

Preface

In this report the interested reader will find a broad overview of the various research activities of the members of the Physik-Institut, including highlights of the last year and progress reports of ongoing projects. The experimental research spans a wide range from particle and astroparticle physics, hard and soft condensed matter physics, surface physics and nanoscience, to the physics of biological systems. Theoretical activities include precision calculations of processes in quantum chromodynamics and new theories beyond the standard model of particle physics, astrophysics and general relativity, and since 2016 also theoretical condensed matter physics as Prof. Titus Neupert joined our department. His work on topological phenomena in electronic systems is introduced in Section 11.

The physics department employs about 150 scientific, technical and administrative staff, originating from 28 countries. As a small- to medium-size physics department, we have chosen to define priority areas, with several groups working for instance in particle and in condensed matter physics. To increase the diversity of research topics, which is important in particular for the students, other physics-related research groups from within the Faculty of Science and beyond are affiliated to our department. Presently, ten working groups, covering fields such as soft condensed matter at the nanoscale, computational science, medical physics, bio-imaging, astrophysics and cosmology and biophysics (see: www.physik.uzh.ch/en/research.html) are affiliated and are open to offer Bachelor or Master projects for our students. An example is the affiliation of the group of Prof. Jan Unkelbach, a recently appointed medical physicist in the department of radiation oncology of the University Hospital.

An important asset to the research environment in the Physik-Institut are the excellent mechanical and electronics workshops, as well as the efficient IT and administrative support. Thanks to this strong infrastructure department, our research groups have been able to make important contributions to large international projects, like for the XENON1T project (Baudis group), the Cherenkov Telescope Array (CTA, Straumann group), or the CMS detector upgrade for the Large Hadron Collider at CERN (Kilminster and Canelli groups).

Also in this year, our groups were very active in organizing conferences, for example the International LISA Symposium (Prof. Philippe Jetzer) or the well attended Workshop on Topological Quantum Phenomena (Profs. Titus Neupert and Johan Chang). A particularly noteworthy success is the ERC Advanced Grant awarded to Prof. Laura Baudis. The professors of the department take part in many scientific organizations, including the national research council, research committees of the Paul Scherrer Institut and advisory boards and panels of numerous international research institutions. Our former director, Prof. Ulrich Straumann, for instance took over the managing directorship of the CTA Organization gGmbH. The professors also contribute to the academic self administration of the university and are members of many national and international search committees for new professors.

As more than 1100 students are taught physics at our university all physicists of the institute are involved in teaching. We run courses for students in the medical faculty and those in our own faculty studying biology, chemistry, geography, earth system sciences, mathematics and the new course of studies in biomedicine. For the latter an additional service lecture in basic physics was introduced. Already in the first year the enrollement was high with about 150 students.

In the period of 11-17 July 2016 our department hosted the 47th International Physics Olympiad. A total of 398 high school students from 84 countries participated in this competition and were accompanied by 256 supervisors and functionaries. This big event, which was organised by Prof. Andreas Schilling and Andrea Schneider, required all personnel resources of the department for several days. Some of our scientific and technical people were busy for several months with designing the experimental and theoretical problems that the students had to solve. The whole event was a big success that attracted the attention of the local, national and international media.

The editorial responsibility of the annual report has been handed over to Dr. Katharina Müller. She follows the footsteps of Dr. Andries van der Schaaf, who has shaped its format for the last 17 years.

Zürich, May 2017

Prof. Dr. Jürg Osterwalder