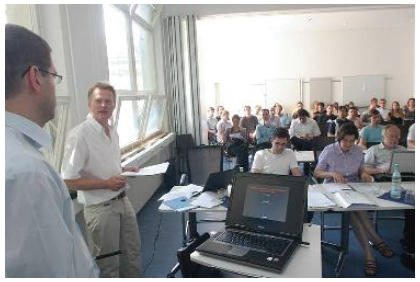
Life Sciences
Newsletter 1
Soft Matters
August´08

REVIEW

INTERNATIONAL LIFENET SYMPOSIUM, July the 2nd of 2008



The International FRIAS LIFENET Symposium, which took place July 2nd of 2008 focused on "Complex Systems" in life sciences. A complex system is a system in which its properties emerge through the relationship between its components and the environment. Thus, the function of a complex system cannot be understood by only looking at the properties of its single components, but instead by studying the system as a whole. The occasion of the symposium was the selection of Junior Fellows at the LIFENET section at FRIAS – Freiburg Institute of Advanced Studies.
Applicants from Denmark, Germany, Spain, Sweden, Switzerland and the United States of America, and an audience of more than 50 professors, assistant professors, fellows and guests took part in this event to discuss the difficulties of formal modelling and simulation of complex systems.
The symposium presentations by the applicants covered several topics. The morning session included the following presentations:
"Spatio-temporal protein dynamics during autophagy" by Jörn Dengjel (Center for Experimental Bioinformatics, Denmark);
"Signal integration at the membrane level studied with high-content computational image analysis" by Dinah Loerke (Scripps Research Institute in La Jolla, California); >>

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"Variability and control in biochemical reaction systems" by Wolfram Liebermeister (MPI for Molecular Genetics, Berlin); and "Gene network dynamics controlling cellular decisions" by Hauke Busch (DKFZ, Heidelberg).
After a short break, the symposium continued with a second session, containing four talks: "Handling and analysis of large scale System Biology image data" by Karol Kozak (ETH, Zürich);
"Genome-wide analysis of cellular signalling" by Robin Ketteler (Massachusetts General Hospital, Boston); "Decoding the post-transcriptional regulatory network" by Markus Landthaler (Rockefeller University, New York); and "Developing new genetic tools to model, understand and treat neurodegenerative diseases" by Christophe Lo Bianco (Wallenberg Neuroscience Center, Lund).
After lunch, the last session of the LIFENET symposium contained three talks:
"Regulation of alternative splicing through cellular regulatory networks" by Britta Hartmann (Centre de Regulació Genòmica, Barcelona);
"Small molecules that increase lifespan in Celegans" by Michael Petraschek (Hutchinson Cancer Research Centre, Seattle);
"Qualitative and quantitative aspects of protein networks and their inhibition" by Katja Arndt (Biology Institute of the Albert-Ludwigs-University, Freiburg).
Once all the sessions were completed, the applicants were interviewed to provide a complete understanding of their particular qualifications and abilities.
Based on organisation, attendance, discussion and interchange of perspectives, the symposium was a great success. For one day, the audience and the speakers shared their expertise and broadened their horizon in the scientific field of "Complex Systems". Furthermore, all applicants were able to present their qualifications and motivations in light of the available Junior Fellowships at the LIFENET section of FRIAS.

TO COME

- Final selection of Junior Fellows
- October: first LIFENET Colloquium

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

REVIEW

HERMANN STAUDINGER LECTURE with Nobel laureate Prof. Osheroff, June the 27th of 2008

For the first Hermann Staudinger Lecture, on Friday, June 27th 2008, the Freiburg Institute of Advanced Studies (FRIAS) welcomed a world-renowned physicist, Douglas D. Osheroff of Stanford University, Departments of Physics and Applied Physics. In 1996 Osheroff was awarded the Nobel Prize in Physics with David Lee and Robert C. Richardson for discovering the superfluidic nature of 3He. This discovery was made in 1971 while Osheroff was a graduate at Cornell University.
In the focus of Osheroff's talk were discoveries and advances in science at large. By their very nature, those discoveries that most change the way we think about nature cannot be anticipated. How, then, are such discoveries made, and are there research strategies which can increase the probability of making such a discovery?
To answer this question positively, Osheroff argued that a linked chain of discoveries and inventions throughout the history of physics can be found.
According to Osheroff, one observation reached by studying different examples of scientific inventions is that the process of advancing science may often lead to inventions and technologies that directly benefit mankind. However, it is impossible to know where the advance will come from that might solve a problem facing mankind. Also important is the use of the best technological instruments available and to understand what exactly your instrumentation is measuring. Before starting the research one should, in addition, look in unexplored regions of the landscape. Most importantly, Osheroff emphasized that in every experiment subtle unexplained behaviour can occur and one should not dismiss it since this of itself could lead to new discoveries.
In the second half of his lecture, Osheroff talked about the history of his own discovery, the superfluidity in 3He. Conclusions he drew from his own >> experiences were not to give up when things go badly during an experiment, avoid too many commitments, and vary the subject of your research occasionally. It is also vital to build flexibility into one's experiments. As an applied physics' scientist, Osheroff commented that theoreticians may have a nose for interesting physics but do not expect them to have all the details correct.
The last conclusion Osheroff drew concerned the fact that advances in science are seldom made by individuals alone. They are a result of the scientific community as a whole, asking questions, developing new technologies and sharing the results and ideas with others. To ensure rapid progress one must support scientific research broadly and encourage scientists to collaborate with each other and devote time to satisfying their own curiosities. Therefore one answer to the question, how advances in sciences are made, lies in collaboration and complementary expertise.
The vivid discussion after the lecture covered the many aspects of Osheroff's personal experiences, his experiments and outlooks gathered throughout his successful academic career.

