

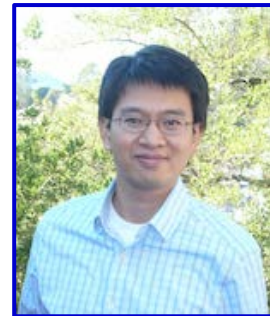


Western

The University of Western Ontario  
DEPARTMENT OF PHYSICS AND ASTRONOMY

## PHYSICS & ASTRONOMY COLLOQUIUM

**Date:** Tuesday, 2<sup>nd</sup> May 2017  
**Time:** 1:30 p.m.  
**Location:** Physics & Astronomy Seminar Room 100



### Dr. Tengming Shen

Lawrence Berkeley National Laboratory  
Berkeley, CA

*Dr. Shen is a candidate for a faculty position in Physics & Astronomy*

***“Superconductivity and magnetism: Have they changed or touched your life, and how can they revolutionize the 21<sup>st</sup> century?”***

#### ABSTRACT

The field of superconductivity and magnetism has seen tremendous achievements. In experimental high-energy physics (HEP), they have enabled the success of many advanced programs: Nb-Ti superconducting magnets allowed the Tevatron to play a leading role in defining the Standard Model and are now enabling the Large Hadron Collider (LHC) to answer many questions beyond the Standard Model in addition to discovering the Higgs Boson. Superconducting MRI systems are widely used for medical diagnosis and brain science (MRCP allowed a surgeon to remove a choledochal cyst using laparoscopy, a minimally invasive procedure, from my son Max when he was 3-months old). However, major challenges and opportunities still remain: The largest application of superconductivity—electrical power applications—has yet to be realized; the potentials of many superconductors besides Nb-Ti are yet to be fully explored whereas superconducting quantum computing is poised to open a new chapter in the information revolution. This talk discusses an array of exciting research directions that may revolutionize medicine, transportation, energy, and frontier physics in the 21<sup>st</sup> century and offers an overlook of challenges and opportunities ahead.