



Péter Hasenfratz (1946-2016)

Péter Hasenfratz was born in Budapest on September 22, 1946. He began to study physics at Eötvös University in Budapest in 1966, finishing his studies in 1971 with a diploma, and in 1973 with a PhD degree. Subsequently he became a member of the Central Research Institute for Physics in Budapest until 1975. His first scientific papers, with Julius Kuti on the MIT bag model, originated from this period.

Afterwards, Péter turned to more fundamental problems in theoretical physics. From 1975 to 1976 he was a postdoc with Gerard 't Hooft in Utrecht, working on topological excitations in quantum field theories. He then returned to Budapest, before moving to CERN in 1979 where he became a staff member at the Theory Division in 1981. At that time he began to work on field theory regularized on a space-time lattice, which would become his main research area. Over the years he made numerous seminal contributions to this field. In particular, in 1980, together with his younger sister Anna, he presented the first correct computation of the scale parameter of quantum chromodynamics (QCD) on the lattice. Péter had extraordinary mathematical talent, and was able to compute things that others could only dream of.

In 1982 Péter organized the first international workshop on lattice field theory at CERN, sending personal handwritten invitations to each of the participants. In this way, he planted the seed for a scientific community which today comprises several hundred scientists worldwide, who meet annually at the Lattice conferences. At these meetings, Péter gave many plenary talks over the years, which reflects the utmost respect that he enjoyed in this community.

After the 1980 Hasenfratz² paper, Péter wrote a Hasenfratz³ paper together with Anna and his wife Etelka. He then thought about expanding his “family business” to a “European Monte Carlo Collaboration (EMC²)” which, unfortunately, was not realized under this name.

In 1984 Péter accepted an associate professorship at the University of Bern, and was promoted to a full professor in 1991. From 1999 till 2001 he was the director of the Institute for Theoretical Physics in Bern. Until his retirement in 2011, he supervised 14 PhD students, in addition to a large number of diploma and master students. Péter was an excellent academic teacher. His lectures, not only in Bern but also at numerous international schools, have been described as a revelation by many of the participants.

Péter was extremely creative and made many original contributions to quantum field theory. He often analytically calculated things that had seemed incalculable before. In this way, together with his long-term collaborator Ferenc Niedermayer, he computed the exact value of the dynamically generated mass gap in several 2-dimensional asymptotically free quantum field theories. In addition, he very significantly contributed to our understanding of chiral symmetry on the lattice. While cleaning up his office in 1997, he discovered an old preprint by Paul Ginsparg and Kenneth Wilson from 1982. That paper contained the by now famous Ginsparg-Wilson relation, which turned out to hold the key to understanding chiral symmetry on the lattice. By constructing a solution for this relation in the form of a fixed point action, Péter breathed new life into this old paper. The Ginsparg-Wilson paper had only 10 citations before 1997 but, after Péter reanimated it, its citations have increased very rapidly, reaching more than 950 by 2016, thus making it one of the most cited papers in lattice field theory. Furthermore, Péter made important contributions to the quantitative understanding of the undoped antiferromagnetic precursors of high-temperature superconductors.

Péter held a special interest in the Higgs mechanism for electroweak symmetry breaking. In particular, he was involved in computations of a non-perturbative upper bound on the Higgs boson mass. Péter had always wished that, within his lifetime, he could witness the discovery of the Higgs boson. Indeed it was discovered at CERN in 2012 (well below the theoretical upper bound) one year after Péter's retirement. Very tragically, after his most remarkable scientific career, a rapidly developing Alzheimer's disease probably prevented him from fully appreciating the scientific significance of this discovery.

Péter was an extraordinary scientist and an extremely friendly and kind person. At his funeral, a friend was quoted as having said about him: "If I would not know Péter's profession, I would have guessed that he must be a pediatrician." Indeed Péter had a very positive effect on other people, even at the end especially still on his grandchildren.

On April 9, 2016, Péter passed away peacefully at his home. He leaves behind his wife Etelka, their four children and six grandchildren, and his sister Anna. Many people will gratefully remember Péter. His scientific work is of lasting value, and the scientific community that he co-initiated will carry his innovative ideas further.

Péter's colleagues