universität ulm
Fakultät für Naturwissenschaften, Fachbereich Physik

Announcement

Seminar Modern Instruments in Biophysics

Description

The invention of optical microscopy in the 17th century revolutionized biology, since the increased resolution revealed a level of organization in biological systems that was previously hidden. Today, the invention of super-resolution microscopy is driving a similar revolution. At the same time new methods that are being developed to observe and manipulate single biomolecules contribute to ground breaking new biological insight.

Join this seminar to learn more about the modern methodologies developed by biophysicists and how they help to understand biology.

Learning Outcomes

Students who attended this seminar

- understand how modern super-resolution microscopy and force spectroscopy methods work
- learn how biophysical methods contribute to a deeper understanding of live phenomena

Content

In this advanced seminar we will cover the following topics:

- single molecule tracking (fluorescence microscopy, iSCAT, light sheet microscopy)
- super-resolution microscopy (STORM/STED/SIM, 3D detection, increased time resolution, molecular counting)
- force spectroscopy methods (optical and magnetic tweezers, AFM, high precision, parallelization)
- ...

Prerequisites

Formal prerequisites: none

Recommended prerequisites: basic physics lectures

Literature

- Textbook chapters
- Review articles
- Original research articles

Additional Information

The module refers to bachelor and master students

Seminar: 3 ECTS

Advanced Seminar: 4 ECTS

Lecturer

Prof. Christof Gebhardt, Institute of Biophysics