



Western University
Department of Physics and Astronomy

PHYSICS & ASTRONOMY COLLOQUIUM

Date: **Thursday, 31 January 2019**
Time: **1:30 p.m.**
Location: **Physics & Astronomy Seminar Room 100**

Dr. Eric Johlin

Department of Mechanical & Materials Engineering
Western University

"Algorithmic design of 3D nanophotonic components"

ABSTRACT

Nanophotonics is the study of the interaction between photons and structures of sizes comparable to the wavelength of light. The increased significance of the wave-nature of photons at this length scale introduces a wide range of phenomena, including interference, cavity effects, and density of state modifications. The utilization of these nanophotonic effects has become invaluable for an expanding range of applications, from controlling the spontaneous emission rate and the directionality of quantum emitters, to reducing material requirements of solar cells by an order of magnitude. While highly beneficial, this wave-nature also makes the design of such devices to control light at the nanoscale highly unintuitive, particularly when working with fully 3D geometries. In this talk we explore the use of algorithmic design to address this challenge, creating 3D structures which can control the propagation of light from nanoscale emitters. Specifically, we investigate the use of an evolutionary algorithm to design nanostructured lenses able to control the directivity of the photoluminescence of single gallium arsenide nanowires. Computational and experimental results will be presented, as well as the group's plans for further exploration of these techniques..

HOST: L. Goncharova

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