

9th International Conference on Advanced COmputational Methods in ENgineering and Applied Mathematics

ACOMEN2025

September 15–19, 2025

Zebrstraat, Ghent, Belgium

Conference Program

Editor:

Karel Van Bockstal, Ghent University

Organising committee:

C. Geuzaine (University of Liège, Belgium)
S. Pop (Hasselt University, Belgium)
M. Ruzhansky (Ghent University, Belgium) (chairman)
M. Slodička (Ghent University, Belgium)
K. Van Bockstal (Ghent University, Belgium)

Scientific committee:

C. Geuzaine (University of Liège, Belgium)
S. Pop (Hasselt University, Belgium)
E. Zuazua (Friedrich Alexander University of Erlangen-Nürnberg, Germany)

Sponsors and partners:



Welcome from the Local Organising Committee

Dear participants,

First of all, we warmly welcome you to the city of Ghent. This week, we will enjoy more than one hundred talks from 37 different countries!

This is already the ninth edition of the international conference on “Advanced COmputational Methods in ENgineering”. The aim of the conference is to provide an international forum to present and discuss the latest developments in computational and applied mathematics across a wide range of engineering and mathematical fields. For this reason, we have also added “and Applied Mathematics” to the title of the conference. We sincerely thank all participants, who make every ACOMEN an inspiring, educational, and enjoyable event.

Another key factor in the success of ACOMEN is the high-level invited plenary lectures delivered by internationally recognised experts in their respective research fields: Peter Bastian (Universität Heidelberg), Jérôme Droniou (University of Montpellier), Jan S. Hesthaven (Karlsruhe Institute of Technology), Barbara Kaltenbacher (Alpen-Adria-Universität Klagenfurt), Michael Klibanov (University of North Carolina at Charlotte), Matti Lassas (University of Helsinki), and Barbara Wohlmuth (Technical University of Munich).

We also thank the organisers of the minisymposia for their commitment: Kristof Cools (Ghent University), Le Van Chien (Ghent University), Minseok Choi (Pohang University of Science and Technology), Jooyoung Hahn (Czech Technical University in Prague), Anna Klünker (Leuphana University Lüneburg), Vamika Rathi (Hamburg University of Technology), Jochen Schütz (Hasselt University), Peter Frolkovič (Slovak University of Technology), Barbara Kaltenbacher (University of Klagenfurt), Vanja Nikolić (Radboud University), D. Di Pietro (University of Montpellier), L. Beirao da Veiga (University of Milano-Bicocca), P. Antonietti (Politecnico di Milano), Jérôme Droniou (University of Montpellier), Julian Köllermeier (Ghent University and University of Groningen), Andrew Dienstfrey (National Institute of Standards and Technology), Amparo Gil (Universidad de Cantabria), Marius Paul Bruchhäuser (Helmut Schmidt University Hamburg), Nils Margenberg (Helmut Schmidt University Hamburg), and Richard Schussnig (Ruhr University Bochum).

Special thanks go to the organisational team of this edition, to all technical staff working behind the scenes, and in particular to Ms Kim Verbeeck, our conference secretary. Should you have any questions or specific needs during the meeting, we will be glad to help you at the conference reception desk.

We hope you will enjoy your stay!

On behalf of the Local Organising Committee,
Michael Ruzhansky (Chairman)
Marián Slodička
Karel Van Bockstal

Plenary speakers



Peter Bastian
Universität Heidelberg



Jérôme Droniou
University of Montpellier



Jan S. Hesthaven
Karlsruhe Institute of Technology (KIT)



Barbara Kaltenbacher
Alpen-Adria-Universität Klagenfurt



Michael Klibanov
University of North Carolina at Charlotte



Matti Lassas
University of Helsinki



Barbara Wohlmuth
Technical University of Munich

Important information

Venue:

All scientific activities take place in the congress center “Zebrastraat” (Zebrastraat 32/001, 9000 Ghent).

Rooms:

The **plenary lectures** take place in room **Ned Kahn**.

The **mini-symposia** and **open sessions** take place in the following rooms:

- **Nick Ervinck**
- **Honoré D’O**
- **Panamarenko**
- **Piranhazaal** (Wednesday before noon and Thursday from 14:00 to 15:00)

The room **Piranhazaal** is available as a meeting and discussion room from 14:00 to 18:00, except on Thursday between 14:00 and 15:00.

Presentations:

The length of an oral presentation is 20 minutes, followed by 5 minutes of Q&A.

The length of a plenary lecture is 45 minutes, followed by 5 minutes of Q&A.

We kindly ask the session chairs to lead the plenary lectures and conference sessions.

Presenters are kindly requested to upload their presentation to the lecture room computer before the session begins. If necessary, it is also possible to connect a personal laptop via HDMI.

Registration and conference desk:

The conference desk is located at the entrance of New Zebra. The easiest way to reach it is to enter from Gustaaf Callierlaan 232, 9000 Gent, see <https://maps.app.goo.gl/mZjdg5imHffhF8uP6>.

Opening hours:

- Monday: 8:30–20:00
- Tuesday, Wednesday, Thursday: 8:30–11:30 and 13:00–14:00

Wi-Fi:

Participants have access to the open network Zebrawifi.

Lunches:

Participants who selected the lunch option during registration will receive their lunch tickets (Monday to Thursday) upon registration.

