COLLOQUIUM

Douglas Farenick
University of Regina

Measurement spaces affiliated with quantum probability measures

Mathematics and Statistics

October 25, 2013
3.30 to 4.30 o'clock
Research & Innovation Centre 209

Abstract: A quantum probability measure is a function ν on a measurable space (X, Σ) that satisfies all the familiar requirements from measure theory, but with the novel aspect that the values of the measure are positive operators on a complex Hilbert space and that the unit mass of the space X is replaced by the requirement that $\nu(X)$ is the identity operator. The measurement space affiliated with ν is the ultraweak closure $\mathcal{T}_\nu$ of the span of the range of ν. Unlike the classical setting, where the measurement space is trivial, the vector space $\mathcal{T}_\nu$ of operators captures important information regarding a quantum probability measure ν (even for 2-dimensional Hilbert spaces). In this lecture I will give an introduction to quantum probability measures and their measurement spaces, and describe collaborative work with Remus Floricel and Sarah Plosker in which measurement spaces are used to characterise quantum probability measures that possess certain optimal features.

University of Regina