

## Organization

The following partners contribute to the organization of the course:

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## Registration

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

[thomas.neu@ufz.de](mailto:thomas.neu@ufz.de)

application deadline 15.08.2018

confirmation of acceptance 01.09.2018

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

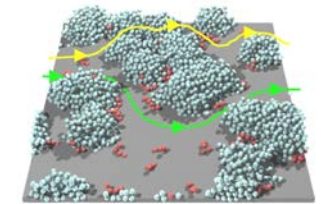
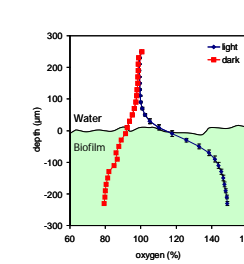
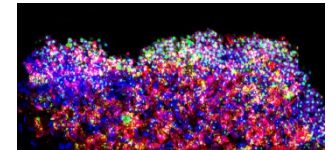
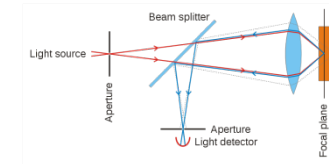
## Fee

The course fee is 750 € and includes course materials as well as lunch, coffee/tea breaks and a workshop dinner. Fee includes 19% VAT.

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



# 13th Advanced Biofilm Course



## October 2018 8th - 13th

Department of River Ecology  
Helmholtz Center for Environmental  
Research - UFZ  
Magdeburg, Germany

## 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.

This will include:

- confocal laser scanning microscopy (multi-channel microscale imaging)
- optical coherence tomography (mesoscale imaging)
- microsensors measurements (gradients and processes)
- 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 and sophisticated approach for characterization of their own microbial biofilm systems.

The course is a hands-on course. Attendees should feel free to communicate to the organizers whether their personal samples can be analyzed.

## Location

Department of River Ecology  
Helmholtz Centre for Environmental  
Research - UFZ  
Brueckstrasse 3A  
391 1 4 Magdeburg  
Germany

<http://www.ufz.de/index.php?en=10149>

## Accommodation:

- local hotels
- youth hostel Magdeburg
- UFZ guest rooms for 24 € per person and day (3 rooms with 4 beds each)

## 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) microsensor techniques
- 3) mathematical modeling

Please bring your own laptop for the modelling part (COMSOL Multiphysics trial version).

## 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 practicals with 1d, 2d and 3d models