Directions to lunch locations:

- Zorghotel Seniorcity Gent (Tijgerstraat 12-22, 9000 Ghent):
see <https://maps.app.goo.gl/2afnB7XuzXgiqhyL6>
- University restaurant De Brug (Sint-Pietersnieuwstraat 45, 9000 Ghent):
see <https://maps.app.goo.gl/4uZctUJZcrMYLVuQ8>

Each day at 12:20, members of the organizing committee will guide participants from Room Ned Kahn to the designated lunch locations.

Group photo:

Tuesday, September 16th at 10:50 (immediately after the plenary lecture) at the “passerelle”.

Welcome reception and conference dinner:

The **welcome reception** with **poster session** takes place in room **Ned Kahn** on **Monday, September 15th at 19:00**. The conference badge will be required for entry.

The **conference dinner** is scheduled for **Wednesday, September 17th at 19:00** at **Restaurant Gök** (Sluizeken 22, 9000 Ghent, see <https://maps.app.goo.gl/ZFXhW7XiVu1z6h5C6>). The conference badge will be required for entry.

Cultural excursion:

The **cultural excursion** is scheduled for **Friday, September 19**.

Program: a boat trip from Temse to Dendermonde along the vegetated banks and the idyllic fishing villages of Mariekerke and Sint-Amands. The tour will be guided in English.

Departure from the congress center **Zebrastraat at 10:00** sharp. We expect to be back in Ghent around **17:30**. The conference badge will be required for entry.

Lunch is included. Drinks are not included and must be paid for on board.

Website conference:

For more information, please visit our conference website: <https://cage.ugent.be/acomen2025/>



Monday, September 15th

8:30 – 9:30	Registration and welcome coffee or tea
9:30 – 10:00	Opening conference in room Ned Kahn
10:00 – 10:50	Plenary lecture Chair: Michael Ruzhansky, Room: Ned Kahn <i>Barbara Wohlmuth</i> — Hybrid PDE models for bio-medical applications
10:50 – 11:20	Coffee break (XYZ Lounge)
11:20 – 12:10	Plenary lecture Chair: Barbara Wohlmuth, Room: Ned Kahn <i>Peter Bastian</i> — Coupled shallow surface and subsurface flow with application to high mountain catchments
12:10 – 14:00	Lunch break
14:00 – 15:40	MS9 — Advanced Numerical Methods for Flow and Related Problems (a) Chair: Marius Paul Bruchhäuser and Nils Margenberg, Room: Nick Ervinck 14:00 – 14:25 <i>Boris Andrews</i> — Stabilisation of the Navier–Stokes equations on under-resolved meshes via enstrophy preservation 14:25 – 14:50 <i>Nawfel Benatia</i> — Flux-Based Interface Coupling in Non-Overlapping Domain Decomposition Methods 14:50 – 15:15 <i>Marius Paul Bruchhäuser</i> — Goal-Oriented Space-Time Adaptivity for Non-stationary Incompressible Flow Problems 15:15 – 15:40 <i>Tim Gabriel</i> — Intrinsic Surface Meshing Using Geodesic Distances for High-Order Methods MS5 — Nonlinear Acoustic Waves: Modeling, Analysis, and Numerics (a) Chair: Barbara Kaltenbacher and Vanja Nikolić, Room: Honoré D'O 14:00 – 14:25 <i>Benjamin Dörich</i> — Robust fully discrete error bounds for the Kuznetsov equation in the inviscid limit 14:25 – 14:50 <i>Pascal Lehner</i> — A p -adaptive space-time discontinuous Galerkin method for nonlinear acoustics 14:50 – 15:15 <i>Mostafa Meliani</i> — On the existence of strong solutions to a heat-conducting fluid system with general Dirichlet boundary conditions 15:15 – 15:40 <i>Vanja Nikolić</i> — Robust error bounds for a combined DG-CG finite element method for the Westervelt equation OS Chair: Christophe Geuzaine, Room: Panamarenko 14:00 – 14:25 <i>Varvara Roubtsova</i> — Oil Propagation in a Substation Hydraulic System 14:25 – 14:50 <i>Pavel Strachota</i> — First-principles modeling of Li-ion cell dynamics and degradation in hybrid electric vehicles 14:50 – 15:15 <i>Sam Subbey</i> — Threshold-Driven Collapse and Recovery in a Simplified Wasp-Waist Ecosystem Model 15:15 – 15:40 <i>Yash Vats</i> — Modeling Somatic and Dendritic membrane potentials with a two-compartment Fractional Leaky Integrate and Fire model
15:40 – 16:10	Coffee break (XYZ Lounge)

16:10 – 17:50

MS9 — Advanced Numerical Methods for Flow and Related Problems (b)**Chair:** Marius Paul Bruchhäuser and Nils Margenberg **Room:** Nick Ervinck16:10 – 16:35 *Roland Greffe* — GPU-Accelerated Substructured Optimized Schwarz Solver for the Helmholtz Equation16:35 – 17:00 *Alexander Heinlein* — Two-level Schwarz preconditioners with an algebraic multiscale coarse spaces for large-scale heterogeneous problems17:00 – 17:25 *Nils Margenberg* — An hp Multigrid Approach for Tensor-Product Space-Time Finite Element Discretizations of the Stokes Equations**MS5 — Nonlinear Acoustic Waves: Modeling, Analysis, and Numerics (b)****Chair:** Barbara Kaltenbacher and Vanja Nikolić, **Room:** Honoré D'O16:10 – 16:35 *Teresa Rauscher* — Mathematical models and multiharmonic algorithms for contrast-enhanced ultrasound16:35 – 17:00 *Arshyn Altybay* — Numerical algorithms for the 2D wave equation in heterogeneous media**OS****Chair:** Marián Slodička, **Room:** Panamarenko16:10 – 16:35 *Richard O. Akinola* — A Differentiation-free Method for the solution of initial value problems16:35 – 17:00 *Ankit Pandey* — A novel non-polynomial spline method and its convergence theory for nonlinear two-point derivative-dependent boundary value problems17:00 – 17:25 *Murat Mukhambetkaliyev* — Source identification in integro-differential pseudoparabolic models with memory

