Biography of Garnet N. Ord

Dr. Garnet Ord is a Canadian physicist known for his originality and persistence in the foundations of quantum mechanics. He completed his PhD in the Physics Department at the University of Toronto in 1983, under the supervision of Professor Stuart Whittington. His thesis “Lattice Decorations and Percolation Theory” was a mathematical approach to percolation theory using exactly solvable models. The use of exact models strengthened results in phase transitions and critical phenomena normally explored using renormalization group and mean field theories.

Concurrently, Dr. Ord pioneered the use of Fractals in quantum physics and discovered that the Heisenberg uncertainty principle and many aspects of relativistic quantum mechanics occurred naturally in the context of Fractals. His paper on the subject, published[1] in the Journal of Physics A, became a classic and is still the most frequently cited paper for that year. As a result of that paper, Dr. Ord had an encouraging interaction with Professor Richard Feynman, arguably the most original physicist of his generation and the inventor of the path-integral formulation of quantum mechanics. The paper and the interaction convinced Dr. Ord that spacetime geometry and special relativity are central to quantum propagation and not simply add-ons as is often assumed.

Between 1983 and 1988 Dr. Ord was a Postdoctoral Associate, first at Cornell University, then at the Courant Institute in New York, working on exactly solvable models of phase transitions, discrete physics, direct correlation functions and discrete interfaces. From 1988 to 1997, Dr. Ord worked as an Assistant Professor in the Applied Mathematics department at the University of Western Ontario in Canada. Following his interest in Feynman's relativistic path integral, he extended the model in several ways but a particularly interesting extension was to include time-reversed paths, an extension that Feynman himself had suggested.

Since 1997 Dr. Ord has been an Assistant, then Associate Professor in the Mathematics Department at Toronto Metropolitan University[2]. As an acknowledgement of his foundational work, in 2007 Ryerson University and the Perimeter Institute of Theoretical Physics granted Dr. Ord a leave of absence from teaching to work at the Institute for a year, and there he further developed the relationship between quantum propagation and classical statistical mechanics. Since then, Dr. Ord’s research has continued to focus on the relationship between

1 Ord, G. N. (1983). Fractal space-time: a geometric analogue of relativistic quantum mechanics. Journal of Physics A: Mathematical and General, 16(9), 1869–1884.
2 Formerly Ryerson University

Quantum Propagation and Minkowski space. The most recent milestone is the extension of Feynman's Chessboard model to 3+1 dimensions. This extension shows that Feynman's original 'toy' model, that for over half a century has been restricted to 1+1 dimensions, is now fully compatible with Minkowski spacetime and shows the origin of phase in Special Relativity. This vindicates Feynman's original conviction that the path integral formulation is able to give more insight into the foundations of quantum mechanics than previous formulations.