



# **4<sup>th</sup> Conference on Recent Trends and Developments in Computational Science and Engineering 2026**

**General meeting of the Canadian Association for Computational Science and  
Engineering (CACSE)**

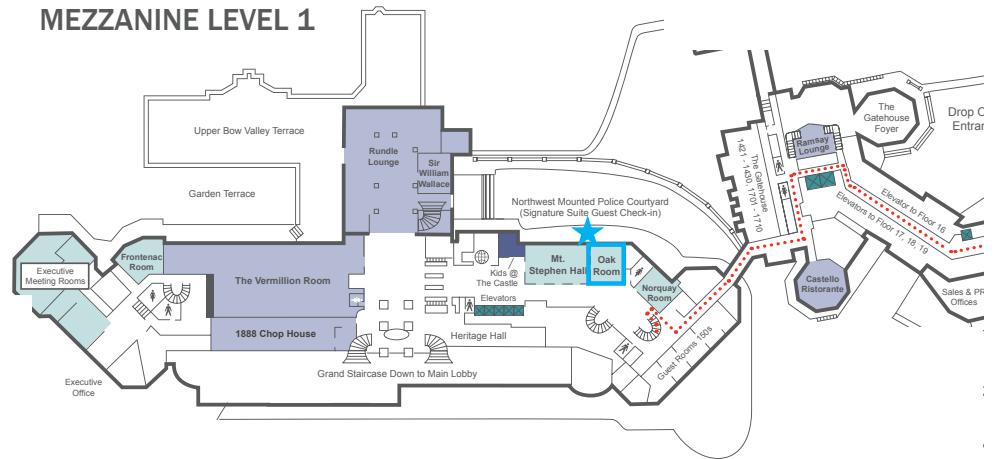
**January 9-11, 2026  
Banff, Alberta, Canada**

## **Conference Organizing Committee**

**Artem Korobenko**, University of Calgary  
**Robert Gracie**, University of Waterloo  
**Ahmad Shakibaeinia**, Polytechnique Montréal  
**Reza Vaziri**, University of British Columbia  
**Serge Prudhomme**, Polytechnique Montréal  
**Marc Laforest**, Polytechnique Montréal

## Hotel Floor Plan

### MEZZANINE LEVEL 1



- ★  Oak Room  
January 9<sup>th</sup>
  - Reception

- ★  Ivor Petrak Room  
January 10<sup>th</sup> and 11<sup>th</sup>
  - Technical program
  - Coffee breaks
  - Lunches
- January 11<sup>th</sup>
  - Dinner

### MEZZANINE LEVEL 2



#### WiFi:

Public network available throughout the hotel

#### Registration and Reception in Oak Room

Friday, 6:00pm – 8:00pm

#### Technical program in Ivor Petrak Room

Saturday, 8:30am – 4:30pm

Sunday, 8:30am – 4:00pm

**Breaks and Lunches will be provided in Ivor Petrak Room foyer.**

#### Conference dinner in Ivor Petrak Room

Sunday, 6:30pm – 10:00pm

**Contact number: call or text 403-714-6414 (Artem)**

**Welcome to the 4<sup>th</sup> Conference on Recent Trends and Developments in Computational Science and Engineering**, organized by the Canadian Association for Computational Science and Engineering (CACSE). We are happy to host our inaugural conference at the Fairmont Banff Springs Hotel in the Canadian Rockies. We bring together experts from academic institutions across Canada to discuss the most recent advances, novel applications and emerging research directions in the field of Computational Science and Engineering (CSE). The technical talks will run for 2 days (Jan. 10 - 11) with a single track.

We are happy to see you for this memorable scientific event and hope you will enjoy the technical and social part of the conference!

Conference co-chairs:

Artem Korobenko  
Robert Gracie  
Ahmad Shakibaeinia  
Reza Vaziri  
Serge Prudhomme  
Marc Laforest

# 4<sup>th</sup> Conference on Recent Trends and Developments in Computational Science and Engineering

January 9-11, 2026

Fairmont Banff Springs Hotel, Banff, Canada

## Friday, January 9

6:00 – 8:00pm Check-In, Oak Room

6:00 – 8:00pm Opening Reception, Oak Room

## Saturday, January 10

### Ivor Petrak Room

8:00 – 8:30am Coffee

8:30 – 8:40am Opening Remark

### 8:40 – 10:00am Session 1. Chair: Serge Prudhomme

8:40 – 9:00am **Artem Korobenko** (University of Calgary)  
*Parametric-based Reduced-Order Modeling for Renewable Energy Systems*

9:00 – 9:20am **Frederick Gosselin** (Polytechnique Montréal)  
*Combining Physics-Informed Neural Networks with the Finite Element Method*

9:20 – 9:40am **Wylie Stroberg** (University of Alberta)  
*Reduced-Order Modeling of Stochastic Chemical Reaction Networks*

9:40 – 10:00am **Yani Ioannou** (University of Calgary)  
*Sparse Neural Network Training*

10:00 – 10:40am Coffee

### 10:40 – 12:00pm Session 2. Chair: Bruno Blais

10:40 – 11:00am **Ahmad Shakibaeinia** (Polytechnique Montréal)  
*Machine learning for enhancing particle methods*

