Detailed Program

July 13-18, 2025

Last Updated July 11th, 2025

Sunday July 13th

Last Updated July 11th, 2025

17:00 - 20:00

Check-In

Leacock Building
Early check-in for the conference will be available in the evening prior to the reception. This is conveniently located next to the reception.

18:00 - 20:00

Reception

Redpath Hall
An evening reception including drinks and canapés will be held in Redpath Hall on McGill campus. Please complete your check-in before attending.

Monday July 14th

Last Updated July 11th, 2025

7:30 - 18:00

Check-In

Leacock Building

8:30 - 9:30

Plenary Speaker

Leacock Building - Room 132
Chair: Yvon Maday, Université Pierre et Marie Curie

Presenter: Xiaoying Dai, Chinese Academy of Sciences

Orthogonality Preserving Methods for Electronic Structure Calculations

9:30 - 10:00

Coffee Break

Leacock Building

10:00 - 12:00

Scientific Sessions

MS 110 The Active Flux method: approximating non-linear hyperbolic problems by a globally continuous representation
Leacock 110
Christian Klingenberg, Wasilij Barsukow

- **10:00 - 10:30** *The many facets of Active Flux*
  Presenter: Philip Roe, University of Michigan
- **10:30 - 11:00** *Progresses in the Supraconvergent Hybrid-Variable Method with Application to Euler Flows*
  Presenter: Xianyi Zeng, Lehigh University
- **11:00 - 11:30** *Active Flux Methods for Hyperbolic Systems Using the Method of Bicharacteristics*
  Presenter: Erik Chudzik, Heinrich Heine University
- **11:30 - 12:00** *An Introduction to the PAMPA (Point-Average-Moment Polynomial-Free) Scheme*
  Presenter: Rémi Abgrall, University of Zurich

MS 117 Advances in High-order CFD Methods: Numerical Methods and High-performance Computing
Leacock 26
Hojun You, Jin Seok Park, Jae-Hun Jung, Sehun Chun

- **10:00 - 10:30** *Discontinuous Galerkin Methods for Hypersonic Flows*
  Presenter: Ngoc Cuong Nguyen, Massachusetts Institute of Technology
- **10:30 - 11:00** *High-Order Auto-Dealiasing Flux Reconstruction Method for Multicomponent and Multiphase Flow Simulations*
  Presenter: Meilin Yu, University of Maryland Baltimore County
- **11:00 - 11:30** *High-Order Accurate Simulation of Phantom Yaw Phenomena on an Asymmetric Ogive-Cylinder Body at High Angles of Attack*
  Presenter: Hyeonuk Yang, Inha University
- **11:30 - 12:00** *h-, p- and k-Refinement Assessment for a NURBS-Based Isogeometric Discontinuous Galerkin Method for the Reynolds-Averaged Navier-Stokes Equations*
  Presenter: Daniel Bulgarini, Università degli Studi di Brescia

MS 118 Quantum algorithms for partial differential equations
Bronfman 210
David Del Rey Fernandez, Frank Gaitan, Ala Shayeghi

- **10:00 - 10:30** *Quantum CFD - Lessons from the Advection-Diffusion Equation*
  Presenter: Philipp Pfeffer
- **10:30 - 11:00** *Quantum Realization of the Finite Element Method*
  Presenter: Daniel Peterseim, University of Augsburg
- **11:00 - 11:30** *Limitations of Quantum Algorithms for Fluid Dynamics*
  Presenter: Joseph Carolan, University of Maryland
- **11:30 - 12:00** *Stability and convergence for symmetrized Carleman linearization*
  Presenter: Sitanshu Gakkhar, University of Waterloo

MS 122 Optimal sampling and natural gradient descent in connection with tensor networks
Bronfman 423
Philipp Trunschke, Martin Eigel

- **10:00 - 10:30** *Physics-Informed Machine Learning with Tensor Networks*
  Presenter: Philipp Trunschke, Physikalisch-Technische Bundesanstalt
- **10:30 - 11:00** *Neural Galerkin Schemes with Dynamical Optimal Sampling*
  Presenter: Benjamin Caris, Eindhoven University of Technology

- **11:00 - 11:30** *Error Control for High-Dimensional Parametric PDEs*
  Presenter: Nando Hegemann, Physikalisch-Technische Bundesanstalt
- **11:30 - 12:00** *Low-Rank Tensor Frames for Resolving Multilevel Structure in PDEs*
  Presenter: Vladimir Kazeev, University of Vienna

MS 124 Recent advances in high-order methods for nonlinear multi-physics systems
Bronfman 410
Tamas Horvath, Tan Bui-Thanh

- **10:00 - 10:30** *Embedded-Hybridized Discontinuous Galerkin for Magnetohydrodynamics*
  Presenter: Tamas Horvath, Oakland University
- **10:30 - 11:00** *Multigrid Methods with Polytopic Agglomeration for Discontinuous Galerkin Modeling in Cardiac Electrophysiology*
  Presenter: Pasquale Claudio Africa, SISSA International School for Advanced Studies
- **11:00 - 11:30** *Adaptive Basis Tailoring for High-Order Approximation of Singular Perturbation Problems*
  Presenter: Krzysztof Fidkowski
- **11:30 - 12:00** *High-Order Numerical Methods for Magnetohydrodynamic Turbulence*
  Presenter: Carolyn Wendeln, Michigan State University

MS 129 Accelerating High-Order CFD Simulations with Surrogate Modeling
Bronfman 310
Pasquale Claudio Africa, Federico Pichi, Niccol Tonicello, Michele Girfoglio, Gianluigi Rozza

- **10:00 - 10:30** *Polytopal Mesh Agglomeration Strategies and Applications to Brain Pathology*
  Presenter: Mattia Corti, Politecnico di Milano
- **10:30 - 11:00** *Machine-Learning-Enhanced Aerodynamic Forces Prediction Based on Sparse Pressure Sensor Inputs*
  Presenter: Junming Duan, University of Wuerzburg
- **11:00 - 11:30** *Data-Driven Regularized Reduced Order Models for Turbulent Flows*
  Presenter: Ping-Hsuan Tsai, Virginia Tech
- **11:30 - 12:00** ~~*Reduced Basis Method Based on a Posteriori Error Estimate for the Parameterized Allen-Cahn Equation*~~
  Presenter: Liang Wu, La Rochelle Université

MS 131 Quadrature, algorithms, and applications for integral equation-based methods

Bronfman 46
Ludvig af Klinteberg, Fredrik Fryklund

- **10:00 - 10:30** *Introduction to the Minisymposium*
  Presenter: Fredrik Fryklund, KTH Royal Institute of Technology
- **10:30 - 11:00** *Snapshots of the Organizers' Research*
  Presenter: Ludvig af Klinteberg
- **11:00 - 11:30** *Near-Singular Integration by Regular Quadratures: Local and Global Corrections*
  Presenter: Bowei Wu, Mälardalen University
- **11:30 - 12:00** *Simulation of Deformable Capsules Flowing Through a Pipe in Stokes Flow*
  Presenter: Joar Bagge, University of Texas at Austin

MS 133 Conservation of differential constraints in hyperbolic systems with high order methods

Leacock 219
Walter Boscheri, Francesco Fambri, Maria Han Veiga, Raphal Loubre, Vincent Perrier

- **10:00 - 10:30** *A Subface-Based Cell-Centered Finite Volume Scheme for the Three-Dimensional Compressible Navier-Stokes Equations on Unstructured Grids: Part I - Solving the Hyperbolic Part Using a Multipoint Flux Approximation*
  Presenter: Pierre-Henri Maire, CEA
- **10:30 - 11:00** *A Subface-Based Cell-Centered Finite Volume Scheme for the Three-Dimensional Compressible Navier-Stokes Equations on Unstructured Grids: Part II - Solving Hypersonic Flows Using Hybrid Grids*
  Presenter: Vincent Delmas, CEA
- **11:00 - 11:30** *Variational Derivation and Compatible Discretizations of the Maxwell-GLM System*
  Presenter: Michael Dumbser, University of Trento
- **11:30 - 12:00** *Local Subcell Monolithic DG-FV Subcell Scheme for Nonlinear Shallow Water Equations with Source Terms on Unstructured Grids*
  Presenter: Sacha Cardonna, Université de Montpellier

MS 139 Recent Advances in Fast and Accurate Methods for Wave Problems

Armstrong 375
Nour Al Hassanieh, Tristan Goodwill

- **10:00 - 10:30** *A Numerical Procedure for Computing Wannier Functions for One-Dimensional Crystalline Systems*
  Presenter: Abi Gopal, UC Davis
- **10:30 - 11:00** *Quasi-Trefftz Spaces for Vector-Valued Equations*
  Presenter: Ilaria Fontana, University of Arizona
- **11:00 - 11:30** *Complex Scattering Makes for Simple Numerics: A Method for Simulating Junctions of Several Semi-Infinite Domains*
  Presenter: Tristan Goodwill, University of Chicago
- **11:30 - 12:00** *A Spectral Overlapping Multislab Solver for Variable Coefficient PDEs*
  Presenter: Simon Jacques Dirckx, UT Austin

MS 140 Symposium in Honour of Anthony Patera and His Contributions
Leacock 232
Catherine Mavriplis, Paul Fischer, Masayuki Yano

- **10:00 - 10:30** *A Few Things I Know from Tony*
  Presenter: Yvon Maday,Sorbonne Université
- **10:30 - 11:00** *Historical Development of the Spectral Element Method*
  Presenter: Paul Fischer, University of Illinois
- **11:00 - 11:30** *Mortar Methods and Their Breadth of Applications*
  Presenter: Catherine Mavriplis, University of Ottawa
- **11:30 - 12:00** *Reflections on Some Early Work on Spectral Element Methods*
  Presenter: Einar Malvin Rønquist, Norwegian University of Science and Technology

MS 142 Recent advances in highly efficient and accurate numerical methods for complex nonlinear systems
Arts Building W-120
Qing Cheng, Jie Shen, Jiang Yang, Fukeng Huang

- **10:00 - 10:30** *A Finite Element Method for the Dynamical Ginzburg–Landau Equations Under Coulomb Gauge*
  Presenter: Huadong Gao, Huazhong University of Science and Technology
- **10:30 - 11:00** *On Arbitrarily High-Order Structure-Preserving Exponential Time Differencing Runge–Kutta Methods for Allen–Cahn Equations*
  Presenter: Chaoyu Quan, The Chinese University of Hong Kong (Shenzhen)
- **11:00 - 11:30** *High Order Energy Stable Adaptive Method for Phase Transition Problem*
  Presenter: Yan Xu, University of Science and Technology of China

- **11:30 - 12:00** *Multiscale Model Reduction for Heterogeneous Perforated Domains Based on CEM-GMsFEM*
  Presenter: Yin Yang, Xiangtan University

MS 147 Advances in Temporal Integration for High Order Methods
Bronfman 422
Carolyn M. V. Pethrick, Mohammad R. Najafian

- **10:00 - 10:30** *Unconditionally SSP Additive Runge–Kutta Methods*
  Presenter: Sigal Gottlieb, UMassD
- **10:30 - 11:00** *Recent Advances in Space-Time Spectral Methods for PDEs in Irregular Geometry*
  Presenter: Chandramali Piyasundara Wilegoda Liyanage, University of Manitoba
- **11:00 - 11:30** *IMEX Compact Runge-Kutta Flux Reconstruction Methods for Hyperbolic Equations*
  Presenter: Arpit Babbar, Johannes Gutenberg University Mainz
- **11:30 - 12:00** *Multilevel Spectral Deferred Correction for Acceleration and Space-Time Adaptivity in Discontinuous Galerkin Methods for Conservation Laws*
  Presenter: Erik Pfister, TU Dresden

12:00 - 13:30

Lunch

Redpath Hall
A complimentary lunch will be provided.

13:30 - 14:30

Plenary Speaker

Leacock 132
Chair: Christoph Schwab, ETH Zurich

Presenter: Olga Mula, Eindhoven University of Technology

Stable Nonlinear Dynamical Approximation with Dynamical Samplings

14:30 - 16:00

Scientific Sessions

MS 106 Synergies of Machine Learning and Numerics
Bronfman 210
Moritz Hauck, Zhi-Song Liu, Andreas Rupp

- **14:30 - 15:00** *Low-Rank Surrogates for Parametric PDEs*
  Presenter: Benno Huber, Universität Heidelberg
- **15:00 - 15:30** *Learning-Enhanced Surrogate Models in Numerical Homogenization*
  Presenter: Roland Maier, Karlsruhe Institute of Technology
- **15:30 - 16:00** *Maximum Likelihood Discretization of the Transport Equation*
  Presenter: Brook Eyob, Georgia Institute of Technology

MS 110 The Active Flux method: approximating non-linear hyperbolic problems by a globally continuous representation
Leacock 110
Christian Klingenberg, Wasilij Barsukow

- **14:30 - 15:00** *A Review of Active Flux Methods for Hyperbolic Conservation Laws*
  Presenter: Christian Klingenberg, Wuerzburg University
- **15:00 - 15:30** *A Fourier Analysis of the Multi-Dimensional Semi-Discrete Active Flux Method*
  Presenter: Lisa Lechner, University of Würzburg
- **15:30 - 16:00** *An Asymptotic-Preserving Active Flux Method for a Kinetic Equation*
  Presenter: Junming Duan, University of Wuerzburg

MS 117 Advances in High-order CFD Methods: Numerical Methods and High-performance Computing
Leacock 26
Hojun You, Jin Seok Park, Jae-Hun Jung, Sehun Chun

- **14:30 - 15:00** *Efficient Characteristic-Galerkin Isogeometric Solver for Miscible Displacement in Porous Media*
  Presenter: Ilham Asmouhm, Innsbruck Universität
- **15:00 - 15:30** *Efficient Reynolds-Averaged Navier-Stokes Simulations of Wall-Bounded Turbulent Flows Based on Function Enrichment*
  Presenter: Xiaorui Xu, Beijing Computational Science Research Center
- **15:30 - 16:00** *High-Order Simulation of Hypersonic Reactive Flows Using Adaptive Subcell Shock Capturing Approach*
  Presenter: Taegeon Kim, Seoul National University

MS 122 Tensor networks and compositional functions for high-dimensional approximation

Bronfman 423
Philipp Trunschke, Martin Eigel

- **14:30 - 15:00** *Properties and Optimisation of Compositional Tensor Networks*
  Presenter: Martin Eigel, WIAS
- **15:00 - 15:30** *Optimal Solvers for Infinite-Dimensional Sparse Approximations in Adaptive Stochastic Galerkin Finite Element Methods*
  Presenter: Henrik Eisenmann, RWTH Aachen
- **15:30 - 16:00** *Iterative Approximation of Solution Operators for PDEs with Neural Networks*
  Presenter: Fabian Zehetgruber, TUWien

