



NEW JUNIOR FELLOW

On December 1st, 2008, **Jörn Dengjel** joined the FRIAS-LIFENET team as a Junior Fellow for an initial period of three years. Jörn studied Biochemistry in Potsdam and Tübingen where he also graduated in August 2001. He

continued his studies in Tübingen as a PhD student in the Department of Immunology under the supervision of Hans-Georg Rammensee and Stefan Stevanović, focusing on the MHC class II peptide repertoire. His main interest was how a specific immune response against tumor cells could be initiated using peptide-based vaccines. Already at this time mass spectrometry was his main analytical tool. He received his PhD in February 2005 and continued to work on peptide-based anti-tumor vaccines at Immatics Biotechnologies, Tübingen. In February 2006, Jörn began work at the Center of Experimental Bioinformatics, University of Southern Denmark, Odense, as a postdoc with Matthias Mann and Jens Andersen. He continued to use mass spectrometry characterizing cellular signaling events and organellar proteomes. His main focus was the regulation and course of autophagy, a cellular degradation and death program. At FRIAS Jörn is continuing to use quantitative mass spectrometry-based proteomics for the functional characterization of spatio-temporal protein dynamics during autophagy. Autophagy is regarded as an unspecific degradation pathway. However, lately more and more evidence suggests that autophagy is rather specific and specific subtypes of autophagy have been discovered.

Jörn and his group will study global protein signaling networks involved in autophagy to develop a model of the corresponding pathways. Being part of an interdisciplinary research team at FRIAS and at the Center for Biological Systems Analysis (ZBSA) opens up the possibility to design exciting cross-disciplinary experiments and to address arising >>

problems with new approaches. Bioinformatics, biology, chemistry, medicine, and physics experts are working next to each other, ready to help with their expertise.

Jörn and his family, Miriam and the children Katharina and Jonathan, acclimatized quickly to southern Germany. They have found a home and started to explore the neighborhood and the Black Forest. All four are looking forward to an enjoyable and fruitful time here in Freiburg.

TO COME

**New Joint Seminar of the Schools of Life Sciences - LIFENET and Soft Matter Research**

From January 2009 on a joint seminar of the Schools of Life Sciences and Soft Matter Research will take place on a weekly basis, every Monday, 11:15 a.m. in the FRIAS seminar room. Afterwards, lunch will be available in the FRIAS lounge. For lunch registrations please contact Olga Kessler ([olga.kessler@frias.uni-freiburg.de](mailto:olga.kessler@frias.uni-freiburg.de)). The seminar series was successfully launched on January 19, 2009 by Prof. Pep Español, external senior fellow at the School of Soft Matter Research, who gave an inspiring talk about "The Theory of Coarse Graining in Action". After a lively discussion, the audience, comprised of fellows, postdocs and PhD students of both schools, met in the FRIAS lounge to continue their talk.

**Speakers :**

- 02.02.2009 11:15h - **Dr. Stefan Schiller**
- 09.02.2009 11:15h - **Prof. Ferenc Nagy**
- 16.02.2009 11:15h - **Prof. Joseph Klafter**
- 23.02.2009 11:15h - **Dr. Katja Arndt**
- 02.03.2009 11:15h - **Dr. Michael Thorwart**
- 09.03.2009 11:15h - **Dr. Gunnar Cedersund**
- 16.03.2009 11:15h - to be confirmed
- 23.03.2009 11:15h - **Dr. Jörn Dengjel**
- 30.03.2009 11:15h - **Prof. Bernhard Breit**

(more Information: <http://www.frias.uni-freiburg.de/lifenet/veranstaltungen>)

REVIEW

of the Hermann Staudinger Lecture with Professor Jean-Marie Lehn, December 3rd, 2008

**"Perspectives in Chemistry: From Molecular to Supramolecular Chemistry towards Adaptive Chemistry"**

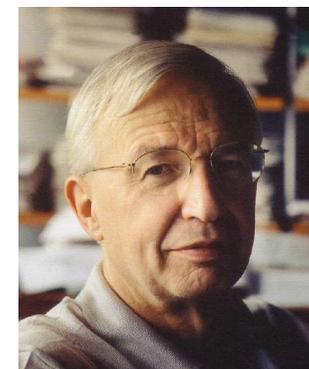
The second Hermann Staudinger Lecture was given by Nobel Prize Laureate Professor Jean-Marie Lehn from the Université Louis Pasteur, Strasbourg, and the Collège de France, Paris. Lehn was awarded the Nobel Prize in Chemistry in 1987 together with Donald Cram and Charles Pedersen for their work on molecules with highly selective, structure specific interactions, i.e. molecules that can "recognize" each other and thereby are able to "choose" with which other molecules they will form complexes.