19:00 – 21:00

Welcome reception with poster session*Mansoor H. Alshehri* — Continuum Modeling of the Interactions Between Noble Metals and Nanosheets*Dorota Bielińska-Wąż* — Alignment-Free Bioinformatics Methods*Nasser Bin Turki* — Exploring the S-Curvature Tensor on Semi-Riemannian Manifolds with Applications in Relativity*Bandar Bin-Mohsin* — The MFS reconstruction of an interior inverse generalized impedance problem for the Modified Helmholtz Equation*Yusuf Jamilu Umar* — In Silico Investigation of the Role of Local and Global Inflammation-Driven Feedback in Myelopoiesis and Clonal Cell Expansion*Eucharía Nwachukwu* — Fractional Order Dynamics of a Prey-Predator Mathematical Model with Holling Type IV Functional Response, Intraspecific Competition, and Harvesting Effect*Mansour Shrahili* — Stochastic Comparisons of Extreme Order Statistics Under Archimedean Dependence*Piotr Wąż* — Nonstandard Analysis of Questionnaire Data: AI Application and Classification in Quality of Life Studies

Tuesday, September 16th

09:10 – 10:00	Plenary lecture Chair: Barbara Kaltenbacher, Room: Ned Kahn <i>Matti Lassas</i> — Neural networks and inverse problems
10:00 – 10:50	Plenary lecture Chair: Jérôme Droniou, Room: Ned Kahn <i>Jan Hesthaven</i> — Time-domain reduced order models through the Laplace transform
10:50 – 11:20	Coffee break (XYZ Lounge)
11:20 – 12:10	Plenary lecture Chair: Matti Lassas, Room: Ned Kahn <i>Michael Klibanov</i> — Convexification Method in Inverse Problems
12:10 – 14:00	Lunch break
14:00 – 15:40	MS1 — Numerical and computational methods for wave equations (a) Chair: Kristof Cools and Le Van Chien, Room: Nick Ervinck 14:00 – 14:25 <i>Francesco P. Andriulli</i> — On a New Class of Fast Direct Solvers for High-Frequency Problems Based on Operator Filtering 14:25 – 14:50 <i>Nicolas Bourdineaud</i> — An arbitrary order finite-volume scheme for two-dimensional elliptic Helmholtz equation with interfaces 14:50 – 15:15 <i>Timothée Galtier</i> — Multi-domain/multi-method preconditioners for an efficient solution of EFIE 15:15 – 15:40 <i>Daan Huybrechs</i> — BEACHpack: a BEM software package for frequency sweeping calculations MS9 — Advanced Numerical Methods for Flow and Related Problems (c) Chair: Marius Paul Bruchhäuser and Nils Margenberg, Room: Honoré D'O 14:00 – 14:25 <i>Boris Martin</i> — To overlap or not to overlap? A large-scale investigation for Helmholtz problems with multiple sources 14:25 – 14:50 <i>Christian Merdon</i> — Pressure-robustness for (nearly) incompressible flows 14:50 – 15:15 <i>Marcus Mohr</i> — TerraNeo: High-Performance Simulation of Geodynamical Fluids with Mesh-Free Finite-Element Methods and Code Generation 15:15 – 15:40 <i>Paul Moujaes</i> — Monolithic convex limiting and implicit pseudo-time stepping for calculating steady-state solutions of the Euler equations OS Chair: Marián Slodička, Room: Panamarenko 14:00 – 14:25 <i>Amin Faghih</i> — A Krylov Subspace and Core Transformation Algorithm for Computing Recurrence Coefficients of Multiple Orthogonal Polynomials 14:25 – 14:50 <i>Frederick Maes</i> — Direct and inverse source problems for the fractional heat equation with phase lag 14:50 – 15:15 <i>Sophie Moufawad</i> — Direct and Inverse Problem for Gas Diffusion in Polar Firn 15:15 – 15:40 <i>Mubasharah Khalid Omer</i> — Stable field extrapolation for volumetric magnetizations
15:40 – 16:10	Coffee break (XYZ Lounge)

16:10 - 17:50

MS1 — Numerical and computational methods for wave equations (b)**Chair:** Kristof Cools and Le Van Chien, **Room:** Nick Ervinck16:10 - 16:35 *Carlos Jerez-Hanckes* — Local Multiple Traces Formulation for Heterogeneous Electromagnetic Scattering16:35 - 17:00 *Quang Huy Nguyen* — Electromagnetic scattering by composite objects: A coupled FEM-BEM approach17:00 - 17:25 *Jay Prakash* — Higher Order Conforming Impedance Boundary Condition17:25 - 17:50 *Anouk Wisse* — Convergence of Calderón Residuals**MS9 — Advanced Numerical Methods for Flow and Related Problems (d)****Chair:** Marius Paul Bruchhäuser and Nils Margenberg, **Room:** Honoré D'O16:10 - 16:35 *Nimra Muqaddass* — Computational Hemodynamic Analysis of Stenosed Coronary Arteries: Non-Newtonian Flow Dynamics and Magnetohydrodynamic Effects Using OpenFOAM16:35 - 17:00 *Michał Wichrowski* — Matrix-Free Methods for Finite-Strain Elasticity: Automatic Code Generation with No Performance Overhead**OS****Chair:** Karel Van Bockstal, **Room:** Panamarenko16:10 - 16:35 *Xudeng Hang* — An Upwind Picard-Newton iterative method for the 2-T heat conduction equations16:35 - 17:00 *Nam Anh Nguyen* — Error analysis for a finite element discretization of a radially symmetric harmonic map heat flow problem17:00 - 17:25 *Niranjan (presented by Ankit Pandey)* — Sixth-Order Compact Implicit Scheme for Time-Dependent Nonlinear Parabolic PDEs with Fisher-Kolmogorov and Reaction-Diffusion Applications

