

Venue

The course will take place at the Technische Universität Ilmenau, Germany, from March 8th to March 12th, 2021. The lectures will be given in the Institute of Micro- and Nanotechnologies MacroNano® (Feynmanbau, room 114/115), close to the cleanroom facilities.

Venue address

Technische Universität Ilmenau
Gustav-Kirchhoff-Straße 7
98693 Ilmenau

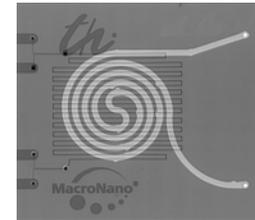


Accommodation

Information about accommodations can be found on:

<https://www.tu-ilmenau.de/ttd/spm/>

Impressions of the IMN MacroNano®



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2nd Short course on Practical Microfluidics



September, 13-17, 2021
Ilmenau, Germany



TECHNISCHE UNIVERSITÄT
ILMENAU

Description

The aim of the interdisciplinary short course is to give a practical introduction on microfluidics and the often astonishing effects that make the flow physics in many situations completely different from the macroscopic world. It further includes an overview of different manufacturing techniques and chip designs to enable the participants to design and built their own microfluidic devices for their individual purposes, e.g. in biochemistry. Since the flow field characterization in these devices is of paramount importance the course will also introduce different advanced optical methods such as particle image velocimetry (PIV), particle tracking velocimetry (PTV) and three-dimensional techniques.

The theoretical introduction is complemented by practical sessions in which the participants can get first hands on experiences on the flow field measurements techniques, will built their own chips with soft lithography, learn about data processing and get the possibility to perform laboratory work in the field of microfluidics. The participants will have also the opportunity to visit the technology center (Center of Micro- and Nanotechnology) with 1,200 m² of clean room facilities, see a large variety of different manufacturing techniques and to discuss with experts of different fields. Manufacturers producing equipment and measurement techniques for microfluidics will introduce their products and the exchange with experienced researchers and other participants will widen the scientific horizon.

Topics

- fundamentals of microfluidics
- micro systems technologies (MEMS, MOEMS)
- manufacturing techniques for microfluidic devices
- experimental characterization of micro flows using μ PIV, μ PTV and advanced three-dimensional techniques
- microscopy methods and optics
- image processing and image evaluation
- data handling and statistics
- applications of micro reaction technologies
- applications of single- and multiphase flows, surface acoustic waves and others

Lecturer

- Prof. Christian Cierpka, TU Ilmenau, Institute of Thermodynamics and Fluid Mechanics
- Prof. Christian Kähler, UniBw Munich, Institute of Fluid Mechanics and Aerodynamics
- Prof. Michael Köhler, TU Ilmenau, Group for Physical Chemistry / Microreaction Technology
- Prof. Jens Müller, TU Ilmenau, Electronics Technology Group
- Prof. Stefan Sinzinger, TU Ilmenau, Optical Engineering Group
- Lars Dittrich, 5microns GmbH, Ilmenau
- Dr. Alexander Groß, TU Ilmenau, Group for Physical Chemistry / Microreaction Technology
- Dr. Meike Hofmann, TU Ilmenau, Optical Engineering Group
- Dr. Jörg König, TU Ilmenau, Institute of Thermodynamics and Fluid Mechanics

Registration

Information on the registration can be found on:
<https://www.tu-ilmenau.de/ttd/spm>

Registration starts by September 1st, 2020. Early registration is highly recommended due to limited number of places for participants in the laboratories. The organizers reserve the right to cancel the course in case of insufficient number of participants.

Course fee

For attending the course the participants are going to be charged with a registration fee of 1.300 €^①. For payments received after January, 2021, the registration fee increases by 100 €. A cancelation fee of 400 € will be charged from persons who cancel their participation after February 8th, 2021.

The course fee includes the participation in all lectures and practical sessions, a complete set of course notes, the refreshments during the coffee breaks and the lunch each day. The welcome party on Tuesday as well as the dinner on Thursday are also covered.

Schedule

Registration starts at 8:00 a.m. on Monday, March 8, 2021. Ten lectures will be given in total accompanied by 8 practical sessions with demonstrations, experiments and the possibility to work in the laboratories, addressing different aspects in microfluidics. An exhibition from manufacturers and a welcome party will take place on Tuesday evening. A dinner is scheduled for Thursday. The course ends on Friday, March 12, 2021 after lunch.

Daily schedule:

8:30 – 10:00 Lecture (Mo – Fri)

coffee break

10:30 – 12:00 Lecture (Mo – Fri)

lunch break

13:00 – 14:45 Practical session (Mo –Thu)

coffee break / change of labs

15:30 – 16:45 Practical session (Mo – Thu).

All lectures and practical sessions will be given in English. Each participant has the opportunity to take part in all practical sessions in the laboratory. Experiments will be carried out in groups with 4 participants at most.

Who should attend?

The course is intended for PhD students, scientists and industrial researchers who have already started to work in the field of microfluidics, or plan to do that in the near future and want to get familiar with the diverse possibilities of microfluidics. Different topics and challenges will be addressed during the course ranging from the fabrication of microfluidic systems to their experimental characterization, enabling the participants to identify difficulties and solutions in advance of own future projects. The adressed research areas comprise fluid dynamics, optical systems for sensing purposes, biochemistry, microfabrication and adjoining fields.

^① tax free scientific and educational event, according to the German Umsatzsteuergesetz (UStG)