In his lecture Professor Lehn invited the audience to follow him on his approach to a fundamental question of chemistry: How does matter become complex? - From a single atom via organized molecules to living and thinking matter. Starting with molecular chemistry, the science of linking atoms through covalent bonds to form molecules, he described the chemist's quest for complexity.

Lehn then moved on to a field that lies beyond molecular chemistry, the supramolecular chemistry. This approach comprises the chemistry of molecular interactions with weak, non-covalent intermolecular bonds generating highly complex chemical systems. The next step towards increased complexity would be the designing of self-organizing chemical systems, i.e. programmed systems that undergo spontaneous organization by self-assembly of their constituents. This is due to the information "stored" in the molecular components and a "recognition algorithm" defined by the interaction pattern. Supramolecular chemistry means dealing with dynamic systems since the non-covalent interactions are labile and reversible and allow constitutional variation through exchange of the molecular components. The same holds true for molecular chemistry after the import of dynamics through reversible covalent bonds. The introduction of diversity and dynamics into the self-organization >>

process leads to a constitutional dynamic chemistry and to the development of molecular and supramolecular constitutional dynamic materials such as dynamers. These are polymeric materials exhibiting reversible exchange of their constituents and corresponding changes in optical and mechanical properties.

Lehn finally presented a few examples for dynamers that are able to respond to the force of external stimuli through constitutional variation. Such novel, self-adjusting systems open new perspectives towards an adaptive, evolutive chemistry.



In his very vivid lecture in the crowded assembly hall of the University, Professor Lehn not only enthused many chemistry students but also a broader audience of FRIAS fellows and other scientists, as well as people from the public. Additionally, correspond-

ents from the local newspaper and television reflected the broad interest this event evoked. Afterwards, the scientific discussion was continued in the Prometheus Hall while enjoying a glass of wine.

It is to be hoped that this lecture is the beginning of a continuing collaboration between Professor Lehn, the FRIAS and the University of Freiburg.

EXPECTED EXTERNAL SENIOR FELLOWS

**Miko Elwenspoek**

Professor of Nanotechnology  
University of Twente, The Netherlands  
Project: "Supermaterials"

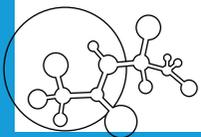
**Joseph Klafter**

Professor of Physical Chemistry  
Tel Aviv University, Israel  
Project: "Manipulating molecules one by one"



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## NEW JUNIOR FELLOWS

Sabine Ludwigs and Svetlana Santer joined the FRIAS School of Soft Matter Research as Junior Fellows on November 1st, 2008, for a period of up to 5 years.



**Sabine Ludwigs** received her PhD in the field of "Physical chemistry of polymers" at Bayreuth University in 2004. She then joined the group of Professor Ulrich Steiner at the Cavendish Laboratory in Cambridge, UK. In 2006, she became a group leader at the Institute for Macromolecular Chemistry and the Materials Research Center in Freiburg (FMF). Just recently, Sabine Ludwigs was awarded an Emmy Noether grant of the DFG and a prestigious stipend of the Landesstiftung Baden-Württemberg.

With her interdisciplinary research team bordering between macromolecular chemistry and polymer physics she is working on the synthesis and the morphological as well as electrochemical characterization of tailor-made functional polymers and nanomaterials for organic solar cells. By joining the FRIAS Junior Fellowship programme she expects to benefit from the excellent infrastructure and the intensive exchange within the School of Soft Matter Research and throughout FRIAS.



**Svetlana Santer** studied Physics at the University of St. Petersburg, Russia, where she graduated in 1996. In 2000, she obtained her PhD in the group of Prof. Martin Möller in Ulm where she carried out novel studies concerning thin polymer films and single synthetic and bio-molecules at surfaces, exploring atomic force microscopy. She became head of a research group at the Materials

Research Center (2001) and a junior research group at the Institute for Microsystems Technology at the University of Freiburg (2003). In 2007 Svetlana Santer received her "habilitation". Currently, she holds a Heisenberg fellowship. The general focus of Santer's research lies on nanomanipulation of adsorbed particles on polymer surfaces by external stimuli such as light or electrical and magnetic forces inducing reversible changes in the surface topography. "Collaborating with other local research groups from theoretical physics and chemistry at the School of Soft Matter Research will add perfectly to my projects", explains Santer.