MS 124 Recent advances in high-order methods for nonlinear multi-physics systems

Bronfman 410
Tamas Horvath, Tan Bui-Thanh

- **14:30 - 15:00** ~~*High-Order Variational Lagrangian Schemes for Compressible Fluids*~~
  Presenter: Guosheng Fu, University of Notre Dame
- **15:00 - 15:30** ~~*Conservative Discontinuous Galerkin Method for a Multi-Species Vlasov-Fokker-Planck Model*~~
  Presenter: Eirik Endeve, Oak Ridge National Laboratory
- **15:30 - 16:00** *A Second Order Partitioned Method for Fluid-Poroelastic Structure Interaction*
  Presenter: Connor Parrow, University of Notre Dame

MS 129 Accelerating High-Order CFD Simulations with Surrogate Modeling

Bronfman 310
Pasquale Claudio Africa, Federico Pichi, Niccol Tonicello, Michele Girfoglio, Gianluigi Rozza

- **14:30 - 15:00** *Chaotic Aerodynamic Optimization using Reduced Order Models and Least Squares Shadowing*
  Presenter: Brian Vermeire, Concordia University
- **15:00 - 15:30** *Improved deep learning of chaotic dynamical systems*
  Presenter: Dibyajyoti Chakraborty, Penn State University

- **15:30 - 16:00** *Model Order Reduction for the Space-Time Boundary Element Formulation of the Heat Equation*
  Presenter: Fernando Henriquez (contributed), TU Wien

MS 131 Quadrature, algorithms, and applications for integral equation-based methods
Bronfman 46
Ludvig af Klinteberg, Fredrik Fryklund

- **14:30 - 15:00** *Fast Hybrid Frequency-Time Methods in Wave Scattering*
  Presenter: Thomas Geoffrey Anderson, Rice University
- **15:00 - 15:30** *Recursive Reduction Quadrature for the Evaluation of Laplace Layer Potentials in Three Dimensions*
  Presenter: Hai Zhu, Flatiron Institute
- **15:30 - 16:00** *Boundary Integral Methods for Flexural Gravity Waves*
  Presenter: Jeremy Hoskins, University of Chicago

MS 133 Conservation of differential constraints in hyperbolic systems with high order methods
Leacock 219
Walter Boscheri, Francesco Fambri, Maria Han Veiga, Raphal Loubre, Vincent Perrier

- **14:30 - 15:00** *A Doubly Divergence Free Virtual Element Method for Magnetohydrodynamic Problems*
  Presenter: Franco Dassi, University Milano Bicocca
- **15:00 - 15:30** *Some Remarks on Anisotropic Diffusion*
  Presenter: Francesca Rapetti, Universite Cote d'Azur
- **15:30 - 16:00** *A Structure Preserving Finite Element Scheme for the Incompressible GPR Model*
  Presenter: Enrico Zampa, University of Vienna

MS 139 Recent Advances in Fast and Accurate Methods for Wave Problems
Armstrong 375
Nour Al Hassanieh, Tristan Goodwill

- **14:30 - 15:00** *The DMK Framework for the Helmholtz Kernel*
  Presenter: Shidong Jiang, Flatiron Institute, Simons Foundation
- **15:00 - 15:30** *Integral Equation Formulations for Flexural Wave Scattering in Sea Ice and Ice Shelves*
  Presenter: Peter Nekrasov, University of Chicago
- **15:30 - 16:00** *A Hybrid Solver for the System That Arises from the HPS Discretization*
  Presenter: Adrianna Marie Gillman, University of Colorado Boulder

MS 140 Symposium in Honour of Anthony Patera and His Contributions
Leacock 232
Catherine Mavriplis, Paul Fischer, Masayuki Yano

- **14:30 - 15:00** *The Journey to Robust Spectral Element Solvers for Advection Dominated Flows*
  Presenter: David A. Kopriva, Florida State University
- **15:00 - 15:30** *Exascale Computing with NekRS*
  Presenter: Misun Min, Argonne National Laboratory
- **15:30 - 16:00** *Unstructured Spectral Elements on Hybrid Elements: Utilising Tensor Collocation Operations for Optimal Performance in Nektar++*
  Presenter: Spencer Sherwin, Imperial College London

MS 142 Recent advances in highly efficient and accurate numerical methods for complex nonlinear systems
Arts Building W-120
Qing Cheng, Jie Shen, Jiang Yang, Fukeng Huang

- **14:30 - 15:00** *Original Energy Dissipation Preserving Exponential Time Differencing Runge–Kutta Methods for Gradient Flows*
  Presenter: Jiang Yang, Southern University of Science and Technology
- **15:00 - 15:30** *On Efficient Laguerre and Hermite Spectral Methods for Problems in Unbounded Domains*
  Presenter: Haijun Yu, Academy of Mathematics and Systems Science, Chinese Academy of Sciences
- **15:30 - 16:00** *A New Class of High-Order Fully Decoupled Schemes for the MHD Equations and Their Error Analysis*
  Presenter: Fukeng Huang, Eastern Institute of Technology

MS 147 Advances in Temporal Integration for High Order Methods
Bronfman 422
Carolyn M. V. Pethrick, Mohammad R. Najafian

- **14:30 - 15:00** *Multirate Infinitesimal Step Flux Splitting Methods in Numerical Weather Prediction*
  Presenter: Marco Artiano, Johannes Gutenberg University Mainz
- **15:00 - 15:30** *Strong Stability Preserving Runge-Kutta Projection Methods*
  Presenter: Mohammad R. Najafian, Concordia University
- **15:30 - 16:00** *Fourth-Order Paired-Explicit Runge-Kutta Methods*
  Presenter: Daniel Doehring, RWTH Aachen University

16:00 - 16:30

Coffee Break

Leacock and Bronfman Buildings

16:30 - 18:00

Scientific Sessions

MS 106 Synergies of Machine Learning and Numerics

Bronfman 210
Moritz Hauck, Zhi-Song Liu, Andreas Rupp

- **16:30 - 17:00** *Towards Optimal Hierarchical Training of Neural Networks*
  Presenter: Michael Feischl,TU Wien
- **17:00 - 17:30** *Solving Roughly Forced Nonlinear PDEs via Misspecified Kernel Methods and Neural Networks*
  Presenter: Matthieu Darcy, Caltech
- **17:30 - 18:00** *Exploring High Order Architectures for Data-Driven Flow Map Learning*
  Presenter: Victor Churchill (contributed), Trinity College

MS 110 The Active Flux method: approximating non-linear hyperbolic problems by a globally continuous representation

Leacock 110
Christian Klingenberg, Wasilij Barsukow

- **16:30 - 17:00** *On Improving the Efficiency of ADER Methods*
  Presenter: Maria Han Veiga, Ohio State University
- **17:00 - 17:30** *High order domain truncation method for an infinite sector*
  Presenter: Cédric Baudet (contributed),
- **17:30 - 18:00** *Domain Decomposition for the Boltzmann Equation and Its Application in the Context of Rarefied Flows*
  Presenter: R.K. Sharma, Eindhoven Institute of Technology

MS 117 Advances in High-order CFD Methods: Numerical Methods and High-performance Computing

Leacock 26
Hojun You, Jin Seok Park, Jae-Hun Jung, Sehun Chun

- **16:30 - 17:00** *Nonlinearly Stable Flux Reconstruction for Implicit Large Eddy Simulation of Wall-Bounded Flows*
  Presenter: Dominic Roy, McGill University

- **17:00 - 17:30** *Metric-Based High-Order Mesh Generation Using Prismatic Layers and Advancing Fronts*
  Presenter: Krzysztof Fidkowski, University of Michigan
- **17:30 - 18:00** *Comparative Analysis of Flux Reconstruction and Continuous Galerkin Spectral Element Methods for High-Order PDE Solutions*
  Presenter: Castro Muela, Barcelona Supercomputing Center

MS 121 Spectral and High-order Methods for Complex PDEs: Medium, Oscillation and Singularity

Bronfman 310
Yongyong Cai, Lilian Wang

- **16:30 - 17:00** ~~*Spectral/Spectral Element Methods for the Transport Equation*~~
  Presenter: Huiyuan Li, Insititute of Software Chinese Academy of Sciences
- **17:00 - 17:30** ~~*An Analytically-Solvable, Wave-Form Asymptotic-Preserving and Energy-Conserving Scheme for Vlasov-Poisson Equations in the Quasi-Neutral Regime*~~
  Presenter: Zhiguo Yang, Shanghai Jiao Tong University
- **17:30 - 18:00** ~~*Artificial Neural Network Based Optimization of Müntz Spectral Methods*~~
  Presenter: Wei Zeng, Beijing Computational Science Research Center

MS 122 Tensor networks and compositional functions for high-dimensional approximation

Bronfman 423
Philipp Trunschke, Martin Eigel

- **16:30 - 17:00** *High Order Low-Rank Approximation to the Schrödinger Equation*
  Presenter: Matthieu Dolbeault, RWTH Aachen
- **17:00 - 17:30** *Sparse Low-Rank Approximation of Multi-Parametric Partial Differential Equations*
  Presenter: Huqing Yang (contributed), Institut für Geometrie und Praktische Mathematik,
- **17:30 - 18:00** *Block-Sparsity in Matrix Product States*
  Presenter: Max Pfeffer, Georg-August-University Göttingen

MS 131 Quadrature, algorithms, and applications for integral equation-based methods
Bronfman 46
Ludvig af Klinteberg, Fredrik Fryklund

- **16:30 - 17:00** *Accurate and Robust Quadrature Based on Error Estimates for Particles in Stokes Flow*
  Presenter: Pritpal Matharu, Max Planck Institute for Mathematics in the Sciences
- **17:00 - 17:30** *Superconvergent Results for Fractional Volterra Integro-Differential Equations with Non-Smooth Solutions*
  Presenter: Ruby Ruby, IIT Jodhpur
- **17:30 - 18:00** *Jacobi Spectral Galerkin Method for Fredholm Integral Equations with Algebraic Weakly Singular Kernel*
  Presenter: Arnab Kayal (contributed), Indian Institute of Technology Jodhpur

MS 133 Conservation of differential constraints in hyperbolic systems with high order methods
Leacock 219
Walter Boscheri, Francesco Fambri, Maria Han Veiga, Raphal Loubre, Vincent Perrier

- **16:30 - 17:00** *High Order Whitney Finite Elements*
  Presenter: Ana M. Alonso Rodriguez, University of Trento
- **17:00 - 17:30** *A Novel Fully Compatible and Asymptotic Preserving Semi-Implicit Method on Staggered Unstructured Tri-Star Meshes*
  Presenter: Elena Bernardelli, University of Verona
- **17:30 - 18:00** *High-Order Structure Preserving Hybrid Methods for Compressible MHD*
  Presenter: Francesco Fambri, Max-Planck Institute for Plasma Physics

MS 136 High-order Algorithms, Software and Applications for Exascale
Bronfman 410
Misun Min, Paul Fischer, Tzanio Kolev

- **16:30 - 17:00** *High Performance Asynchronous I/O for Exascale Spectral Element Methods*
  Presenter: Freddie Witherden, Texas A&M University
- **17:00 - 17:30** *The SiMPL Method for High-Order Density-Based Topology Optimization*
  Presenter: Boyan Lazarov, Lawrence Livermore National Laboratory

- **17:30 - 18:00** *Efficiently Leveraging Heterogeneous Architectures in the Nektar++ Framework*
  Presenter: Chris Cantwell, Imperial College London

MS 140 Symposium in Honour of Anthony Patera and His Contributions
Leacock 232
Catherine Mavriplis, Paul Fischer, Masayuki Yano

- **16:30 - 17:00** *Enhancing CFD Simulations for Digital Twins by Surrogate Model Order Reduction with Scientific Machine Learning*
  Presenter: Gianluigi Rozza, SISSA mathLab
- **17:00 - 17:30** *Old and New Aspects of Space-Time RBMs*
  Presenter: Karsten Urban, Ulm University
- **17:30 - 18:00** *Greedy Sampling in High Dimensions via the Polytope Division Method*
  Presenter: Karen Veroy-Grepl, Eindhoven University of Technology (TU/e)

MS 141 Weighted Essentially Non-Oscillatory and discontinuous Galerkin Methods with Machine Learning
Armstrong 375
Jiaxi Gu, Jae-Hun Jung

- **16:30 - 17:00** *Improved Physics-Informed Neural Networks for the Reinterpreted Discrete Fracture Model*
  Presenter: Yang Yang, Michigan Technological University
- **17:00 - 17:30** *A Third-Order Finite Difference WENO Scheme with Conservative Approximation and Symmetry*
  Presenter: Kwanghyuk Park, Pohang University of Science and Technology
- **17:30 - 18:00** *Simulating a ternary Cahn-Hilliard equation with high-order moving-mesh spectral-elements: A multiphase fluids case study*
  Presenter: Eric William Hester (contributed), University of Bath

MS 142 Recent advances in highly efficient and accurate numerical methods for complex nonlinear systems
Arts Building W-120
Qing Cheng, Jie Shen, Jiang Yang, Fukeng Huang

- **16:30 - 17:00** ~~*Optimization and Preconditioning: TPDv Algorithms for Nonlinear PDEs*~~
  Presenter: Ruchi Guo, Sichuan University
- **17:00 - 17:30** ~~*A Hybrid Computational Framework for Multicomponent Fluid Systems*~~Presenter: Qi Wang, University of South Carolina
- **17:30 - 18:00** *A Framework for Computing Derivatives of Tree Tensor Networks: With Application in Constructing Order Conditions of the Runge-*

Kutta Method
Presenter: Jizu Huang, Academy of Mathematics and Systems Science, Chinese Academy of Sciences

MS 147 Advances in Temporal Integration for High Order Methods
Bronfman 422
Carolyn M. V. Pethrick, Mohammad R. Najafian

- **16:30 - 17:00** *A Space-Time Approach to Fully Discrete Nonlinearly Stable Flux Reconstruction*
  Presenter: Carolyn Pethrick, McGill University
- **17:00 - 17:30** *Mixed Precision/Mixed Model Runge–Kutta Methods*
  Presenter: Sigal Gottlieb (contributed), University of Massachusetts Dartmouth
- **17:30 - 18:00** *High Order Strong Stability Preserving Two-Derivative Explicit, Implicit, and IMEX Methods*
  Presenter: Zachary Grant (contributed), University of Massachusetts Dartmouth

Tuesday July 15th

Last Updated July 11th, 2025

7:30 - 18:00

Check-In

Leacock Building

8:30 - 9:30

Plenary Speaker

Leacock Building - Room 132
Chair: Jens M. Melenk, TU Wien

Presenter: David Zingg, University of Toronto Institute for Aerospace Sciences

Some Recent Developments in High-Order Methods Related to the Summation-by-Parts Property

