



Western University
Department of Physics and Astronomy

PHYSICS & ASTRONOMY COLLOQUIUM

Date: **Thursday, 23rd November 2017**
Time: **1:30 p.m.**
Location: **Physics & Astronomy Seminar Room 100**

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Department of Physics
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“Superoxygenation and Superconductivity in Copper Oxide Thin Films”

ABSTRACT

Copper oxides astonished the world decades ago by showing superconductivity above liquid-nitrogen temperature. Since then, the quest for room-temperature superconductivity has proliferated among a variety of materials and sample forms, guided by a growing knowledge base and also progressing by serendipity. One strategy for discovering new superconductors is to apply extreme thermodynamics, particularly pressure, to access and stabilize exotic phases of materials. In this talk, I will report on progress along one such front, namely the use of superoxygenation on the canonical copper oxide $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ in epitaxial thin-film form. The guiding principles are: to increase the chemical complexity by enhanced oxidation; and to tailor the basic Cu-O lattice components, as the structural DNA of high-temperature superconductivity. Our approach is informed by a fundamental tenet of nanomaterial synthesis in exploiting the high surface-to-volume ratio of thin films, and also motivated by a recent ultrafast optical spectroscopy study showing transient evidence for room-temperature superconductivity in $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$.

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