

Graduiertenzentrum Mathematik, Informatik und Naturwissenschaften

International Graduate College Statistical Physics of Complex Systems



Deutsch-Französisches Doktorandenkollegium (DFDK) / Collège Doctoral Franco-Allemand (CDFA)
supported by the Deutsch-Französische Hochschule (DFH-UFA)

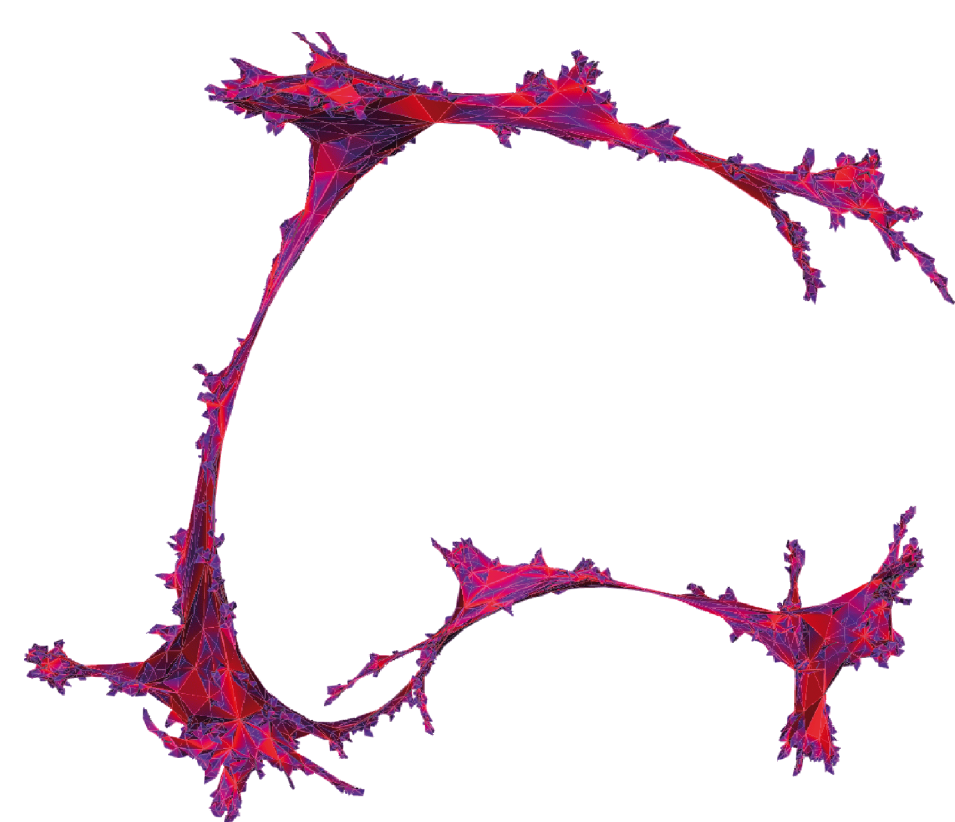
Speakers: Prof. Dr. Wolfhard Janke (Universität Leipzig), Prof. Dr. Bertrand Berche (Université Nancy)

Research Profil

The statistical physics of complex systems is a very broad field ranging from the study of quantum phenomena to the conformational behaviour of biomolecules, which can only be successfully tackled by employing a variety of different theoretical methods. Bringing together the expertise in analytical theory from Nancy and the long-standing experience in sophisticated computer simulation studies from Leipzig, the Graduate College promises unique prospects in the education by research into this important field. The current research topics include:

- disorder effects on phase transitions (diluted ferromagnets, spin glasses, random graphs and networks)
- non-equilibrium relaxation
- topological excitations
- conformational statistics of macromolecules
- ice and water models
- quantum phase transitions

Binational grants with the Ukraine and Russia on the French side supported by CNRS and with Sweden and China on the German side supported by the DAAD as well as an Institutional Partnership of the Alexander von Humboldt Foundation with Krakow, Poland, and the EU RTN Network „ENRAGE” provide an additional excellent background for further collaborations with internationally renowned scientists.



