

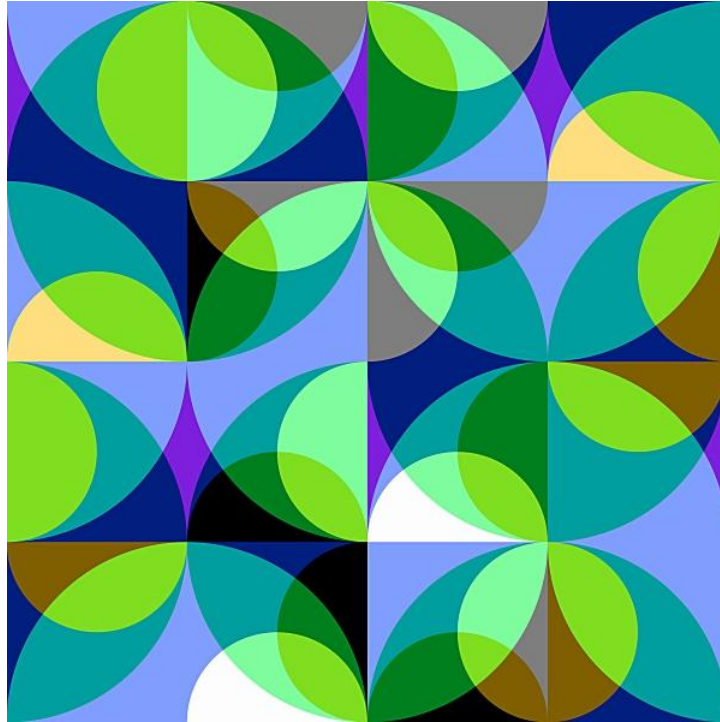
The B.U Centers for Einstein Studies & for Philosophy and History of Science present

Dr. Cecilia Flori, Perimeter Institute

Topos formulation of Quantum Theory

Friday, March 2, 3:00pm – 5:00pm

School of Theology, Room 525, 745 Commonwealth Avenue



Sudoku 4B by Kerry Mitchell

Abstract: The usual formulation of quantum theory leads to a non realist interpretation of the theory. In particular, the mathematical way in which certain objects are defined, such as the state space, the concept of proposition, etc., imply that properties cannot be said to possess numerical values. All that can be said is that, if a measurement is repeated a number of times, then a certain result will be obtained with a given probability. This is the so-called relative frequency (or Copenhagen) interpretation, which requires a sharp distinction between the notions of observer and observed system. It thus ascribes to measurement an almost ontological status, leading to the well-known measurement problem. The topos formulation of quantum theory was put forward in an attempt to solve such interpretational problems. The basic idea is to fully utilize the intimate connection between the mathematical formalism and associated philosophical interpretation of a theory. If one changes the way in which objects are defined mathematically in quantum theory, one can give a different physical interpretation of the formalism. I will show that describing quantum systems mathematically in framework of topos theory enables us to give a more realist interpretation of quantum theory and thus avoid some of the interpretational problems inherent in the old formulation.

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