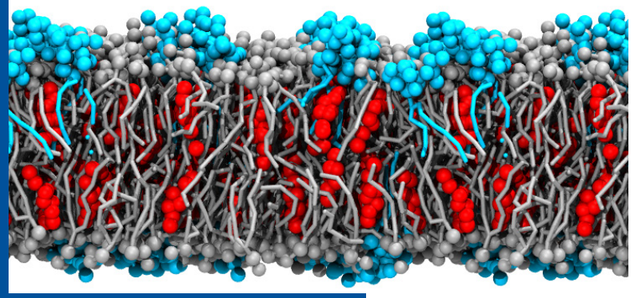

SOFT MATTER

Soft matter science is an interdisciplinary field of research, attracting attention from chemists, physicists, biologists and engineers. To some extent, this appeal comes from the amazing properties of “soft materials” e.g., from their unique capability to respond to external stimuli. Even weak stimuli may induce significant changes in behaviour due to softness and mesoscopic structuring of these materials. While softness results from weak interactions between the constituents, mesoscopic structuring is often a consequence of spontaneous self-assembly into ordered arrangements much larger in size than the constituent molecules.

SYNTHETIC AND BIOLOGICAL MEMBRANES

Many of today’s interesting systems consist of multiple components, have various interfaces, and exhibit complex effective interactions. Understanding the synergies between the regulating factors, thus predicting and controlling their impact on material properties, is a great scientific challenge. Advances in this direction should enable the creation of novel materials with a high level of functionality similar to those existing in nature.

PROGRAMME

The SoMaS Summer School 2016 aims to give attendees a broad exposure to **Synthetic and Biological Membranes**. The school integrates knowledge from chemistry, materials science, biology and physics.

The SoMaS School 2016 consists of:

- Introductory courses and lectures
- Research seminars and tutorials
- Poster sessions
- Career seminars

INVITED SPEAKERS

Fouzia Boulmedais
Institut Charles Sadron, Strasbourg, France

Min-Hui Li
Chimie ParisTech, Paris, France

Wolfgang Meier
Universität Basel, Switzerland

Murugappan Muthukumar
University of Massachusetts, Amherst, MA, USA

Oswald Prucker
Universität Freiburg, Germany

Joachim Rädler
Ludwig-Maximilians-Universität, München, Germany

Justin Rofeh
University of California, Santa Barbara, CA, USA

Olivier Sandre
Université de Bordeaux, France

Ana-Suncana Smith
Universität Erlangen, Germany

Luke Theogarajan
University of California, Santa Barbara, CA, USA

Andreas Zumbühl
Université de Fribourg, Switzerland

ORGANIZERS

Pursuing the tradition of **Soft Matter Science** in the Rhine Valley by introducing the young generation of researchers to this field, the **International Research Training Group (IRTG) "Soft Matter Science: Design of Functional Materials"** organizes a series of annual summer schools in Alsace, France.

Strasbourg
Freiburg
IRTG SoMaS
Soft Matter Science
Mulhouse
Basel

Supported by

Université franco-allemande
Deutsch-Französische Hochschule

UNIVERSITÉ DE STRASBOURG

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
AMBASSADE DE FRANCE EN ALLEMAGNE

INVESTISSEMENTS D'AVENIR

UNI FREIBURG

INSTITUT Charles SADRON
CNRS - UdS - STRASBOURG

DFG

INTRODUCTORY COURSES

Opening Lecture: Single-molecule transport through nanopores: ubiquity, challenges, and opportunities
(Murugappan Muthukumar)

Self-assembled macromolecular membranes and nanostructures
(Min-Hui Li)

- Amphiphilic macromolecules for self-assembly into membranes and vesicles: inspired by self-assembly principles of small molecular amphiphiles
- Synthesis of complex amphiphilic macromolecules
- Formation and characterization of polymer vesicles
- Functions of polymer vesicles: stimuli-responsive polymer vesicles and controlled release, bio-imaging, micro- and nano-reactors

Tailored self-assembling amphiphilic block copolymers as stable membrane scaffolds for protein based biosensors
(Luke Theogarajan)

- Synthetic polymer membrane
- Single molecule biophysics
- Automated polymer membrane formation
- Polymersomes
- Noise in polymer membranes
- Protein-membrane interactions
- Tailored polymer membranes
- Modular synthesis of block copolymers
- Click coupling, metal-free click coupling

Cells interacting with micro- and nanostructured surfaces
(Joachim Rädler)

- Physics of polymer-functionalized interfaces
- Micro-patterning & self-assembly
- Surface guided cell migration

GENERAL INFORMATION

Centre de Mittelwihr
16 rue du Bouxhof
68630 Mittelwihr, France
+ 33 (0) 3 89 47 93 09
www.mittelwihr.com

Duration of the Summer School
Beginning: Sunday 3th July (afternoon)
End: Friday 8th July (after lunch)

Participation Fee
(including accommodation): 200,– €

Deadline for Registration and Abstract
May 25th, 2016

Further Information and Registration
www.softmattergraduate.uni-freiburg.de/summerschool2016

CONTACT

Melisa Mustafovic
softmattergraduate@uni-freiburg.de
+49 (0) 761 203 678 34

IRTG SoMaS
International Research Training Group

ANNUAL SUMMER SCHOOL JULY 3-8, 2016

SYNTHETIC AND BIOLOGICAL MEMBRANES