

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.

NON-EQUILIBRIUM PHENOMENA

One fundamental characteristic of soft materials is their unique capability to respond to external stimuli. Even weak stimuli may induce significant changes in behavior due to the 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.

Structuring on several length scales also implies a hierarchy of dynamic processes which can span many orders of magnitude in time. This large spread of time scales makes complex relaxation phenomena ubiquitous in soft matter systems: They can be easily brought out of equilibrium by external fields, leading to nonlinear response to these fields, and display material properties that are determined by the history of the processing conditions. The importance of the interplay between mesoscopic structuring, intrinsic time scales, external stimuli and memory effects requires the development of new, possibly, hierarchical approaches to understand the nonlinear and nonequilibrium phenomena, which is one of the central issues of current soft matter research.

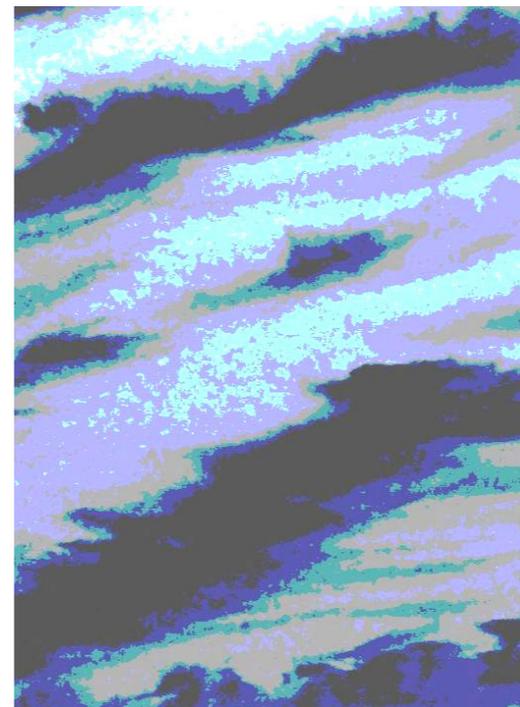


PROGRAMME

The SoMaS Summer School 2018 aims to give attendees a broad overview of **Non-Equilibrium Phenomena in Soft Matter Science**. The school integrates knowledge from chemistry, materials science, biology and physics.

The SoMaS School 2018 consists of:

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



CONFIRMED SPEAKERS

Matthias Ballauff
Helmholtz-Zentrum Berlin, Germany

Peter Keim
University of Konstanz, Germany

Matthias Mayer
Matthias Mayer Seminare & Coaching, Berlin, Germany

Claire Mcllroy
University of Nottingham, UK

Marcus Müller
Georg-August University, Göttingen, Germany

Murugappan Muthukumar
University of Massachusetts, Amherst, MA, USA

Peter D. Olmsted
Georgetown University, Washington DC, USA

H. Jelger Risselada
Georg-August University, Göttingen, Germany

Jürgen Rühle
Albert-Ludwigs University Freiburg, Germany

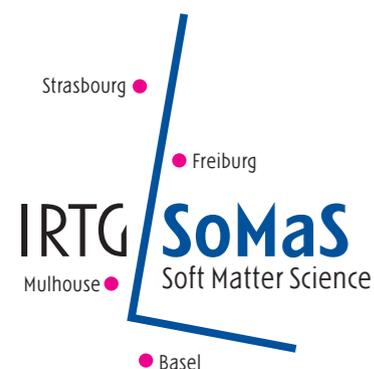
Arnaud Spangenberg
Université de Haute-Alsace, Mulhouse, France

Thomas Voigtmann
German Aerospace Center, Köln, Germany

Jianjun Xu
DSM Materials Science Center, Geleen, Netherlands

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.



INTRODUCTORY COURSES

To wet or not to wet - that is the question
(*Jürgen Rühe*)

Processing Strategies and Properties of UHMWPE
(*Jianjun Xu*)

Nonlinear rheology of colloidal suspensions
(*Thomas Voigtmann*)

- From shear thinning to shear thickening: flow phenomena in suspensions
- Macroscopic theoretical rheology: continuum mechanics and material laws
- Microscopic dynamics of shear-thinning suspensions
- Numerical techniques

Structure formation and transformation in soft matter (*Marcus Müller*)

- Continuum models, free-energy landscape and collective kinetics
- Spinodal phase separation and nucleation
- Exploring the free-energy landscape: metastable states and saddle points
- Applications to block copolymers

Polymer dynamics and applications to additive manufacturing (*Peter D. Olmsted*)

- Dynamics of unentangled and entangled polymers
- Instabilities in entangled melts and solutions
- Applications to additive manufacturing (3D printing) in polymers

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, July 8th (afternoon)
End: Friday, July 13th (after lunch)

Participation Fee

(including accommodation): 300,- €
Reduced fee for Master students: 150,- €

Deadline for Registration and Abstract

May 25th, 2018

Further Information and Registration

www.softmattergraduate.uni-freiburg.de/summerschool2018

CONTACT

Birgitta Zovko

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

IRTG SoMaS
International Research Training Group

ANNUAL
SUMMER SCHOOL
JULY 8-13, 2018

NON-EQUILIBRIUM
PHENOMENA IN
SOFT MATTER SCIENCE

