SEMINAR

GIRMA BITSUAMLAK - Western Ontario University

“Recent advances in experimental and computational modeling of tornadic wind fields and loads”

Tornado-resilient design for critical infrastructure and other tornado-risk exposure assessment efforts require modeling of tornadic-like vortices and their interactions with essential buildings. The presentation will include a tornado generation discussion by using (i) computational fluid dynamics (CFD)-based modeling at SHARCNET high-performance computing and (ii) physical testing at WindEEE Dome. The unique capabilities of WindEEE Dome for generating both stationary and translating tornados, including novel flow measurements and visualization techniques will be presented. The WindEEE Dome produces high quality flow and aerodynamic data useful for validating numerical models. The validated numerical model in return produces tornado types and sizes beyond the reach of the experimental facilities. Recent tornado study examples based on tornado touchdowns in Ontario will be presented. Finally, remarks on the newly proposed Tornado provision on ASCE 2022 will be made in comparison with recent studies carried out at WindEEE.

Short bio

Dr. Bitsuamlak is a Professor and Canada Research Chair in Wind Engineering. Dr. Bitsuamlak serves as Director of the WindEEE Research Facilities (comprises the Dome, the Boundary Layer Wind Tunnel and the Three Little Pigs (3LP) laboratories) www.windeee.ca. He also serves as site leader for Sharcnet advanced research computing center at Western. He is a member of the research council for Digital Research Alliance of Canada, and a Fellow of the Canadian Society of Civil Engineers. His research expertise is in climate-resilient and sustainable buildings and cities. Currently, his team is actively working on developing advanced experimental and computational methods for assessing (i) extreme wind/climate effects on buildings and civil infrastructure (e.g., hurricane and tornado), (ii) interplay between aerodynamics and other micro-climate stressors for applications in net-zero building design and retrofit, and (iii) developing novel advanced computational tools for Digital Twins. His research utilizes a combination of experimental and Computational fluid dynamics-based simulations (and assisted with Artificial Intelligence) by using advanced research computing, and physical experiments in wind tunnels. He has executed wind-induced load and response studies for socially and historically significant super tall buildings such as Freedom Tower in New York, Burj Khalifa in Dubai in wind tunnel.

13/06/2022 - 12:00am (CET)
Villa Cambiaso - Salone Nobile, Via Montallegro 1 (GE)
School of Engineering, UNIGE.
Streaming on Teams channel using this link:
https://teams.microsoft.com/l/meetup-join/19%3ae439ea223bad42bda8c1ef8a548d784c%40thread.tacv2/1654511908369?context=%7b%22Tid%22%3a%226cd36f83-1a02-442d-972f-2670cb5e9b1a%22%2c%22Oid%22%3a%2288610694-2b30-4244-bc3f-4e944dd7f268%22%7d