TO COME

**February 3, 2009, 4:15 p.m.**

**Nobel Laureate Prof. Richard R. Ernst**

Location: Chemistry Lecture Hall, Albertstr. 41

On February the 3rd in the context of our Hermann Staudinger Lecture Series, we will welcome Nobel Laureate Richard R. Ernst (ETH, Zurich). Professor Ernst will give a lecture about "Fascinating Insights in Chemistry, Biology and Medicine by NMR".

(more Information: [http://www.frias.uni-freiburg.de/matter\\_research/veranstaltungen](http://www.frias.uni-freiburg.de/matter_research/veranstaltungen))

**July 8-11, 2009, FRIAS, Freiburg, Germany**

**Black Forest Focus on Soft Matter - Computational Methods for Soft Matter and Biological Systems**

Black Forest Focus on Soft Matter is a four day workshop which will discuss recent advances in modelling and simulation of soft matter and biological systems. Several internationally renowned scientists will participate at the workshop. The venue is the FRIAS institute within walking distance of the old town of Freiburg.

**Application deadline is February 28, 2009**

For further information visit <http://www.frias.uni-freiburg.de/BFF/>



## NEW JUNIOR FELLOW

On December 1st, 2008, Hauke Busch joined the FRIAS-LIFENET team as a Junior Fellow for an initial period of three years. Hauke studied Physics in Dublin, Ireland and Darmstadt, graduating in 1998. He continued as a PhD student in the field of non-linear dynamics and complex systems at the Institute of Applied Physics under the supervision of Friedemann Kaiser. During this time he was associated with the DFG graduate school 340 'Communication in biological systems', which sparked his first interest for research in life science.

Having received his PhD in May 2004, he continued to work as a post-doctoral fellow at the German Cancer Research Center in Heidelberg in the division of theoretical bioinformatics, headed by Roland Eils. There, he established the group of Applied Systems Biology, working on the modeling and simulation of different biological systems. For the last two years his main focus has been the application of concepts from systems theory to develop dynamic phenomenological models that allow the prediction and control of cell fate decision: how does a cell decide to proliferate, to differentiate or to migrate? What are the necessary and the sufficient signaling events over time? Separating biological processes by means of their respective time-scales, he has developed methods to reverse engineer dynamic gene regulatory networks that capture and predict essential control points in cell migration.

Moving upstream Rhine and joining the FRIAS Junior Fellowship Program has provided Hauke with novel opportunities to establish a truly integrative systems biology group with a cell culture lab at the ZBSA and a share in the Black Forrest Computer Grid. This will open up unprecedented possibilities in iterating *in silico* model predictions with *in vitro* experimental verification. With these means at FRIAS it will be possible to study and to control differentiation decisions in various cell types, and to elucidate cell-cell communication in the skin as well as in the tumor microenvironment to gain insight >>

into the process of skin aging, wound healing and tumor progression.



## EXTRA SUPPORT IN THE ADMINISTRATIVE TEAM

In January 2009, Katrin Brandt joined the administrative team headed by Britta Küst as project coordinator in the Schools of Life Sciences and Soft Matter Research.

Katrin Brandt studied chemistry at the University of Bonn where she received her diploma in 2001 and her PhD in 2005. During her diploma and PhD theses she held fellowships of the Theodor-Layman Foundation and the German Chemical Industry Association.

In 2006, Katrin Brandt continued as a postdoctoral research associate in the Surface Science and Catalysis Research Group of Professor Richard M. Lambert, University of Cambridge, UK supported by a DFG research fellowship. Her research concerned the application of surface science techniques to the chemoselective hydrogenation of  $\alpha$ ,  $\beta$ -unsaturated aldehydes on single crystal surfaces of silver. Her research project involved experimental work, both in the Cambridge laboratory and at the ELETTRA synchrotron radiation facility, Trieste, Italy.

In 2007, Katrin Brandt accepted a position in project management at the Department for Pharmaceutical and Medicinal Chemistry at the University of Freiburg. She coordinated the application process of the graduate school "Chemical Biology" within the framework of the Excellence Initiative.

In 2008, Katrin Brandt joined the Coordination Site of the Bernstein Network for Computational Neuroscience at the University of Freiburg as junior scientist in project coordination and public relations. Her tasks were, among others, to organise exhibitions of the Bernstein Network at international conferences and to help generate a print media network.

(more Information: <http://www.frias.uni-freiburg.de/lifenet/>)



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