



**Western University**  
**Department of Physics and Astronomy**

## **PHYSICS & ASTRONOMY COLLOQUIUM**

**Date:** **Thursday, 25 February 2021**

**Time:** **1:30 p.m.**

**via Zoom:** <https://westernuniversity.zoom.us/j/94564867550?pwd=Y0RhTEoveVhKRjUxaFRLSWNtWGhyd09>

### **Dr. Girma Bitsuamlak**

WindEEE Research Institute / Boundary Layer Wind Tunnel Laboratory  
Department of Civil and Environmental Engineering  
Western University

### ***“Computational and experimental generation of tornado-like vortices”***

#### **ABSTRACT**

Tornado-resilient design for critical infrastructure and other tornado-risk exposure assessment efforts require tornadic-like vortices modelling and their interactions with buildings. The presentation will include a tornado generation using (i) computational fluid dynamics-based Modeling at SHARCNET high-performance computing and (ii) experimental modelling at WindEEE Dome. The unique capabilities of WindEEE Dome to generate both stationary and translating tornados, including the associated computational efforts, will be highlighted. These studies focus near the ground where the impacts of a tornado are the highest. Alan Davenport’s “wind-loading-chain” links the modelling of extreme wind, exposure, aerodynamics, and dynamics to particular design criteria. Its expansion to tornadic flows will be presented, focusing on topographic effects and recent case studies from tornado touchdowns in Ontario.

**Host:** **Prof. W. K. Hocking**