9:30 - 10:00

Coffee Break

Leacock Building

10:00 - 12:00

Scientific Sessions

MS 116 Numerical methods for complex wave propagation problems
Bronfman 423
Theophile Chaumont-Frelet, Markus Melenk

- **10:00 - 10:30** *Integral Equation Methods for Acoustic Scattering by Fractals*
  Presenter: David Hewett, University College London
- **10:30 - 11:00** *A Trefftz Continuous Galerkin Method for Helmholtz Problems*
  Presenter: Nicola Galante, Alpines, Inria Paris – LJLL, Sorbonne University
- **11:00 - 11:30** *An Optimised Quasi-Trefftz Method for the Iterative Solution of Time-Harmonic Wave Problems*
  Presenter: Matthias Rivet, ONERA
- **11:30 - 12:00** *Higher-Order Multiscale Techniques for the Wave Equation*
  Presenter: Roland Maier, Karlsruhe Institute of Technology

MS 117 Advances in High-order CFD Methods: Numerical Methods and High-performance Computing
Leacock 26
Hojun You, Jin Seok Park, Jae-Hun Jung, Sehun Chun

- **10:00 - 10:30** *Advances in High-Order CFD Solvers for Industrial Geometries*
  Presenter: David Moxey, King's College London
- **10:30 - 11:00** *DNS/iLES Vortex Dynamics of Vertical-Axis Wind Turbines*
  Presenter: Harry Joseph Dunn, Newcastle University
- **11:00 - 11:30** *Positivity-Preserving Implicit Finite Volume Methods on Unstructured Grids for Compressible Flows*
  Presenter: Qian Wang, Beijing Computational Science Research Center
- **11:30 - 12:00** *A Fourth-Order Iterative Discretization Scheme for the Monge-Ampère Equation*
  Presenter: Jan ten Thije Boonkkamp (contributed), Eindhoven University of Technology

MS 119 Machine learning enhanced numerical methods for nonlinear partial differential equations
Bronfman 210
David Del Rey Fernandez, Nathaniel Trask

- **10:00 - 10:30** *Machine-Learning-Based Spectral Methods for Partial Differential Equations*
  Presenter: Panos Stinis, Pacific Northwest National Laboratory
- **10:30 - 11:00** *A Variable Projection Based Neural Network Method for Computational PDEs*
  Presenter: Suchuan Dong, Purdue University
- **11:00 - 11:30** *Diffeomorphic Neural Operator Learning*
  Presenter: Seth Taylor, McGill University
- **11:30 - 12:00** *Neural Chaos: A Spectral Stochastic Neural Operator*
  Presenter: Bahador Bahmani, Johns Hopkins University

MS 121 Spectral and High-order Methods for Complex PDEs: Medium, Oscillation and Singularity
Bronfman 310
Yongyong Cai, Lilian Wang

- **10:00 - 10:30** ~~*Spectral Galerkin Methods with Sinh Orthogonal Functions for Rapid Decay and Heavy-Tailed Problems*~~
  Presenter: Yujian Jiao, Shanghai Normal University

- **10:30 - 11:00** ~~*Over-Penalized Weak Galerkin Method for Convection-Diffusion-Reaction Problems*~~
  Presenter: Lunji Song, Lanzhou University
- **11:00 - 11:30** ~~*Data Driven Nested Quadrature for Polynomial Chaos-Based Uncertainty Quantification*~~
  Presenter: Ling Guo, Shanghai Normal University
- **11:30 - 12:00** *Sparse spectral methods for partial differential equations on generalised Koornwinder domains*
  Presenter: Jiajie Yao (contributed), University of Leicester

MS 123 Advanced stabilization methods for high-order discretizations of hyperbolic problems
Leacock 110
Dmitri Kuzmin, Andres Rueda-Ramrez

- **10:00 - 10:30** *High-Order Limiting Methods for the Euler Equations Using Bounds Derived from the Boltzmann Equation*
  Presenter: Tarik Dzanic, Lawrence Livermore National Lab
- **10:30 - 11:00** *Monolithic Convex Limiting for Implicit Finite Element Discretizations of the Compressible Euler Equations*
  Presenter: Dmitri Kuzmin, TU Dortmund University
- **11:00 - 11:30** *A Critical Analysis of Convex Limiting in DGSEM: Good vs. Bad*
  Presenter: Benjamin Bolm, University of Cologne
- **11:30 - 12:00** *An Artificial Viscosity Approach to Entropy Stable High Order DG Methods*
  Presenter: Jesse Chan, Rice University

MS 132 Advances in provably stable high-order discretizations of non-linear PDEs and their applications
Bronfman 422
Anita Gjesteland, Zelalem Worku, Jesse Chan

- **10:00 - 10:30** *Linear and Nonlinear Boundary Conditions: What's the Difference?*
  Presenter: Jan Nordström, Linköping University
- **10:30 - 11:00** *High-Order Dual Time-Stepping Positivity-Preserving Entropy Stable Schemes for the 3-D Compressible Navier-Stokes Equations*
  Presenter: Nail K. Yamaleev, Old Dominion University
- **11:00 - 11:30** *Entropy-Stable Multirate Time-Integration through Paired-Explicit Relaxation Runge-Kutta Methods*
  Presenter: Daniel Doehring, RWTH Aachen University

- **11:30 - 12:00** *Fully Discrete Entropy-Stable Summation-by-Parts for Shock Tracking for Hyperbolic Conservation Laws*
  Presenter: Dongze Li, University of Waterloo

MS 133 Conservation of differential constraints in hyperbolic systems with high order methods
Leacock 219
Walter Boscheri, Francesco Fambri, Maria Han Veiga, Raphal Loubre, Vincent Perrier

- **10:00 - 10:30** *Structure Preserving Schemes for Lagrangian Continuum Mechanics: Thermodynamics and Involutions*
  Presenter: Walter Boscheri, CNRS
- **10:30 - 11:00** *Development of Discontinuous Galerkin Methods That Preserve a Curl or a Divergence Constraint*
  Presenter: Vincent Perrier, INRIA
- **11:00 - 11:30** *The Semi-Discrete Active Flux Method for Multi-Dimensional Conservation Laws*
  Presenter: Christian Klingenberg, Wuerzburg University
- **11:30 - 12:00** *A Semi-Discrete Active Flux Method of Arbitrarily High Order on 2-D Cartesian Grids*
  Presenter: Lisa Lechner, University of Würzburg

MS 135 Recent Advances in High-Order Methods for Numerical Weather Prediction
Armstrong 375
Carlos A. Pereira, Shoyon Panday, Stphane Gaudreault, Philipp Birken

- **10:00 - 10:30** *Exponential Time Integrators for Numerical Weather Prediction*
  Presenter: Mayya Tokman, University of California, Merced
- **10:30 - 11:00** *Dubious No More: Evaluation of the Matrix Exponential by Solving Differential Equations*
  Presenter: Raymond John Spiteri, University of Saskatchewan
- **11:00 - 11:30** *On the Application of Neural Semi-Lagrangian Architecture for Weather Forecasting*
  Presenter: Stéphane Gaudreault, Environment and Climate Change Canada
- **11:30 - 12:00** *WxFactory: Toward Efficient High-Order Weather Prediction on the Cubed Sphere*
  Presenter: Carlos Pereira, Environment and Climate Change Canada (ECCC)

MS 136 High-order Algorithms, Software and Applications for Exascale
Bronfman 410
Misun Min, Paul Fischer, Tzanio Kolev

- **10:00 - 10:30** *Matrix-Free MPM on High-Order Meshes with Ratel and libCEED*
  Presenter: Jeremy L. Thompson, CU Boulder
- **10:30 - 11:00** *Advancing High-Dimensional Physics with Matrix-Free Discontinuous Galerkin Methods*
  Presenter: Yohann Dudouit, Lawrence Livermore National Laboratory
- **11:00 - 11:30** *Preconditioning of High-Order Matrix-Free Diffusion Problems on Exascale Systems*
  Presenter: Veselin Dobrev, Lawrence Livermore National Laboratory
- **11:30 - 12:00** *Spectral Element Simulation of Liquid Metal Magnetohydrodynamics*
  Presenter: Misun Min, Argonne National Laboratory

MS 140 Symposium in Honour of Anthony Patera and His Contributions
Leacock 232
Catherine Mavriplis, Paul Fischer, Masayuki Yano

- **10:00 - 10:30** *Development of Error Bounds and Estimates for Reduced-Basis Methods*
  Presenter: Masayuki Yano, University of Toronto
- **10:30 - 11:00** *Optimization-Based Model Order Reduction of Fluid Structure Interaction Problems*
  Presenter: Tommaso Taddei, Inria Bordeaux South-West
- **11:00 - 11:30** *Reduced Basis Methods for Nonlinear PDEs: From Historical Foundations to Recent Advances*
  Presenter: Ngoc Cuong Nguyen, Massachusetts Institute of Technology
- **11:30 - 12:00** *Implicit Schwarz domain decomposition method for a Rayleigh-Bénard problem*
  Presenter: Henar Herrero (contributed), Universidad de Castilla-La Mancha

MS 142 Recent advances in highly efficient and accurate numerical methods for complex nonlinear systems
Arts Building W-120
Qing Cheng, Jie Shen, Jiang Yang, Fukeng Huang

- **10:00 - 10:30** *Efficient Energy-Stable Numerical Schemes for Bulk-Membrane Coupled Systems with Phase Separation Dynamics*
  Presenter: Xueping Zhao, University of Nottingham Ningbo China
- **10:30 - 11:00** *A Fast FEM for Nonlocal Models and Its Application to Material Fracture Simulations*
  Presenter: Jiwei Zhang, Wuhan University

- **11:00 - 11:30** *Solving Singular PDEs by Using Deep Learning with Error Control*
  Presenter: Zhiping Mao, Eastern Institute of Technology, Ningbo
- **11:30 - 12:00** *Efficient Solvers for Coupled Brown-Neel Fokker-Planck Equations*
  Presenter: Manfred Faldum (contributed), RWTH Aachen University

MS 149 Spectral and high-order methods in computational quantum physics
Bronfman 46
Jason Kaye

- **10:00 - 10:30** *Decomposing Feynman Diagrams by Sum-of-Exponentials Expansion*
  Presenter: Jason Kaye, Flatiron Institute, Simons Foundation
- **10:30 - 11:00** *A Spectral hp-FEM Method for the Integrodifferential Real-Time Quantum Many-Body Dyson Equation*
  Presenter: Hugo U. R. Strand, Örebro University
- **11:00 - 11:30** *Spectral Renormalization Due to Dissipative Dynamics*
  Presenter: Thomas John Blommel, University of California Santa Barbara
- **11:30 - 12:00** *Advancing Pseudo-Spectral Time-Domain Methods: Mathematical Insights and Applications*
  Presenter: Carlos Spa (contributed), Barcelona Supercomputing Center

12:00 - 12:30

Group Photo

Redpath Hall
Please join us outside Redpath Hall for a group photo.

12:30 - 13:30

Lunch

Redpath Hall
A complimentary lunch will be provided.

13:30 - 14:30

Plenary Speaker

Leacock Building - Room 132
Chair: Jie Shen, Eastern Institute of Technology

Presenter: Jing-mei Qiu, University of Delaware

Low rank tensor methods for high dimensional time-dependent PDEs

14:30 - 16:00

Scientific Sessions

MS 116 Numerical methods for complex wave propagation problems

Bronfman 423
Theophile Chaumont-Frelet, Markus Melenk

- **14:30 - 15:00** *Radial PML-type Techniques for Wave Scattering Problems: Real Versus Complex Coordinate Transformations*
  Presenter: Li-Lian Wang, Nanyang Technological University
- **15:00 - 15:30** *On Edge Multiscale Space based Hybrid Schwarz Preconditioner for Helmholtz Problems with Large Wavenumbers*
  Presenter: Guanglian Li, The University of Hong Kong
- **15:30 - 16:00** *Preasymptotic Error Estimates of EEM and CIP-EEM for the Time-Harmonic Maxwell Equations with Large Wave Number*
  Presenter: Haijun Wu, Nanjing University

MS 117 Advances in High-order CFD Methods: Numerical Methods and High-performance Computing

Leacock 26
Hojun You, Jin Seok Park, Jae-Hun Jung, Sehun Chun

- **14:30 - 15:00** *High-Order Implicit Time Marching Schemes Based on Temporal Reconstruction for Compressible Navier-Stokes Solvers*
  Presenter: Hanyu Zhou, Tsinghua University
- **15:00 - 15:30** *Towards High-Order Spinning Disk Reactor Simulations Using a Stabilized Navier-Stokes Solver*
  Presenter: Saavedra Prieto, Polytechnique Montreal
- **15:30 - 16:00** *Geometric adaptive smoothed aggregation multigrid for Discontinuous Galerkin discretisations*
  Presenter: Per-Olof Persson, UC Berkeley

MS 119 Machine learning enhanced numerical methods for nonlinear partial differential equations

Bronfman 210
David Del Rey Fernandez, Nathaniel Trask

- **14:30 - 15:00** ~~*Exactly Conservative Physics-Informed Neural Networks and Deep Operator Networks for Dynamical Systems*~~
  Presenter: Elsa Cardoso-Bihlo, Memorial University of Newfoundland
- **15:00 - 15:30** *Sample-Efficient Active Learning Strategies with Generalized Christoffel Functions for Nonlinear PDEs*
  Presenter: Nick Dexter, Florida State University
- **15:30 - 16:00** *Enriching Continuous Lagrange Finite Element Approximation Spaces Using Neural Networks*
  Presenter: Frédérique Lecourtier, Inria Grand-Est, Strasbourg, France

MS 121 Spectral and High-order Methods for Complex PDEs: Medium, Oscillation and Singularity

Bronfman 310
Yongyong Cai, Lilian Wang

- **14:30 - 15:00** *Informed Normalized Gradient Flow Method for Parameterized Schrödinger Operators: A Case Study on Photonic Graphene*
  Presenter: Emmanuel Lorin, Carleton University
- **15:00 - 15:30** *Multidomain Fourier-Chebyshev Spectral Method for Computing Rogue Waves in the Nonlinear Schrödinger Equation*
  Presenter: Sheng Chen, Beijing Normal University
- **15:30 - 16:00** *A Bayesian Framework for Spectral Reprojection*
  Presenter: Anne Gelb (contributed), Dartmouth College

MS 123 Advanced stabilization methods for high-order discretizations of hyperbolic problems

Leacock 110
Dmitri Kuzmin, Andres Rueda-Ramrez

- **14:30 - 15:00** *Stable Volume Dissipation for High-Order Finite-Difference and Spectral-Element Methods with the Summation-by-Parts Property*
  Presenter: Alex Bercik, University of Toronto
- **15:00 - 15:30** *A Novel Active Flux Method for Accurate Multifluid Simulations*
  Presenter: Lorenzo Micalizzi, North Carolina State University
- **15:30 - 16:00** *Higher-Order, Bound-Preserving Methods for Variably Saturated Flow In Porous Media*
  Presenter: Chris Kees, Louisiana State University