People

PhD Students:

Universität Leipzig:

Rainer Bischof
Andreas Nußbaumer
Stefan Schnabel
Thomas Vogel
Sandro Wenzel

Université Nancy:

Oleksandr Kapikranian
Thierry Platini
Jean-Charles Walter

Senior Researchers:

Universität Leipzig:

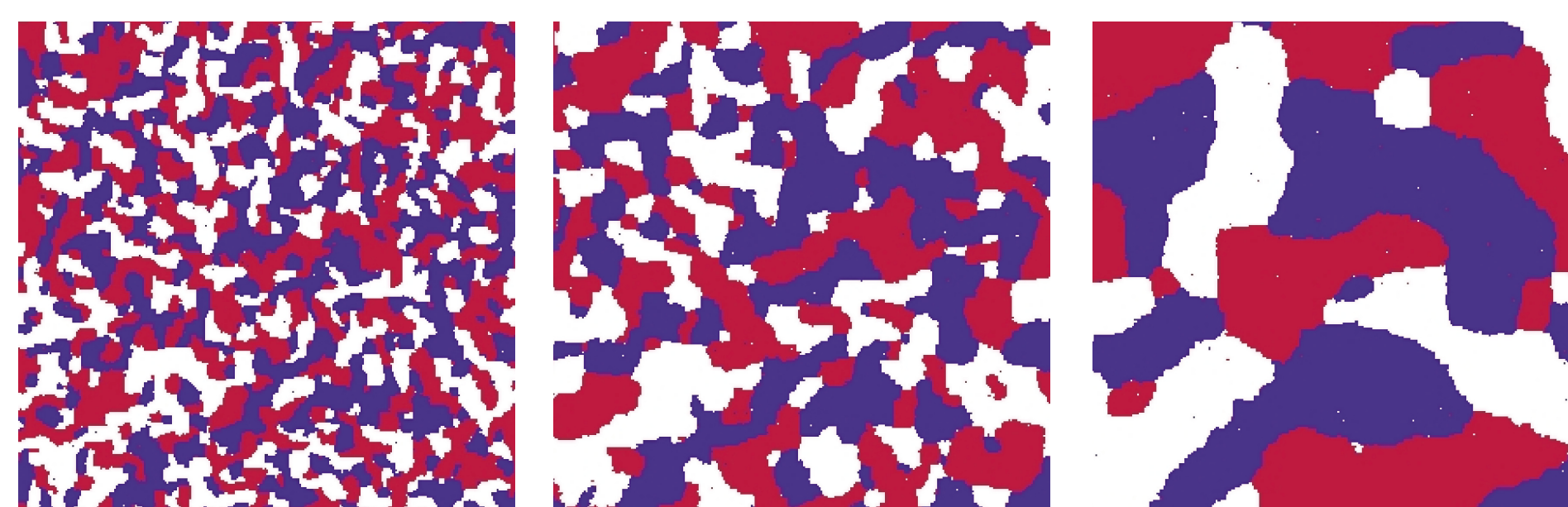
Michael Bachmann
Elmar Bittner
Viktoriya Blavatska
Martin Hasenbusch
Wolfhard Janke
Bartlomiej Waclaw

Université Nancy:

Bertrand Berche
Christophe Chatelain
Olivier Collet
Malte Henkel
Dragi Karevski

Training Profil

The emphasis of the school is on fostering close collaborations of the PhD students in Leipzig and Nancy. To this end, in the initial phase the school plays a vital role in the organization of extended visits of the students of the partner universities for periods of 2–3 months and a joint regular seminar programme taking reciprocally place in Leipzig and Nancy. With the next generation of PhD students, joint supervision by scientists in Leipzig and Nancy and a final degree from both universities („co-tutelle de thèse”) are envisaged. In Nancy, the educational aspects are structurally embedded into the „Saar-Lor-Lux” integrated study course of the universities in Saarbrücken, Nancy, and Luxemburg and coordinated through the Lorraine-wide Graduate Research School „EMMA”. In Leipzig, the analogous role is played by the „Mitteldeutscher Universitätsverbund” of the universities in Jena, Leipzig, and Halle, and by the local Research Academy Leipzig (RAL).



