

## In Search of New Quantum Fluids of Light and Matter

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**DATE:** Wednesday, March 11, 2015

**TIME:** 11:00 AM

**PLACE:** C2045

Timbits or Donuts will be served.

**ABSTRACT:** If intense light irradiates solids, an exotic phase of matter called a Bose-Einstein condensate (BEC) is possible. By interacting strongly with materials, light couples with electrons to make 'half-light, half-electron' quasiparticles, termed exciton-polaritons, many of which may occupy the same quantum-mechanical state, so they all move as one, akin to a large ensemble of pairs of figure skaters, all performing in exquisite choreography when the spotlight is upon them. Individual particles lose their identity, acting cooperatively as a 'quantum liquid' over the entire solid when the laser shines on it. Such macroscopic spontaneous coherence (the collective quantum behaviour of polaritons, much like the large number of figure skaters) of is at the origin of many important but poorly understood condensed-matter phenomena such as superfluidity. I will give a survey of the consequences of strong light-matter coupling to produce spontaneous coherence in materials, as well as our own research efforts to generate quantum condensates in molecular semiconductors.

**ALL ARE WELCOME!!!**