MS 128 High-Order Methods for Interpolation, Integration, and Differentiation of Regular Functions on High-Dimensional Flat and Manifold Domains

Leacock 232
Michael Hecht, Phil-Alexander Hofmann, Gentian Zavalani

- **14:30 - 15:00** *Fast Summation of Stokes Potentials Using the DMK Framework*
  Presenter: Anna-Karin Tornberg, KTH Mathematics
- **15:00 - 15:30** *The Fast Newton Transform: Fast Interpolation in Downward Closed Spaces Reaching the Optimal Geometric Approximation Rates for Bos-Levenberg-Trefethen Functions*
  Presenter: Phil-Alexander Hofmann, Helmholtz-Zentrum Dresden-Rossendorf
- **15:30 - 16:00** ~~*A Fast and Accurate Method for Close-to-Touching Rigid Body Interactions*~~
  Presenter: Daniel Fortunato, Flatiron Institute

MS 132 Advances in provably stable high-order discretizations of non-linear PDEs and their applications

Bronfman 422
Anita Gjesteland, Zelalem Worku, Jesse Chan

- **14:30 - 15:00** *A Simple and Robust Adaptive Flux Reconstruction Shock-Capturing Method for the Nonlinearly Stable Flux Reconstruction High-Order Method*
  Presenter: Sai Shruthi Srinivasan, McGill University
- **15:00 - 15:30** *Structure-Preserving Limiting Methods for Fluid Flows Derived from the Boltzmann Equation*
  Presenter: Tarik Dzanic, Lawrence Livermore National Lab
- **15:30 - 16:00** *TBD*

MS 133 Conservation of differential constraints in hyperbolic systems with high order methods

Leacock 219
Walter Boscheri, Francesco Fambri, Maria Han Veiga, Raphal Loubre, Vincent Perrier

- **14:30 - 15:00** *Differential and Algebraic Constraints in Numerical MHD: Preserving and Linking Divergence-Free and Positivity Properties*
  Presenter: Kailiang Wu, Southern University of Science and Technology
- **15:00 - 15:30** *A High-Order Divergence Free Spectral Difference Method*
  Presenter: Maria Han Veiga, Ohio State University

- **15:30 - 16:00** *Higher Order PCP Methods for Constrained Systems — Applications to MHD and Relativistic MHD*
  Presenter: Dinshaw Balsara, University of Notre Dame

MS 135 Recent Advances in High-Order Methods for Numerical Weather Prediction
Armstrong 375
Carlos A. Pereira, Shoyon Panday, Stphane Gaudreault, Philipp Birken

- **14:30 - 15:00** *Low Mach Preconditioning for Atmospheric Flow Simulations*
  Presenter: Shoyon Panday, Environment and Climate Change Canada (ECCC)
- **15:00 - 15:30** ~~*Accelerating Numerical Weather Prediction: Strengths and Shortcomings of Recycling Techniques and Integrating Machine Learning*~~
  Presenter: Yuesheng Xu, Environment and Climate Change Canada (ECCC)
- **15:30 - 16:00** *Multirate Integrators for Nonlinearly Partitioned Equations*
  Presenter: Tommaso Buvoli, Tulane University

MS 136 High-order Algorithms, Software and Applications for Exascale
Bronfman 410
Misun Min, Paul Fischer, Tzanio Kolev

- **14:30 - 15:00** *On Efficiency of High-Order Methods for Scale-Resolving Simulation of Compressible Flows on Aurora*
  Presenter: James Ray Wright III, University of Colorado Boulder
- **15:00 - 15:30** *Dispersion in the SEM: Closing Spectral Gaps by Filtering*
  Presenter: James Lottes, Google
- **15:30 - 16:00** *Scaling High-Order Poisson Problems for Exascale Platforms*
  Presenter: Paul Fischer, University of Illinois

MS 138 High-Order Methods for Kinetic Equations and Moment Methods
Arts Building W-120
James McDonald, Clinton Groth

- **14:30 - 15:00** *High-Order Micro-Macro Decomposition Schemes for Boltzmann-BGK*
  Presenter: James Rossmanith, Iowa State University
- **15:00 - 15:30** *Inferring Kinetic Collision Operators from Molecular Dynamics*
  Presenter: B.W.T. Gieling, Eindhoven University of Technology
- **15:30 - 16:00** *Variational Multiscale Moment Closure to Extend the Navier-Stokes Equations for Rarefied Transport*
  Presenter: Michael Abdelmalik, TU Eindhoven

MS 149 Spectral and high-order methods in computational quantum physics
Bronfman 46
Jason Kaye

- **14:30 - 15:00** *Adaptive Diagonal Basis Sets for Electronic Structure Theory*
  Presenter: Michael Lindsey, UC Berkeley
- **15:00 - 15:30** *DFT-FE: Fast, Accurate and Large-Scale Ab-Initio Calculations for Materials Modeling*
  Presenter: Vikram Gavini, University of Michigan
- **15:30 - 16:00** *High-Order Methods for Brillouin Zone Integration of Green's Functions and Their Van Hove Singularities*
  Presenter: Lorenzo Xavier Van Munoz, Massachusetts Institute of Technology

16:00 - 16:30

Coffee Break

Leacock and Bronfman Buildings

16:30 - 18:00

Scientific Sessions

MS 108 Recent progress in Higher-Order Numerical Integration
Armstrong 375
Patrick Joly, Maryna Kachanovska, Zos Moitier

- **16:30 - 17:00** *High-order methods for Brillouin zone integration in electronic structure*
  Presenter: Ewen Lallinec, Laboratoire de Mathématiques d'Orsay
- **17:00 - 17:30** *Adaptive Green's function integration over Bloch wavevectors explicitly handling complex singularities*
  Presenter: Alex Barnett, Flatiron Institute, Simons Foundation
- **17:30 - 18:00** ~~*A high-order numerical method for solving non-periodic scattering problems in three-dimensional bi-periodic structures*~~
  Presenter: Ruming Zhang, Technical University of Berlin

MS 116 Numerical methods for complex wave propagation problems
Bronfman 423
Theophile Chaumont-Frelet, Markus Melenk

- **16:30 - 17:00** *Generalized Optimized Schwarz Method for the solution to FEM-BEM coupling applied to Helmholtz problems*
  Presenter: Xavier Claeys, ENSTA
- **17:00 - 17:30** *Stable integral equations for Helmholtz problems with piecewise Lipschitz coefficients*
  Presenter: Gräßle Benedikt, University of Zurich
- **17:30 - 18:00** *On the redundancy of regularity splittings for k-explicit hp-FEM analysis of the Helmholtz equation*
  Presenter: Martin Halla, Karlsruhe Institut of Technology

MS 117 Advances in High-order CFD Methods: Numerical Methods and High-performance Computing
Leacock 26
Hojun You, Jin Seok Park, Jae-Hun Jung, Sehun Chun

- **16:30 - 17:00** *A spectral element continuous Galerkin Lattice Boltzmann method with flux boundary condition*
  Presenter: Saumil Patel, Argonne National Laboratory
- **17:00 - 17:30** *Topological analysis with persistent homology of vascular flows by Nek5000*
  Presenter: Jae-Hun Jung, POSTECH
- **17:30 - 18:00** *Anisotropic h-adaptation on unstructured grids for modal Discontinuous Galerkin schemes with application to aircraft configurations*
  Presenter: Anton Schotte (contributed), ONERA

MS 119 Machine learning enhanced numerical methods for nonlinear partial differential equations
Bronfman 210
David Del Rey Fernandez, Nathaniel Trask

- **16:30 - 17:00** *Fast Neural Network Solvers for Nonlinear Conservation Laws*
  Presenter: Jue Yan, Iowa State University
- **17:00 - 17:30** *A graph neural network-based reduced-order modeling for shape optimization: Application to multi-objective fluid-acoustics optimization*
  Presenter: Farnoosh Hadizadeh, The University of British Columbia

- **17:30 - 18:00** *A finite element-inspired hypergraph neural network: Applications to modeling periodic and chaotic fluid flow*
  Presenter: Rui Gao, University of British Columbia

MS 123 Advanced stabilization methods for high-order discretizations of hyperbolic problems
Leacock 110
Dmitri Kuzmin, Andres Rueda-Ramrez

- **16:30 - 17:00** *Shock-capturing WENO quadrature for dissipative stabilization terms in high-order finite element discretizations of hyperbolic problems*
  Presenter: Joshua Vedral, TU Dortmund University
- **17:00 - 17:30** *A bound preserving and conservative enriched Galerkin method for elliptic problems*
  Presenter: Andreas Rupp, Saarland University
- **17:30 - 18:00** *Unconditionally stable high-resolution implicit numerical schemes for some hyperbolic problems*
  Presenter: Peter Frolkovič, Slovak University Of Technology

MS 128 High-Order Methods for Interpolation, Integration, and Differentiation of Regular Functions on High-Dimensional Flat and Manifold Domains
Leacock 232
Michael Hecht, Phil-Alexander Hofmann, Gentian Zavalani

- **16:30 - 17:00** ~~*Logarithmic Fourier spectral methods for coherent structures*~~
  Presenter: Keaton J. Burns, Massachusetts Institute of Technology
- **17:00 - 17:30** *Local polynomial reproduction on embedded manifolds*
  Presenter: Thomas Hangelbroek, University of Hawaii
- **17:30 - 18:00** *Kernel based multilevel methods*
  Presenter: Christian Rieger, Philipps-Universität Marburg

MS 132 Advances in provably stable high-order discretizations of non-linear PDEs and their applications
Bronfman 422
Anita Gjesteland, Zelalem Worku, Jesse Chan

- **16:30 - 17:00** *Entropy-stable discontinuous Galerkin methods for the spherical shallow water equations in flux form*
  Presenter: Tristan Montoya, University of Cologne
- **17:00 - 17:30** *Stable and non-dissipative kinetic-energy and entropy preserving high-order flux reconstruction (KEEP-FR) schemes for*

compressible flows
Presenter: Issei Homma, Tohoku University

- **17:30 - 18:00** *Numerical Dissipation Control in High Order Methods for Compressible Turbulence: Recent Development*
  Presenter: Dmitry V. Kotov, Independent Researcher

MS 133 Conservation of differential constraints in hyperbolic systems with high order methods
Leacock 219
Walter Boscheri, Francesco Fambri, Maria Han Veiga, Raphal Loubre, Vincent Perrier

- **16:30 - 17:00** *A structure-preserving numerical scheme for MHD equations*
  Presenter: Andrea Thomann, Inria Université de Strasbourg
- **17:00 - 17:30** *Development of a Magnetohydrodynamics Solver with a Generalized Lagrange Multiplier Approach to Divergence Cleaning in VERTEX-CFD*
  Presenter: Doug Stefanski, Oak Ridge National Laboratory
- **17:30 - 18:00** *Bound Preserving Lax-Wendroff Flux Reconstruction Method for Special Relativistic Hydrodynamics*
  Presenter: Sujoy Basak (contributed), Indian Institute of Technology Delhi

MS 138 High-Order Methods for Kinetic Equations and Moment Methods
Arts Building W-120
James McDonald, Clinton Groth

- **16:30 - 17:00** *Symmetric Gauss-Seidel method with a preconditioned fixed-point iteration for the steady-state Boltzmann equation*
  Presenter: Zhenning Cai, National University of Singapore
- **17:00 - 17:30** *Towards a Model-Adaptive High-Order Discontinuous Galerkin Scheme for Hierarchical Moment Equations*
  Presenter: Matthias Geratz, RWTH Aachen University
- **17:30 - 18:00** *A GPU-Accelerated High-Order Discontinuous-Galerkin-Hancock Method for Moment Equations*
  Presenter: Osman El-Ghotmi, University of Ottawa

MS 144 Robust and Efficient Numerical Methods of Nonlocal Models
Bronfman 310
Zhaopeng Hao, Xiaobo Yin

- **16:30 - 17:00** *Finite element approximation of a fractional p-Laplacian*
  Presenter: Juan Pablo Borthagaray, Universidad de la República
- **17:00 - 17:30** ~~*Solvers for the Fractional Fokker-Planck Equation with Singular Initial Conditions and Their Applications*~~
  Presenter: Qihao Ye, University of California, San Diego

- **17:30 - 18:00** ~~*A walk-on-sphere-motivated finite difference method for the fractional Poisson equation on a bounded d-dimensional domain*~~
  Presenter: Daxin Nie, Lanzhou university

Contributed Talks 1
Bronfman 410
Bruno Blais

- **16:30 - 17:00** *A simple new methodology for generating inflow turbulent boundary layers for (i)LES*
  Presenter: Rodrigo Costa Moura (contributed), Instituto Tecnológico de Aeronáutica
- **17:00 - 17:30** *Adaptive spectral-element simulation of vortex dominated flows*
  Presenter: Daniele Massaro (contributed), Massachusetts Institute of Technology
- **17:30 - 18:00** *Implicit LES of a low Re and nearly incompressible flow over a triangular airfoil*
  Presenter: Rodrigo C Moura (contributed), Instituto Tecnológico de Aeronáutica

Contributed Talks 2
Bronfman 46
Lilia Krivodonova

- **16:30 - 17:00** *High-Order Shock Capturing on Moving Grids using Discontinuous Galerkin Spectral Element Methods*
  Presenter: Anna Schwarz (contributed), University of Stuttgart
- **17:00 - 17:30** *Efficient Entropy Stable Discontinuous Galerkin Spectral Element Implementation on Heterogeneous Grids*
  Presenter: Jens Keim (contributed), University of Stuttgart
- **17:30 - 18:00** *A Finite Volume Algorithm Boosted by a Limited Gradient Approach at Neighboring Cell Interfaces on Unstructured Grid for the Shallow Water Equations*
  Presenter: Nuray Öktem (contributed), Ankara Yıldırım Beyazıt University

Wednesday July 16th

Last Updated July 11th, 2025

7:30 - 12:00

Check-In

Leacock Building

8:30 - 9:30

Plenary Speaker

Leacock Building - Room 132
Chair: Spencer Sherwin, Imperial College London

Presenter: Tzanio Kolev, Lawrence Livermore National Laboratory

High-Order Finite Elements for Exascale Applications

9:30 - 10:00

Coffee Break

Leacock Building

10:00 - 12:00

Scientific Sessions

MS 108 Recent progress in Higher-Order Numerical Integration
Armstrong 375
Patrick Joly, Maryna Kachanovska, Zos Moitier

- **10:00 - 10:30** *Numerical Steepest Descent method for oscillatory integrals with singular phase functions*
  Presenter: Thomas Caussade, University College London
- **10:30 - 11:00** *On numerical methods via quadrature for computing integrals on fractal sets*
  Presenter: Patrick Joly, INRIA
- **11:00 - 11:30** *Numerical quadrature for singular integrals on fractal sets*
  Presenter: David Hewett, University College London
- **11:30 - 12:00** *Implementing the Legendre Wavelets Integration Method to Solve Partial Differential Equations*
  Presenter: Aktham Mansi (contributed),