A further important task is the joint organization of Topical Schools and Workshops:

- Topical School „Open Quantum Systems”, October 2007, Nancy
- 8th Annual International Workshop „Comp-Phys07 – New Developments in Computational Physics”, November 2007, Leipzig
- Topical School „Monte Carlo Simulations of Disordered Systems” (jointly with EU RTN Network „ENRAGE”), March 2008, Leipzig
- International Workshop „Atelier Nancy”, May 2008, Nancy

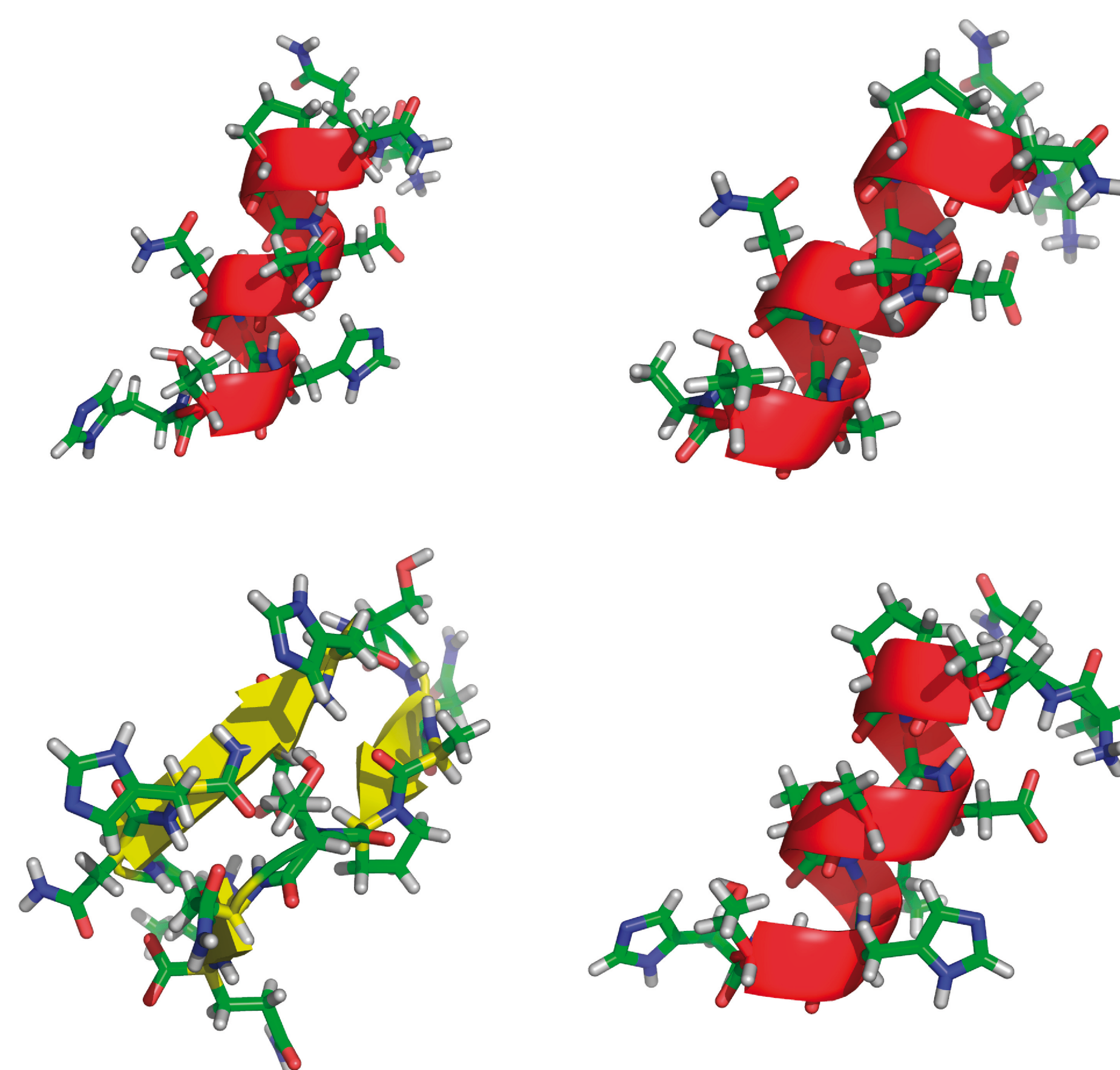
External International Partners

Bernd A. Berg (Tallahassee, FL, USA), Zdzislaw Burda (Krakow, Poland), Yuriy Holovatch (Lviv, Ukraine), Anders Irbäck (Lund, Sweden), Desmond Johnston (Edinburgh, UK), Ralph Kenna (Coventry, UK), David P. Landau (Athens, GA, USA), Ernesto Medina (Caracas, Venezuela), Bo Zheng (Hangzhou, P. R. China)