Wednesday, September 17th

09:10 - 10:25

MS7 — Model reduction via moment closures with application to complex transport phenomena based on kinetic theory and free-surface flows (a)**Chair:** Julian Koellermeier, **Room:** Nick Ervinck09:10 - 09:35 *Julian Koellermeier* — Moment models for free-surface flows and their energy conservation properties09:35 - 10:00 *Ullika Scholz* — Spline Shallow Water Moment Equations10:00 - 10:25 *Mieke Daemen* — Asymptotic Analysis of Shallow Water Moment Models**MS8 — Recent Trends in Mathematical Software (a)****Chair:** Andrew Dienstfrey and Amparo Gil, **Room:** Honoré D'O09:10 - 09:35 *Hiroshi Fujiwara* — Implementation of Gaussian Quadrature with Even Node Distribution for the Unit Sphere09:35 - 10:00 *Wilfried Gansterer* — Algorithm-based Resilience in Scalable Conjugate Gradient Methods10:00 - 10:25 *Michael Mascagni* — The Walk on Spheres Monte Carlo Algorithm for Solving Partial Differential Equations**OS****Chair:** Christophe Geuzaine, **Room:** Panamarenko09:10 - 09:35 *Masoud Behzad* — Transient Thermo-fluid Behavior of Airflow in Porous SiC Structures for Concentrated Solar Power Plants09:35 - 10:00 *Jonas Bundschuh* — Extended homogenization methods for foil windings10:00 - 10:25 *Nuray Öktem* — Numerical Simulation of Flows at Open Channel Junctions with Various Confluence Angles**OS****Chair:** Marián Slodička, **Room:** Piranhazaal09:10 - 09:35 *Aziz Takhirov* — Arrow-Hurwicz scheme for steady two-dimensional Grade-Two Fluid Equations09:35 - 10:00 *Ritu Kumari* — Wavelet collocation method for the solution of optimal control problems governed by diffusion equations on metric graphs10:00 - 10:25 *Li Liao* — Efficient Mesh Generation and Application for Large-Scale Multiphysics Coupled Simulations

10:25 - 10:55

Coffee break (XYZ Lounge)

10:55 - 12:10

MS7 — Model reduction via moment closures with application to complex transport phenomena based on kinetic theory and free-surface flows (b)**Chair:** Julian Koellermeier, **Room:** Nick Ervinck10:55 - 11:20 *Julio Careaga* — Modelling the friction effect in the shallow water moment equations for granular flows11:20 - 11:45 *Robin Paar* — Moment Approximations to Shallow Flows with Non-Hydrostatic Pressure11:45 - 12:10 *Antoine Oriou* — Intrinsic Dimension Estimating Autoencoder (IDEA) Using CancelOut layer and a Projected Loss Application to Vertically Resolved Shallow Flow Simulations

MS8 — Recent Trends in Mathematical Software (b)**Chair:** Andrew Dienstfrey and Amparo Gil, **Room:** Honoré D'O10:55 - 11:20 *Aaron Melman* — Symbiosis of Scalar and Matrix Polynomials11:20 - 11:45 *Javier Segura* — Improving the quality of numerical software for distribution functions11:45 - 12:10 *Jules Zaleski* — Numerical investigation of finite element formulations for ICRH plasma heating**MS3 — Modelling, simulation and analysis of inertial particle dynamics****Chair:** Anna Klünker and Vamika Rath, **Room:** Panamarenko10:55 - 11:20 *Ahmed Saleh Almohaimeed* — Mathematical Modelling for Gravity Waves Interactions Coupled with Localized Water Vapour and Ozone in the Atmosphere11:20 - 11:45 *Meike F. Bos* — The Maxey-Riley-Gatignol equations for macroplastics in oceanic flows11:45 - 12:10 *Vamika Rath* — Maxey-Riley-Gatignol equations for tracking Lagrangian devices in chemical reactors**OS****Chair:** Marián Slodička, **Room:** Piranhazaal10:55 - 11:20 *Ismaila Muhammed* — Data-driven Construction of Reduced Size Models Using Computational Singular Perturbation Method11:20 - 11:45 *Balgaisha Mukanova* — AI-based Detection of Small Dams in Kazakhstan Using Map Fragment Classification11:45 - 12:10 *Narin Petrot* — Addressing Solution Challenges in Bilevel Optimization through Set-Based Approaches

