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Quantum and classical dynamics in hilbert spaces of states

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A recently proposed mathematical framework that unifies the standard formalisms of classical mechanics, relativity and quantum theory will be presented. In the framework, states of a classical particle are identified with Dirac deltas. The classical space is "made" of these functions and becomes a sub-manifold in a Hilbert space of states of the particle. The resulting embedding of the classical space into the space of states is highly non-trivial and accounts for numerous deep relations between classical and quantum physics and relativity. One of the most striking results is the proof that the normal probability distribution of position of a macroscopic particle (equivalently, position of the corresponding delta state within the classical space sub-manifold) yields the Born rule for transitions between arbitrary quantum states.

Biography

Alexey Kryukov received his Doctoral degree from the School of Mathematics of the University of Minnesota and from Division of Theoretical Physics, Department of High Energy Physics of St Petersburg State University. He is currently Professor of Mathematics at the Department of Mathematics, University of Wisconsin Colleges. His research interests are in Functional Analysis, Differential Geometry, and Quantum Theory and General Relativity. His recent publications in *JMP, Physics Letters and Foundations of Physics* are dedicated to finding a bridge between classical and quantum physics and gravity.

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