Organization

The following partners contribute to the organization of the course:

Prof. Dr. Harald Horn
harald.horn@kit.edu
Dr. Michael Wagner
michael.wagner@kit.edu
(KIT, DVGW)

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

LOCAL ORGANIZER
AND MAIN CONTACT

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

Registration

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

Prof. Michael Kühl, mkuhl@bio.ku.dk

Application deadline	30.08.2023
Confirmation of acceptance	07.09.2023

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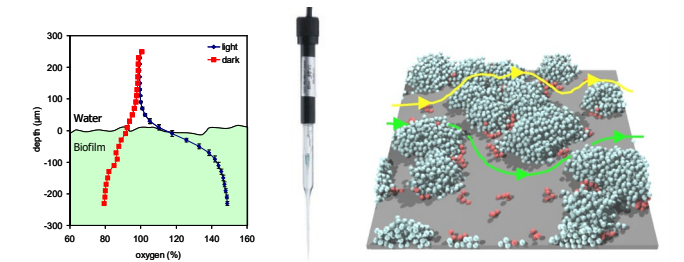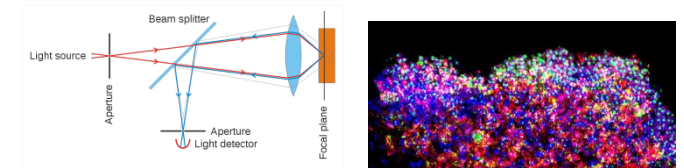
Fee

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

The course evolved as a result of the EC project PHOBIA (QLK3-CT-2002-01938).

16th Advanced Biofilm Course

23 - 28 October 2023

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

Welcome note

In 2005 the idea came up to offer an Advanced Biofilm Course (ABC) with theoretical and practical aspects implementing an innovative approach.

The aim of the course is to explore a given biofilm with advanced methods for examination of structure, function and processes of biofilms. This includes:

- 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. Attendees should feel free to communicate with the organizers whether their personal samples can be analyzed.

Location

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

Accommodation

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

Scope and key issues

The course aims to teach the major tools used in biofilm research:
1) biofilm imaging at the micro- and mesoscale
2) microelectrode 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. It is also possible to get a Surface Pro4 laptop for the duration of the course.

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

Microsensors
- substrate gradients, diffusion and kinetics
- theoretical and practical aspects of microenvironmental analyses

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