12:10 - 14:00

Lunch break

14:00 - 15:40

MS7 — Model reduction via moment closures with application to complex transport phenomena based on kinetic theory and free-surface flows (c)**Chair:** Julian Koellermeier, **Room:** Nick Ervinck14:00 - 14:25 *Rik Verbiest* — Adaptive simulation of One-Dimensional Shallow Water Moment Equations14:25 - 14:50 *Michael Redle* — Moment Approximations to Magnetic Rotating Shallow Flows14:50 - 15:15 *Kevin Brooks* — High-Order Velocity Moment Coupling for Polydisperse Liquid Fuel Sprays15:15 - 15:40 *Clinton Groth* — High-Order Flux Reconstruction Methods for Hyperbolic Moment Closures**MS6 — New generation methods for numerical challenges in curl-div problems: Electromagnetism, MHD, and derived models (a)****Chair:** Jérôme Droniou, **Room:** Honoré D'O14:00 - 14:25 *Théophile Chaumont-Frelet* — A hybridizable discontinuous Galerkin method with transmission variables for time-harmonic electromagnetic problems14:25 - 14:50 *Ahmed Chabib* — GPU implementation of a hybridized discontinuous finite element solver for frequency-domain wave problems14:50 - 15:15 *Boris Andrews* — Topology-preserving discretisation of the magneto-frictional equations arising in the Parker conjecture15:15 - 15:40 *Kaibo Hu* — Finite elements for symmetric and traceless tensors in three dimensions

OS**Chair:** Karel Van Bockstal, **Room:** Panamarenko14:00 - 14:25 *Omar Alsayyed* — Operational Quadrature Methods for Approximating Fractional Integrals with Applications14:25 - 14:50 *Yashveer Kumar* — Efficient Numerical Techniques for Fractional Laplacian Differential Equation with Distributed Order Fractional Term14:50 - 15:15 *Zeynab Saki* — Numerical Techniques for Distributed-Order Fractional Differential Equations Based on Spectral Methods15:15 - 15:40 *Imtiaz Waheed* — Mikusiński Operational Calculus for the Hadamard Fractional Derivative

15:40 - 16:10

Coffee break (XYZ Lounge)

16:10 - 17:50

MS7 — Model reduction via moment closures with application to complex transport phenomena based on kinetic theory and free-surface flows (d)**Chair:** Julian Koellermeier, **Room:** Nick Ervinck16:10 - 16:35 *Eda Yilmaz* — A New Class of Nonlinear Closures Based on Orthogonal Polynomials16:35 - 17:00 *Georgii Oblapenko* — Sparse kinetic distribution estimation17:00 - 17:25 *Satyvir Singh* — Application of the R13 moment system to shock wave dynamics with viscous and non-equilibrium corrections**MS6 — New generation methods for numerical challenges in curl-div problems: Electromagnetism, MHD, and derived models (b)****Chair:** Jérôme Droniou, **Room:** Honoré D'O16:10 - 16:35 *Orian Louant* — Multi-GPU Discontinuous Galerkin Solver for Maxwell's Equations16:35 - 17:00 *Vito Patierno* — A Reynolds- and Hartmann-semirobust hybrid method for magnetohydrodynamics17:00 - 17:25 *Jia Jia Qian* — The Discrete De Rham method for the exterior calculus Einstein's equations17:25 - 17:50 *Shuo Zhang* — Primal finite element schemes of the $H(d) \cap H(\delta)$ problems**MS2 — Advancements in Neural Network Solvers for PDEs: Applications and Challenges (a)****Chair:** Seunggyu Lee, **Room:** Panamarenko16:10 - 16:35 *Minseok Choi* — CEENs: Causality-enforced evolutionary networks for solving time-dependent partial differential equations16:35 - 17:00 *Jae Hyuk Lim* — Causality-enhanced physics-informed simulators with sparse sensor measurements for real-time full-field estimation17:00 - 17:25 *Alexander Heinlein* — Adaptive sampling for physics-informed neural networks17:25 - 17:50 *Jooyoung Hahn* — Deep Learning with Viscosity-Reduction Variational Approach for Anisotropic Eikonal Equations

19:00 - 22:00

Conference dinner

Thursday, September 18th

10:00 – 10:50

Plenary lecture**Chair:** Peter Bastian, **Room:** Ned Kahn*Jérôme Droniou* — The Discrete De Rham method for electromagnetic models: from Maxwell to Yang–Mills to manifolds

10:50 – 11:20

Coffee break (Ned Kahn)

11:20 – 12:10

Plenary lecture**Chair:** Marián Slodička, **Room:** Ned Kahn*Barbara Kaltenbacher* — Forward and Inverse Problems in Nonlinear Acoustics

12:10 – 14:00

Lunch break

14:00 – 15:40

MS2 — Advancements in Neural Network Solvers for PDEs: Applications and Challenges (b)**Chair:** Minseok Choi, **Room:** Nick Ervinck14:00 – 14:25 *Seunggyu Lee* — Unconditionally gradient stable but explicit numerical method for solving gradient flows14:25 – 14:50 *Sanchita Malla* — A Deep Learning-based Numerical Algorithm for a Tumor Growth Model with Moving Boundary Conditions14:50 – 15:15 *Jinsil Lee* — Data-Efficient Operator Networks with Asymptotic Bases for Singularly Perturbed PDEs15:15 – 15:40 *Yeonju Lee* — Understanding the Diffusion Process via ODE-based Sampling**MS4 — Implicit high-order time integration for hyperbolic PDEs (a)****Chair:** Jochen Schütz and Peter Frolkovič, **Room:** Honoré D'O14:00 – 14:25 *Peter Frolkovič* — Compact implicit high resolution fast sweeping methods for some hyperbolic problems14:25 – 14:50 *Nikola Gajdošová* — Unconditionally stable higher order semi-implicit level set method14:50 – 15:15 *Andreu Martorell* — Low Mach number implicit-explicit schemes for the incompressible Cahn-Hilliard-Navier-Stokes equations15:15 – 15:40 *Afsaneh Moradi* — Filtered implicit second derivative time-stepping methods**OS****Chair:** Christophe Geuzaine, **Room:** Panamarenko14:00 – 14:25 *Michal Beneš* — Computational model of freezing front propagation in samples of porous media14:25 – 14:50 *Alex Bolyn* — Geodesic distance map generation algorithms for the geometrical inspection of flexible parts14:50 – 15:15 *Miroslav Kolář* — On qualitative aspects of discrete dislocation dynamics model based on evolving curves15:15 – 15:40 *Maneesh Narayanan* — Applications of Constrained Curvature Flow in Plane

