



Announcement

Hearing and Seeing - A Molecular Biophysics Perspective

Prof. Hoerber

Description

The course on Hearing and Seeing will provide a basic understanding of both senses at the molecular level. No prerequisites are required, as necessary biochemistry will be introduced by discussing physical measurements performed with scanning probe techniques and with optical techniques on cellular structures relevant for hearing and seeing. Finally, in comparison with recent technical developments of optical and acoustic sensor systems, the physical principals to characterize the performance of these senses will be introduced. The aim of the course is to enable students to read primary scientific literature on visual and auditory systems and to provide a broad basis for biomedical research collaborations.

Content

- Introduction to Biophysics
- Relevant Biochemistry
- Studying molecular structures with STM and AFM
- Optical Microscopy of cellular structures
- Molecular basis of Seeing
- Molecular basis of Hearing
- Comparison between natural and artificial systems

Prerequisites

None

Literature

Anatomy and Physiology of Eye, 2nd Edition 1.12.2008

A.K. Khurana, CBS publishers & Distributors

ISBN: 8123912677

Eye and Brain, The Physiology of Seeing, 5th Edition 30.10.1997

Richard L. Gregory, Oxford University Press

ISBN: 0198524120

The Evolution of the Eye, 8.10.2015

Georg Glaeser und Hannes F. Paulus, Springer

ISBN: 3319174754

Essential Principles of Image Sensors, 12.8.2014

Takao Kuroda, Apple Academic Press

ISBN: 1482220056

Hearing. Anatomy, Physiology and Disorders of the Auditory System

Aage R. Møller, Plural Publishing, 1.10.2011

ISBN: 1597564273

Fundamentals of Hearing

William Yost, Academic Press, 2.10.2006

ISBN: 0123704731

Additional information

Lecture with exercises (24 hours lecture Jan. /Feb. 2019)

Examination: student presentations of recent research papers on hearing and seeing

3 ECTS credits

Lecturer

Dr. J.K.H. Hoerber, Senior Professor