MS 114 Advances in numerical methods for multi-physics problems and applications
Leacock 26
Stefano Bonetti, Francesca Bonizzoni, Mattia Corti, Franco Dassi, Ivan Fumagalli

- **10:00 - 10:30** *Adaptive Polytopal Discontinuous Galerkin Approximations of Neuronal Electrophysiology*
  Presenter: Stefano Pagani, Politecnico di Milano
- **10:30 - 11:00** *The virtual element method for crack propagation in materials*
  Presenter: Gianmarco Manzini, Los Alamos National Laboratory
- **11:00 - 11:30** *Pressure and convection robust time-DG schemes for the Navier-Stokes equation*
  Presenter: Lourenco Beirao da Veiga, University of Milano-Bicocca
- **11:30 - 12:00** *Polytopal schemes for flows in fractured porous media*
  Presenter: Jerome Droniou, CNRS & University of Montpellier

MS 115 High Order Approximation and Operator Learning in SciML
Bronfman 423
Carlo Marcati, Christoph Schwab

- **10:00 - 10:30** *Exploiting Low-dimensional Data Structures by Deep Neural Networks with Applications in Operator Learning*
  Presenter: Hao Liu, Hong Kong Baptist University
- **10:30 - 11:00** *Variationally correct methods for model reduction of parameterized (transport) equations by neural networks*
  Presenter: Mathias Oster, RWTH Aachen
- **11:00 - 11:30** *Data Complexity Estimates for Operator Learning*
  Presenter: Nikola Kovachki, NVIDIA
- **11:30 - 12:00** *Optimal deep learning of holomorphic operators between Banach spaces*
  Presenter: Nick Dexter, Florida State University

MS 119 Machine learning enhanced numerical methods for nonlinear partial differential equations
Bronfman 210
David Del Rey Fernandez, Nathaniel Trask

- **10:00 - 10:30** *Machine learning enhanced summation-by-parts discretizations*
  Presenter: Andrew Christian Gray, University of Waterloo

- **10:30 - 11:00** *Stabilization of the Gradient Method for the Solving of Linear Systems*
  Presenter: Ibrahima Dione, Université de Moncton
- **11:00 - 11:30** *Discontinuous Galerkin method based on compact SIAC reconstruction*
  Presenter: Lyes Tezkratt, ONERA
- **11:30 - 12:00** *A Surrogate Model for Efficient Quantification of Uncertainties in Fish Population Dynamics*
  Presenter: Mohammed Seaid (contributed), Mohammed VI Polytechnic University

MS 125 Novel Methods for wave problems and integral equations
Leacock 219
Oscar Bruno, Mark Lyon

- **10:00 - 10:30** *Evaluation of time domain wave scattering for trapping obstacles via frequency domain singularity subtraction*
  Presenter: Manuel A. Santana, California Institute of Technology
- **10:30 - 11:00** *Robust, High-Order Discretization of Hyperbolic Action Principles*
  Presenter: Thomas Hagstrom, Southern Methodist University
- **11:00 - 11:30** *On Stable High-Order Boundary Conditions for Wave Equations*
  Presenter: Mark Lyon, University of New Hampshire
- **11:30 - 12:00** *Multi-patches/multiple-scattering frequency-time hybrid solvers for wave equation problems*
  Presenter: Tao Yin, Academy of Mathematics and Systems Science, Chinese Academy of Sciences

MS 128 High-Order Methods for Interpolation, Integration, and Differentiation of Regular Functions on High-Dimensional Flat and Manifold Domains
Leacock 232
Michael Hecht, Phil-Alexander Hofmann, Gentian Zavalani

- **10:00 - 10:30** ~~*High-order integration and spectral methods on static and evolving surfaces*~~
  Presenter: Gentian Zavalani, TU Dresden
- **10:30 - 11:00** *Convergence analysis of hypersingular integral equations of first kind using spectral projection methods*
  Presenter: Saloni Gupta, Indian Institute of Technology Jodhpur

- **11:00 - 11:30** *Numerical solutions of the two to six dimensional Poisson eigenvalue problem with radial basis functions*
  Presenter: Edward J Kansa (contributed), Convergent Solutions
- **11:30 - 12:00** *Computing whispering gallery modes for spherical symmetric heterogeneous Helmholtz problems with piecewise smooth refractive index*
  Presenter: Bouchra Bensiali (contributed),

MS 132 Advances in provably stable high-order discretizations of non-linear PDEs and their applications

Bronfman 422
Anita Gjesteland, Zelalem Worku, Jesse Chan

- **10:00 - 10:30** *Maximum principle preserving and entropy stable time implicit DGSEM for degenerate parabolic equations*
  Presenter: Michael Pio Basile,ONERA
- **10:30 - 11:00** *Entropy-Stable High-Order Methods for the Compressible Euler Equations in Potential Temperature Formulation for Atmospheric Flows*
  Presenter: Marco Artiano, Johannes Gutenberg University Mainz
- **11:00 - 11:30** *Comparison of structure preserving schemes for the stochastic Galerkin shallow water equations*
  Presenter: Philipp Öffner, TU Clausthal
- **11:30 - 12:00** ~~*Efficient space-time discontinuous Galerkin discretization for computational fluid dynamics*~~
  Presenter: Florent Renac, ONERA

MS 137 Advances in Structure-Preserving Discretizations for Wave Propagation Problems

Bronfman 410
Manuel Sanchez, Jeonghun Lee

- **10:00 - 10:30** *Structure-preserving time-splitting schemes for the cold-plasma model using Finite Element Exterior Calculus*
  Presenter: Elena Moral Sánchez, Max Planck Institute of Plasma Physics
- **10:30 - 11:00** *Symplectic Discontinuous Galerkin Methods for Nonlinear Shallow Water Equations*
  Presenter: Manuel Sanchez, Pontificia Universidad Catolica de Chile
- **11:00 - 11:30** *An hp Multigrid Approach for Tensor-Product Space-Time Finite Element Discretizations of Wave Equations*
  Presenter: Nils Margenberg, Helmut Schmidt University
- **11:30 - 12:00** *On the stability of perfectly matched layer for the elastic wave equation in layered media*
  Presenter: Siyang Wang, Umea University

MS 138 High-Order Methods for Kinetic Equations and Moment Methods
Arts Building W-120
James McDonald, Clinton Groth

- **10:00 - 10:30** *High-Order Flux Reconstruction Methods for Hyperbolic Moment Closures*
  Presenter: Clinton Groth, University of Toronto
- **10:30 - 11:00** *Asymptotic-preserving and energy stable dynamical low-rank approximation for thermal radiative transfer equations*
  Presenter: Chinmay Patwardhan, Karlsruhe Institute of Technology
- **11:00 - 11:30** *Asymptotic preserving micro-macro decomposition scheme for the kinetic Boltzmann-ES-BGK equation*
  Presenter: Preeti Sar, Oak Ridge National Laboratory
- **11:30 - 12:00** *Quinpi: integrating hyperbolic conservation laws with high order implicit schemes*
  Presenter: Gabriella Puppo (contributed), Università di Roma La Sapienza

MS 144 Robust and Efficient Numerical Methods of Nonlocal Models
Bronfman 310
Zhaopeng Hao, Xiaobo Yin

- **10:00 - 10:30** ~~*Entropy Stability in Numerical Schemes for Nonlocal Conservation Laws in Traffic Flow Modeling*~~
  Presenter: Kuang Huang, The Chinese University of Hong Kong
- **10:30 - 11:00** *A well-posed peridynamic neural operator for modeling complex material responses*
  Presenter: Jihong Wang, Lehigh university
- **11:00 - 11:30** ~~*A scalable solver for a class of variable-order fractional diffusion problems*~~
  Presenter: Wenyu Lei, University of Electronic Science and Technology of China
- **11:30 - 12:00** *Approximation of partial differential equations with incomplete input data*
  Presenter: Diane Guignard, University of Ottawa

MS 149 Spectral and high-order methods in computational quantum physics
Bronfman 46
Jason Kaye

- **10:00 - 10:30** *Integral formulation of Dirac singular waveguides*
  Presenter: Solomon Quinn, Flatiron Institute

- **10:30 - 11:00** *Momentum Space Algorithm for Electronic Structure of Double-Incommensurate Trilayer Graphene*
  Presenter: Daniel Massatt, Flatiron Institute
- **11:00 - 11:30** *High-order wave packet approximations to non-normalizable eigenstates*
  Presenter: Andrew Horning, Rensselaer Polytechnic Institute
- **11:30 - 12:00** *Fourth-Order Accurate Compact Scheme for First-Order Maxwell's Equations*
  Presenter: Semyon Tsynkov (contributed), NC State University

Contributed Talks 3
Leacock 110
Sigal Gottlieb

- **10:00 - 10:30** *Numerical Analysis of Viscosity-Splitting Methods for Generalized Newtonian Fluids*
  Presenter: Driss Yakoubi (contributed), Léonard De Vinci Pole Universitaire
- **10:30 - 11:00** *A Semi-Lagrangian Adaptive-Rank (SLAR) Method for Wigner-Poisson Equations*
  Presenter: Sining Gong (contributed), Michigan State University
- **11:00 - 11:30** *Low-Dimensional Approximation of Function Spaces of Interior Regularity*
  Presenter: Sandra Aziz (contributed), Universität Bayreuth
- **11:30 - 12:00** *TBD*

12:00 - 13:30

Lunch

Lunch not provided.

13:30 - 18:00

Excursions

Please follow the instructions provided on your excursion ticket.

Thursday July 17th

Last Updated July 11th, 2025

7:30 - 18:00

Check-In

Leacock Building

8:30 - 9:30

Plenary Speaker

Leacock Building - Room 132
Chair: Fengyan Li, Rensselaer Polytechnic Institute

Presenter: Yan Xu, University of Science and Technology, China

High order well-balanced numerical methods for hyperbolic balance laws

9:30 - 10:00

Coffee Break

Leacock Building

10:00 - 12:00

Scientific Sessions

MS 105 High-order methods for nonlinear PDEs with low regularity and nonlocal terms
Bronfman 410
Bao Weizhu, Yue Feng

- **10:00 - 10:30** *Low regularity integrators for the conservative Allen-Cahn equation with a nonlocal constraint*
  Presenter: Lili Ju, University of South Carolina
- **10:30 - 11:00** *High-order splitting finite element methods for the subdiffusion equation with limited smoothing property*
  Presenter: Zhi Zhou, The Hong Kong Polytechnic University
- **11:00 - 11:30** *Low-Regularity Estimates of Time-Splitting and Spectral Method for Schrodinger Equations with Non-differentiable Nonlinearity*
  Presenter: Li-Lian Wang, Nanyang Technological University
- **11:30 - 12:00** *Long-time error bounds of low-regularity integrators for nonlinear Schrödinger equations*
  Presenter: Yue Feng, Xi'an Jiaotong University

MS 109 Recent advances on the analysis of high-order Boundary Element Methods for wave propagation problem
Bronfman 46
Emanuele Arcese, Matthias Baray, Luca Desiderio

- **10:00 - 10:30** *Analysis of h-convergence of a virtual element approximation-based BEM in electromagnetism for non-smooth geometries*
  Presenter: Sébastien Pernet, ONERA
- **10:30 - 11:00** *An Energetic Boundary Integral Non-Reflecting Condition for a 3D elastodynamic problems*
  Presenter: Alessandra Jannelli, University of Messina
- **11:00 - 11:30** *Space-Time Energetic Galerkin BEM for the numerical solution of 3D Elastodynamic problems. Overcoming challenges of the strongly singular integral operator.*
  Presenter: Luciano Coppolino, University of Messina
- **11:30 - 12:00** *Space-time adaptive boundary elements for wave equations*
  Presenter: Heiko Gimperlein, University of Innsbruck

MS 111 Advanced numerical methods and mathematical models for compressible multi-phase flows
Armstrong 375
Michael Dumbser, Firas Dhaouadi, Laura del Rio Martin, Ilya Peshkov

- **10:00 - 10:30** *HTC schemes for hyperbolic systems*
  Presenter: Michael Dumbser, University of Trento
- **10:30 - 11:00** *A positive- and bound-preserving vectorial lattice Boltzmann method in two dimensions*
  Presenter: Rémi Abgrall, University of Zurich
- **11:00 - 11:30** *Hyperbolic approximations of phase-field models for two-phase flows*
  Presenter: Christian Rohde, University of Zurich
- **11:30 - 12:00** *Numerical methods for compressible two-phase flows in elastic media*
  Presenter: Laura del Rio, University of Trento

MS 112 Adaptive and High-Order Numerical Methods for Nonlinear Hyperbolic Problems
Leacock 110
Alina Chertock, Alexander Kurganov

- **10:00 - 10:30** *Divergence-Preserving and Curl-Preserving Prolongation Methods for Mimetic AMR Methods*
  Presenter: Dinshaw Balsara, University of Notre Dame

- **10:30 - 11:00** ~~*A time-continuous embedding method for solving one-dimensional hyperbolic conservation laws on manifolds*~~
  Presenter: Bao-Shan Wang, Ocean University of China
- **11:00 - 11:30** *High-order well-balanced Point-Average-Moment PolynomiAl-interpreted (PAMPA) method for one-dimensional blood models*
  Presenter: Yongle Liu, University of Zurich
- **11:30 - 12:00** *Algorithms of very high space-time orders of accuracy for hyperbolic equations in the semidiscrete WENO-DeC framework*
  Presenter: Lorenzo Micalizzi, North Carolina State University

MS 113 Discrete complexes and polytopal methods: a NEMESIS minisymposium

Leacock 232
Jerome Droniou, Lourenco Beirao da Veiga, Paola Antonietti, Daniele Di Pietro

- **10:00 - 10:30** *High order structure preserving Lagrangian schemes for the solution of hyperbolic equations on moving polygonal meshes with topology changes*
  Presenter: Elena Gaburro, University of Verona
- **10:30 - 11:00** *A SUPG-Stabilized Virtual Element Method with A Posteriori Error Estimate for the Steady Advection-Reaction Equation*
  Presenter: Mathias Dauphin, Scuola Superiore Meridionale, Naples
- **11:00 - 11:30** *A pressure and convection robust Finite Element Method for non-newtonian Navier-Stokes system*
  Presenter: Kirubell B. Haile, Kirubell B. Haile
- **11:30 - 12:00** *Stabilization-Free Virtual Element Method for a Second Order Eigenproblem*
  Presenter: David Mora, Universidad del Bio-Bio

MS 114 Advances in numerical methods for multi-physics problems and applications

Leacock 26
Stefano Bonetti, Francesca Bonizzoni, Mattia Corti, Franco Dassi, Ivan Fumagalli