OS**Chair:** Karel Van Bockstal, **Room:** Piranhazaal14:00 - 14:25 *Shakir Aidos* — Inverse Source Problem for Pseudoparabolic Equation with Memory Term and Damping14:25 - 14:50 *Simon Reyntjens* — A Prüfer angle based shooting method for Sturm-Liouville problems with non-separated boundary conditions14:50 - 15:15 *Alibek Yeskermessuly (presented by Arshyn Altybay)* — Very Weak Solutions to Parabolic Equations with Singular Coefficients and Boundary Data: Analysis and Computation15:15 - 15:40 *Zahra Keyshams* — Very Weak Solutions of the Heat Equation with Anisotropically Singular Time-Dependent Diffusivity

15:40 - 16:10

Coffee break (Ned Kahn)

16:10 - 17:50

MS2 — Advancements in Neural Network Solvers for PDEs: Applications and Challenges (c)**Chair:** Jooyoung Hahn, **Room:** Nick Ervinck16:10 - 16:35 *Shuo Zhang* — A Natural Deep Ritz Method for Essential Boundary Value Problems16:35 - 17:00 *Florent Purnode* — Accounting for Hysteresis and Eddy Currents in FEM Simulations of Ferromagnetic Laminated Cores using a Recurrent Neural Network17:00 - 17:25 *Louis Denis* — Acceleration of Multi-Scale Finite-Element Superconducting Magnet Simulations with Neural Network Surrogate Models**MS4 — Implicit high-order time integration for hyperbolic PDEs (b)****Chair:** Jochen Schütz and Peter Frolkovič, **Room:** Honoré D'O16:10 - 16:35 *Carlos Parés* — Well-balanced second-order compact implicit numerical scheme for hyperbolic balance laws16:35 - 17:00 *Arjun Thenery Manikantan* — Implicit Compact Approximate Taylor schemes17:00 - 17:25 *Aamir Yousuf* — Unified numerical analysis for thermoelastic diffusion and thermo-poroelasticity of thin plates**OS****Chair:** Sorin Pop, **Room:** Panamarenko16:10 - 16:35 *François Henrotte* — A mathematical definition for electromagnetic forces16:35 - 17:00 *Eduard Marušić-Paloka* — Fluid flow through porous wall and the Darcy interface condition17:00 - 17:25 *Amine Arhandou* — Combining Subdivision Schemes and Machine Learning for Geometric Modeling

List of participants

Name	University	E-mail
Akinola Richard	University of Jos	akinolar@unijos.edu.ng
Alheit Benjamin	TU Delft	b.h.alheit@tudelft.nl
Ali Irfan	Ghent University	irfan.ali@ugent.be
Almohaimeed Ahmed	Qassim University	ahs.almohaimeed@qu.edu.sa
Alsayyed Omar	The Hashemite University	omarm_re@hu.edu.jo
Alshehri Mansoor	King Saud University	mhalshehri@ksu.edu.sa
Altybay Arshyn	Ghent University	arshyn.altybay@ugent.be
Andrews Boris	University of Oxford	boris.andrews@maths.ox.ac.uk
Andriulli Francesco Paolo	Politecnico di Torino	francesco.andriulli@polito.it
Arhandou Amine	ENSA Morocco	examens.arhandou@gmail.com
Bastian Peter	Heidelberg University	peter.bastian@iwr.uni-heidelberg.de
Behzad Masoud	Universidad Diego Portales	masoud.behzad@mail.udp.cl
Benatia Nawfel	University of Liège	nawfel.benatia@uliege.be
Beneš Michal	Czech Technical University in Prague	michal.benes@jfji.cvut.cz
Bielinska-Waz Dorota	Medical University of Gdansk	djwaz@gumed.edu.pl
Bin Mohsin Bandar	King Saud University	balmohsen@ksu.edu.sa
Bin Turki Nasser	King Saud University	nassert@ksu.edu.sa
Bolyn Alex	University of Liège	a.bolyn@uliege.be
Bos Meike	Utrecht University	m.f.bos@uu.nl
Bourdineaud Nicolas	CEA-CESTA	nicolas.bourdineaud@u-bordeaux.fr
Brooks Kevin	University of Toronto	kevin.brooks@mail.utoronto.ca
Bruchhäuser Marius Paul	Helmut Schmidt University Hamburg	bruchhaeuser@hsu-hh.de
Bundschuh Jonas	Technical University of Darmstadt	jonas.bundschuh@tu-darmstadt.de
Chabib Ahmed	POEMS, CNRS, ENSTA	ahmed.chabib@ensta-paris.fr
Chaumont-Frelet Théophile	Inria Univ. Lille	theophile.chaumont@inria.fr
Choi Minseok	Pohang University of Science and Technology	mchoi@postech.ac.kr
Christian Merdon	Weierstrass Institute for Applied Analysis and Stochastics	christian.merdon@wias-berlin.de
Coelho da Silva Isadora	Ghent University/USP	isadora.vieiracoelhodasilva@ugent.be
Cools Kristof	Ghent University	kristof.cools@ugent.be
Cools Ronald	KU Leuven	ronald.cools@kuleuven.be
Dörich Benjamin	Karlsruhe Institute of Technology	benjamin.doerich@kit.edu
Daemen Mieke	University of Groningen	m.e.f.daemen@rug.nl
Denis Louis	University of Liège	louis.denis@uliege.be
Dienstfrey Andrew	National Institute of Standards and Technology	andrew.dienstfrey@nist.gov
Droniou Jérôme	CNRS & University of Montpellier; Monash University	jerome.droniou@umontpellier.fr
Faghih Amin	KU Leuven	amin.faghih@kuleuven.be
Frolkovič Peter	Slovak University of Technology in Bratislava	peter.frolkovic@stuba.sk
Gabriel Tim	University of Liège	tim.gabriel@uliege.be
Galtier Timothée	ONERA	timothee.galtier@onera.fr
Gansterer Wilfried	University of Vienna	wilfried.gansterer@univie.ac.at
Geuzaine Christophe	University of Liège	cgeuzaine@uliege.be
Gil Amparo	University of Cantabria	amparo.gil@unican.es
Grefe Roland	University of Liège	r.grefe@uliege.be
Groth Clinton	University of Toronto	groth@utias.utoronto.ca
Hahn Jooyoung	Czech Technical University in Prague	jooyoung.hahn@jfji.cvut.cz

