

# Preface

As of January 1st, 2014, the theoretical and experimental physics institutes of the University of Zurich re-united into a single department. After extensive discussions about how to merge the different cultures and regulations into a successful new organisation. This step will further strengthen the existing cooperations between experimental and theoretical research groups in elementary particle physics. In the context of the merging process a new professor position in theoretical condensed matter physics has been created, both to support the experimental research activities and to re-establish profound teaching of theoretical methods, mainly at the master level.

At the same time parts of the former theory institute founded a new *Institute for Computational Science* concentrating on the development of simulation algorithms applicable in high performance computers with the goal to expand into other disciplines like bio-informatics, neuro-informatics, statistics, applied mathematics, medicine, chemistry and geography.

With great sadness we learned that our colleague Peter Meier, retired professor for theoretical condensed matter physics, died in March 2014 at age 74. Peter was an intriguing physicist, a charming person and a great mentor for his students. We will miss him. The obituary below summarizes his scientific career and his contributions to the institute in particular.

Theoretical physics at the *Physikalisches Institut* of our university started in 1909, when a chair for theoretical physics was created for Albert Einstein, his first professorship at any university. He was followed by other famous physicists, like Peter Debye, Max von Laue, Erwin Schrödinger and Gregor Wentzel. In 1949 Hans H. Staub and Walter Heitler became professors for experimental and theoretical physics, respectively. H.H. Staub concentrated on nuclear physics research and also initiated the method of nuclear magnetic resonance (NMR), which had been invented shortly before by Felix Bloch in Stanford. W. Heitler worked, among other topics, on renormalization problems and quantum effects in electromagnetic radiation and wrote a famous text book: *The Quantum Theory of Radiation*. At this time, Walter Heitler used *Seminar für theoretische Physik* as his address.

In the early 1950's a strong expansion of the number of students at our university started. Until then their number was only about one-tenth of what it is now and most fields were represented by just one Ordinarius. Many new professor positions were created during this period, also in physics, starting in 1950 with H. Wäffler, an experimental physicist, who worked with cosmic rays on the Jungfrauoch.

In 1958 the institute moved from Rämistrasse 69 to Schönberggasse 9, into a new building designed to the visions of Staub. At that occasion the name of our department was changed into *Physik-Institut*. In the same year Armin Thellung became the second professor in theoretical physics, working in the fields of statistical mechanics and condensed matter and shortly after we find the first mentioning of the *Institut für theoretische Physik*. These innovative activities during the 1950's laid the foundation of the fundamental physics research at our university for the following decades.

55 years later the two institutes merged again and presently the *Physik-Institut* comprises eight experimental and three theoretical chairs, three assistant professors supported by the Swiss National Science Foundation and two additional independent research groups. The institute covers a broad spectrum of research in experimental and theoretical physics, including the physics of biological systems, of nanometer structures, of fundamental properties of materials and of high temperature superconductors as well as surface physics and accelerator and non-accelerator based elementary particle and astroparticle physics.

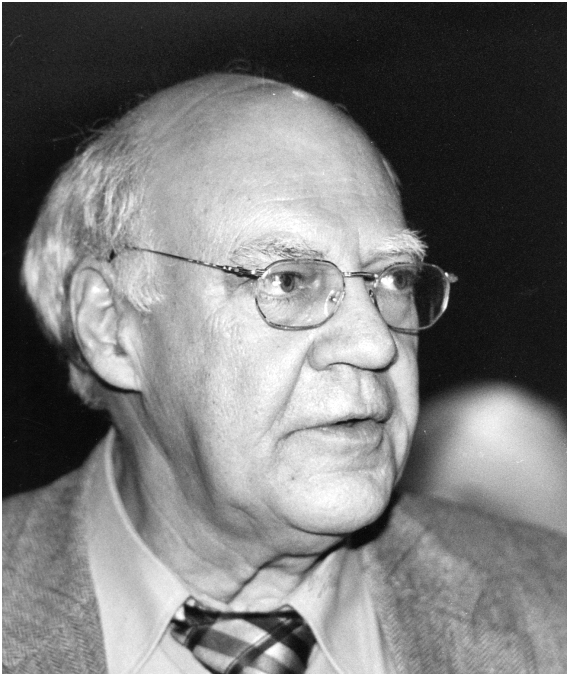
This report summarizes the activities and achievements of our sixteen research groups during the past year. During the reporting period the institute's 155 employees achieved many new results, as documented by no less than 179 presentations at international conferences, 223 original publications and 17 PhD theses.

