

# Formalism and Interpretation in Quantum Theory

Wilce, Alexander (2008) Formalism and Interpretation in Quantum Theory.

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## Abstract

Quantum Mechanics can be viewed as a linear dynamical theory having a familiar mathematical framework but a mysterious probabilistic interpretation, or as a probabilistic theory having a familiar interpretation but a mysterious formal framework. These points of view are usually taken to be somewhat in tension with one another. The first has generated a vast literature aiming at a "realistic" and "collapse-free" interpretation of quantum mechanics that will account for its statistical predictions. The second has generated an at least equally large literature aiming to derive, or at any rate motivate, the formal structure of quantum theory in probabilistically intelligible terms. In this paper I explore, in a preliminary way, the possibility that these two programs have something to offer one another. In particular, I show that a version of the measurement problem occurs in essentially any non-classical probabilistic theory, and ask to what extent various interpretations of quantum mechanics continue to make sense in such a general setting. I make a start on answering this question in the case of a simplified version of the Everett interpretation.

**Subjects:** [Specific Sciences: Physics: Quantum Mechanics](#)

**ID Code:** 3794

**Deposited By:** [Wilce, Alexander](#)

**Deposited On:** 03 January 2008

**Additional Information:** A slightly edited version of a paper to appear as part of a Festschrift for Jeff Bub.