- **10:00 - 10:30** *A posteriori error analysis for a coupled Stokes-poroelastic system with multiple compartments*
  Presenter: Marco Verani, Politecnico di Milano
- **10:30 - 11:00** *Riemannian optimisation methods for ground states of multicomponent Bose-Einstein condensates*
  Presenter: Daniel Peterseim, University of Augsburg
- **11:00 - 11:30** *Hybridization of strongly anisotropic mixed systems on arbitrary meshes with HDG*
  Presenter: Jan Nikl, Lawrence Livermore National Laboratory

- **11:30 - 12:00** *A Reynolds Semi-Robust and Pressure-Robust Hybrid high-order method for the solution of the incompressible navier-stokes equations on general meshes*
  Presenter: Daniel Castanon Quiroz, IIMAS-UNAM

MS 125 Novel Methods for wave problems and integral equations
Leacock 219
Oscar Bruno, Mark Lyon

- **10:00 - 10:30** *Multiple Traces Formulation for Elastic Wave Scattering by Piecewise Homogeneous Domains*
  Presenter: Stephanie Chaillat, CNRS
- **10:30 - 11:00** *High-order methods for wave equations with implicit time integration and pseudospectral approximations*
  Presenter: Songting Luo, Iowa State University
- **11:00 - 11:30** *High-accuracy BIE strategies for spectral optimization*
  Presenter: Nilima Nigam, Simon Fraser University
- **11:30 - 12:00** *Fast and provably high-order accurate volume integral operators, with application to inhomogeneous PDEs and scattering*
  Presenter: Thomas Geoffrey Anderson, Rice University

MS 127 Robust and structure preserving high order numerical methods for PDEs
Arts Building W-120
Kenneth Duru, Kieran Ricardo, David Lee, Tom Hagstrom

- **10:00 - 10:30** *A Penalty Approach for Solving the Anisotropic Diffusion Equation in Magnetic Fields*
  Presenter: Dean Muir, Australian National University
- **10:30 - 11:00** *Energy and entropy conservation for the thermal shallow water equations*
  Presenter: Tamara A. Tambyah, Monash University
- **11:00 - 11:30** *From exact space-time symmetry conservation to automatic mesh refinement in discrete IBVPs*
  Presenter: Alexander Rothkopf, Korea University
- **11:30 - 12:00** *Combining radial basis functions with summation-by-parts operators for stable mesh-free numerical methods*
  Presenter: Joshua Lampert, University of Hamburg

MS 130 Recent advances in high-fidelity methods and applications

Bronfman 310
Huiyuan Li, Zhiguo Yang

- **10:00 - 10:30** ~~*Optimal Error Estimates for Gegenbauer Approximations in Fractional Spaces*~~
  Presenter: Wenjie Liu, Harbin Institute of Technology
- **10:30 - 11:00** ~~*An efficient spectral collocation method for the truncated nonlocal Laplacian with its applications*~~
  Presenter: Zhaopeng Hao, Southeast University
- **11:00 - 11:30** *Sparse discovery of differential equations based on multi-fidelity Gaussian process*
  Presenter: Yue Qiu, Chongqing University
- **11:30 - 12:00** *A Reinforcement Learning-Based Multi-Objective Graph Partitioning Method*
  Presenter: Yupeng Wang, Institute of Software, Chinese Academy of Sciences

MS 132 Advances in provably stable high-order discretizations of non-linear PDEs and their applications

Bronfman 422
Anita Gjesteland, Zelalem Worku, Jesse Chan

- **10:00 - 10:30** *Discontinuous Galerkin Methods for Kinetic Equations with Flexible Coordinates: Conservation Relations, L^2 stability, and more*
  Presenter: James Juno, Princeton Plasma Physics Laboratory
- **10:30 - 11:00** *Challenges in the design of entropy-stable fluxes for nonconservative systems*
  Presenter: Patrick Ersing, Linköping University
- **11:00 - 11:30** *Non-constant bathymetry and its impact on stable open boundary conditions for shallow water flows*
  Presenter: Andrew R Winters, Linköping University
- **11:30 - 12:00** *A Cost-Minimizing Approach to Address Temporal Entropy Change*
  Presenter: Carolyn M. V. Pethrick, McGill University

MS 134 Finite Elements for Structure Preservation

Bronfman 423
Charles William Parker, Pablo Brubeck

- **10:00 - 10:30** *Error estimators for IPDG in the natural energy norm*
  Presenter: Théophile Chaumont-Frelet, Linköping University

- **10:30 - 11:00** *High-order finite element schemes for three-dimensional multicomponent convection-diffusion*
  Presenter: Aaron Baier-Reinio, University of Oxford
- **11:00 - 11:30** *High-order Taylor-Hood finite element methods for the surface Stokes problem*
  Presenter: Michael Neilan, University of Pittsburgh
- **11:30 - 12:00** *Characteristic Boundary Conditions for Hybrid Discontinuous Galerkin Methods*
  Presenter: Philip Lukas Lederer, Universität Hamburg

MS 148 Theoretical Development and Industrial Application of Flux Reconstruction Methods
Bronfman 210
Brian Vermeire, Freddie Witherden, Peter Vincent

- **10:00 - 10:30** *Fully-discrete spatial eigenanalysis of discontinuous spectral element methods*
  Presenter: Niccolò Tonicello, International School for Advanced Studies
- **10:30 - 11:00** *Large-Eddy Simulation of low-Reynolds Turbine and Compressor Profiles using a Flux Reconstruction Navier-Stokes Solver*
  Presenter: Fernando Gisbert, ITP Aero
- **11:00 - 11:30** *A Variable Filtering Approach for Discontinuity Resolution with Flux Reconstruction*
  Presenter: Kyle Schau, Texas A&M University
- **11:30 - 12:00** *A Hybridized Flux Reconstruction Solver for Hyperbolic Elasticity*
  Presenter: Abhishek Barat, Concordia University

12:00 - 13:30

Lunch

Lunch not provided.

13:30 - 14:30

Plenary Speaker

Leacock Building - Room 132
Chair: Weizhu Bao, National University of Singapore

Presenter: Andrea Beck, University of Stuttgart

Efficient Solution Strategies for Multiscale Flow Problems: Combining Adaptive High Order Discretizations, Models and Data

14:30 - 16:00

Scientific Sessions

MS 105 High-order methods for nonlinear PDEs with low regularity and nonlocal terms

Bronfman 410
Bao Weizhu, Yue Feng

- **14:30 - 15:00** *Spectral/spectral-element methods for computing eigenvalues of the Schroedinger operator and applications*
  Presenter: Weizhu Bao, National University of Singapore
- **15:00 - 15:30** *Numerical methods for the nonlinear Schrödinger equation with low regularity or singularity*
  Presenter: Chushan Wang, National University of Singapore
- Leacock Building - Room 132

  15:30 - 16:00 *Sparse Solutions of Nonlinear PDEs with RBF Networks*
  Presenter: Xiaochuan Tian, University of California, San Diego

MS 109 Recent advances on the analysis of high-order Boundary Element Methods for wave propagation problem

Bronfman 46
Emanuele Arcese, Matthias Baray, Luca Desiderio

- **14:30 - 15:00** *Higher order boundary element formulation in time domain based on IGA and CQM*
  Presenter: Martin Schanz, Graz University of Technology
- **15:00 - 15:30** *A Low-Frequency-Stable Higher-Order Isogeometric Discretization of the Augmented Electric Field Integral Equation*
  Presenter: Maximilian Nolte, Technische Universität Darmstadt
- **15:30 - 16:00** *Simple Helmholtz Decomposition of High Order Boundary Elements for Low Frequency Electromagnetics with Applications to Eddy Current Testing*
  Presenter: Edouard Demaldent, CEA

MS 111 Advanced numerical methods and mathematical models for compressible multi-phase flows

Armstrong 375
Michael Dumbser, Firas Dhaouadi, Laura del Rio Martin, Ilya Peshkov

- **14:30 - 15:00** *Numerical methods for multiphase flow*
  Presenter: Gabriella Puppo, Università di Roma La Sapienza

- **15:00 - 15:30** *A structure preserving discretization of a unified HTC multiphase model of continuum mechanics*
  Presenter: Davide Ferrari, University of Trento
- **15:30 - 16:00** ~~*Thermodynamically compatible modeling of mixtures*~~
  Presenter: Ilya Peshkov, University of Trento

MS 112 Adaptive and High-Order Numerical Methods for Nonlinear Hyperbolic Problems

Leacock 110
Alina Chertock, Alexander Kurganov

- **14:30 - 15:00** *Exploring High-Order Bound-Preserving Numerical Methods and Related Theory*
  Presenter: Kailiang Wu, Southern University of Science and Technology
- **15:00 - 15:30** *Bound- and Positivity-preserving Affine-invariant WENO Scheme for the Five-equation Model of Two-medium Flows*
  Presenter: Yaguang Gu, South China University of Technology
- **15:30 - 16:00** *New Adaptive Low-Dissipation Central-Upwind Schemes*
  Presenter: Shaoshuai Chu, RWTH Aachen University

MS 113 Discrete complexes and polytopal methods: a NEMESIS minisymposium

Leacock 232
Jerome Droniou, Lourenco Beirao da Veiga, Paola Antonietti, Daniele Di Pietro

- **14:30 - 15:00** *Asymptotic Preserving Virtual Element Methods for viscous compressible flows*
  Presenter: Walter Boscheri, CNRS
- **15:00 - 15:30** *A polytopal discontinuous Galerkin method for fluid-poroelastic structure interaction with applications to brain fluid mechanics*
  Presenter: Ivan Fumagalli, Politecnico di Milano
- **15:30 - 16:00** *A Hybrid High-Order Method for Phase-Field Modeling of Fracture Propagation*
  Presenter: Alessandra Crippa, IFP Energies Nouvelles

MS 114 Advances in numerical methods for multi-physics problems and applications

Leacock 26
Stefano Bonetti, Francesca Bonizzoni, Mattia Corti, Franco Dassi, Ivan Fumagalli

- **14:30 - 15:00** *A high-order matrix-free finite element method for hyperbolic problems*
  Presenter: Svetlana Tokareva, Los Alamos National Laboratory

- **15:00 - 15:30** *Discontinuous Galerkin methods for coupled Stokes and porous media flow on general meshes*
  Presenter: Michele Botti, Politecnico di Milano
- **15:30 - 16:00** *A posteriori error estimates and adaptive mesh refinement for VEM*
  Presenter: Stefano Berrone, Politecnico di Torino

MS 115 High Order Approximation and Operator Learning in SciML
Bronfman 423
Carlo Marcati, Christoph Schwab

- **14:30 - 15:00** *Practical existence theorems for deep learning approximation in high dimensions*
  Presenter: Simone Brugiapaglia, Concordia University
- **15:00 - 15:30** *Expression Rates of Neural Operators for Some Elliptic PDEs*
  Presenter: Carlo Marcati, Università di Pavia
- **15:30 - 16:00** *Fundamental order bounds for numerical algorithms on Neural Networks*
  Presenter: Michael Feischl, TU Wien

MS 118 Quantum algorithms for partial differential equations
Arts Building W-120
David Del Rey Fernandez, Frank Gaitan, Ala Shayeghi

- **14:30 - 15:00** *Evaluation of fault-tolerant quantum algorithms for solving classical CFD problems*
  Presenter: Leigh Lapworth, Rolls-Royce plc.
- **15:00 - 15:30** *Nonlinear quantum computing by amplified encodings*
  Presenter: Deiml Matthias, University of Augsburg
- **15:30 - 16:00** *High-order summation-by-parts quantum computing algorithms for the advection equation*
  Presenter: Vyom Patel, University of Waterloo

MS 125 Novel Methods for wave problems and integral equations
Leacock 219
Oscar Bruno, Mark Lyon

- **14:30 - 15:00** *Solution of the Fractional Laplacian problem in terms of weakly-singular volumetric and boundary integral operators*
  Presenter: Sabhrant Sachan, Caltech
- **15:00 - 15:30** *Trefftz methods for approximating electromagnetic scattering problems*
  Presenter: Peter Monk, University of Delaware

- **15:30 - 16:00** *Domain decomposition solvers for the simulation of interaction of waves with infinite lattice arrays of discrete scatterers in two dimensions*
  Presenter: Catalin Turc, new jersey institute of technology

MS 130 Recent advances in high-fidelity methods and applications
Bronfman 310
Huiyuan Li, Zhiguo Yang

- **14:30 - 15:00** *A Novel Pointwise Divergence-Free Spectral Element Method for 3D Spherical Dynamo Equations*
  Presenter: Huiyuan Li, Insititute of Software Chinese Academy of Sciences
- **15:00 - 15:30** *Space-time continuous Galerkin discretization of parabolic equations: error profile and postprocessing*
  Presenter: Lijun Yi, Shanghai Normal University
- **15:30 - 16:00** *On the convergence of Galerkin methods for auto-convolution Volterra integral and integro-differential equations*
  Presenter: Hui Liang, Harbin Institute of Technology, Shenzhen

MS 132 Advances in provably stable high-order discretizations of non-linear PDEs and their applications
Bronfman 422
Anita Gjesteland, Zelalem Worku, Jesse Chan

- **14:30 - 15:00** *Nonlinearly Stable Methods for Wall-Modelled Large Eddy Simulation*
  Presenter: Julien Brillon, McGill University
- **15:00 - 15:30** *Limiters for the Discontinuous Galerkin Method on Quadrilateral Meshes*
  Presenter: Lilia Krivodonova, University of Waterloo
- **15:30 - 16:00** *Implicit BDF2 dual time-stepping positivity-preserving entropy-stable schemes for unsteady compressible viscous flows*
  Presenter: Mohammed Sayyari (contributed), Old Dominion University

MS 148 Theoretical Development and Industrial Application of Flux Reconstruction Methods
Bronfman 210
Brian Vermeire, Freddie Witherden, Peter Vincent

- **14:30 - 15:00** *Conservative direct projection method for non-conforming cell-boundary flux points in stable and non-dissipative kinetic-energy and entropy preserving (KEEP) flux-reconstruction schemes*
  Presenter: Taichi Hattori, tohoku university

- **15:00 - 15:30** *Enabling Scale-Resolving Aerodynamic Optimization with Flux Reconstruction Methods*
  Presenter: Brian Vermeire, Concordia University
- **15:30 - 16:00** *Accuracy Preserving Shock Capturing Techniques for Discontinuous Galerkin and Flux Reconstruction Methods*
  Presenter: H. T. Huynh, NASA Glenn Research Center

16:00 - 16:30

Coffee Break

Leacock and Bronfman Buildings

16:30 - 18:00

Scientific Sessions

MS 105 High-order methods for nonlinear PDEs with low regularity and nonlocal terms
Bronfman 410
Bao Weizhu, Yue Feng

