

In Appreciation of Kurt Haller on His Seventieth Birthday

A life in physics has many challenges and rewards. Foremost among the rewards are the appreciation by friends and colleagues of the importance that our work has for each of us and the recognition by peers of the contributions we make at the frontiers of the field. We hope these three special issues of *Foundations of Physics* honoring Kurt Haller on the occasion of his seventieth birthday will convey to Kurt that he has lived the life of a physicist which has been amply enriched by both of these rewards.

Kurt was born in Vienna, Austria, and came to the United States at the age of ten after being in an internment camp for a while. His mentor, a physician aunt, steered him to Columbia College where he earned his A.B. degree in 1949. Kurt completed his graduate studies at Columbia University and received his Ph.D. in theoretical physics in 1958. After a two-year postdoctoral appointment at Washington University, St. Louis, he became an assistant professor at the Physics Department of New York University. Then, in 1964, Kurt moved permanently to the University of Connecticut at Storrs, and embarked on a fruitful career of research, teaching, and academic service that has now spanned nearly four decades.

Kurt's approach to research is marked by a quest to formulate precisely the problem addressed, to follow meticulously the steps involved as dictated by the formulation, and then to reflect on the deeper understanding that emerges at the end. Such a disciplined approach was essential to Kurt's program of developing consistent gauge-independent descriptions of quantized gauge fields where ghosts abound and interactions reach out to infinite distances.

Kurt devoted a great deal of very thorough research effort to an investigation of how QED needs to be formulated as a consistent quantized field theory and how equivalence between different gauges (covariant, Coulomb, and axial) can be established. His work on the Abelian QED gauge theory earned him the distinction of Fellow of the American Physical Society. Kurt was also intrigued by the possibility that relativistic charged particle states coupled to a Chern–Simons field might develop “exotic” statistics

that are neither fermionic nor bosonic, and with a student studied canonically quantized Maxwell–Chern–Simons theory in $2 + 1$ dimensions. Subsequently, Kurt focused his considerable gauge theory expertise on non-Abelian gauge theories, and along with a steady stream of talented students whom he himself nurtured, produced a series of papers on a consistent formulation of Gauss’s law and the explicit construction of gauge invariant states and operators in QCD. The success of this effort prompted Kurt to examine the appearance of a nonlocal interaction in QCD (analogous to the Coulomb interaction in QED) which can dominate the low-energy hadronic regime. At his graduation reception at Columbia College, Kurt’s physical education instructor (remembering his performance on the tennis court) shook Kurt’s hand warmly and remarked “Haller, I am glad to see that you are good at something!” Little did he know—his remark would be deemed prophetic by Kurt’s peers half a century later.

Besides ardently pursuing his own research, Kurt worked hard to establish a particle physics group at the University of Connecticut. His persistent efforts paid off and by the mid-eighties four additional faculty members had joined him to form an active particle physics group. The group organized the 1988 Meeting of the Division of Particles and Fields of the American Physical Society. Kurt, as Chair of the Organizing Committee, played a pivotal role. The Conference proceedings (*Proceedings of the Storrs Meeting*, World Scientific, 1989) with its 900 pages of presented scientific discourse serves as a permanent testimonial to Kurt’s commitment to his profession.

To pay tribute to Kurt on the occasion of his seventieth birthday, we invited many of Kurt’s friends and colleagues to contribute original research papers to issues of *Foundations of Physics* dedicated to him. Their prompt and positive response heartened us and underscored the high regard that all of us hold for Kurt. Acceptance of our proposal to create a *festschrift* for Kurt by the Editor of *Foundations of Physics*, Alwyn van der Merwe, who has overseen creation of twenty-six previous such *festschriften*, not only provided the impetus we needed to move forward, but also meant that Kurt’s name was to be added to a very distinguished roster of physicists. To Alwyn and to all of our contributors go our thanks. They have helped us celebrate the life in physics of a man committed to his profession, demanding of high intellectual integrity, and totally dedicated to his work—our friend and colleague Kurt Haller.

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