



Western University
Department of Physics and Astronomy

PHYSICS & ASTRONOMY COLLOQUIUM

Date: THURSDAY, 26th April 2018
Time: 1:30 p.m.
Location: Physics & Astronomy Seminar Room 100

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Department of Civil Engineering
University of Toronto

“Graphene-based composite: Future in Civil Engineering application”

ABSTRACT

Graphene is a recently re-invented wonder nanomaterial with extraordinary physicochemical properties has excellent potential for developing composites in Civil Engineering applications. Graphene is comprised of tightly-knit carbon atoms arranged into a one atom thick 2D sheet. It is about 200 times stronger than steel, flexible and even superconductive. Bulk quantities of graphene materials can be produced through chemical oxidation and exfoliation of graphite, and there are three common forms—graphene oxide (GO), reduced graphene oxide, and pure graphene. So far, two significant potentials in Civil Engineering are graphene-based cement composite materials and graphene-based filtration composites for water purification. In cement composite, graphene materials can reinforce capillary and gel pores and creates interlocking between cement hydration products which improves the overall properties. Recently, a hybrid film was developed based on the graphene oxide/fungal hyphae (GO-FH) interaction. The developed GO-FH bio-nanocomposite material was used for the adsorption of chromium(VI) metal ions from water. In another study, the interfacial behaviour of multilayer GO films was directly investigated via GO-to-GO friction force microscopy, and the interfacial shear strength (ISS) was measured to be 5.3 ± 3.2 MPa. The findings of this study can be useful for engineering topological structures with tunable mechanical properties.

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