Besides pushing back the frontiers of knowledge in our different research projects, communicating our achievements to the public remains a major task which goes beyond the obvious responsibility for the physics education of students at our university. Members of the institute gave talks for the general public and carried out courses about new research developments for high school teachers. We guided school children through our labs, and contributed lectures and demonstration experiments to the *Kinderuniversität*. We organized information days for pupils of the *Gymnasium* and regularly participate in the *European Masterclasses for Particle Physics*. There were 27 such outreach events in 2013, corresponding to about 870 working hours in total.

An important part of the success of our research and our international visibility is based on the excellent technical infrastructure (mechanical and electronics workshop, information technology) and on the highly qualified and strongly motivated technical experts. This allows us to construct state-of-the-art laboratory equipment, and to push experimental methods beyond existing technical limits. Our reliable and efficient administrative staff plays a very important role in creating the excellent working climate which is so beneficial for all of us.

Zürich, June 2014

Prof. Dr. Ueli Straumann



## Obituary

**Prof. Dr. Peter Fritz Meier**

22 April 1940 - 31 March 2014

Peter Meier, longtime staff member of the *Physik-Institut*, died of complications from a difficult surgery on March 31, 2014. He was an *emeritus Titularprofessor* of theoretical condensed matter physics at the University of Zurich.

Peter was born on April 22, 1940 in Aarau (Switzerland). After high school graduation he studied physics at the University of Zurich and received a PhD in theoretical physics in 1968. Peter continued his studies as a postdoc at the University of Nijmegen and at the IBM Research Laboratory in Rüschlikon. Next, he worked for two years as a research associate in the theory group at SIN (Swiss Institute of Nuclear Research) and completed his *Habilitation* at the University of Zurich. In 1977, Peter became a senior research associate (*Oberassistent*) in the group of Prof. Walter Kündig, and in 1981 he was promoted to *Titularprofessor*, conducting his own very active research team since 1992.

Peter's contributions to the field of theoretical condensed matter physics and computational solid state physics have been both manifold and substantial. He was always in close dialog with the experimental physicists in and outside the *Physik-Institut*. Some of his contributions are briefly mentioned here. In his early work he was interested in the interpretation of  $\mu$ SR data of magnetic systems and muonium states semiconductors and isolators with numerical methods. In collaboration with the experimental groups of Prof. Ernst Brun and Prof. Franz Waldner he was also strongly involved in chaos research in nonlinear systems. Soon after the discovery of high-temperature superconductivity in cuprates, Peter started comprehensive investigations of the complex magnetic and electronic properties of cuprate high-temperature superconductors using *ab initio* calculations. In particular, his novel interpretation of NMR and NQR experiments in cuprates was well received. His broad scientific interest is also reflected in an interdisciplinary project with the Medical Faculty of our University dealing with the search for precursors and predictors of epileptic seizures by means of methods devised in nonlinear dynamics.

Peter's lectures in theoretical solid state physics were admired by his students and he was also the founder of the course *Spezielle Informatik für Naturwissenschaftler (SPIN)*. He was able to attract many talented students to perform their diploma or PhD work in his group. They characterize him as an honored researcher, teacher, and colleague. Moreover, Peter was an enthusiastic soccer fan, in particular for his home team FC Aarau, and a competent expert on the physics of that game which he even demonstrated on TV on several occasions.

Peter Meier retired end of April, 2005. His friendly and open minded character, his different acts of kindness, his deep insight, and his natural sense of humor made him a respected and trusted person at the *Physik-Institut* and in the physics community world-wide. His legacy is not just in his remarkable contributions to research and teaching, but in the younger generations he inspired. Peter was a great mentor and colleague. We will miss him dearly.