Professur Partikel- und Fasertechnologie für biobasierte Materialien
TUM Campus Straubing für Biotechnologie und Nachhaltigkeit
Technische Universität München

The Technical University of Munich (TUM) at Campus Straubing is looking for a

PhD (f/m/d) in Polymer Physics/Materials Science

funded by ERC StG with excellent opportunities for both research and career development.

About us

Our research focuses on extracting and isolating bio-based polymers such as cellulose and proteins from renewable feedstocks and waste streams. We aim to develop sustainable processes to convert these materials into high-performance fibers and functional materials. By manipulating molecular interactions through chemical and physical methods, we tailor the structural and mechanical properties of bio-based materials to advance the potential of biopolymers in various applications.

Project description

Cellulose is the most abundant biopolymer on earth and offers significant potential for applications such as sustainable packaging materials and textiles. However, its use in mass production is limited by its inability to melt like conventional thermoplastics. This limitation arises from the strong intermolecular bonding within cellulose: upon heating between 240 °C and 350 °C, cellulose begins to decompose rather than transitioning into a meltable phase.

LaserCell funded by ERC StG envisions an innovative approach to reshape and rearrange cellulose at the molecular level by disrupting cohesive interactions through resonant excitation of specific bonds. It will revolutionize the field of biopolymer processing beyond cellulose and yield fundamental insights into supramolecular structure and dynamics in biomaterials.

Your profile

We are looking for a candidate with the following qualifications:

- Master's degree in polymer science, physical chemistry, materials science, or materials engineering, or a closely related field
- Experience with cellulose and its processing technologies is an advantage
- Strong willingness to contribute to the setup and management of laboratory infrastructure
- Fluency in English, particularly in scientific writing and communication, is required; A good working knowledge of German is preferred to facilitate communication with technical staff and administrative services
- Basic knowledge of mechanical engineering or experience with fiber spinning equipment is an advantage
- Practical, hands-on skills and technical competence are highly valued, especially given that the laboratory is in the expansion phase

We offer

We offer excellent working conditions within a young and interdisciplinary team. In an open and collaborative environment, you will have the freedom to develop and pursue your own ideas. Located at the gateway to the Bavarian Forest, Straubing—a historic ducal town on the Danube—is a leading center for renewable materials and sustainability technologies in Germany.

This position offers a three-year contract (65% E13 TV-L) with the possibility of extension. You will benefit from international collaboration opportunities, especially in the Nordic countries, as well as conference participation and research in a modern, well-equipped laboratory environment.

As an equal opportunity and affirmative action employer, TUM explicitly encourages applications from women and individuals who can contribute to the diversity of the university's research and teaching. Preference will be given to candidates with disabilities who have equivalent qualifications.

Join us!

To apply this position, please submit your application including the attachments mentioned below as **one single PDF** document in English via email to applications.pft@cs.tum.de

- CV including publications
- A max one page motivation letter
- Degree certificates and academic transcripts
- Contact details of two referees

The deadline for application is **June 13th, 2025**.

We regret that we are only able to contact shortlisted candidates. If you do not hear from us within two weeks after submission, you may assume that your application was not successful.