

Faculty (continued)

Prof. Frank Müller
Forschungszentrum Jülich
*Molecular and Cellular
Physiology*

Prof. Andreas Offenhäusser
Forschungszentrum Jülich
Bioelectronics

Prof. Walter Richtering
RWTH Aachen University
*Physical Chemistry
of Complex Fluids*

Prof. Christine R. Rose
Heinrich-Heine-Universität
Düsseldorf
Neurobiology

Prof. Carsten Sachse
Forschungszentrum Jülich
Structural Biology

Prof. Annette M. Schmidt
Universität zu Köln
Physical Chemistry

Jun.-Prof. Gunnar F. Schröder
Forschungszentrum Jülich
Structural Biochemistry

Prof. Claus Seidel
Heinrich-Heine-Universität
Düsseldorf
Molecular Physical Chemistry

Jun.-Prof. Birgit Strodel
Forschungszentrum Jülich
Structural Biochemistry

Prof. Dieter Willbold
Heinrich-Heine-Universität
Düsseldorf and
Forschungszentrum Jülich
Structural Biochemistry

Prof. Roland G. Winkler
Forschungszentrum Jülich
*Theoretical Physics of Living
Matter*

Location



The Helmholtz Association researches major challenges to secure the future of our society. With more than 40,000 staff in 19 research centres, the Helmholtz Association is Germany's largest scientific organization. Its work follows in the tradition of the great scientist and philosopher Hermann von Helmholtz (1821 – 1894).

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Admission



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Forschungszentrum

Forschungszentrum Jülich, Heinrich-Heine-Universität Düsseldorf, Universität zu Köln, RWTH Aachen University, and Forschungszentrum caesar in Bonn offer positions for three-year PhD projects. The advertised projects in biology, chemistry, and physics will be conducted within the IHRS BioSoft, which provides an intensive training in experimental and theoretical techniques, and in transferable skills.

- The Research School is open to highly qualified and motivated applicants from all countries.
- Applicants must hold a master's degree in biology, chemistry, physics, or related subjects.
- The teaching language is English; candidates should therefore have an adequate proficiency of English. Linguistic competence can be demonstrated by taking a standard test (e.g. TOEFL).
- Applications will be accepted at all times.
- The Research School is committed to an equal opportunities policy.

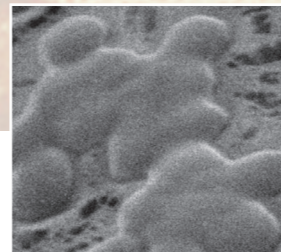
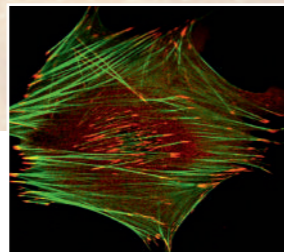
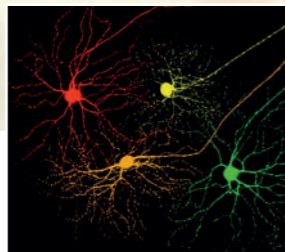
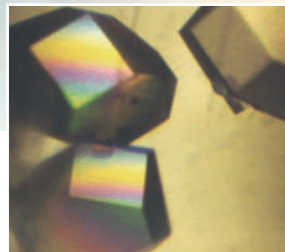
For further information and an application form:
www.ihrs-biosoft.de

Contact: Forschungszentrum Jülich
IHRS BioSoft | 52425 Jülich | Germany
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PhD Studies at the

International Helmholtz Research School of Biophysics and Soft Matter

Coordinators: Prof. G. Gompper | Prof. R. Merkel
Forschungszentrum Jülich | Heinrich-Heine-Universität Düsseldorf |
Universität zu Köln | Forschungszentrum caesar Bonn |
RWTH Aachen University



RWTH AACHEN
UNIVERSITY

caesar
center of advanced
european studies
and research

hhu Heinrich Heine
Universität
Düsseldorf



Our Goals

In recent years, life science research has undergone a fundamental transition. It has become evident that even the simplest molecular machines display an astounding complexity, leaving alone networks of genes and proteins in a living cell. In neural networks, information processing on the protein and cellular level can lead to the complex behaviour of mammals. Thus, there is an urgent need for a more quantitative, theory-oriented approach. Soft matter research has, in parallel, made great progress in understanding the structure of complex multi-component macromolecular systems, their non-equilibrium behaviour and their response to external fields. A particular focus is laid upon unravelling the physics of biologically relevant systems, heading towards synthetic biology.

Undergraduate curricula in biology, chemistry, and physics are often organized along the lines of traditional disciplines, and hence fail to adequately prepare students for research at the interface between biology and physics. These fields are

rapidly converging and thus entirely new research areas are forming at the cutting edge of this worldwide development.

The “International Helmholtz Research School of Biophysics and Soft Matter” (IHRS BioSoft) provides intensive training where physics, chemistry, biology, and neuroscience meet. It also offers a comprehensive framework of experimental and theoretical techniques that will enable PhD students to gain a deeper understanding of the structure, dynamics, and function of complex systems, especially those related to information processing in living systems.

The ultimate goal of the school is to advance the integration and exchange between physics, chemistry, biology, and neuroscience both in research and education. Students benefit not only from lectures, seminars, and lab courses given by experts in the field, but also from courses in transferable skills. In addition, they experience the environment provided by a large, multidisciplinary research centre.

Research Topics and Methods

- Complex Fluids
- Colloid and Polymer Physics
- Dynamics of Macromolecules
- Supramolecular/Amphiphilic Self-Assembly
- Polymer and Nanomaterial Synthesis
- Flow Dynamics and Microfluidics
- Bioelectronics
- Cell and Tissue Mechanics
- Optogenetics
- Cell Biophysics
- Structural Biology and Molecular Biophysics
- Cellular Signalling Pathways
- Neurobiology
- Receptor-Ligand Interactions
- Artificial and Biological Membranes
- Optical Spectroscopy and Imaging
- Single-Molecule Techniques
- Statistical Physics
- Computer Simulations
- NMR
- Electron Cryo-Microscopy
- Light, Neutron and X-ray Scattering
- Rheology
- Patch-Clamp Measurements
- Cell-Chip Coupling
- Quantitative Image Analysis
- and many more

Faculty

Prof. Arnd Baumann
Forschungszentrum Jülich
Molecular and Cellular Physiology

Prof. Jan K.G. Dhont
Forschungszentrum Jülich
Biomacromolecular Systems and Processes

Prof. Stefan U. Egelhaaf
Heinrich-Heine-Universität
Düsseldorf
Physics of Soft Matter

PD Dr. Jens Elgeti
Forschungszentrum Jülich
Theoretical Physics of Living Matter

Prof. Christoph Fahlke
Forschungszentrum Jülich
Molecular and Cellular Physiology

Prof. Jörg Fitter
RWTH Aachen University and
Forschungszentrum Jülich
Cellular Structural Biology

Prof. Stephan Förster
Forschungszentrum Jülich
Neutron Scattering and Biological Matter

Prof. Gerhard Gompper
Forschungszentrum Jülich
Theoretical Physics of Living Matter

Prof. Patricia Hidalgo
Forschungszentrum Jülich
Molecular and Cellular Physiology

Prof. U. Benjamin Kaupp
Forschungszentrum caesar,
Bonn
Molecular Sensory Systems

Prof. Berenike Maier
Universität zu Köln
Biophysics

Prof. Rudolf Merkel
Forschungszentrum Jülich
Mechanobiology

