundation in their primary discipline, QMB students gain expertise in multiple approaches, learn to think across fields, and develop the ability to communicate and collaborate effectively with scientists from diverse backgrounds.

Key components of the QMB program include:

- An interdisciplinary research project
- A structured program of coursework
- Professional skills training

Requirements
Applicants must hold a completed Master's degree (or equivalent) in a relevant field before starting the PhD. Full details of our requirements are available here:
https://qbm.genzentrum.lmu.de/application/requirements/

Applications must be submitted in English via our online tool:
https://www.portal.graduatecenter.uni-muenchen.de/ocgc/qmb

Timeline

- Application opens: August 21, 2025
- Application deadline: October 6, 2025
- Reference deadline: October 14, 2025
- Interviews: scheduled individually
- Notification of results: December 2025

For questions, please contact: office-qbm@genzentrum.lmu.de

QMB is a joint initiative of leading scientists from Ludwig-Maximilians-University Munich, the Technical University of Munich, the Max Planck Institute of Biochemistry, and Helmholtz Center Munich. Employment contracts are issued either by Ludwig-Maximilians-University Munich or one of the partner institutions.