

**Tuesday, February 23rd, 2:30 pm**

**Speaker:** Dr. Brian Colquhoun

**Institution:** York University

**Title:** Exotic states on a lattice

**Abstract:** Much is known about a whole host of mesons and baryons, but there remains a minimal amount of experimental evidence for hadrons comprising four or more quarks. To aid in experimental searches, it would be helpful to know which states should exist, their masses and the channels by which they should be expected to decay. At York, we are using lattice QCD to study tetraquarks, where, in particular, those tetraquarks contain one or more heavy quarks. Lattice QCD has already been a highly successful tool in calculations of the meson and baryon spectrum, and the determination of fundamental parameters of the Standard Model and is well-suited to studying tetraquark properties.

I will outline the basics of a lattice field theory calculation and explain how we apply these techniques to tetraquarks. Our results should aid in experimental searches and help differentiate between model calculations with contradictory predictions of tetraquark binding energy. I will also talk briefly about other exotic states of matter that the lattice can be used to study, including a model of strongly-interacting dark matter we are exploring at York.