

Incompleteness and Quantum Theory

Kurt Gödel arrived at his incompleteness theorems at roughly the same time when quantum mechanics reached its early maturity (as indicated e.g. by the publication of von Neumann's "Mathematische Grundlagen der Quantenmechanik" in 1932). So it is hardly a coincidence that some researchers began very early to relate this meta-mathematical result to quantum theory. This talk will explore the different strands of these attempts, ranging from Einstein, Podolsky and Rosen's claim to have shown the incompleteness of quantum theory, the issue of hidden variables (von Neumann, de Broglie, Bohm), to most recent work on the undecidability of the spectral gap problem (Cubitt et al.).