

William E. Baylis received his doctoral degree from the Technical University of Munich in 1967 (Dr. rer. Nat., mit Auszeichnung), after M.Sc. and B.Sc. degrees from the University of Illinois and Duke University, respectively. After a two-year post-doctoral fellowship at JILA in Boulder, Colorado, he joined the physics department at the University of Windsor, where except for sabbatical leaves in Göttingen (Germany), Saclay (France), and Cambridge (England) he has been ever since. He has been active in the areas of atomic interactions, atomic scattering, atomic spectra in the presence of collisional interactions, and numerical techniques related to such problems. In the late 70s, he was excited to discover a 2×2 -matrix representation of spacetime vectors, the electromagnetic field, and Lorentz transformations. Gradually, he came to recognize that it is the algebra, and not the specific matrix representation, that is important, and that the algebra is a Clifford algebra also known as the Pauli algebra. He learned the relation to complex quaternions and to David Hestenes' Spacetime Algebra and has been hooked ever since. Rather than adopt Hestenes' spacetime algebra (STA), he has stayed with the algebra of physical space (APS), which is isomorphic to the Pauli algebra, the even subalgebra of STA, and the algebra of complex quaternions, to see how much can be wrung from it and to learn whether APS is in any way limited in its description of relativistic phenomena. To date, he has not found any. He showed that paravector space in APS automatically inherits a Minkowski spacetime metric and can therefore nicely model spacetime. He saw how the double role played by elements in APS closely reflects common usage and that the APS is superior for relating traditional vector notation to covariant algebraic formulations with a minimum of overhead. His student George Jones showed that APS formed an excellent framework for general relativity, while Baylis himself showed that it leads to a simple derivation of the Dirac equation, one with implications for the interpretation of relativistic quantum theory. Working with another student, Y. Yao, he showed the power of projector and spinor tools in APS to solve what had been viewed as an intractable problem of charge motion in plane wave pulses superimposed on axial electric and magnetic fields. Baylis has authored two books, edited three others, and written about 100 articles in refereed journals as well as dozens of chapters in encyclopedias, handbooks, and other collections. He is a Fellow of the American Physical Society and has served as chair of the Divisions of Atomic and Molecular Physics and of Theoretical Physics of the Canadian Association of Physicists.