- **16:30 - 17:00** *A fast Fourier spectral method for the linearized Boltzmann collision operator*
  Presenter: Zhenning Cai, National University of Singapore
- **17:00 - 17:30** *Simulation of Droplet Bouncing on Superhydrophobic Microcone Arrays Using the Smoothed Particle Hydrodynamics Method*
  Presenter: Zhonghua Qiao, The Hong Kong Polytechnic University
- **17:40 - 18:10** *Strang--Hermite approach to the Gross--Pitaevskii equation with time dependent potential*
  Presenter: Karolina Kropielnicka, Polish Academy of Sciences

MS 111 Advanced numerical methods and mathematical models for compressible multi-phase flows
Armstrong 375
Michael Dumbser, Firas Dhaouadi, Laura del Rio Martin, Ilya Peshkov

- **16:30 - 17:00** *Implicit numerical schemes for the compressible Cahn-Hilliard-Navier-Stokes equations*
  Presenter: Pep Mulet, University of Valencia
- **17:00 - 17:30** *A thermodynamical compatible scheme for two-phase flow*
  Presenter: Andrea Thomann, Inria Université de Strasbourg
- **17:30 - 18:00** *Numerical analysis for coupled multiphysics problems using the Nitsche approach*

Presenter: Aparna Bansal (contributed), Indian Institute of Technology Roorkee

MS 112 Adaptive and High-Order Numerical Methods for Nonlinear Hyperbolic Problems
Leacock 110
Alina Chertock, Alexander Kurganov

- **16:30 - 17:00** *Local Characteristic Decomposition of Equilibrium Variables for Hyperbolic Systems of Balance Laws*
  Presenter: Alexander Kurganov, Southern University of Science and Technology
- **17:00 - 17:30** *A high-order unstructured CWENO method for the shallow water equations using adaptive subgrids*
  Presenter: Max Bitsch, Technical University of Denmark
- **17:30 - 18:00** *hp-Adaptive Immersed Boundaries in the Discontinuous Galerkin Spectral Element Method*
  Presenter: Amit Nayak (contributed talk), University of Ottawa

MS 113 Discrete complexes and polytopal methods: a NEMESIS minisymposium
Leacock 232
Jerome Droniou, Lourenco Beirao da Veiga, Paola Antonietti, Daniele Di Pietro

- **16:30 - 17:00** *Polytopal discontinuous Galerkin approximation of a thermo/poro-viscoelasticity model*
  Presenter: Stefano Bonetti, Politecnico di Milano
- **17:00 - 17:30** *Polytopal Stokes--de Rham BGG diagram and complex, and application to the Reissner--Mindlin and Kirchhoff--Love plate models*
  Presenter: Arax Leroy, Université de Montpellier
- **17:30 - 18:00** *Construction of finite element form-valued form in any dimension*
  Presenter: Ting Lin, Peking University

MS 114 Advances in numerical methods for multi-physics problems and applications
Leacock 26
Stefano Bonetti, Francesca Bonizzoni, Mattia Corti, Franco Dassi, Ivan Fumagalli

- **16:30 - 17:00** *Virtual Element Method for non-newtonian Stokes problems*
  Presenter: Giuseppe Vacca, University of Bari
- **17:00 - 17:30** *Recent advances and applications of general mesh discontinuous Galerkin methods*
  Presenter: Andrea Cangiani, SISSA

- **17:30 - 18:00** *A geometric multigrid method for optimal control using phase-fields for whole cell tracking*
  Presenter: Anotida Madzvamuse, University of British Columbia

MS 115 High Order Approximation and Operator Learning in SciML
Bronfman 423
Carlo Marcati, Christoph Schwab

- **16:30 - 17:00** *Theory-to-Practice Gap in Operator Learning*
  Presenter: Margaret Trautner, Caltech
- **17:00 - 17:30** *TBD*
- **17:30 - 18:00** *TBD*

MS 116 Numerical methods for complex wave propagation problems
Bronfman 46
Theophile Chaumont-Frelet, Markus Melenk

- **16:30 - 17:00** *Sharp preasymptotic error estimates for high-order finite element discretizations of time-harmonic Maxwell's equations*
  Presenter: Theophile Chaumont-Frelet, Inria Univ. Lille
- **16:30 - 17:00** *Solving the Acoustic Wave Equation with PIML: challenges with source terms and absorbing boundary conditions*
  Presenter: Francesco Tedesco (contributed), Barcelona Supercomputing Center
- **17:00 - 17:30** *WKB Across Caustics: The Screened-WKB Method*
  Presenter: Oscar Bruno, Caltech

MS 118 Quantum algorithms for partial differential equations
Bronfman 422
David Del Rey Fernandez, Frank Gaitan, Ala Shayeghi

- **16:30 - 17:00** *Learning the Lattice Boltzmann Collision Operator Using a Surrogate Quantum Circuit*
  Presenter: Monica Lăcătuș, Delft University of Technology
- **17:00 - 17:30** *Simulating shocks and travelling waves using quantum algorithms for solving partial differential equations*
  Presenter: Biswajit Basu, Trinity College Dublin
- **17:30 - 18:00** *Incorporating finite volume and weighted essentially non-oscillatory methods into a quantum algorithm for nonlinear partial differential equations*
  Presenter: Frank Gaitan, Laboratory for Physical Sciences

MS 125 Novel Methods for wave problems and integral equations
Leacock 219
Oscar Bruno, Mark Lyon

- **16:30 - 17:00** *Interpolated Factored Green's Function (IFGF) Acceleration Method for Perfectly Conducting Electromagnetic Scattering*
  Presenter: Matthew R. D'Amico, University of New Hampshire
- **17:00 - 17:30** *IFGF Green function acceleration with high-order interpolation and geometric adaptivity*
  Presenter: Sebastian A. Lamas, Caltech
- **17:30 - 18:00** *Rate-Optimal Higher-Order Adaptive Conforming FEM for Biharmonic Eigenvalue Problems*
  Presenter: Benedikt Gräßle (contributed), University of Zurich

MS 127 Robust and structure preserving high order numerical methods for PDEs
Arts Building W-120
Kenneth Duru, Kieran Ricardo, David Lee, Tom Hagstrom

- **16:30 - 17:00** *A dual-pairing summation-by-parts finite difference framework for nonlinear conservation laws*
  Presenter: Kenneth Duru, The University of Texas at El Paso
- **17:00 - 17:30** *On the local energy-stability of dual-pairing summation by parts methods for nonlinear conservation laws*
  Presenter: Dougal Koji Mitsumochi Stewart, Monash University
- **17:30 - 18:00** *A Dual-Pairing Summation-by-Parts in Time Framework for Wave Equations*
  Presenter: Kenny Wiratama, Ulsan National Institute of Science and Technology

MS 130 Recent advances in high-fidelity methods and applications
Bronfman 310
Huiyuan Li, Zhiguo Yang

- **16:30 - 17:00** ~~*A class of higher-order length preserving and energy decreasing IMEX schemes for the Landau-Lifshitz equation*~~
  Presenter: Xiaoli Li, Shandong University
- **17:00 - 17:30** *Iterative two-level spectral methods for nonlinear elliptic problems*
  Presenter: Zhaoxiang Li, Shanghai Normal University
- **17:30 - 18:00** *A Simple New Methodology for Generating Inflow Turbulent Boundary Layers for (i)LES*

Presenter: Rodrigo Costa Moura (contributed), Instituto Tecnológico de Aeronáutica

MS 148 Theoretical Development and Industrial Application of Flux Reconstruction Methods
Bronfman 210
Brian Vermeire, Freddie Witherden, Peter Vincent

- **16:30 - 17:00** *On the Connections Between Filtered Discontinuous Galerkin and Flux Reconstruction*
  Presenter: Mathias Dufresne-Piché, McGill University
- **17:00 - 17:30** ~~*Applications of Flux Reconstruction to Incompressible Flows on Deforming Domains*~~
  Presenter: Marie-Pier Bolduc, Concordia University
- **17:30 - 18:00** *Spectral Collocation Solutions to Lubrication Approximation Equations for Thin Viscous Films*
  Presenter: Calin-Ioan Gheorghiu (contributed), Tiberiu Popoviciu Institute of Numerical Analysis

18:30 - 21:00

Banquet

The Windsor Ballroom, 1170 Rue Peel
Please follow the instructions provided on your banquet ticket.

Friday July 18th

Last Updated July 11th, 2025

7:30 - 18:00

Check-In

Leacock Building

8:30 - 9:30

Plenary Speaker

Leacock Building - Room 132
Chair: Mark Ainsworth, Brown University

Presenter: Tao Zhou, Chinese Academy of Sciences

Efficient deep learning methods for very high dimensional parabolic and HJB equations

9:30 - 10:00

Coffee Break

Leacock Building

10:00 - 12:00

Scientific Sessions

MS 104 Hybrid and Polytopal Methods for Problems in Continuum Mechanics and Related Applications

Leacock 110
David Mora, Ricardo Ruiz-Baier

- **10:00 - 10:30** ~~*C1 Conforming Virtual Element Method for the Optimal Control Of Oseen Equations with Stream-Function Formulation*~~
  Presenter: Harpal Singh, IIT Roorkee
- **10:30 - 11:00** *Adaptive Multilevel Newton Algorithm for a Class of Nonlinear Problems*
  Presenter: Eun-Jae Park, Yonsei University
- **11:00 - 11:30** *Fully-mixed Virtual Element methods for linear poroelasticity*
  Presenter: Michele Botti, Politecnico di Milano
- **11:30 - 12:00** *Stabilization-free Virtual Element Method for 2D second order elliptic equations*
  Presenter: Stefano Berrone, Politecnico di Torino

MS 107 New trends in kernel methods
Bronfman 210
Emma Perracchione, Elisabeth Larsson

- **10:00 - 10:30** *On the convergence of greedy kernel-based approximation algorithms*
  Presenter: Armin Iske, University of Hamburg
- **10:30 - 11:00** *AI-based feature selection techniques: can we predict geoeffective solar events?*
  Presenter: Fabiana Camattari, Università degli Studi di Genova
- **11:00 - 11:30** *Learning optimized kernel bases for greedy approximation*
  Presenter: Francesco Marchetti, University of Padova
- **11:30 - 12:00** *Multiscale interpolation in samplet coordinates*
  Presenter: Sara Avesani, Università della Svizzera Italiana

MS 109 Recent advances on the analysis of high-order Boundary Element Methods for wave propagation problem
Bronfman 46
Emanuele Arcese, Matthias Baray, Luca Desiderio

- **10:00 - 10:30** *Solving acoustic transmission problems by a spectral boundary element method*
  Presenter: Silvia Falletta, Politecnico di Torino
- **10:30 - 11:00** *Discretizing volume integral operators with higher-order spline-based basis functions*
  Presenter: Merle Backmeyer, Technical University of Darmstadt
- **11:00 - 11:30** *Cancellation Integration Scheme for the Magnetic Boundary Integral Operator on Curved Elements and Application to the Accurate Computation of the Radar Cross Section*
  Presenter: Matthias Baray, CEA
- **11:30 - 12:00** ~~*Nonconforming least squares spectral element approximation for parabolic PDE with corner singularity*~~
  Presenter: Pankaj Biswas (contributed), NIT Silchar

MS 113 Discrete complexes and polytopal methods: a NEMESIS minisymposium
Leacock 232
Jerome Droniou, Lourenco Beirao da Veiga, Paola Antonietti, Daniele Di Pietro

- **10:00 - 10:30** *Handling Arbitrarily Distorted 8-Node Bricks with the Virtual Element Method*
  Presenter: Alessandro Russo, University of Milano-Bicocca

- **10:30 - 11:00** *New estimates for potential operators in vector calculus and exterior calculus*
  Presenter: Martin Licht, EPFL
- **11:00 - 11:30** *Uniform Poincaré inequalities for the discrete de Rham complex of differential forms*
  Presenter: Silvano Pitassi, University of Montpellier
- **11:30 - 12:00** *Analysis of Discrete De Rham Scheme for Contact Mechanics with Tresca Friction*
  Presenter: Ritesh Ritesh (contributed), Université de Montpellier

MS 120 New trends for the numerical solution of hyperbolic systems in compressible fluid flows
Bronfman 422
Anita Gjesteland, Jens Keim, Per-Olof Persson, Christian Rohde

- **10:00 - 10:30** *Variational Multiscale Modeling and Convex Limiting for Finite Element Discretizations of Hyperbolic Problems*
  Presenter: Insa-Marie Schneider, TU Dortmund University
- **10:30 - 11:00** *Convergence of a stochastic collocation finite volume method for the compressible Euler system*
  Presenter: Simon Schneider, Johannes Gutenberg-University Mainz
- **11:00 - 11:30** *On a GRP solver for a hyperbolic model governing two-phase thin film flow*
  Presenter: Rahul Barthwal, UNIVERSITY OF STUTTGART
- **11:30 - 12:00** ~~*A deep neural network based numerical flux function for implicit LES of compressible turbulence*~~
  Presenter: Wenbin Zhang, Technical University Munich

MS 125 Novel Methods for wave problems and integral equations
Leacock 219
Oscar Bruno, Mark Lyon

- **10:00 - 10:30** *Towards high-order accurate numerical scattering of non-periodic sources from periodic surfaces in 3D*
  Presenter: Fruzsina Julia Agocs, University of Colorado Boulder
- **10:30 - 11:00** *Frequency-robust formulations for electromagnetic scattering by perfect conductors via Helmholtz integral operators*
  Presenter: Juan Burbano-Gallegos, University of Twente
- **11:00 - 11:30** *Multidimensional Fourier-Continuation methods and applications to direct and inverse PDE problems*
  Presenter: Oscar Bruno, Caltech

- **11:30 - 12:00** *Absorption Techniques for Simulating Acoustic Wave Propagation in Human Tissue using PSTD Methods*
  Presenter: Carlos Spa (contributed), Barcelona Supercomputing Center

MS 127 Robust and structure preserving high order numerical methods for PDEs
Arts Building W-120
Kenneth Duru, Kieran Ricardo, David Lee, Tom Hagstrom

- **10:00 - 10:30** *Compact Runge-Kutta Flux Reconstruction for Hyperbolic Conservation Laws with admissibility preservation*
  Presenter: Arpit Babbar, Johannes Gutenberg University Mainz
- **10:30 - 11:00** *Entropy stable reduced order modeling of nonlinear conservation laws using discontinuous Galerkin methods*
  Presenter: Ray Qu, Rice University
- **11:00 - 11:30** *A multiscale approach to the stationary Ginzburg–Landau equations of superconductivity*
  Presenter: Benjamin Dörich, Karlsruhe Institue of Technology
- **11:30 - 12:00** *Symmetric Positive-Weight Quadrature Rules on Simplices*
  Presenter: Zelalem Arega Worku, University of Waterloo

MS 130 Recent advances in high-fidelity methods and applications
Bronfman 310
Huiyuan Li, Zhiguo Yang

