



# 11th NAMIS Autumn School

October 2<sup>nd</sup> – 6<sup>th</sup>, 2017 | IMTEK – University of Freiburg, Germany

**Micro & nano systems engineering:  
From fundamentals to industrial applications**



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# GENERAL INFORMATION

The 11<sup>th</sup> NAMIS Autumn School will take place at the Department of Microsystems Engineering (IMTEK) of the University of Freiburg.



## Street address / Transportation

Georges-Köhler-Allee 101,  
79110 Freiburg – Lecture hall 101 00 026

### *Tram from Black Forest Hostel:*

Alternative A:

Walk (app. 10 min) to Tram Stop “Bertoldsbrunnen” take Tram 4 (direction Messe) and get off at the final stop “Technische Fakultät” – Bldg. 101 is directly to your left.

Alternative B:

Walk (app. 3 min) to Tram Stop “Oberlinden”, take line 1 (direction Landwasser) to “Rathaus im Stühlinger” and then Tram 4 (direction Messe) and get off at the final stop “Technische Fakultät” – Bldg. 101 is directly to your left.

### *From Hotel Stadt Freiburg*

Turn right into Berliner Allee and walk down the street. Bldg. 101 is to your left right after the underpass of the train tracks. 7-10 min walk (800 m). Alternatively, take Tram 4 (direction Messe) and get off at the final stop “Technische Fakultät” – Bldg. 101 is directly to your left (two stops).

## Poster Session

The poster session will take place in the lobby of Bldg. 101. Pins will be provided as needed. Put up your poster during the lunch break and take it down again at the end of the session.

You need to provide a Powerpoint file for your flash presentation. Please send this file to [prucker@imtek.de](mailto:prucker@imtek.de) and name the file ##-firstname-lastname.pptx with ## being the poster number 01 ... 60 (see poster list). Example: 07-oswald-prucker.pptx.

## WLAN

All eduroam users are good to go in any university building. Your home credentials will be accepted. All other participants: Connect to the WLAN called *NAMIS* and use the password *uf-560Jahre*. This connection will only be available in Bldg. 101.

# PROGRAM

## Overview

TIME	SUNDAY Oct. 1	MONDAY Oct. 2	TUESDAY Oct. 3	WEDNESDAY Oct. 4	THURSDAY Oct. 5	FRIDAY Oct. 6	SATURDAY Oct. 7			
08:00		Registration	German national holiday = NAMIS autumn school excursion day: Vogtsbauernhöfe, Uhrenmuseum							
08:45		Introduction		Registration	Registration	Registration				
09:00		Rühe (ALU)			Zappe	Kim	Egert			
09:15										
09:30		Peter				Montgomery				
09:45										
10:00										
10:15										
10:30		Coffee break			Coffee break	Coffee break	Coffee break			
10:45										
11:00		Zengerle			Reindl	Ahopelto	Rühe			
11:15										
11:30										
11:45										
12:00					Wilde	Asplund				
12:15										
12:30		Lunch break			Lunch break	Lunch break	Lunch break			
12:45										
13:00		Team building contest				Ruther	Bernardini			
13:15										
13:30										
13:45										
14:00										
14:15		Poster slam		Hands-on activity: (a) Surface functionalization (b) Lab-on-chip technology	Hands-on activity: (a) Lab-on-chip technology (b) Surface functionalization	Bosseboeuf				
14:30										
14:45									Coffee break	
15:00										
15:15									Rühe	
15:30										
15:45		Poster session with coffee and refreshments				Meier				
16:00										
16:15										
16:30										
16:45										
17:00				Transfer		Paul				
17:15										
17:30						Transfer				
17:45										
18:00		Casual get-together	Free evening	Visit of Uniseum,	Free evening	Banquet / farewell party				
Evening										

## Details

SUNDAY, OCT 1 2017

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Arrival in Freiburg.

