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Universität Ulm

Master of Science Physics (PO 2019)

Seminar Modern Instruments in Biophysics

Code	8812875204
ECTS credits	3
Attendance time	2
Language of instruction	English
Duration	1
Cycle	irregular
Coordinator	Dean pf Physics Studies
Instructor(s)	Prof. Christof Gebhardt
Allocation of study programmes	Physics M.Sc., elective module, 1st or 2nd semester Wirtschaftsphysik M.Sc., elective module, 1st – 3rd semester
Recommended prerequisites	Basic physics lectures
Learning objectives	Students who successfully passed this module • understand how modern super#resolution microscopy and force spectroscopy methods work. • learn how biophysical methods contribute to a deeper understanding of live phenomena.
Syllabus	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.

	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, molecu#lar counting) • force spectroscopy methods (optical and magnetic tweezers, AFM, high precision, parallelization)
Literature	-
Teaching and learning methods	Seminar (2 hours per week)
Workload	30 hours Seminar 60 hours self study and talk preparation Total: 90 h
Assessment	The module examination consists of completing an assignement on a given topic and a graded oral presentation of the results as well as participating in the discussion.
Grading procedure	The module grade is equal to the examination grade.
Basis for	Research in the field of biophysics