

Introductory lecture: Out-of-equilibrium physics in biology

In contrast to the forms of matter studied conventionally in physics, biological matter is intrinsically kept out of thermodynamic equilibrium. This is due to chemical reactions that occur essentially everywhere and that drive the processes of life. The frameworks of Thermodynamics and Statistical Physics thus need to be suitably generalised to describe living matter. In this talk we will first review essential notions of equilibrium physics. Then, we will discuss general physical principles that apply to equilibrium as well as non-equilibrium systems. We will see, how these can be used to guide the physical analysis of bundles of actin filaments and myosin motors. Finally, we will introduce the following lectures of the session.