Hang Xudeng	Institute of Applied Physics and Computational Mathematics, Beijing	hang_xudeng@iapcm.ac.cn
Heinlein Alexander	Delft University of Technology	a.heinlein@tudelft.nl
Henrotte François	University of Liège	francois.henrotte@uliege.be
Hesthaven Jan	Karlsruhe Institute of Technology (KIT)	jan.hesthaven@kit.edu
Hiroshi Fujiwara	Kyoto University	fujiwara@acs.i.kyoto-u.ac.jp
Hu Kaibo	University of Edinburgh	kaibo.hu@ed.ac.uk
Huybrechs Daan	KU Leuven	daan.huybrechs@kuleuven.be
Jamilu Umar Yusuf	Khalifa University	100060967@ku.ac.ae
Jerez-Hanckes Carlos	INRIA Chile	carlos.jerez@inria.cl
Julio Careaga	University of Groningen	j.c.careaga.solis@rug.nl
Kaltenbacher Barbara	University of Klagenfurt	barbara.kaltenbacher@aau.at
Kambaso Kunda	Springer Nature	kunda.kambaso@birkhauser-science.com
Karimov Erkinjon	Ghent University	erkinjon.karimov@ugent.be
Klünker Anna	Leuphana University of Lüneburg	anna.kluenker@leuphana.de
Klibanov Michael	University of North Carolina at Charlotte	mklibanv@charlotte.edu
Koellermeier Julian	Ghent University	julian.koellermeier@ugent.be
Kolar Miroslav	Czech Technical University in Prague	kolarmir@fjfi.cvut.cz
Kumar Vishvesh	Ghent University	vishvesh.kumar@ugent.be
Kumar Yashveer	INESC ID	yashveerkumar.rs.mat18@inesc-id.pt
Kumari Ritu	Indian Institute of Technology Delhi	ritsrishu98@gmail.com
Lassas Matti	University of Helsinki	matti.lassas@helsinki.fi
Le Van Chien	Ghent University	vanchien.le@ugent.be
Lee Yeonju	Korea University - Sejong	leeyeonju08@korea.ac.kr
Lee Seunggyu	Korea University	sky509@korea.ac.kr
Lee Jinsil	Seoul National University	jl74942@snu.ac.kr
Lehner Pascal	University of Klagenfurt	pascal.lehner@aau.at
Liao Li	Institute of Applied Physics and Computational Mathematics, Beijing	liliao@iapcm.ac.cn
Lim Jae Hyuk	Kyung Hee University	jaehyuklim@khu.ac.kr
Louant Orian	University of Liège	orian.louant@uliege.be
Maes Frederick	Ghent University	frederick.maes@ugent.be
Malla Sanchita	IIT Delhi	qiz218587@iitd.ac.in
Margenberg Nils	Helmut Schmidt University Hamburg	nils.margenberg@mailbox.org
Martin Boris	University of Liège	boris.martin@uliege.be
Martorell Garcés Andreu	Universitat De València	andreumartorell00@gmail.com
Marusic-Paloka Eduard	University of Zagreb	emarusic@math.hr
Mascagni Michael	NIST/Florida State University	michael.mascagni@gmail.com
Meliani Mostafa	Czech Academy of Sciences	meliani@math.cas.cz
Melman Aaron	Santa Clara University	amelman@scu.edu
Mohr Marcus	LMU Munich	marcus.mohr@lmu.de
Moradi Afsaneh	Otto von Guericke University Magdeburg	afsaneh.moradi@ovgu.de
Moufawad Sophie	American University of Beirut (AUB)	sm101@aub.edu.lb
Moujaes Paul	TU Dortmund University	paul.moujaes@math.tu-dortmund.de
Muhammed Ismaila	Khalifa University	100061894@ku.ac.ae
Mukanova Balgaisha	Astana IT University	mbsha01@gmail.com
Mukhambetkaliyev Murat	Kazakh National University	mukhambetkaliyevmurat@gmail.com
Muqaddass Nimra	IMT School for Advanced Studies Lucca	nimra.muqaddass@imtlucca.it
Narayanan Maneesh	Czech Technical University in Prague	narayman@cvut.cz
Nguyen Nam Anh	RWTH Aachen University	nguyen@igpm.rwth-aachen.de
Nguyen Huy	Ghent University	quanghuy.nguyen@ugent.be
Nikola Gajdosova	Slovak University of Technology in Bratislava	gavana1998@gmail.com
Nikolic Vanja	Radboud University	vanja.nikolic@ru.nl
Niranjan	South Asian University	niranjanverma@students.sau.ac.in
Nwachukwu Eucharia	University of Port Harcourt	eucharia.nwachukwu@uniport.edu.ng

