

MPNS COST Action 1205

Advances in Optofluidics: Integration of Optical Control and Photonics with Microfluidics

COST Action Training School

Optofluidic Sensor Systems and Technologies

14-18 September 2015

Institute for Optofluidics and Nanophotonics (IONAS)

Karlsruhe University of Applied Sciences (HsKA), Germany

Introduction

The Training School on Optofluidic Sensor Systems and Technologies provides a mixture of lectures, seminars and hands-on training, as well as a full-day workshop on the first day. The School will be organized at Karlsruhe University of Applied Sciences (HsKA), Institute for Optofluidics and Nanophotonics (IONAS), Karlsruhe, Germany.

The School will focus on applying fabrication technologies suitable for mass-production (such as for instance UV-Nanoimprint Lithography) for optofluidic and biomedical sensing systems to facilitate the transfer between university research and industry development. Action members with expertise in optofluidics, optical sensing, microfluidics and biosensors will be involved as trainers. During the five days, the students will learn about the theoretical background of optofluidics, fabricate devices and apply them for dielectrophoretic and optofluidic experiments and biomedical sensing.

Specific activities and workshops

The training school will comprise lectures by invited experts presented in a workshop on Monday, hands-on training sessions as well as seminars.

The participants will learn how to...

- Describe and understand the needs for industrially relevant fabrication of polymer-based optofluidic sensor systems
- Fabricate a polymer-based sensor device using microfabrication technologies such as UV-Nanoimprint Lithography
- Selectively infiltrate periodic nanostructures for application in life science experiments and characterize the resulting device
- Construct blood analysis devices comprising a microfluidic channel network, optical waveguides and grating couplers, and a dielectrophoresis section

More details can be found online at www.hs-karlsruhe.de/ionas

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Program

Sunday, September 13

From 19:00 **Get-together of Participants and Trainers***
Café Emaille, Kaiserstraße 142, 76133 Karlsruhe

Monday, September 14

Workshop on Optofluidic Sensor Systems and Technologies

09:00-10:00 **Registration and Coffee**

10:00-10:30 **Welcome and Introduction to the Training School**
Prof. Dr.-Ing. Christian Karnutsch, IONAS, Hochschule Karlsruhe

10:30-11:15 **Novel Evanescent Waveguide Platforms for Optofluidics**
Prof. Dr. Arnan Mitchell, RMIT University, Melbourne, Australia

11:15-11:45 Coffee break

11:45-12:30 **Optofluidics Systems Technology**
Prof. Dr.-Ing. Dominik G. Rabus, Bürkert Fluid Control Systems, Ingelfingen, Germany

12:30-13:00 **Short walk to Coffee Boxx**

13:00-14:30 **Lunch**
Coffee Boxx, Moltkestraße 44, 76133 Karlsruhe

14:30-15:15 **Invited Talk 3**
TBD

15:15-15:30 Coffee break

15:30-16:15 **Low Cost Manufacturing of Printed Functionalities for Highly Integrated Optofluidic Lab-on-Chip Systems**
Dr.-Ing. Erik Beckert, Fraunhofer Institute for Applied Optics and Precision Engineering (IOF), Jena, Germany

16:15-16:30 Coffee break

16:30-17:15 **Invited Talk 5**
TBD

17:15-17:30 **Concluding Remarks**
Prof. Dr.-Ing. Christian Karnutsch, IONAS, Hochschule Karlsruhe

19:00 **Welcome Dinner**

* Expenses not included in the registration fee

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Tuesday, September 15

09:30-12:00 **Seminar: Microfluidics and Optofluidics**

12:00-13:30 **Lunch**

HsKA Student Canteen

13:30-17:00 **Hands-on Training: Fabrication of PDMS-based Microfluidic Devices**

Wednesday, September 16

09:30-12:00 **Seminar: Polymer Photonics**

12:00-13:30 **Lunch**

HsKA Student Canteen

13:30-17:00 **Hands-on training:
Characterization of Polymer Photonic Integrated Circuits**

18:00 **Departure for Tour “Over the Rooftops of Karlsruhe”, Turmberg
Durlach**

20:00 **Dinner***

*Restaurant “Schützenhaus auf dem Turmberg”, Jean-Ritzert-Straße 8
76227 Karlsruhe*

Thursday, September 17

09:30-12:00 **Seminar: UV-Nanoimprint Lithography**

12:00-13:30 **Lunch**

HsKA Student Canteen

13:30-17:00 **Hands-on training: UV-Nanoimprint Lithography**

18:30 **Visit and Tour of the local Hoepfner Brewery**

Haid-und-Neu-Straße 18, 76131 Karlsruhe

20:30 **Dinner***

Hoepfner-Burghof, Haid-und-Neu-Straße 18, 76131 Karlsruhe

Friday, September 18

09:30-12:00 **Seminar: SEM (Scanning Electron Microscopy) and AFM (Atomic
Force Microscopy)
Hands-on Training: SEM**

12:00-13:30 **Lunch**

HsKA Student Canteen

Afternoon **Departure of the participants**

* Expenses not included in the registration fee