In the quantum optics laboratory

Working at the LHC

4.3 EXTENDED RESEARCH

With the increase in staff, it is not only possible to improve and cover the extended teaching and mentoring requirements of the Graduate School, but also to further our research goals and to start additional research projects. This also creates additional options from which the School's doctoral students can select their thesis subjects.

4.4 INTERNATIONAL EXCHANGE PROGRAMME

Students of the HGSFP are able to participate in the extensive international exchange programme of the School. With its dedicated funds, this programme facilitates student exchanges with leading physics institutions around the world. Students may visit internationally renowned institutions, such as the physics departments at Stanford, JILA and ITAMP at Harvard in the USA, SISSA in Italy, ITEP in Russia, the ENS in France and Tsinghua University in Beijing.

In addition to the student exchange programme, the HGSFP offers a substantial guest programme.

4.5 STUDENT PROJECTS

The HGSFP offers the possibility for students to organise events freely and independently. They regularly organise their own winter school and workshops. They thus have a platform to develop and implement their own ideas creatively.

4.6 SKILLS BEYOND RESEARCH

Within the HGSFP, training of other skills that are helpful to further the careers of students are offered and supported financially. These include key competencies such as writing scientific texts, and time and project management.

4.7 SCHOLARSHIPS

A limited number of doctoral scholarships are available for study at the HGSFP.

5 ORGANISATION

The School is governed by a directorate consisting of four faculty members, the administrative director of the School as well as a graduate student representative. The Central Office of the HGSFP handles all organisational issues with respect to the School and is the seat of the administrative director.

6 ADMISSION

For information on how to apply, please see our website under "Applicants".

7 CONTACT

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HGSFP

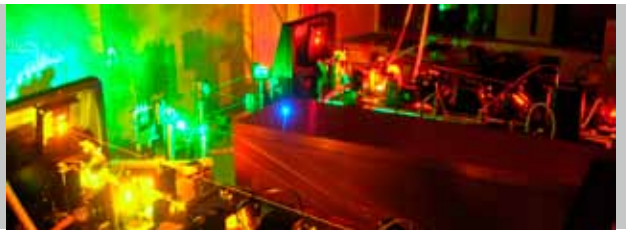
UNIVERSITÄT HEIDELBERG
ZUKUNFT SEIT 1386

HEIDELBERG GRADUATE SCHOOL OF FUNDAMENTAL PHYSICS

INFORMATION FOR STUDENTS

Star forming region S106 (Subaru Telescope)

View from the HGSFP Central Office



Colour play in the NaLi laboratory

1 GENERAL INFORMATION

The Heidelberg Graduate School of Fundamental Physics (HGSFP) was established in recognition of the scientific excellence of the fundamental physics done at Heidelberg University by the Excellence Initiative of the German Federal and State Governments.

The School regularly invites applications from local and international students to the doctoral programme.

2 BACKGROUND INFORMATION AND GOALS

A substantial grant awarded by the Excellence Initiative has enabled the Department of Physics and Astronomy to introduce and develop modern concepts of doctoral training in physics and astronomy in order to increase its status of excellence both within Germany and abroad.

Today many exciting developments are occurring across various fields of fundamental physics. In this atmosphere, it is a definitive goal of the most interested doctoral students to extend their knowledge beyond their immediate area of research to neighbouring branches of physics where seemingly disparate fields grow together and depend on each other. Active learning, cross-disciplinary discussions involving students and staff alike, international exchange and mentoring are the key concepts of modern graduate training. A modular training programme and flexible entrance requirements serve to allow easier acceptance of students from different countries, who come to Germany with different degrees. Note that the doctoral programme in Heidelberg follows on the Bachelor/Master system.

3 FIELDS OF RESEARCH OF THE GRADUATE SCHOOL

Several exciting and rapidly developing fields of physics and astronomy are well represented at Heidelberg University and the local research institutions. They form the core of research of the members of the Graduate School.

These fields are:

- the physics of elementary particles and their fundamental interactions, as it experiences a dramatic evolution with the Large Hadron Collider at CERN being operational
- the physics of complex quantum systems, for which Bose-Einstein condensates, the physics of disordered systems or atomic and molecular quantum dynamics are prominent examples
- astronomy and astrophysics, which is confronted with the mysterious discoveries of dark matter and dark energy, and which depends on links to all areas of physics, from quantum dynamics to relativity
- complex classical systems, encompassing fundamental research into complex biophysical systems such as the human brain
- environmental physics, for example facing the problems of anthropogenic climate change
- mathematical physics, including renormalization group and string theory.

The branch of the Graduate School dealing with astronomy and astrophysics is identical with the International Max Planck Research School of Astronomy and Cosmic Physics at the University of Heidelberg. Students accepted into the Graduate School are automatically members of the IMPRS-HD and conversely. Members of the IMPRS-QD in physics and IMPRS-PTFS are also members of the HGSFP.

4 SPECIFIC BENEFITS FOR GRADUATE STUDENTS

The Heidelberg Graduate School of Fundamental Physics has introduced a modified concept of educating graduate students in the fields of physics and astronomy. This benefits all students and serves to meet the goals set by the School. The most important features for our doctoral students are briefly detailed here.

4.1 COMPREHENSIVE THESIS ADVICE AND MENTORING

The concept of a single thesis advisor per student has been extended to a three person mentoring system forming a doctoral thesis committee. In addition to the traditional role of simply acting as thesis advisors, the mentors provide support for the students to improve their competencies and research profile. Dedicated courses, seminars, and other modules form part of the structured teaching programme, designed to meet the personal interests and needs of each student. Emphasis is specifically placed on modules requiring active participation.

4.2 IMPROVED TEACHING

In order to be able to provide more courses within the newly structured doctoral programme, it is necessary to increase teaching and research staff. The HGSFP has obtained funds to do just this and is able in this way to cover the new and extended teaching programme with several new lecturers at the group leader level.