

DPG-School on Physics  
Supported by the Wilhelm and Else Heraeus-Foundation

# Efficient Algorithms in Computational Physics

9 – 14 September 2012, Physikzentrum Bad Honnef, Germany

Alexander K. Hartmann (University of Oldenburg) and A. Peter Young (University of California Santa Cruz)

Computer simulations play an ever increasing role in physics research. This school will provide an introduction to the field, including up-to-date research topics. In addition to lectures, an important part of the school will be hands-on exercises at the computer. The school addresses students which have a physics background and basic knowledge in a higher programming language like Pascal, C/C++, or Fortran. The language used throughout the school will be the C programming language (and some Python scripts).

## Lecturers:

Anthוניus Coolen (King's College, London, UK)  
Alexander K. Hartmann (University of Oldenburg, Germany)  
Helmut G. Katzgraber (Texas A&M University, College Station, USA)  
Werner Krauth (Ecole Normale Superieure Paris, France)  
Frauke Liers (University of Cologne, Germany)  
Roger G. Melko (University of Waterloo, Canada)  
Heiko Rieger (University of Saarbruecken, Germany)  
A. Peter Young (University of California, Santa Cruz, USA)  
Robert M. Ziff (University of Michigan, Ann Arbor, USA)

## Fees

Covering full board and lodging at the Physikzentrum Bad Honnef 475 € (for DPG members 375 €),  
for students 315 € (for DPG members 215 €), without lodging 210 €.

**Application & more information at [www.pbh.de](http://www.pbh.de)**

Deutsche Physikalische Gesellschaft



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# Heavy Particles at the LHC

16 – 21 September 2012, Physikzentrum Bad Honnef, Germany

**Tilman Plehn (Heidelberg University) and Thomas Schörner-Sadenius (DESY)**

In 2011 the LHC has delivered about  $5 \text{ fb}^{-1}$  to ATLAS and CMS. Their analysis results include Standard Model physics, Higgs searches, and limits on many new particles predicted by various extensions of the Standard Model like supersymmetry, extra dimensions, models with extra gauge bosons, etc.

The year 2012, with an additional luminosity around  $15 \text{ fb}^{-1}$  per experiment, will provide the necessary statistics to finally answer the question of a Standard Model Higgs boson. The accumulated data sets might also reveal first insights into the structure of physics beyond the Standard Model.

The School will prepare its participants for upcoming discoveries by discussing the production and properties of heavy particles in the Standard Model or expected in its extensions. Lectures will cover the various particles including the theoretical framework, current constraints, QCD aspects relevant for the LHC, experimental detection, and analysis techniques necessary for their discovery, reconstruction and interpretation. The school aims at advanced master students, PhD students and young postdocs from LHC experiment and theory, and from related fields. Knowledge of the basics of hadron collider physics is required.

## Confirmed Lecturers:

QCD, Experiment, Andy Pilckington (Manchester)

History of the top quark, Tom Ferbel (Rochester)

Top, Theory, Adrian Signer (PSI)

Massive stable particles, Aafke Kraan (INFN Pisa)

Higgs, Experiment, Vivek Sharma (UC San Diego)

Higgs, Theory, Tao Han (Pittsburgh)

SUSY, Experiment, Richard Cavanaugh (UI Chicago)

SUSY, Theory, Jay Wacker (SLAC)

Extra Dimensionen, Theory, Graham Kribs (Oregon)

Exotica, Albert DeRoeck (CERN)

Quest for light particles, Jörg Jäckel (Durham)

WIMPs, Dan Hooper (FNAL/U Chicago)

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Advanced DPG Physics School  
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# Forces and Flow in Biological Systems

23 – 28 September 2012, Physikzentrum Bad Honnef, Germany

**Ulrich Schwarz (Heidelberg) and Gerhard Gompper (Jülich)**

Force and movement are central elements of life. In contrast to traditional man-made material, however, biomaterials have unusual elastic and viscous properties and therefore deform and flow differently. In order to understand the physics related to forces and flow in biological systems, one has to extend traditional approaches like continuum mechanics to address the fact that they are complex, hierarchical, thermally fluctuating, and active. Recent advances in the physics of soft condensed matter and non-equilibrium physics provide rewarding avenues for meeting this challenge. Moreover large and complex systems can be approached today with computer simulations to much more quantitative detail than formerly possible. This school will bring together some of the leading physicists working with analytical and computational approaches to study forces and flow in cellular systems.

## Confirmed speakers & subjects:

Cytoskeletal pattern formation: Self-organization of driven filaments, Andreas Bausch (TU Munich)

Quantitative modeling of tissue organization on histological scales, Dirk Drasdo (Paris)

Collective phenomena in active cytoskeletal systems, Erwin Frey (LMU Munich)

Green algae as model organisms for biological fluid dynamics, Ray Goldstein (U Cambridge)

Active hydrodynamics at small scales: self-propulsion and coordination, Ramin Golestanian (U Oxford)

Mesoscale hydrodynamic simulations, Gerhard Gompper (FZ Jülich)

Modeling active particles, membranes and gels, Nir Gov (Weizmann Inst. Israel)

Cellular polarization by coupling an active fluid to a pattern forming system, Stephan Grill (MPI Dresden)

Mechanics and growth of tissues, Jean-Francois Joanny (Paris)

Dynamic organisation of developing tissues, Frank Jülicher (MPI Dresden)

Multiscale modeling of hematologic disorders, George Karniadakis (U Brown)

Swimming in viscoelastic media, Tom Powers (U Brown)

Active contractility of cells and tissue, Ulrich Schwarz (U Heidelberg)

Hydrodynamic interactions in soft matter and active particle systems, Holger Stark (TU Berlin)

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