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Drawing Quantum Mechanics DOUGLAS SWEETSER, Quaternions.com of Acton, MA — Causality is different between classical and quantum mechanics. Why? The worldline of a classical particle is a record of time and 3D location in space-time. Each event has a time-like relation to the last event. In quantum mechanics, the location of the observer in space is known: 0, 0, 0. The worldline of an observer must be identical to the time axis, forever staying at the spatial origin. The wave function by contrast has more freedom to wander through space-time. In classical quantum mechanics, it is reasonable to constrain the wave function events to sets that have time-like separations as happens in classical mechanics. The conjugate of the wave function will be a reflection across the time axis, switching the signs of each of the three spatial components. Each event of the conjugate is space-like separated from the wave function proper, no exceptions. A conjugate is a mirror reflection augmented by a 180 degree rotation. A reflection in a mirror is both exquisitely precise yet unreachable. Every calculation in quantum mechanics pairs information with its space-like reflection. This is the reason quantum mechanics is nonlocal. The t-shirt *may* be done in time...

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