Oblapenko Georgii	RWTH Aachen	oblapenko@acom.rwth-aachen.de
Oktem Nuray	Ankara Yildirim Beyazit University	nbozkaya@gmail.com
Oktem Tahir	Turkish Airlines Technique	toktem@thy.com
Omer Mubasharah Khalid	Université Côte d'Azur	mubasharah.omer@inria.fr
Oriou Antoine	Ghent University / CentraleSupélec	antoine.oriou@student-cs.fr
Oubrahim Rachid	Mohamed First University	rchd.oubrahim@gmail.com
Paar Robin	RWTH Aachen University	paar@eddy.rwth-aachen.de
Pandey Ankit	South Asian University	pankit8386@students.sau.ac.in
Parés Carlos	Universidad de Málaga	pares@uma.es
Patierno Vito	CNRS IMAG	vito.patierno99@gmail.com
Petrot Narin	Naresuan University	narinp@nu.ac.th
Pop Sorin	Hasselt University	sorin.pop@uhasselt.be
Prakash Jay	Ghent University	jprakash.jayprakash@ugent.be
Purnode Florent	University of Liège	florent.purnode@uliege.be
Qian Jia Jia	Monash University	jiajia.qian1@monash.edu
Rathi Vamika	Hamburg University of Technology	vamika.rathi@tuhh.de
Rauscher Teresa	University of Klagenfurt	teresa.rauscher@aau.at
Redle Michael	RWTH Aachen University	redle@acom.rwth-aachen.de
Reyntjens Simon	Ghent University	simon.reyntjens@ugent.be
Rosario Eduardo	Ghent University/IBB-Unesp	eduardo.rosario@unesp.br
Roubtsova Varvara	Hydro-Quebec	roubtsova.varvara@ireq.ca
Runge Daniel	Weierstrass Institute for Applied Analysis and Stochastics	runge@wias-berlin.de
Ruzhansky Michael	Ghent University	michael.ruzhansky@ugent.be
Saki Zeynab	Sahand University	zeynabsakiii98@gmail.com
Schuetz Jochen	Hasselt University	jochen.schuetz@uhasselt.be
Segura Javier	University of Cantabria	segurajj@unican.es
Shakir Aidos	Al Farabi Kazakh National University	ajdossakir@gmail.com
Shrahili Mansour	King Saud University	mshrahili@ksu.edu.sa
Simão Fernanda	Ghent University/USP	fernanda.martinssimao@ugent.be
Singh Satyvir	RWTH Aachen University	singh@acom.rwth-aachen.de
Slodička Marián	Ghent University	marian.slodicka@ugent.be
Strachota Pavel	Czech Technical University in Prague	pavel.strachota@fjfi.cvut.cz
Subbey Sam	Institute of Marine Research, Norway	samuels@imr.no
Takhirov Aziz	University of Sharjah	atakhirov@sharjah.ac.ae
Thenery Manikantan Arjun	Hasselt University	arjun.thenerymanikantan@uhasselt.be
Ullika Scholz	RWTH Aachen	scholz@acom.rwth-aachen.de
Van Bockstal Karel	Ghent University	karel.vanbockstal@ugent.be
Vats Yash	Indian Institute of Technology Delhi	yashvats425@gmail.com
Verbiest Rik	University of Groningen	rik.verbiest@skynet.be
Wisse Anouk	TU Delft	a.c.wisse@tudelft.nl
Waheed Imtiaz	National University of Sciences and Technology	imtiaz.waheed@ugent.be
Waz Piotr	Medical University of Gdansk	phwaz@gumed.edu.pl
Wichrowski Michal	Heidelberg University	mtwichrowski@gmail.com
Wohlmuth Barbara	TU Munich	wohlmuth@cit.tum.de
Yeghoyan Rafik	Ghent University	rafik.yeghoyan@ugent.be
Yeskermessuly Alibek	Altynsarin University	alibek.yeskermessuly@gmail.com
Yilmaz Eda	ACoM	yilmaz@acom.rwth-aachen.de
Yimer Markos	Addis Ababa University	markos.fisseha@aau.edu.et
Yousuf Aamir	Indian Institue of Technology Bombay	aamir72@iitb.ac.in
Zaleski Jules	University of Liège	j.zaleski@uliege.be
Zapico Viña Miguel	ArcelorMittal Global R&D	miguel.zapico@arcelormittal.com
Zeng Kai	Ghent University	kai.zeng@ugent.be
Zhang Shuo	Academy of Mathematics and Systems Science	szhang@lsec.cc.ac.cn

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

