Registration

To register, please visit www.mcs.uni-oldenburg.de.
The deadline for registration is **June 1, 2009.**

All participants are asked to complete a questionnaire stating their fields of interest and previous knowledge.

The reduced registration fee is **100 EUR** (including accommodation, breakfast, dinner, and workshop material). Only a limited number of students can be granted the reduced fee; therefore, an application process is necessary (see www.mcs.uni-oldenburg.de). Notification about the success of the applications will be sent out until **June 15, 2009.**

We also offer the option to register immediately and pay the full fee of 450 EUR.

Accommodation

Room reservations (including breakfast) have been made in a hotel close to the Wechloy Campus. The registration fee also includes dinner at the Wechloy Campus.

The dining facilities at the Wechloy Campus (same building) or at the Haarentor Campus (a 15-minute walk away) offer a variety of lunch choices.
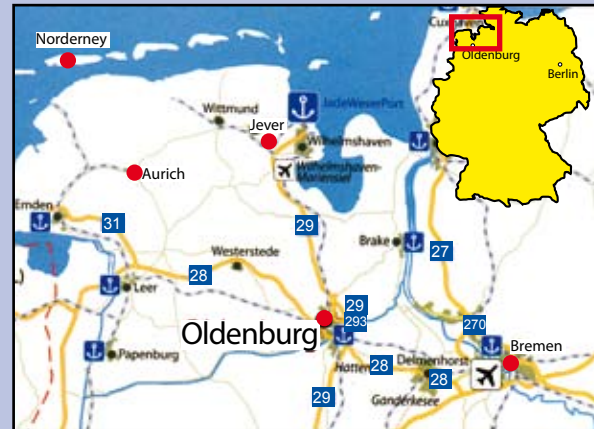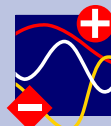
Organisation

Prof. Dr. Alexander K. Hartmann, University of Oldenburg
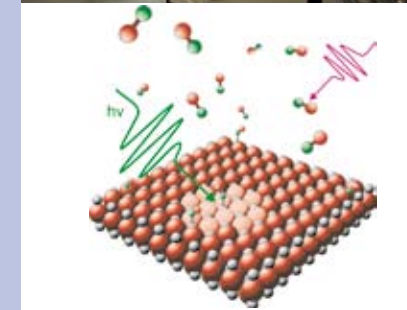Dr. Reinhard Leidl, University of Oldenburg

Contact

mcs@uni-oldenburg.de
Please refer to the website www.mcs.uni-oldenburg.de
for updates and more detailed information.
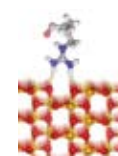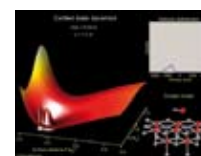
Sponsored by:

ICBM

ForWind
Center for Wind Energy Research

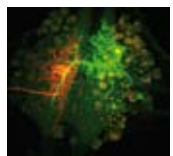Volkswagen**Stiftung**

CARL VON OSSIETZKY **universität** OLDENBURG

Summer School

MODERN COMPUTATIONAL SCIENCE

August 16 – 28, 2009
University of Oldenburg, Germany

Overview

Computer simulations play an ever-increasing role in many areas of pure and applied science. With hardware costs continuing to fall and the development of sophisticated algorithms, many research projects in biology, chemistry, computer science, applied mathematics, and physics rely heavily on the use of modern computer systems. This summer school addresses students from their third year onwards (including PhD students) who wish to learn more about recent developments in computational science. Participants should have a basic knowledge of a higher programming language like C/C++ or Fortran.

In the first part, an introduction into basic tools and methods (programming, data structures, numerical algorithms, statistical data analysis, etc.) will be given. The second part will be devoted to specific topics. The lecturers will present results at the forefront of research from their respective areas of expertise. Practical computer exercises will complement the lectures, enaabling the participants to deepen their knowledge in a hands-on approach.

Topics

- **Fundamentals**: programming, algorithms, differential equations, data analysis, software engineering
- **Computational Fluid Dynamics**: wind energy, sediment dynamics
- **Quantum Chemistry**: ab initio and density functional theory, surface photochemistry
- **Simulations in Statistical Physics**: Monte Carlo methods, disordered systems, random processes
- **Modelling of Biological Systems**: ecosystems, evolutionary biology, neurobiology
- **Engineering Applications**: hybrid systems, signal processing

Lecturers from the University of Oldenburg

Jörn Anemüller, Speech Processing/Biomedical Data Analysis

Olaf R. P. Bininda-Emonds, Systematics and Evolutionary Biology

Bernd Blasius, Mathematical Modelling of Biosystems

Andreas Engel, Theoretical Physics/Statistical Physics

Ulrike Feudel, Theoretical Physics/Complex Systems

Martin Fränzle, Computer Science/Hybrid Systems

Volker Hohmann, Acoustic Systems, Signal Processing

Burkhard Kleihaus, Gravitational Physics

Thorsten Klüner, Theoretical Chemistry

Thomas Kneib, Statistics

Rainer Koch, Computational Chemistry

Jutta Kretzberg, Computational Neuroscience

Joachim Peinke, Hydrodynamics and Wind Energy/ForWind

Hannes Uecker, Applied Analysis

Jörg-Olaf Wolff, Physical Oceanography (theory)

External Lecturers

Helmut G. Katzgraber, Computational Physics, Texas A&M University

Stephan Mertens (to be confirmed), Computational Complexity and Statistical Mechanics, Otto-von-Guericke University Magdeburg

Marc Mézard, Statistical Physics of Disordered Systems, Université de Paris Sud

Pekka Orponen, Computational Complexity and Combinatorics, Helsinki University of Technology TKK

Lecture Notes

Each participant will receive lecture notes at the beginning of the summer school. Additionally, the organizers are planning to give away free copies of the new book *A Practical Guide to Computer Simulations* by A. K. Hartmann.

Venue

The summer school will be held at the Wechloy Campus of the University of Oldenburg, offering a pleasant environment and plenty of nearby amenities.

Special Events

On Wednesday, August 19, participants will be invited to a workshop dinner at a restaurant in the city of Oldenburg. Excursions will be organised on Wednesday afternoons and on the weekend.

Isle of Norderney

Jever Brewery

wind turbine

City of Bremen