Organization

The following partners contribute to the organization of the course:

Prof. **Harald Horn**
harald.horn@kit.edu
Dr. **Michael Wagner**
michael.wagner@kit.edu
(*Karlsruhe Institute of Technology*)

Prof. **Michael Kühl**
(*University of Copenhagen*)
mkuhl@bio.ku.dk

LOCAL ORGANIZER
AND MAIN CONTACT

Prof. **Cristian Picioreanu**
(*King Abdullah University of Science and Technology*)
cristian.picioreanu@kaust.edu.sa

Registration

Send your short application as 1 PDF file with CV and a short letter of motivation (max. 1/2 page) to the local organizer:

Prof. Michael Kühl, mkuhl@bio.ku.dk

Application deadline	**20.09.2024**
Confirmation of acceptance	**25.09.2024**

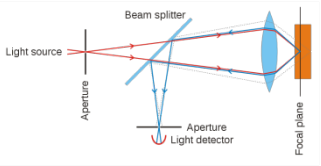
In order to provide high-value lessons and practical hands-on experience, the number of participants is limited to 16.

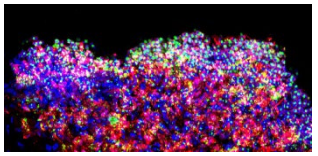
Fee

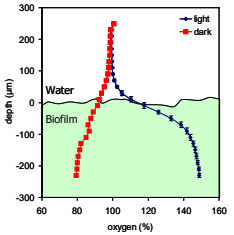
The course fee is 900 €. The fee includes course materials as well as lunch, refreshments in the breaks, as well as a course dinner on October 30. Fee includes taxes.

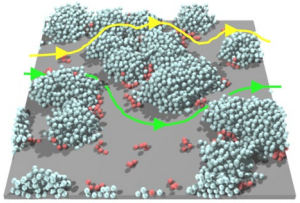
The course evolved from the EC project PHOBIA (QLK3-CT-2002-01938).

16th Advanced Biofilm Course









Oct 28 – Nov 2, 2024

Marine Biology Section
Department of Biology
University of Copenhagen
Strandpromenaden 5
3000 Helsingør, Denmark

Welcome note

The Advanced Biofilm Course (ABC) was initiated in 2005 and aims to introduce and explore advanced methods for examination of the structure and function of biofilms, such as:

- confocal laser scanning microscopy (multi-channel microscale imaging)
- optical coherence tomography (mesoscale imaging)
- microsensor measurements (gradients and processes)
- numerical modeling of the data (data organization and logical thinking)

The course is intended for PhD students and Post-Doctoral researchers in microbiology, environmental technology, bioengineering and related areas, who are going to use this combined multidisciplinary approach for characterization of their own microbial biofilm systems.

The course is a hands-on course with lectures in the morning and practical work in the afternoon. Attendees should feel free to communicate with the organizers whether their personal samples can be analyzed.

The course starts at 09:00 on Monday October 28 and ends at 12:00 on Saturday November 2.

Location

Marine Biology Section
Department of Biology, University of Copenhagen
Strandpromenaden 5
3000 Helsingør, Denmark

The hands-on confocal sessions will take place in a bioimaging facility in Copenhagen.

Accommodation

Transportation to/from the course and accommodation must be arranged individually by the participants.

It is recommended to book accommodation in Helsingør (Copenhagen is 45 min train ride away) Some options:
www.danhostel.dk/en/hostel/danhostel-helsingoer \ https://hotelhamlet.dk/en/ \ https://www.hotelskandia.dk/ or via AirBnB

Scope and key topics

The course covers fundamental concepts and major tools used in biofilm research:
1) biofilm imaging at the micro- and mesoscale
2) microsensor techniques
3) mathematical modeling

Please bring your own computer for the modelling part (with mouse and power supply). You will be provided with the necessary installation files.

Topics in detail

Cultivation of Biofilms
- growth devices and reactors
- processes (e.g. substrate metabolism)
- development (e.g. growth and decay)

Biofilm Imaging
- microscopic imaging with fluorescence microscopy
- theory and application of optical sectioning at the microscale by means of confocal laser scanning microscopy (CLSM)
- theory and application of optical sectioning at the mesoscale by means of optical coherence tomography (OCT)

Digital Image Analysis
- visualization of 3d data sets
- quantification of 3d data sets

Microenvironmental analysis
- substrate gradients, diffusion and kinetics
- theoretical and practical aspects of microenvironmental analyses
- microsensors and chemical imaging

Theory and Practice of Biofilm Modeling
- biofilm modeling principles, building blocks and applications
- computer practice with 1-d, 2-d and 3-d numerical models