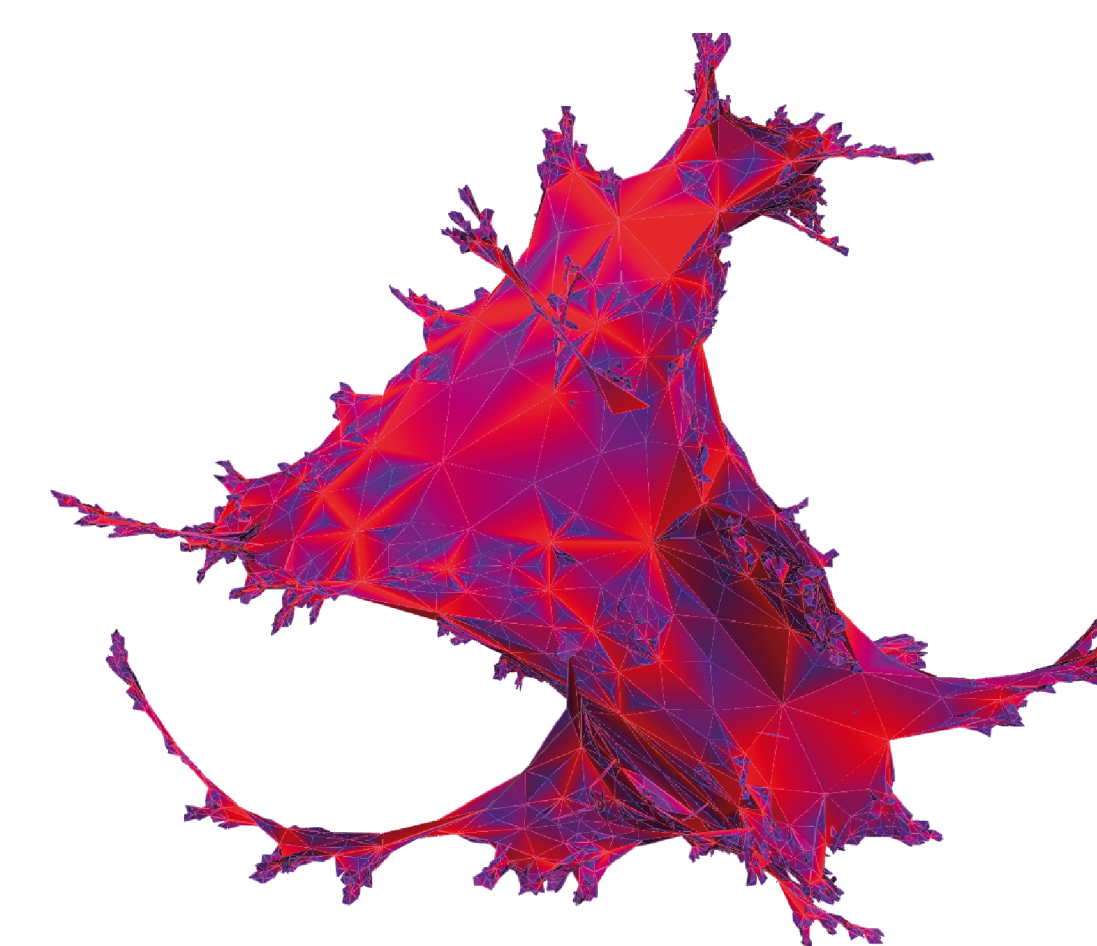
Research Projects

Currently, our PhD students are investigating the following specific research problems:

- Statics and dynamics of spin glasses
- Folding properties of polymers and proteins
- Adsorption of short peptides



- Simulation studies of quantum phase transitions in (disordered) 1D quantum spin systems
- Quantum Monte Carlo simulations of 2D quantum spin systems
- Low-temperature properties of spin systems with continuous symmetry
- Non-equilibrium properties of quantum spin chains
- Equilibrium and non-equilibrium behaviour of fully frustrated systems



Contact

Prof. Dr. Wolfhard Janke
Institut für Theoretische Physik
Faculty of Physics and Earth Science
Universität Leipzig
Postfach 100 920
D-04009 Leipzig, Germany

phone: +49 341 97-32725/32420
fax: +49 341 97-32747/32548
e-mail: wolfhard.janke@itp.uni-leipzig.de
URL: <http://www.physik.uni-leipzig.de/~janke/dfdk-cdfa/>

UNIVERSITÄT LEIPZIG