- **10:00 - 10:30** *Tensor Neural Networks for Fokker-Planck Equations in High Dimensions*
  Presenter: Zhongqiang Zhang, Worcester Polytechnic Institute
- **10:30 - 11:00** *Structure-Preserving Spectral Element Methods of the Euler-Maxwell Equations*
  Presenter: Lechang Qin, Shanghai Jiao Tong Uinversity
- **11:00 - 11:30** *Quasi-entropy and physical range preserving numerical methods in liquid crystal dynamics*
  Presenter: Jie Xu, Academy of Mathematics and Systems Science
- **11:30 - 12:00** *Solving fractional differential equations in unboundeddomains via rational approximation*
  Presenter: Huifang Yuan, Harbin Institute of Technology

MS 134 Finite Elements for Structure Preservation
Bronfman 423
Charles William Parker, Pablo Brubeck

- **10:00 - 10:30** *Error estimates for some structure preserving Galerkin discretizations for incompressible magnetohydrodynamics systems*
  Presenter: Lorenzo Mascotto, University of Milano-Bicocca
- **10:30 - 11:00** *Higher order bounds-preserving methods for time-dependent partial differential equations*
  Presenter: Robert C Kirby, Baylor University
- **11:00 - 11:30** *Finite elements for double forms*
  Presenter: Evan Gawlik, Santa Clara University
- **11:30 - 12:00** *Generalizing Riemann curvature to Regge metrics*
  Presenter: Michael Neunteufel, Portland State University

MS 146 High-order low-rank methods with applications to high-dimensional problems
Armstrong 375
William Alvah Sands, Jing-Mei Qiu

- **10:00 - 10:30** *A Novel Hybrid Low Rank Nodal Discontinuous Galerkin Method for the BGK Equation*
  Presenter: Andres Felipe Galindo Olarte, University of Texas at Austin
- **10:30 - 11:00** *High-order Adaptive Rank Integrators for Multi-scale Linear Kinetic Transport Equations in the Hierarchical Tucker Format*
  Presenter: Tao Xiong, University of Science and Technology of China
- **11:00 - 11:30** *Spectral Multi-scale Time Integration in the Quantized Tensor Train Format*
  Presenter: Erika Ye, Lawrence Berkeley National Laboratory
- **11:30 - 12:00** *A semi-implicit, low-rank DG method for a kinetic model of radiation*
  Presenter: Cory Hauck, Oak Ridge National Laboratory

MS 150 High-order methods and PDE-constrained optimization
Bronfman 410
Jason Hicken, Graeme Kennedy

- **10:00 - 10:30** *Sensitivity analysis of point-cloud summation-by-parts discretizations*
  Presenter: Jason Edward Hicken, Rensselaer Polytechnic Institute
- **10:30 - 11:00** *Existence, Uniqueness and Boundedness of the Solution to the Adjoint LSS*
  Presenter: Pranshul Thakur, McGill University

- **11:00 - 11:30** *A reduced-order modelling approach to shape optimization via time-dependent bases*
  Presenter: Adam Vieno, University of Waterloo
- **11:30 - 12:00** *High-order topology optimization using cut continuous Galkerin difference methods*
  Presenter: Graeme Kennedy, Georgia Institute of Technology

12:00 - 13:30

Lunch

Lunch not provided.

13:30 - 15:00

Scientific Sessions

MS 104 Hybrid and Polytopal Methods for Problems in Continuum Mechanics and Related Applications

Leacock 110
David Mora, Ricardo Ruiz-Baier

- **13:30 - 14:00** ~~*Hybrid high-order method for the extended Fisher-Kolmogorov and the Fisher-Kolmogorov equations*~~
  Presenter: Neela Nataraj, Indian Institute of Technology Bombay
- **14:00 - 14:30** *Curvilinear Virtual Elements for 2D solid mechanics applications*
  Presenter: Franco Dassi, University Milano Bicocca
- **14:30 - 15:00** *Stream Virtual Elements for the Navier-Stokes System*
  Presenter: David Mora, Universidad del Bio-Bio

MS 107 New trends in kernel methods

Bronfman 210
Emma Perracchione, Elisabeth Larsson

- **13:30 - 14:00** *Kernel-based norm minimization for unknown surface reconstruction of point cloud*
  Presenter: Alex Chu, Hong Kong Baptist University
- **14:00 - 14:30** *Shape optimized radial basis function approximation*
  Presenter: Elisabeth Larsson, Uppsala University
- **14:30 - 15:00** *Nearly-optimal kernel design via Discontinuous Neural Networks: Applications to inverse problems*
  Presenter: Emma Perracchione, Politecnico di Torino

MS 113 Discrete complexes and polytopal methods: a NEMESIS minisymposium

Leacock 232
Jerome Droniou, Lourenco Beirao da Veiga, Paola Antonietti, Daniele Di Pietro

- **13:30 - 14:00** *A Reynolds- and Hartmann-semirobust hybrid method for magnetohydrodynamics*
  Presenter: Vito Patierno, CNRS
- **14:00 - 14:30** *On structure preservation for hybrid polyhedral discretizations*
  Presenter: Simon Lemaire, INRIA
- **14:30 - 15:00** *A family of CIP-stabilized VEM for advection-dominated problems*
  Presenter: Manuel Trezzi, Università di Milano Bicocca

MS 114 Advances in numerical methods for multi-physics problems and applications

Leacock 26
Stefano Bonetti, Francesca Bonizzoni, Mattia Corti, Franco Dassi, Ivan Fumagalli

- **13:30 - 14:00** *Mixed-domain and multi-physics modelling in the FEniCS framework*
  Presenter: Jørgen Schartum Dokken, Simula Research Laboratory
- **14:00 - 14:30** *High order cell methods for acoustic and electromagnetic waves*
  Presenter: Joachim Schoeberl, TU Wien
- **14:30 - 15:00** *A HHO Method for Semilinear Sobolev Equation*
  Presenter: Ajeet Singh (contributed), IIT Roorkee

MS 120 New trends for the numerical solution of hyperbolic systems in compressible fluid flows

Bronfman 422
Anita Gjesteland, Jens Keim, Per-Olof Persson, Christian Rohde

- **13:30 - 14:00** *Efficient Static Condensation for Discontinuous Galerkin Discretizations*
  Presenter: Per-Olof Persson, University of California, Berkeley
- **14:00 - 14:30** *Advances of the Domain of Dependence stabilization for hyperbolic conservation laws on cut cell meshes*
  Presenter: Gunnar Birke, Münster University
- **14:30 - 15:00** *Fully-discrete stability analysis of the Domain of Dependence stabilization for cut cell meshes*
  Presenter: Louis Petri, Johannes Gutenberg University Mainz

MS 125 Novel Methods for wave problems and integral equations
Leacock 219
Oscar Bruno, Mark Lyon

- **13:30 - 14:00** *Higher-order boundary element methods for wave equations in polyhedral domains*
  Presenter: Heiko Gimperlein, University of Innsbruck
- **14:00 - 14:30** *Fast Singular-Kernel Convolution on General Non-Smooth Domains via Truncated Fourier Filtering*
  Presenter: Jinghao Cao, Caltech
- **14:30 - 15:00** *An Optimal O(N) Helmholtz Solver for Complex Geometry using WaveHoltz and Overset Grids*
  Presenter: William Douglas Henshaw, Rensselear Polytechnic Institute

MS 126 High Order Mimetic Differences and Applications
Bronfman 410
Jose E Castillo, Miguel Dumett, Anand Srinivasan, Jarred Brzenski

- **13:30 - 14:00** *High Order Mimetic Shock Capturing Schemes For the Inviscid Burgers Equation*
  Presenter: Jose Eligio Castillo, San Diego State University
- **14:00 - 14:30** *Spectral Properties of Mimetic Operators for Robust Fluid–Structure Interaction*
  Presenter: J. de Curtò, Universitat Oberta de Catalunya
- **14:30 - 15:00** *A finite-difference summation by parts conditionally stable partitioned algorithm for conjugate heat transfer problems*
  Presenter: Sarah Nataj, University of Waterloo

MS 127 Robust and structure preserving high order numerical methods for PDEs
Arts Building W-120
Kenneth Duru, Kieran Ricardo, David Lee, Tom Hagstrom

- **13:30 - 14:00** *Accurate and nonoscillatory Lie advection of differential forms on unstructured meshes*
  Presenter: Maciej Waruszewski, Sandia National Laboratories
- **14:00 - 14:30** *An Energy-Based Discontinuous Galerkin Method for the Nonlinear Schrödinger Equation with Wave Operator*
  Presenter: Lu Zhang, Rice University
- **14:30 - 15:00** *EDG-GR: An energy-based discontinuous Galerkin method for general relativity*
  Presenter: Jaryd S. Domine, Southern Methodist University

MS 134 Finite Elements for Structure Preservation
Bronfman 423
Charles William Parker, Pablo Brubeck

- **13:30 - 14:00** *hp-FEM for the integral fractional Laplacian: quadrature*
  Presenter: Markus Melenk, TU Wien
- **14:00 - 14:30** *Positivity-preserving PolyDG for the numerical modeling of neurodegenerative diseases*
  Presenter: Francesca Bonizzoni, Politecnico di Milano
- **14:30 - 15:00** *On the symmetry constraint and angular momentum conservation in high order mixed stress formulations for polar fluids*
  Presenter: Umberto Zerbinati, University of Oxford

Contributed Talks 4
Bronfman 310
James McDonald

- **13:30 - 14:00** ~~*Hermite-Discontinuous Galerkin Error Inhibiting Methods and Their Relations to Block Finite Difference Schemes*~~
  Presenter: Adi Ditkowski (contributed), Tel Aviv University
- **14:00 - 14:30** *A Nonconforming Least-Squares Spectral Element Method for 2D/3D Stokes Problems with Discontinuous Viscosity and Singular Forces*
  Presenter: Shivangi Joshi (contributed), BITS PILANI HYDERABAD CAMPUS
- **14:30 - 15:00** *Challenges of SIAC filtering on non-uniform meshes*
  Presenter: Roman Stuhlmacher (contributed), KTH Royal Institute of Technology

Contributed Talks 5
Bronfman 46
Jason Hicken

- **13:30 - 14:00** *A Discrete Correction Function Method for Electromagnetic Problems with Boundary and Interface Conditions*
  Presenter: Yann-Meing Law (contributed), Polytechnique Montréal
- **14:00 - 14:30** *Phase Field Method for Growing Tumors in Confined Geometries*
  Presenter: Sungha Yoon (contributed), University of California at Irvine
- **14:30 - 15:00** *Acceleration of Newton's Method in Structural Mechanics with p-FEM Initializations*
  Presenter: Lina Fesefeldt (contributed), Hamburg University of Technology

15:00 - 15:30

Coffee Break

Leacock and Bronfman Buildings

15:30 - 17:00

Scientific Sessions

MS 120 New trends for the numerical solution of hyperbolic systems in compressible fluid flows

Bronfman 422
Anita Gjesteland, Jens Keim, Per-Olof Persson, Christian Rohde

- **15:30 - 16:00** *Stable and asymptotic preserving space-time discretisations of linear kinetic transport equations*
  Presenter: Anita Gjesteland, University of Waterloo
- **16:00 - 16:30** *Towards very efficient Discontinuous Galerkin spectral element Navier-Stokes solver on unstructured domains with various element types*
  Presenter: Boyang Xia (contributed), King's College London
- **16:30 - 17:00** ~~*On Local Minimum Entropy Principle of High-Order Schemes for Relativistic Euler Equations*~~
  Presenter: Linfeng Xu (contributed), Southern University of Science and Technology

MS 126 High Order Mimetic Differences and Applications

Bronfman 410
Jose E Castillo, Miguel Dumett, Anand Srinivasan, Jarred Brzenski

- **15:30 - 16:00** *High Order Skew-Symmetric Mimetic Discretizations For Incompressible Navier Stokes Equation*
  Presenter: Anand Srinivasan, San Diego State University
- **16:00 - 16:30** *Quantities Preserved in High-Order Mimetic Differences for Systems of Conservation Laws*
  Presenter: Miguel Dumett, San Diego State University
- **16:30 - 17:00** *Efficiency of Solutions to the Navier-Stokes Equations Using Higher-Order Mimetic Methods*
  Presenter: Jose E. Castillo, San Diego State University

MS 127 Robust and structure preserving high order numerical methods for PDEs

Arts Building W-120
Kenneth Duru, Kieran Ricardo, David Lee, Tom Hagstrom

- **15:30 - 16:00** *A scalable ADER-DG transport method with a polynomial-order-independent CFL limit for efficient high-order simulations*
  Presenter: Kieran Ricardom, The Australian National University
- **16:00 - 16:30** *Structure-preserving discretisations for collision operators in plasma physics*
  Presenter: Sandra Jeyakumar, Max-Planck Institute for Plasma Physics
- **16:30 - 17:00** *How Boundary Approximations Affect the Solutions to Hyperbolic Initial Boundary-Value Problems*
  Presenter: David A Kopriva (contributed), Florida State University

MS 134 Finite Elements for Structure Preservation
Bronfman 423
Charles William Parker, Pablo Brubeck

- **15:30 - 16:00** *Cohomology of Discrete Tensor Complexes*
  Presenter: Ting Lin, Peking University
- **16:00 - 16:30** *High-Order and Sparsity-Promoting Stokes Elements*
  Presenter: Pablo Brubeck, University of Oxford
- **16:30 - 17:00** *Locking-Free Methods for Nonclamped, Holely Reissner-Mindlin Plates*
  Presenter: Charles William Parker, University of Oxford

Contributed Talks 6
Leacock 232
James McDonald

- **15:30 - 16:00** *Finite element method for the Oseen problem with general boundary conditions*
  Presenter: Verónica Anaya Domínguez (contributed), Bío-Bío University
- **16:00 - 16:30** *A high-order NURBS-based isogeometric transport method for modelling ocean circulation*
  Presenter: Mofdi El-Amrani (contributed), Mohammed VI Polytechnic University
- **16:30 - 17:00** *Comparison of high-order numerical solvers for scale-resolved simulations of the supersonic Taylor-Green vortex flow*
  Presenter: Jean-Baptiste Chapelier (contributed), ONERA

Contributed Talks 7
Bronfman 210
Catherine Mavriplis

- **15:30 - 16:00** *Parallel adaptive high-order multigrid DG solvers based on the FAS scheme*
  Presenter: Joerg Stiller (contributed), TU Dresden

- **16:00 - 16:30** *Code-generation of highly efficient finite element operations using the MLIR compiler infrastructure*
  Presenter: Edward Erasmie-Jones (contributed), King's College London
- **16:30 - 17:00** *Implicit Sliding Mesh Solver for High-Fidelity Simulation of Moving Geometries in Nektar++*
  Presenter: Junjie Ye (contributed), Imperial College London