



Paul Busch 1955–2018

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It is with great sadness that we announce the untimely death of our friend and colleague Paul Busch. Paul died in York, UK, on Saturday 9th June 2018 after a brief illness.

Paul was born in Refrath, Germany, BRD, on February 15, 1955. His Alma Mater was the University of Cologne. There he earned his Dr.rer.nat. degree in 1982 under the supervision of Professor Peter Mittelstaedt, in the subjects of Mathematical Physics, Physics, and Philosophy, and habilitation in Mathematical Physics in 1985. Paul held numerous academic positions; after his years in Cologne, he served during 1995–2005 as a lecturer, reader, and professor of mathematical physics at the University of Hull, UK, serving as Head of Department (Mathematics) from 2001–2005. Subsequently,

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from 2005 onwards, he was appointed as Professor at the Department of Mathematics of the University of York.

Among the many awards and honours Paul received, the most recent ones are Elected Fellow of the Institute of Physics (2014), Invited to Membership of Foundational Questions Institute (2015), Elected President of International Quantum Structures Association IQSA (2016), Elected full member of L'Académie Internationale de Philosophie des Sciences (2016). At the time of his death, he was enjoying a Royal Society Leverhulme Trust Senior Research Fellowship.

Paul was a passionate scientist with a keen interest in the foundations of physics, specifically of quantum mechanics, and the subject of his doctoral thesis *Indeterminacy relations and simultaneous measurements in quantum theory* gave direction to much of his scientific life. He was unerring in his desire to confront important and difficult problems despite growing pressure to join popular research agendas, and committed to upholding the highest standards of mathematical rigour and conceptual clarity, guided always by his deep physical intuition. He was the quintessential scientist: objective, meticulous and critical, yet creative and open to radical ideas.

Paul's list of scientific publications consists of a good 150 items, with 92 peer reviewed journal papers. These articles, ranging from 1980 to the present, cover a rich variety of topics, from quantum measurements and quantum structures to development of his cherished ideas on the concept of unsharp reality. His books *The Quantum Theory of Measurement* (with P Lahti, P Mittelstaedt, Springer, 1991, 2nd rev.ed. 1996), *Operational Quantum Physics* (with M Grabowski, P Lahti, Springer, 1995, 2nd corrected printing 1997), *Quantum Measurement* (with P Lahti, J-P Pellonpää, K Ylinen, Springer, 2016) contain much of Paul's thinking on quantum mechanics.

He also served his community through extensive editorial work, being currently an editor for the quantum mechanics section of the journal *Foundations of Physics*, and was praised by editors of other journals for his extremely thoughtful evaluations of the work of others. With public lectures and recently initiated *The Quantum Uncertainty Page*¹ Paul also served a larger audience interested in foundational questions of quantum physics.

Paul was a frequently requested plenary and invited speaker in international conferences and workshops, and presently he was the acting President of the *International Quantum Structures Association*, IQSA. In that capacity, he was actively involved in organizing the fourteenth Biennial IQSA Conference Quantum Structures 2018 which took place in Kazan, Russian Federation, 16–20 July 2018.

Paul was a truly international scientist. In addition to his visiting research posts at the Lyman Laboratory of Physics, Harvard University, 8/1994–7/1995, and Perimeter Institute for Theoretical Physics, Waterloo, Ontario, 9/2005–8/2007, he made several longer research visits all around the globe.

The Department of Mathematics at the University of York will acutely miss Paul's presence. He was enthusiastic in lecturing the subjects close to his heart, and readily volunteered to teach subjects far from his own discipline when the department needed it. He was profoundly generous to his research students, to whom Paul was a wise and knowledgeable mentor, but also a friend outside the University confines. He was

¹ <http://paulbusch.wixsite.com/qu-page>.

dedicated to all facets of his working life, taking on onerous tasks with the same care and thought that his academic work so profited from.

Paul also had a strong connection to the University of Turku, where he was nominated as an Adjunct Professor of Theoretical Physics in 1991. Since 1983 he made around 40 visits to Turku, with total duration of one and a half years. His importance to the Turku branch of the *Operational Quantum Physics* research has been immense both professionally and personally. This connection started in 1981 in Cologne where one of us (PL) worked as an Alexander von Humboldt Fellow in Peter Mittelstaedt's research group.

Paul was a man of humility and integrity, who had the highest moral and ethical values to guide his daily life and scientific work. He was concerned whenever he found that these moral principles were not appropriately followed. He held his colleagues in high esteem, young and old alike, and he had a persistent drive to dig out the origins of scientific ideas and give due credit to their originators.

Paul was not an activist, but had firmly held political beliefs and felt strongly the injustice of the global economical order and the dishonesty rife in modern political discourse. He was deeply concerned about the United Kingdom's exit from the European Union, the treatment of immigrants throughout the world, and the troubling developments across the Atlantic.

Paul was a warm and approachable person, with an extraordinary ability to listen to other people, and he kept his mind open to new ideas. He never rejected a new or elusive idea without careful and respectful consideration, and he was always willing to try to jointly refine the proposed ideas. He also readily brought his own ideas for common deliberation.

These remarkable qualities of Paul made him a unique unifying figure among colleagues with different backgrounds. Many younger researchers quickly found Paul highly supportive and he became an important mentor to many of them. He was a loyal friend and an international leader of a large school of researchers. He had reached a pinnacle in his intellectual growth and we had the promise of even greater contributions in the coming years. His loss will be deeply felt by the scientific community as well as by his family and colleagues.