## Probabilistic Operator Algebra Seminar

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## July 14 Daniel Pepper, York University

## Title: How Certain Multi-Algebra Independences can Arise in Bi-Free Probability

The success of bi-free independence for pairs of algebras spawned several other notions of multialgebra independence. Among these were notions of free-Boolean independence and free-monotone independences for pairs of algebras and a free-free-Boolean independence for triples of algebras introduced by Liu. Skoufranis was able to show that Boolean and Monotone independence can arise in bi-free probability, so the question of whether bi-free independence could model Liu's multialgebra independences comes as a natural extension. In this talk, we show how free-free-Boolean families may be embedded into certain bi-free structures in a distribution preserving way. In addition, we show how one can define free-free-Boolean cumulants by using appropriately chosen bi-free cumulants. While this talk focuses on the free-free-Boolean independence for triples of algebras, simple observations about free-Boolean and free-monotone independences arise therein.