

# Sebastian Fürthauer

*TU Wien, Institut für Angewandte Physik*

**Tuesday, 26<sup>th</sup> April 2022, 16:00 s.t.**

TU Wien, Institut für Angewandte Physik, E134  
1040 Wien, Wiedner Hauptstraße 8-10  
Yellow Tower „B“, 5th floor, SEM.R. DB gelb 05 B

**The seminar will be also held as a Zoom Meeting**

<https://tuwien.zoom.us/j/94333345551?pwd=eS81b0xWRkxIRFZYjRvK1MyTDRNdz09>

Meeting ID: 943 3334 5551

Password: ZjDND1J8



## Towards a physics of living materials

Living cells move, deform and divide. The engine of these behaviors is the cytoskeleton, a highly crosslinked network of polymer filaments and molecular scale motors that use chemical energy to do work. We develop a theory that predicts how the micro-scale properties of molecular motors and crosslinks tune the networks emergent material properties and generate predictable, and possibly controllable, behaviors. I will present how this theory is constructed, and discuss its implications for cytoskeletal networks in vitro and in vivo, highlighting how it has helped to quantitatively understand motor driven microtubule fluxes in a system made from XCTK2 motors and stabilized microtubules, and how it resolved long-standing puzzles about the motion of microtubules in spindles. I will then discuss some future research directions and sketch how the approach taken here can be generalized to describe different and larger biological assemblies such as cells and tissues and form the basis for a quantitative physics of living materials.

All interested colleagues are welcome to this seminar lecture  
(30 min. presentation followed by discussion).

Friedrich Aumayr  
(LVA-Leiter)

Gerhard Schütz  
(Seminar Chair)