

# Technical Program

Version June 18, 2025

We take this opportunity to thank and welcome everyone to the 8<sup>th</sup> Cleaner Earth & Atmosphere Conference, Eco-Friendly Engineering 2025, and Nurturing Humanity Sustainably 2025. We hope that you will have a wonderful time in the Southernmost city of Canada.

Please refer to <https://www.caeconference.ca/>, <https://efe2025.ca/> and/or <https://nhs2025.ca/> for updates and details.

The banquet will be on Thursday June 19. Please advise us of dietary restriction, special needs, etc. via email to [TELab@uwindsor.ca](mailto:TELab@uwindsor.ca)

This in-person-only conference is for paid delegates only. If you have not registered, please do so at <https://www.uwindsor.ca/engineering/research/495/turbulence-and-energy-lab-annual-conference> Remember to save the receipt as you checkout.

EFE2025 is running parallel to NHS2025, under the 8<sup>th</sup> Cleaner Earth & Atmosphere Conference umbrella. Only one registration is required to attend. If the number of presentations is small, NHS2025 presentations will be scheduled in series with EFE2025 presentations. If required, the presentations may run in parallel to fit all presentations within the two days, based on first come (register) first serve, where overflows will be presented as poster presentations only.

Please limit your presentation to 15 minutes, leaving 3 minutes for discussion, and 2 minutes for changeover. In case of a no-show, the next presentation(s) will be advanced accordingly.





Selected papers for the CEA2025 will be considered for a Refereed Conference Proceeding, a Reviewed Volume with Springer Nature. The first come (accepted after the review process) first serve approach will be invoked, where overflows may be considered for other active volumes we are editing.

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## Notation

- \* presenting author
- † corresponding author

## Paper/presentation Status

-  presentation + full-length paper
-  reviews conveyed, waiting for revision
-  paper accepted for the Springer Nature Proceeding
-  pending confirmation; please update us

<b>Thursday, June 19, 2025</b>	
08:15–08:45	<b>Centre for Engineering Innovation (CEI) Atrium</b> <a href="#"><u>Breakfast</u></a> Registration Package Pickup
08:45–09:00	<b>Welcome and Opening Remarks (Room 1101 CEI)</b> Rupp Cariveau VP Research & Innovation – Shanthi Johnson, Dean of Engineering – Bill Van Heyst
09:00–09:40	<b>Plenary Lecture #1 (Room 1101 CEI)</b> Sustain What? For Who? – Graham T. Reader
	<b>Eco-Friendly Engineering, Room 1101. Co-Chairs: David Lubitz &amp; Finney Cherian</b>
09:40–10:00	The Global Warming Potential of Geoengineering via Radiative Cooling. Atousa Pirvaram*, Siu Ning Leung, Paul G. O'Brien† Department of Mechanical Engineering, Lassonde School of Engineering, York University, Ontario, Canada
10:00–10:20	Broadband Stimulated Raman Spectroscopy for Label-Free, Background-Free Phosphate Detection: Advancing Water Quality Monitoring in the Great Lakes. Nathan G. Drouillard*†, T.J. Hammond Attosecond Condensed Matter Experiments Laboratory, Department of Physics, University of Windsor, Canada
10:20–10:40	<a href="#"><u>Coffee Break</u></a>
	<b>Nature &amp; Humanity, Room 1101. Co-Chairs: Paul G. O'Brien &amp; Ahmadreza Vassel-Be-Hagh</b>
10:40–11:00	Measured Night Sky Brightness in Southwestern Ontario. William David Lubitz*† School of Engineering, University of Guelph, Canada
11:00–11:20	Off Site Greenhouse Gas Emission due to an Operation of Wastewater Treatment Plant in Windsor, Ontario – A Comparative Analysis Seema Das, Rajan Ray*†, Niharendu Biswas Climate & Environment, City of Calgary, Canada Civil & Environmental Engineering, University of Windsor, Ontario, Canada
11:20–11:40	Enhancing Urban Stormwater Management Using SWMM Model and LID implementation: A case study in Windsor, Ontario. Richa Rayamajhi†*, Charitha Pathipati, Tirupati Boliseti Department of Civil and Environmental Engineering, University of Windsor, Windsor, Canada
11:40–12:00	Metakaolin in Cementitious Systems: A Comprehensive Literature Review. Oluwasogo Adedayo Ogunfuwa†*, Morteza Karbasi, Abimbola Grace Oyeyi Department of Civil and Environmental Engineering, University of Windsor, Windsor, Canada
12:00–13:00	<a href="#"><u>Lunch &amp; Poster Presentation</u></a>

