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## Student exchange programme

■ The HGSFP offers students the opportunity within our exchange programme to visit excellent institutes around the world. This programme has now started up and already several doctoral visits are planned. Our graduate students will visit, for example, the Universities of Harvard, Baltimore, and Amherst in the USA, and Pisa in Italy. ◀

## The »Graduate Days«

■ The coming »Graduate Days« will take place in autumn from 29th September to the 2nd October. The organisation promises once again a diverse and interesting programme of lectures, with topics ranging from current exciting applications of physics in medicine with magnetic resonance imaging, to quantum optics, quantum chromodynamics, chiral perturbation theory and non-equilibrium dynamics in low-D systems. In addition, we will have a series of lectures on the physics of compact stars, as well as on the evolution of the cosmological large scale structure. ◀



Students relaxing after lectures at the April »Graduate Days«

## Editorial

The Heidelberg Graduate School of Fundamental Physics is now in its second year and many of the planned structures and projects have been implemented and are fully operational. Still, we are trying to keep up the pace of innovation and improvement in attaining our goal of providing excellent graduate education in fundamental physics in Heidelberg.

Having been inspired by a meeting of all excellence institutions in Bonn this spring, we felt it would be a good idea to have a regular means of communication for the members of the graduate school, in addition to our web-pages. And this is how our newsletter came into being. I very much hope you enjoy reading it and you are warmly welcome to provide contributions, give us feedback and make suggestions for improvements and addenda.

Peter Schmelcher

## Workshops and guest lecture series this summer

■ The following workshops are planned for the summer of 2009 in the Graduate School. These are:

- The workshop on P and T violation at low energies and related phenomena, organised by Prof. O. Nachtmann, see the website <http://www.thphys.uni-heidelberg.de/home/workshop/PandT2008/> and
- The Jahn-Teller workshop, organised by Prof. Horst Koeppel, which will take place from 25th-29th August 2008, see: <http://jt2008.uni-hd.de/index.php?m=12UH>

Lecture series this year will be held by Paul Schechter (Professor of Physics at MIT, USA) and Ralph Pudritz (Professor of Physics at McMaster University, Canada).

Details and further lecture series will be announced shortly. ◀

## Industry collaborations and support

■ The HGSFP welcomes direct collaborations with industry. At the moment, a collaboration with the company Selex Galileo Finmeccanica Group on the study of electromagnetic interaction of metals with waves in the micro and radio-frequency regime is coming into being, through one of our Junior Research Group Leaders, Dr. Sandro Wimberger.

This collaboration will also benefit the Graduate School.

The HGSFP also welcomes indirect collaborations with industry. Several companies, such as d-fine in Frankfurt, McKinsey, Deutsche Industrie Services (DIS-AG) as well as Schneider-Neureither and Partner (SNP-AG) have contributed generously to the Graduate School. ◀

## Graduate School life and work in pictures



■ A picture says a thousand words. With this motto in mind, we would welcome it if you send us superb digital images of your work, if these are electronically generated, for use in our flyers, posters, etc. Please don't forget to give a description of the contents. Send your contributions to: [info@gsfp.uni-heidelberg.de](mailto:info@gsfp.uni-heidelberg.de).

To this end, the Central Office has purchased a digital camera for creating our own HGSFP images. For those who would like to photograph their experimental apparatus and/or events, the camera can be made available. Check in advance at the Central Office. ◀

## Student projects

■ Students who have ideas for mini-workshops and other projects that may aid them in their research and further their education can suggest these to the student representatives. The student representatives for the HGSFP in general are Bernd Hezel and Marc Deissenroth (Institute of Physics). For the astronomy branch, the IMPRS-HD, the student representatives are Steve Boudreault (MPIA) and Giulia Vannoni (MPIK), Marcello Cacciato (MPIA) and Rosalind Skelton (MPIA) and Kelly Foyle (MPIA) and Leonard Burtscher (MPIA). ◀



Peter Schmelcher



Matthias Bartelmann



Hans-Christian Schultz-Coulon



Markus Oberthaler



Joachim Wambsganß



Arthur Hebecker



Bernd Hezel



Marc Deissenroth



Sandra Klevansky

## Personalia

■ The HGSFP congratulates Thorsten Lisker, who has received the Swiss Physical Society award 2008 in the category General Physics for his research on dwarf galaxies.

In addition our congratulations go to Markus Oberthaler, who has received the State Research Prize for his research in fundamental physics of quantum systems at ultra cold temperatures in 2008.

The Directorate of the HGSFP thanks-

Peter Schmelcher for taking on the post of Spokesperson for the Graduate School for a second term of office.

We all welcome the newcomers to the HGSFP: ■ Jürgen Schaffner-Bielich, who has received an offer of a professorship at the HGSFP in the Theory Department, in order to continue his research that bridges the fields of particle physics and astronomy.