MONDAY, OCT 2 2017

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- 8:00 Registration
- 8:45 **Introduction to NAMIS and to the NAMIS Autumn School**  
Alain Bosseboeuf
- 9:00 **IMTEK and the University of Freiburg**  
Jürgen Rühle
- 9:45 **Optical micro systems and in particular about optical microresonators on chip for sensing and tuning**  
Yves-Alain Peter
- 10:30 Coffee Break
- 11:00 **Molecular diagnostics at the Point-of-Care by centrifugal microfluidics**  
Roland Zengerle
- 12:30 Lunch Break
- 13:15 Team building contest
- 14:15 Poster slam
- 16:00 Poster session (with coffee and refreshments)
- 18:00 Casual get-together

TUESDAY, OCT 3 2017

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- 9:00 NAMIS Autumn School excursion to the Black Forest  
Visits to:  
[Schwarzwälder Freilichtmuseum Vogtsbauernhof](#)  
[Deutsches Uhrenmuseum Furtwangen](#)
- ca. 17:00 Return to Freiburg – free evening

WEDNESDAY, OCT 4 2017

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- 9:00     **Photons and Phluids**  
          Hans Zappe
- 10:30     Coffee Break
- 11:00     **Power supply for wireless sensor systems**  
          Leonhard Reindl
- 11:45     **Some like it hot - Electronic systems operating up to 500 °C**  
          Jürgen Wilde
- 12:30     Lunch Break
- 13:15     **Hands-on activity**  
          a) Surface functionalization  
          b) Lab-on-Chip-Technology
- 16:45     Transfer
- 17:15     Uniseum & casual dinner in downtown Freiburg

THURSDAY, OCT 5 2017

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- 9:00     **Revolution of transdermal drug delivery by dissoluble micro needles**  
          Beomjoon Kim
- 9:45     **Microsphere assisted interferometry for high resolution nanometrology**  
          Paul Montgomery
- 10:30     Coffee Break
- 11:00     **Ultra-thin Free-Standing Si Membranes**  
          Jouni Ahopelto
- 11:45     **Stability of neural interfaces - electrochemical stability, biological stability and why long term stable neural interfaces are not yet in clinical use**  
          Maria Asplund
- 12:30     Lunch Break
- 13:15     **MEMS-based optical probes**  
          Patrick Ruther
- 14:00     **Hands-on activity**  
          a) Lab-on-Chip-Technology  
          b) Surface functionalization
- Free evening

FRIDAY, OCT 6 2017

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- 9:00      **Neuronal (Network) Activity - From Signal to Interpretation**  
Ulrich Egert
- 10:30     Coffee break
- 11:00     **Tailormade surfaces for microsystems and the life sciences**  
Jürgen Rühle
- 12:30     Lunch break
- 13:15     **Gas microsensors for air quality**  
Sandrine Bernardini
- 14:00     **Interference microscopy techniques for fabrication process, MEMS and wafer-level packaging characterization**  
Alain Bosseboeuf
- 14:45     Coffee break
- 15:15     **Surface-attached polymer networks for applications in the life sciences**  
Jürgen Rühle
- 16:00     **Cells on Chip, what do we have to control?**  
Matthias Meier
- 16:45     **How to save time and money by half-blind calibration of sensor systems**  
Oliver Paul
- 17:30     Transfer
- 18:00     **Banquet and farewell party**

SATURDAY, OCT 7 2017

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Departure.

# PRELIMINARY POSTER LIST

1. **Opto-mechanical probe to reach video rate AFM**  
Lucien Schwab
2. **Transdermal alcohol measurements using MOX sensors in clinical trials**  
Latevi Bruno Lawson-Gadayiglo
3. **Self-organized magnetic traps for Lab-on-chip**  
Samir Mekkaoui
4. **On the influence of strong magnetic field on MOS transistors**  
Duc-Vinh Nguyen
5. **Development of a 2D array of micromachined electromagnetic digital actuators for microconveyance applications**  
Zhichao Shi
6. **Microsensors developed on flexible substrates for the measurement of skin**  
Fatima Garcia Castro
7. **Design and development of a 3-D digital electromagnetic actuator.**  
Ajinkya Deshmukh
8. **Modelling and preliminary measurements of silicon samples for stress and defects mapping by microphotoelasticity**  
Clément Bessouet
9. **Low noise amplifiers for Nuclear Magnetic Resonance applications**  
Lucas Werling
10. **Super-resolution profilometry for nanoscale materials**  
Stephane Perrin
11. **Polymer-derived ceramic for (bio)MEMS applications**  
Lorenz Hagelüken
12. **Lab-on-a-chip platform for single-cell electrorotation using 3D electrodes**  
Kevin Keim



