TECHNISCHE UNIVERSITÄT
IN DER KULTURHAUPTSTADT EUROPAS
CHEMNITZ

Institut für Physik
Physikalisches Kolloquium

Donnerstag, 06.02.2025, 15:30 Uhr

Ort: Reichenhainer Str. 90,
Zentrales Hörsaal- und Seminargebäude,
Raum C10.013

Prof. Dr. Shivprasad Patil

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Mechanics of Single Proteins and Living Cells

One of the most prominent yet often neglected properties of living matter is its viscoelastic response. In physics and materials science, knowledge about the mechanical response of materials is central to engineering design principles. We are only beginning to apply such principles to understand the function of living matter in terms of its response to external mechanical perturbations. Indeed, many living systems, from organisms to cells to molecules, are under constant mechanical stress as a result of their interaction with the environment. Understanding their response and classifying them into types such as gel-like, glass-like or soft solids can give us insight into the function they have evolved to perform. In my laboratory, we study the mechanics of living matter at different length scales, such as the tissue of multicellular microorganisms [1], single cells [2], and single proteins [3], using a spatially resolved technique called atomic force microscopy. In this talk I will present our efforts in this direction. The hope is to use the mechanical characterisation of living matter for therapeutic and/or diagnostic purposes.

(1) Differential tissue stiffness of body column facilitates locomotion of *Hydra* on solid substrates, S. Naik et al. *J. Exp. Biol*. 2020, **223** (20), jeb232702.
(2) Soft glassy rheology of single cells with pathogenic protein aggregates, S. S. Rajput, S. Bansi Singh, D. Subramanyam, S. Patil, *Soft Matter*, 2024, **20**, 6266-6274.
(3) Viscoelasticity of single folded proteins using dynamic atomic force microscopy, Surya Pratap S Deopa, S. Patil, *Soft Matter*, 2023, **19**, 4188-4203.

Alle Zuhörer sind ab 15:15 Uhr zum Kaffee vor dem Hörsaal eingeladen.

Informationen zum Vortrag erteilt:
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