Quantum Probability

Organizers:
Emmanuel Haven (University of Leicester) and Mike Oaksford (Birkbeck College)

Speakers:
Jerome Busemeyer (Indiana University)
Arkady Plotnitsky (Purdue University)
Acacio de Barros (San Francisco State University)
Andrei Khrennikov (Linnaeus University)
Emmanuel Haven and Sandro Sozzo (University of Leicester)

Abstract

Social scientists are well acquainted with the axioms of Boolean logic (which include for instance commutativity). But there are other ways to think about events and probabilities. Just as Euclidean axioms have been relaxed to give insights into other spaces (like the Klein space), can we relax axioms of probability theory too? The theory of probability was altered upon the advent of quantum physics. In fact the axiomatics for this new theory were provided by von Neumann in the 1930’s. The essential change with the use of quantum probability is that events are now subspaces of a vector space. This new approach can accommodate several behavioural traits in decision making such as non-commutativity. But the issue of using quantum mechanics in decision making also appeals to the valid use of for instance wave-particle duality in the area of decision making (superposition: ambiguity; and collapse: decision is made). This special session will present the latest work in the area of quantum probability as it applies to issues which relate to decision making.