Thursday, June 19, 2025	
	<b>Cleaner Tomorrow, Room 1101. Co-Chairs: Ranjan Ray &amp; Paul Henshaw</b>
13:00–13:20	Recent Advances in Thermophotovoltaic Technology. Paul G. O'Brien*†, Nima Talebzadeh, Keshaw Ramparsad, Shahryar Homaei Department of Mechanical Engineering, Lassonde School of Engineering, York University, Toronto, Ontario, Canada
13:20–13:40	✓ Quantifying the Impact of Flow Speed on Flame Initiation and Propagation in Lean Methane Combustion. Muhammad Shaheer Haider*†, Long Jin, Xiao Yu, Ming Zheng Department of Mechanical, Automotive & Materials Engineering, University of Windsor, Windsor, Ontario, Canada
13:40–14:00	Advancing Freshwater Ecosystem Monitoring through the Application of a Slocum Glider. Lydia L. Paulic*†, R.L. Robinson, R. Miller, T.A., Hayden, B. Possamai, J.D. Stockell, K. Rosier, S. Ruberg, K. Johnson, D.M. Webber, C. Smith, T. Fraser, M. Wells, Aaron T. Fisk RAEON, School of the Environment, University of Windsor, Ontario, Canada University of Michigan, Cooperative Institute for Great Lakes Research, Michigan, USA Center for Systems Integration and Sustainability, Department of Fisheries and Wildlife, Michigan State University, Michigan, USA Rubenstein Ecosystem Science Laboratory, University of Vermont, Vermont, USA National Oceanic and Atmospheric Administration, Great Lakes Environmental Research Laboratory, Michigan, USA Innovasea, Nova Scotia, Canada University of Toronto Scarborough, Ontario, Canada
14:00–14:20	Potential of Renewable Fuels for Ultra-low NOx Mobility. Navjot Sandhu*†, Xiao Yu, David Ting, Ming Zheng Clean Combustion Engine Laboratory, University of Windsor, Windsor, Ontario, Canada
14:20–14:40	Quantifying the Hidden Harms of Material Extrusion Additive Manufacturing (ME-AM): VOC Emissions, Carbon Fiber Exposure, and a Proposed Low-Cost Monitoring Device. Dora Strelkova*† Mechanical Engineering, University of Windsor, Windsor, Ontario, Canada
14:40–15:00	<u>Coffee Break</u>
	<b>Nurturing the Next Generation, Room 1101. Co-Chairs: Quade Digweed &amp; Narayan Kar</b>
15:00–15:20	An Overview of Recent Advances in Using Direct Air Capture for Removing Indoor Carbon Dioxide. Sebastian Bissainthe-Vandermeer*, Saania Syed Azam Pasha Albiz, Paul G. O'Brien† Mechanical Engineering, York University, Toronto, Ontario, Canada
15:20–15:40	Hot Water Heat Pumps for Greenhouse Heating and Cooling. Quade Digweed*†, Jason Lanoue, Xiuming Hao Agriculture and Agri-Food Canada
15:40–16:00	An Energy Efficient Greenhouse. Kayes Reza*† Under Sun Acres Inc.. Canada
16:00–16:20	Exploring Canadian Cattle, Poultry, and Swine Barn Clean Energy Pathways. Nicholas Schembri, Jacqueline Stagner†, Rupp Carriveau* Environmental Energy Institute, Turbulence & Energy Laboratory, University of Windsor, Windsor, Canada
16:20–16:40	
16:50	<b>Bus leaves CEI, University of Windsor (@ 4:50 pm) for Banquet</b>
18:00–20:00	Banquet at Sprucewood Winery
20:00	Bus returns from banquet (~8:00 pm) to CEI, & then, hotels, as needed