11:00 – 11:20am **Robert Gracie** (University of Waterloo)  
*A Reduced-Dimension Model for Subglacial (Basal) Flows with Inertia*

11:20 – 11:40am **Fabian Denner** (Polytechnique Montréal)  
*Conditional Quadrature Method of Moments for Disperse Multiphase Flows*

11:40 – 12:00pm **Ian Frigaard** (University of British Columbia)  
*Computing Penetration: From Displacement Flows to Networks, in Pursuit of the Perfect Squeeze*

12:00 – 1:40pm **Lunch, Ivor Petrak Room**

1:40 – 3:00pm **Session 3. Chair: Fabian Denner**

- 1:40 – 2:00pm **François Morency** (École de technologie supérieure)  
*Wing-Tip Effects and Ice Accreted Mass on Rotating Blades*
- 2:00 – 2:20pm **Marius Paraschivoiu** (Concordia University)  
*CFD-Based Power Analysis of a Vertical-Axis Wind Turbine in the Martian Atmosphere*
- 2:20 – 2:40pm **Bruno Savard** (Polytechnique Montréal)  
*Towards H<sub>2</sub>-Fuelled Gas Turbines: Insights from Direct Numerical Simulations*
- 2:40 – 3:00pm **Sébastien Poncet** (University of Sherbrooke)  
*Advanced CFD Modeling of Key Components of Refrigeration and Heat Pump Systems*

3:00 – 3:30pm **Break**

3:30 – 4:30pm **Session 4. Chair: Mayank Sabharwal**

- 3:30 – 3:50pm **Peter Tieleman** (University of Calgary)  
*Using Machine Learning to Develop Force-Field Parameters*
- 3:50 – 4:10pm **Eric Lees** (University of British Columbia)  
*Multiphysics Modelling of Electrochemical Systems*
- 4:10 – 4:30pm **Dennis Salahub** (University of Calgary)  
*Progress on Quantum Active Learning for Materials Discovery*

**Sunday, January 11**  
**Ivor Petrak Room**

8:00 – 8:40am **Coffee**

8:40 – 10:00am **Session 5. Chair: Brian Vermeire**

- 8:40 – 9:00am **Faramarz Samavati** (University of Calgary)  
*Toward Globe-Centric GeoAI*
- 9:00 – 9:20am **Marina Gavrilova** (University of Calgary)  
*Ensuring Transparency and Trustworthiness in the Era of Generative AI*
- 9:20 – 9:40am **Giovannantonio Natale** (University of Calgary)  
*Dynamics of Brownian Rods with Anisotropic Translational Diffusion*
- 9:40 – 10:00am **Eldad Haber** (University of British Columbia)  
*Understanding and Improving Flow Matching*

10:00 – 10:40am **Coffee**

**10:40 – 12:00pm** **Session 6. Chair: Ahmad Shakibaeinia**

10:40 – 11:00am **Bruno Blais** (Polytechnique Montréal)  
*Matrix-Free CFD–DEM: A Path Towards the Simulation of Large-Scale Particle-Laden Flows*

11:00 – 11:20am **Zhiwei Peng** (University of Alberta)  
*Dispersion of Active Particles in Oscillatory Poiseuille Flow*

11:20 – 11:40am **Duane Cronin** (University of Waterloo)  
*Multi-Physics Simulation Techniques for Human Safety*

11:40 – 12:00pm **Serge Prudhomme** (Polytechnique Montréal)  
*Algorithms for Contact Detection Between Pairs of Ellipses and Ellipsoids*

12:00 – 1:20pm **Lunch, Alhambra Room**

**1:20 – 2:40pm** **Session 7. Chair: Eldad Haber**

1:20 – 1:40pm **Brian Vermeire** (Concordia University)  
*Recent Progress on Non-Linearly Stability for Runge–Kutta Schemes*

1:40 – 2:00pm **Yann-Meing Law-Kam-Cio** (Polytechnique Montréal)  
*The Hermite Discrete Correction Function Method for Surface-Driven Electromagnetic Problems*

2:00 – 2:20pm **Mayank Sabharwal** (University of Calgary)  
*Insights into water electrolyzer performance using a multiscale cell model*

2:20 – 2:40pm **Alla Edine Benchikh Le Hocine** (University of Sherbrooke)  
*Optimization of fans by using OpenFoam, Metamodels and Ajoint method*

2:40 – 3:00pm **Break**

**3:00 – 4:20pm** **Session 8. Chair: Artem Korobenko**

3:00 – 3:20pm **Reza Vaziri** (University of British Columbia)  
*A Physics-Informed Neural Network for Inverse Characterization of Composite Damage Models Using Full-Field Experimental Data*

3:20 – 3:40pm **Vaishnavi Kale** (University of Calgary)  
*Topology optimization aided design for energy applications*

3:40 – 4:00pm **Chityalla Simha** (University of Guelph)  
*Modeling the Rupture of CO<sub>2</sub> Pipelines: Materials Design and Load Evolution*

4:00 – 4:20pm

**Tao Jin** (University of Ottawa)

*Gradient Projection BFGS Monolithic Scheme for Phase-Field Crack Simulation: Solver Robustness and Irreversibility Enforcement*

6:30 – 10:00pm

**Dinner and Closing Remark, Ivor Petrak Room**