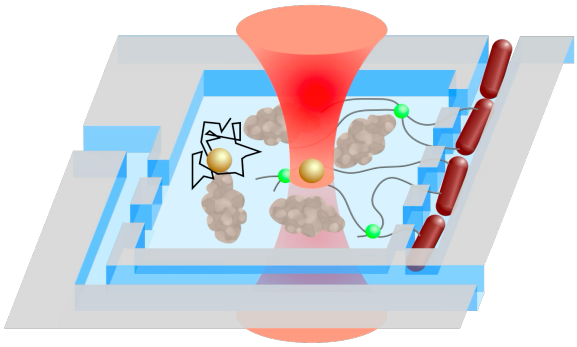
We are offering:

PhD position at the University of Freiburg

in the new collaborative project funded by the German Research Foundation (DFG) and the Israel Science Foundation (ISF)

Understanding microscopic mechanisms of the bacterial extracellular matrix formation

(starting fall/winter 2025)



Bacterial biofilms are ubiquitous and play a critical role in many aspects of human life. They help us to digest food and keep our teeth clean, but they can also cause deadly hospital-acquired infections and large-scale industrial problems such as clogging oil pipes and slowing down cruise ships. One of the key hallmarks of a biofilm is the extracellular matrix (ECM), which is secreted by the aggregating bacteria to encapsulate and integrate them as a whole. Remarkably, despite decades of research on bacterial ECM, while its components and responsible genes are relatively well characterized for many bacterial species, the sequential process of multicomponent ECM formation in the extracellular space remains unclear.

In this project, the interdisciplinary team will combine their expertise in bio-microfluidics (Thomas Pfohl, Physics Institute, University of Freiburg), bacterial ECM mechanobiology and biochemistry (Liraz Chai, Hebrew University of Jerusalem) and theoretical modeling (Vasily Zaburdaev Max-Planck-Zentrum für Physik und Medizin, Erlangen) in order to decipher the chronology and microscopic mechanisms of bacterial ECM formation. This project will uncover the hitherto unknown mechano-physico-chemical mechanisms that lead to ECM formation – the key component that cements bacterial biofilms together – thus providing novel insights into their physiology.

We are seeking a highly motivated and well-trained individual with a specific interest in biophysics, soft and complex matter, and microfluidics, for the **biophysics and bio-microfluidics team at the Physics Institute of the University of Freiburg**. Ideally, candidates should have a strong interest in interdisciplinary research and a multidisciplinary educational background, and possess a Master's degree in physics, physical chemistry, chemical engineering, materials science, nanoscience, mechanical engineering, or a closely related discipline.

Please submit your application or contact us if you require any further information.

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