<b>Friday, June 20, 2025</b>	
08:15–08:45	<b>Centre for Engineering Innovation (CEI) Atrium</b> <a href="#">Breakfast</a> Registration Package Pickup
08:45–09:00	<b>Gift Draw (Room 1101 CEI)</b> Rupp Carriveau
09:00–09:40	<b>Plenary Lecture #2 (Room 1101 CEI)</b> Resilient Nuclear-Renewable Hybrid Energy Systems – Hossam A. Gabbar
	<b>Building a Resilient Tomorrow, Room 1101. Co-Chairs: Jacqueline A. Stagner &amp; Jamie Smith</b>
09:40–10:00	NACA 0012 Airfoil in Turbulent Wind. Johnson Babalola*, David S-K Ting† Turbulence & Energy Laboratory, University of Windsor, Canada
10:00–10:20	Enhanced Radiative Cooling Using Underlying Parabolic Reflectors. Po-Chun Chiu*, Atousa Pirvaram, Thomas Cooper, Siu Ning Leung, Paul G. O'Brien† Department of Mechanical Engineering, Lassonde School of Engineering, York University, Toronto, Ontario, Canada
10:20–10:40	<a href="#">Coffee Break</a>
	<b>Energy and Food, Room 1101. Co-Chairs: Fadi Al-Daoud &amp; Niharendu Biswas</b>
10:40–11:00	Best Management Practices for Managing Nighttime Greenhouse Light Emissions. Fadi Al-Daoud*† Ontario Ministry of Agriculture, Food and Agribusiness, Canada
11:00–11:20	Economic Viability Assessment of Clean Hydrogen as a Fuel in Corn Drying. Muhammad Ali*, David S-K Ting, Rupp Carriveau† Turbulence & Energy Laboratory, University of Windsor, Canada
11:20–11:40	Plants Under Pressure: Engineering High Intensity LED Lights for Fundamental Plant Science. Sabrina Sawan*, Quade Digweed†, Jason Lanoue Agriculture and Agri-Food Canada
11:40–12:00	
12:00–13:00	<a href="#">Lunch &amp; Posters</a>

Friday, June 20, 2025	
	<b>Natural Resources, Room 1101. Co-Chairs: Atousa Pirvaram &amp; Rajeev Ruparathna</b>
13:00–13:20	Roof-top Panels Equipped with Radiative Cooling Surfaces and Phase Change Materials for Improved Airflow and Reduced Cooling Loads in Buildings. Fatemeh Massah*, Siu Ning Leung, Paul G. O'Brien† Department of Mechanical Engineering, Lassonde School of Engineering, York University, Ontario, Canada
13:20–13:40	Convective Turbulent Wind across a PV Panel. Hok Yin Angus Wong*, Johnson Babalola, David S-K Ting† Hong Kong Polytechnic University, Hong Kong Turbulence & Energy Laboratory, University of Windsor, Canada
13:40–14:00	Clean Energy Applications & Energy Storage: Thermal and Electrochemical. Himanshu Tyagi*† Department of Mechanical Engineering, Indian Institute of Technology Ropar, Rupnagar, Punjab, India
14:00–14:20	Development of an App for Water Distribution Emergency Monitoring and Response Stanley Madiziyire*, Jacqueline Stagner†, Rupp Carriveau, Katelynn Johnson, Aaron Fisk Environmental Energy Institute, Turbulence & Energy Laboratory, School of the Environment, University of Windsor, Windsor, Ontario, Canada
14:20–14:40	
14:40–15:00	<a href="#"><u>Coffee Break</u></a>
	<b>Holistic Engineering, Room 1101. Co-Chairs: Himanshu Tyagi &amp; Lucas R. Bruck</b>
15:00–15:20	Aerodynamics of Rotating Automotive Wheels. Zhi-Sheng Chen*†, David S-K Ting Ford Motor Company, Dearborn, Michigan, USA Turbulence & Energy Laboratory, University of Windsor, Canada
15:20–15:40	Understanding Thermal Transport Processes in the Atmospheric Boundary Layer with Utility-Scale Photovoltaic Plants. Scott Vandelan, Michael Edgemon, Ahmed Tolba, Ahmadreza Vassel-Be-Hagh*† Department of Mechanical & Aerospace Engineering, University of South Florida, Tampa, Florida, USA
15:40–16:00	Evaluating Hydrogen and Electric Alternatives for High-Horsepower Agriculture Equipment. Joshua Martin*, Jacqueline Stagner†, Rupp Carriveau Environmental Energy Institute, Turbulence & Energy Laboratory, University of Windsor, Windsor, Ontario, Canada
16:00–16:20	✈️✔️ Design and Analysis of an Integrated Solar-Assisted Supercritical CO <sub>2</sub> Brayton Cycle for Power and Cooling Application: Enhancing Efficiency through Waste Heat Recovery. Muhammad Sajid Khan*†, Chen Chen Innovation Research Institute of Zhejiang University of Technology, Shengzhou, Zhejiang, China College of Mechanical Engineering, Zhejiang University of Technology, Hangzhou, Zhejiang, China
16:20–16:40	<b>Awards Committee Meet</b> <b>Committee: Paul O'Brien (Chair), David Lubitz, Jacqueline Stagner, Ahmadreza Vassel-Be-Hagh</b>
16:40–17:00	<a href="#"><u>Awards' Presentation in Atrium</u></a>
	Thank you for your contribution. We look forward to seeing you next year.