■ Björn Schäfer, who takes up the position of Junior Research Group Leader in the research field of astronomy.

The current directorate is constituted by Peter Schmelcher, spokesperson (quantum dynamics and complex quantum systems), Matthias Bartelmann (astronomy and cosmic physics) and Hans-Christian Schultz-Coulon (fundamental interactions and cosmology). Deputies are Markus Oberthaler, Joachim Wambsganß and Arthur Hebecker in each of the respective fields. Bernd Hezel is the student representative in the directorate and Marc Deissenroth is his deputy. The administrative director is Sandra Klevansky. ◀

## Online application forms

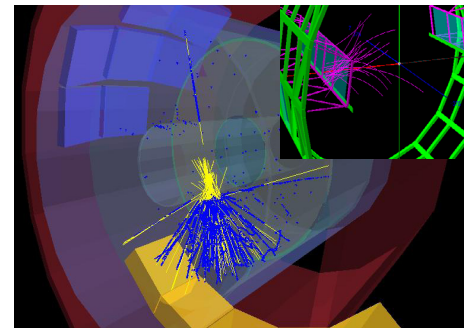
■ Students completing their doctoral studies must apply for entrance to the final examination and thesis defense. The forms required for doing so are now online, see our website under [Graduate Students>FinalExamForms](#)

Application for funds can also be made online - simply log yourself onto the internal pages, and follow the instructions. ▶

## Support for women doing doctoral studies

■ Special support for female students doing their doctoral studies can be made available on request to the HGSFP. Female doctoral students should also be aware of the support programmes offered by the University through the Graduate Academy, see the web site: <http://www.graduateacademy.uni-heidelberg.de> ▶

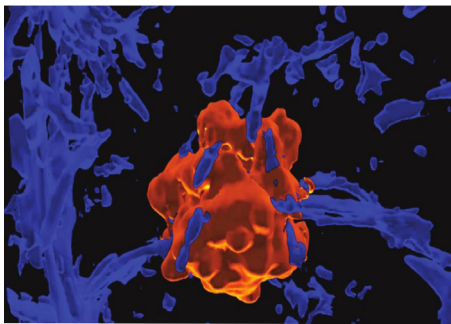
## The ALICE detector at CERN



Reconstructing particle tracks from a cosmic event.

■ After 15 years of development and construction, the ALICE experiment at the CERN LHC has taken shape and is in the commissioning phase. Above is a display of a real event due to cosmic radiation in the two main detector systems of ALICE, the Time Projection Chamber (TPC) and the Transition Radiation Detector (TRD). The groups from Heidelberg (Herrmann, Schweda, Stachel at the PI, and Kerschull, Lindenstruth at the KIP) have played a large role in building these detector systems as well as the High Level Trigger (HLT). With the accelerator LHC nearly completed - first beams will be injected in late July and collisions should happen a few weeks later - the team of scientists is eagerly awaiting the start of an exciting exploration of new physics. ▶

## Supernovas and star formation



Simulation of a supernova.

■ How and when the first stars appeared in the Universe, and what effects they had, is still an open and vividly debated question. It may be that the first stars were very massive, ending their short lives in extremely energetic supernova explosions. This image, taken from a paper by Greif et al. (ITA) shows the simulated propagation of a supernova shock front of a star of 200 solar masses (orange) in the ambient gas (blue). The event is so violent, that it disrupts the host structure of the supernova and terminates further star formation for 200 million years. ▶

## Bose-Einstein condensates

■ Exciting new discoveries on the behaviour of Bose-Einstein condensates (BEC) in a double well have been made in the labs of Markus Oberthaler (KIP). On splitting a BEC into two parts, fluctuations of the number difference reveal that even at finite temperature entanglement can prevail. The experiments also show that a useful quantum resource has been generated, which allows for the improvement of the precision of existing atom interferometers beyond the standard limit for thermal gases. ▶

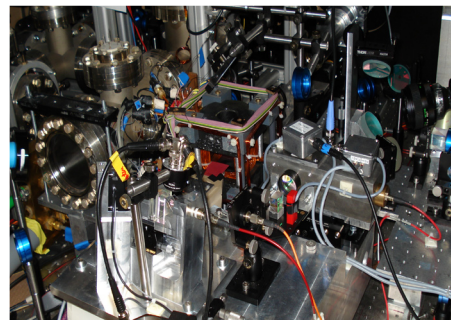


Table top experiment for manipulating a condensate.

### You're welcome:

... to send us suggestions of topics which you would like to be mentioned in the next newsletter: [info@gspf.uni-heidelberg.de](mailto:info@gspf.uni-heidelberg.de)