REALITY WITHOUT GEOMETRY: VEDANTA AND QUANTUM PHYSICS

Metaphysical insights into the foundations rather than more mathematical tools and techniques are needed to understand the nature of reality without geometric constraints.

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ABSTRACT

It is generally agreed that one of the central problems of physics today, if not the central problem is to understand the nature of reality. What began as a simple wave-particle duality more than a century ago has now grown to cast shadow on the nature of reality itself— whether an objective physical reality exists or if it is just an illusion that has no existence beyond our theories. This was at the center of the famous Bohr-Einstein debate of the 1930s leading to the EPR experiment proposed in 1935, which in turn gave rise to Bell's theorem and Alain Aspect's experiment (and others). These served to draw attention to the foundations of quantum mechanics after a long hiatus. Despite the undoubted success of quantum physics in applications, the foundational problems of reality and the domain of quantum physics remain unresolved.

The problem of reality had also occupied Indian philosophers of the Vedanta school for many centuries. Acharya Madhva (1238 – 1317) of the *dvaita* (dualist) school had observed: "There exist two orders of reality—the manifest and the unmanifest. …The goal of philosophy is to appreciate the difference, and *understand the relationship between the two."* This suggests Madhva saw observed duality as only the symptom of a much deeper duality in nature.

Remarkably, in 1925, Erwin Schrõdinger, a student of Vedanta, resolved the paradox (to his own satisfaction) in the following words: "…the plurality that we perceive is only *an appearance*; *it is not real*. In Vedantic philosophy… one of the most attractive (analogies) being the many-faceted crystal which, while showing hundreds of little pictures of what is in reality a single existent object, does not really multiply the object. ...you may suddenly come to see, in a flash, the profound rightness of the basic conviction of Vedanta."

This brings one close to the many worlds interpretation of Hugh Everett (and others). The presentation will examine the foundations of quantum physics in the light of Vedantic ideas with particular emphasis on the postulates (of Von Neumann) which are mathematical in nature containing little physics. Particular attention will be paid to key experiments of quantum physics and their interpretation in this new framework based on a reexamination of spacetime geometry.

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