## **The Awards are:**

Best Cleaner Earth & Atmosphere Presenter  
Exceptional Eco-Friendly Paper / Poster  
Finest Nurturing Humanity Sustainably Paper /Poster  
Most Pragmatic Research Presenter

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## **Accepted Posters**

Economic Viability Assessment of Clean Hydrogen as a Fuel in Corn Drying.  
Muhammad Ali, David S-K Ting, Rupp Carriveau  
Turbulence & Energy Laboratory, University of Windsor, Canada

NACA 0012 Airfoil in Turbulent Wind.  
Johnson Babalola, David S-K Ting  
Turbulence & Energy Laboratory, University of Windsor, Canada

Aerodynamics of Rotating Automotive Wheels.  
Zhi-Sheng Chen, David S-K Ting  
Ford Motor Company, Dearborn, Michigan, USA  
Turbulence & Energy Laboratory, University of Windsor, Canada

Design and Analysis of an Integrated Solar-Assisted Supercritical CO<sub>2</sub> Brayton Cycle for Power and Cooling Application:  
Enhancing Efficiency through Waste Heat Recovery.  
Muhammad Sajid Khan, Chen Chen  
Innovation Research Institute of Zhejiang University of Technology, Shengzhou, Zhejiang, China  
College of Mechanical Engineering, Zhejiang University of Technology, Hangzhou, Zhejiang, China

Development of an App for Water Distribution Emergency Monitoring and Response  
Stanley Madiziyire, Jacqueline Stagner, Rupp Carriveau, Katelynn Johnson, Aaron Fisk  
Environmental Energy Institute, Turbulence & Energy Laboratory, School of the Environment, University of Windsor,  
Windsor, Ontario, Canada

Lightweight Cellular Concrete (LCC): A Sustainable Solution for Insulated Pavement Subbases.  
Oluwasogo Adedayo Ogunfuwa, Abimbola Grace Oyeyi  
Department of Civil and Environmental Engineering, University of Windsor, Windsor, Canada

• Small Modular Reactors and Greenhouse Integration: A Sustainable Path to Carbon-Negative Heating and Electricity.  
Anup Jwala Poudel, David S-K. Ting, Rupp Carriveau, Mohammad Tohidi, Travis Pettigrew  
Turbulence and Energy Lab, University of Windsor, Canada  
CEDIR Group, Canadian Nuclear Laboratories, Canada

Enhancing Urban Stormwater Management Using SWMM and LID implementation: A case study in Windsor, Ontario.  
Richa Rayamajhi, Charitha Pathipati, Tirupati Boliseti  
Department of Civil and Environmental Engineering, University of Windsor, Windsor, Canada

Deflagration to Detonation Transition of Hydrogen Mixture under Elevated Pressure.  
Xiao Yu, Long Jin, Linyan Wang, Navjot Sandhu, Sankara Narayan Varadaraj, Ming Zheng  
Clean Combustion Engine Laboratory, University of Windsor, Windsor, Ontario, Canada  
Convective Turbulent Wind across a PV Panel.  
Hok Yin Angus Wong, Johnson Babalola, David S-K Ting  
Hong Kong Polytechnic University, Hong Kong  
Turbulence & Energy Laboratory, University of Windsor, Canada

• Delegate will bring the poster, CEA2025 will provide the easel.

**See you next year!**

The 9<sup>th</sup> Cleaner Earth & Atmosphere Conference, June 18-19, 2026. Information will become available at

<https://www.caeconference.ca/>

<http://www.turbulenceandenergylab.org/>

<http://www.turbulenceandenergylab.org/-annual-conference-series.html>

Forging Forward Tenably 2026.

Holistic Engineering 2026.

The 10<sup>th</sup> Cleaner Earth & Atmosphere Conference, June 17-18, 2027.

<https://www.caeconference.ca/>

Creating a Vibrant Tomorrow 2027