

MICRO-800

Summer School on Micro and Optical Technologies in Biomedical Science (2018)

Gijs Martinus

Cursus	Sem.	Type
Microsystems and Microelectronics		Obl.

Language of teaching	English
Credits	2
Session	
Exam	Oral presentation
Workload	60h
Hours	30
Courses	20
TP	10
Number of positions	

Frequency

Only this year

Remark

From 9 to 14 September 2018 - Fiesch (Switzerland)

Summary

Technical review of micro and optical technologies in the field of biomedicine. Topics cover microfabrication of devices, micromanipulation of biomolecules and cells, optical microscopy techniques, optical devices. Introduction to innovation management in industrial R&D.

Content

Advances and discoveries in biology and medicine are major targets of current academic and industrial research because of the huge impact that they can have on human health. Nevertheless, biomedical science is nowadays no more a field where biologists and medical doctors act alone towards this common target. Scientists and engineers coming from other disciplines are becoming real enablers. Major developments in micro and optical technologies have been supporting biomedical science for several decades, and they are still growing very fast. Clinical diagnostics, drug discovery and medical therapies are some of the fields which have already profited from this technical evolution. This field will have a key role in empowering breakthrough advances in biology and medicine, and with this summer school we aim at giving an overview of the current landscape in micro and optical technologies for applications in biomedical science. The focus will be on technologies that have been proven successful tools for fundamental biological research or medical application. Topics will cover: micro-instrumentation, microtechnology, microfluidics, optical microscopy and optical devices.

Scientists in these fields will present their work related to life sciences. Moreover, we will show some industrial outcomes of such technologies, by inviting R&D engineers from companies working in these sectors. Special sessions on innovation management will present methods to value creativity and applications of such technologies. Finally, space will be given to teamwork on projects and industry workshops, which will be evaluated along with presentations and posters to assess the student participation. Everything will be accompanied with ludic and social activities.

SPEAKERS

Research advances:

- Alexandre Aubry – Langevin Institute (FR)
- Madhavi Krishnan – University of Zurich (CH)
- Laura M. Lechuga – Catalan Institute of Nanoscience and Nanotechnology (ES)
- Hervé Rigneault – Fresnel Institute (FR)
- Ben Schuler – University of Zurich (CH)
- Roland Zengerle – University of Freiburg (DE)
- Babak Ziaie – Purdue University (USA)
- Florian Hoffelder – Imperial College (UK)

Industry and Innovation:

- Cédric Allier – CEA (FR)
- Cristina Martin-Olmos – CSEM (CH)
- Iago Pereiro – IBM (CH)
- Tilo Peters – swissSIER (CH)
- Peter Seitz – Kenzen (CH)

EVALUATION

The first 3 days, students will work in groups on assignments proposed by the speakers during afternoon sessions. During the workshop on the 4th day, they will present the results to the entire audience. During the last day of the summer school, the students will present their own PhD project through flash presentations or posters.

Keywords

microtechnology, optics, bioengineering, innovation, R&D

Resources

Websites

- <http://mot2018.epfl.ch>