



Western University
Department of Physics and Astronomy

PHYSICS & ASTRONOMY COLLOQUIUM

Date: **Thursday, 6th April 2017**
Time: **1:30 p.m.**
Location: **Physics & Astronomy Seminar Room 100**

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Department of Physics / Department of Chemistry
University of Toronto

“Nanoengineering materials: A bottom-up approach towards understanding long outstanding challenges in condensed materials science”

ABSTRACT

Chemists have made tremendous advances in synthesizing a variety of nanostructures with control over their size, shape, and chemical composition. Plus, it is possible to control their assembly and to make macroscopic materials. Combined, these advances suggest an opportunity to “nanoengineer” materials i.e., controllably fabricate macroscopic materials from the nanoscale up. This affords an opportunity to realize a wide range of controlled and potentially even new behaviours.

This talk will present a variety of examples of such behaviours, such as single electron effects, metal-insulator transitions, semiconductor transistor-like conductance gating, and, most recently, strongly correlated electronic behavior. The latter is particularly exciting since strongly correlated electrons are known to lie at the heart of some of the most exotic, widely studied and still outstanding challenges in condensed matter science (e.g. high T_c superconductivity in the cuprates and others).

The talk will also survey new insights and new opportunities that arise as a result of using this nanoengineering approach, including how such materials have provided inspiration for new technologies.

COFFEE + light snacks will be available in the Atrium, 2nd floor, at 1:15 p.m.