To see the full lecture (video stream):
http://www.frias.uni-freiburg.de/matter_research/veranstaltungen/osheroff_lecture_event

TO COME

SOFT MATTER RESEARCH LECTURE

Professor Pep Espanol
"Dissipative Particle Dynamics – revisited"
Time: 01.08.2008 10:15 a.m.
Location: Room SR 02-016/18 (top floor);
Faculty of Applied Sciences
Georges-Köhler-Allee 101; 79110 Freiburg.

SYMPOSIUM
"Current Status of Soft Matter Research"
Time: 21.10.2008, whole day
Location: to be announced.

(more Information: www.frias.uni-freiburg.de/matter_research/veranstaltungen)

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NEW FELLOW

ULLRICH STEINER is John Humphrey Plummer Professor of Physics of Materials and Fellow and Director of Studies at St. Edmund's College at Cambridge University, UK. He was awarded the Raymond and Beverely Sackler Prize in the Physical Sciences in 2002.

At FRIAS, Prof. Steiner analyzes the influence of molecular order on charge transport in con-jugated polymers. -conjugated polymers represent promising materials for the develop-ment of organic electronic technology such as transistors in logic circuits, light emitting diodes, and photovoltaic cells. His project investigates the application of directed molecular assembly techniques developed from semi-crystalline polymers. This study focuses on the kinetics of molecular organi-zation phenomena coupled with alignment techniques in thin films. The controlled growth of large oriented 'single-crystal' like domains allows the measurement of in-plane an-isotropic opto-electronic properties along different molecular directions in correlation with the degree of molecular order and specific mesoscale morphologies.

The central goal of this project is to unravel key mechanisms which correlate the overall degree of molecular order and specific meso-scale morphologies with the performance characteristics of derived devices.

Professor Steiner will be supported in his research by post-doc *Ed Crossland* who will also start his project in August.

Also starting in August:
Stefan Schiller
Michael Thorwart

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Prof. Dr. Jan G. Korvink
Professor of Microsystems Technology
Freiburg, Germany

Prof. Dr. Hermann Grabert
Professor of Theoretical Physics
Freiburg, Germany

Prof. Dr. Bernhard Breit
Professor of Organic Chemistry and Biochemistry
Freiburg, Germany

Prof. Dr. Rolf Mülhaupt
Professor of Macromolecular Chemistry
Freiburg, Germany

Dr. Stefan Schiller
Supramolecular Pathways to Biohybrid Nanoscience
Freiburg, Germany

Prof. Dr. Ullrich Steiner
Professor of Physics
Cambridge, United Kingdom

Dr. Michael Thorwart
Theoretical Condensed Matter Physics
Freiburg, Germany

Prof. Dr. Gerald A. Urban
Professor of Sensor Technology
Freiburg, Germany

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Prof. Dr. Miko Elwenspoek
Professor of Nanotechnology
Enschede, Twente, The Netherlands

Prof. Dr. Pep Español
Professor of Fundamental Physics
Madrid, Spain

Prof. Dr. Joseph Klafter
Professor of Chemistry
Tel Aviv, Israel

Prof. Dr. Michael Krische
Professor of Chemistry and Biochemistry
Austin, Texas

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Prof. Dr. Ralf Baumeister
Professor of Bioinformatics and Molecular Genetics
Freiburg, Germany

Prof. Dr. Leena Bruckner-Tuderman
Professor of Dermatology and Venerology
Freiburg, Germany

Prof. Dr. Wolfgang Driever
Department of Developmental Biology
Institute of Biology I
Freiburg, Germany

Prof. Dr. Peter Jonas
Department of Physiology
Medical Faculty
Freiburg, Germany

Prof. Dr. Thomas Laux
Department of Genetics
Institute of Biology III
Freiburg, Germany

Prof. Dr. Robert Murphy
Lane Professor of Computational Biology
Departments of Biological Sciences, Biomedical Engineering and Machine Learning, Carnegie Mellon University
Pittsburgh, PA, USA

Prof. Dr. Klaus Palme
Department of Botany
Institute of Biology II
Freiburg, Germany

Prof. Dr. Jens Timmer
Department of Physics
Faculty of Mathematics and Physics
Freiburg, Germany

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Prof. Dr. Ferenc Nagy
Professor of Biology
Institute of Plant Biology, Biological Research Center of the hungarian academy of sciences
Szeged, Hungary

NEW FELLOW

ROBERT F. MURPHY is the Ray and Stephanie Lane Professor of Computational Biology and director of the Ray and Stephanie Lane Center for Computational Biology at Carnegie Mellon University. He also is Professor of Biological Sciences, Biomedical Engineering, and Machine Learning, and Director (with Jelena Kovacevic) of the Center for Biomedical Image Informatics at Carnegie Mellon.

Prof. Murphy´s laboratory combines research in cell and computational biology. He has developed tools for objectively choosing a representative microscopic image from a set, tools for comparing sets of images, systems for automating the determination of subcellular location, and tools for organizing unknown proteins by their location patterns. The critical component of each of the systems is a set of numerical features that capture essential biological information in the images. The work has implications for automated characterization of newly identified proteins and for high-throughput drug screening using microscopy.

Murphy currently leads NIH-funded projects for proteome-wide determination of subcellular location in 3T3 cells and continued development of the SLIF system for automated extraction of information from text and images in online journal articles. He is especially interested in modeling of spatiotemporal subcellular patterns and application of active learning methods to biological problems.

At FRIAS, Robert Murphy will extend his research on automated image processing and will help in building up the automating aspect of systems biology.