13. **Dielectric Transduction of NEMS**  
Kaitlin Howell
14. **Label free sensing of DNA amplification using SiNW ISFETs**  
Saurabh Tomar
15. **Thermal-Responsive Biodegradable MEMS Implant for Drug Delivery**  
Ya Wang
16. **Thermal probe nanopatterning enables nanoparticle assembly on PDMS substrates**  
Shao-Chi Yu
17. **Nanochannels embedded in resonators for single nanoparticles characterization**  
Davide Scaiola
18. **Aluminum Nitride & Rare earth nitride alloys for MEMS applications**  
Patrick Daoust
19. **Bi-Modal Probe for Neurotransmitter Modulation and Sensing**  
Hamza Landari
20. **All-polymer whispering-gallery-mode microresonators for gas sensing applications**  
Cédric Lemieux-Leduc
21. **Design and fabrication of a micro steam turbine**  
Amrid Amnache
22. **On-chip delay line of coupled-resonator optical waveguide**  
Marc-Antoine Bianki
23. **Gas sensor using an array of multiplexed deformable Fabry-Perot interferometer with functionalized polymer**  
Régis Guertin
24. **Microfluidic Culture Device for Applying Shear Stress to Primary Cilia on Tubular Cells**  
Masamoto Chikamori

25. **Identification of the role of pericytes in angiogenesis using 3D co-culture microvessel model**  
Eujin Lee
26. **MEMS actuator for in situ TEM mechanical testing**  
Nicolas Lobato-Dauzier
27. **Surface activated bonding of Si at liquid nitrogen temperature**  
Yasuhisa Morishita
28. **Bifurcation dynamics produced by enzymatic DNA computing**  
Shu Okumura
29. **Plug-and-play organ modules on chips**  
Sun Mingyue
30. **MEMS-in-TEM for measurement of near-field radiative heat transfer**  
Saeko Tachikawa
31. **Room Temperature Temporary Bonding of PI/Glass for TFT Fabrication**  
Kai Takeuchi
32. **Microvessel-on-a-chip to visualize a barrier function**  
Ryo Usuba
33. **Microscale acousto-fluidic sensing**  
Yves Janssen
34. **A novel polymer filled CMOS-MEMS inductive-type tactile sensor with wireless sensing capability**  
Sheng-Kai Yeh
35. **Optical Analysis Method for Quality Control of Microfluidic Devices Based on Zinc-Oxide Nanowire Arrays**  
Mazen Sayed Ahmed
36. **Self-Assembled Tip-Merged Microneedle: Potential as Controlled and Continuous Transdermal Drug Release System**  
Jungeun Lim
37. **Measurement of PCR-induced error by NGS results validation**  
Yonghee Lee

38. **Ultra-sensitive detection of rare mutation by NGS validation**  
Yeom Huiran
39. **Single Cell mRNA Retrieval Method using Laser Isolation System**  
Hyunho Lee
40. **Discovery of novel cell subtypes using pathologically linked single cell transcriptomics and machine learning**  
Yongju Lee
41. **High-throughput NGS-based Error-free DNA Synthesis**  
Jinsung Noh
42. **Assymetric beads aggegation for microfluidic immunodetection**  
Sanghoon Han
43. **PiezoMEMS at VTT**  
Ville Pale
44. **Unique and Unclonable Capacitive Sensor**  
Cyril Baby Karuthedath
45. **Scaling Up Silicon Photonics Characterisation: Automation & Wafer Level Testing**  
Ben Wälchli
46. **Micro/Nanometrology and applications at VTT**  
Seppâ Jeremias
47. **Half-blind Calibration of Nonlinear Multisensor Systems**  
Moritz Berger
48. **First Smart Bracket with sufficient Transmission Distance for Orthodontic Applications**  
Julian Hafner
49. **LED-based Intracerebral Optrode for Simultaneous Optical Stimulation and Electrophysiological Recording**  
Elisabeth Otte

50. **Hydrogel-based biomaterial therapy to re-establish the intervertebral disc biomechanics**  
Anayancy Osorio
51. **Assessment of chitosan-based hydrogels in the cell culture of fibroblasts**  
Ana Isabel Juvier-Madrado
52. **Preparation and characterization of fiber-reinforced hydrogel composites for applications in intervertebral disc tissue engineering**  
Ingo Doench
53. **Flexible rectifiers using Organic TFT transistors**  
Ghada Ibrahim
54. **Muscle-MEMS - Liquid Crystal Elastomers striving for integration**  
Yannick Follwill
55. **Biologically inspired, environmentally friendly water based lubricants**  
Wei Chen