



## PHYSIKALISCHES KOLLOQUIUM

**Referentin:** **Dr. Elisabeth Fischer-Friedrich**  
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**Thema:** **Time-dependent mechanics of biopolymer materials – from protein condensates to the actin cytoskeleton** (*Vorstellung für Habilitation*)

**Zeit und Ort:** Dienstag, 12.11.2019, 16:40 Uhr  
Recknagel-Bau, Hörsaal REC/C213, Haeckelstr. 3

**Leiter:** Prof. Dr. Stefan Diez

**Kurzfassung:** Biopolymer materials serve in many biological contexts as generators of shape stability and mechanical integrity while still giving the option of long-term plastic deformation under the action of forces. This seeming contradiction is achieved by viscoelastic and thus time-dependent mechanical properties which are rooted in the structure of molecular constituents and their mutual interactions. Understanding how biopolymer materials tune their material properties does not only reveal how biopolymers function in cells but also stimulates ideas for biomimetic materials. In my talk, I will present data on the time-dependent mechanical properties of i) liquid-liquid phase-separated protein condensates which have been suggested to scaffold membrane-free organelles in cells and ii) the actin cytoskeleton which is a polymer network in the cell that acts as a major regulator of cell shape and tissue morphogenesis. I will discuss characteristic time scales of the measured mechanical properties that mark the transition from solid-like to liquid-like mechanical properties and define a finite shape memory of the material under consideration.

**Biographie:** Elisabeth Fischer-Friedrich studied Physics in Leipzig. She did her PhD in the group of Prof. Karsten Kruse dedicated to the topic of "Pattern formation by the Min system of *Escherichia coli*". 2009-2011, Elisabeth went to Israel for a postdoc in the group of Prof. Nir Gov at the Weizmann Institute of Sciences where she worked on the modelling of the structure formation of the bacterial cytoskeletal protein FtsZ. From 2011-2019, Elisabeth did a second postdoc in the field of experimental cell mechanics jointly affiliated to the groups of Prof. Anthony Hyman (MPI CBG, Dresden) and Prof. Frank Jülicher (MPI PKS, Dresden). Since 2017, Elisabeth works as a group leader affiliated to the Biotec and since recently to the Physics of Life cluster of excellence. The work of her group focuses on the mechanical properties of active biopolymer materials using experimental and theoretical techniques.

