ENUMATH 2023

LISBOA
PORTUGAL

04 - 08
SEPTEMBER

European Conference on Numerical Mathematics and Advanced Applications

PROGRAMME

Detailed Programme

Conference Rooms:
- Auditorium (AUD) – Congress Center
- Rooms: 01.1, 02.1, 02.2, 02.3 – Congress Center
- Amphitheatres: VA1, VA2, VA3, VA4 – Civil Engineering Building
- Amphitheatre Abreu Faro (AF) – Complexo Interdisciplinar

Monday, September 4th

8h00 - 9h00 | Registration

9h00 - 9h45 | Opening Session - Auditorium (AUD)

9h45 - 10h30 | Plenary Lecture

ROOM/TIMETABLE	PLENARY LECTURE
AUD	**Chair:** Adélia Sequeira
9h45 *40m + 5m*	Challenges in numerical modeling of extreme plasma physics in the laboratory and in astrophysics **Luís Oliveira e Silva** (Department of Physics, IST, University of Lisbon, Portugal)

10h30 - 11h00 | Coffee Break

Monday, September 4th

11h00 - 12h40 | Minisymposia

ROOM /TIMETABLE		MINISYMPOSIA
AUD		**MS31 - part 1 | Advances in polytopal methods for multiphysics problems** **Chair:** Daniele Prada
	11h00 *20m + 5m*	Multi level Algorithms and Rational Approximations for Multi-Physics problems **Kent Andre Mardal**
	11h25 *20m* + 5m	Discontinuous Galerkin Methods for Fisher-Kolmogorov Equation with Application to Prionic Proteins' Spreading in Neurodegeneration **Mattia Corti**
	11h50 *20m + 5m*	Application of hybrid high-order methods to the elasto-acoustic problem **Omar Duran**
VA1		**MS02 - part 1 | Mixed Precision Computations in Theory and Practice** **Chair:** Bastien Vieuble
	11h00 *20m + 5m*	Mixed precision Rayleigh quotient iteration for total least squares problems **Eda Oktay**
	11h25 *20m* + 5m	Iterative refinement of Schur decompositions **Zvonimir Bujanovic**
	11h50 *20m + 5m*	Responsibly reckless matrix algorithms for HPC scientific applications **Hatem Ltaief**
VA2		**MS08 - part 1 | Problems in biomedical fluid mechanics** **Chair:** Petr Sváček
	11h00 *20m + 5m*	On the strain based hemolysis models in the context of viscoelastic fluids flows **Tomáš Bodnár**
	11h25 *20m* + 5m	Application of artificial diffusion in simulations of Oldroyd-B type viscoelastic fluids for biomedical flows **Marília Pires**
	11h50 *20m + 5m*	Numerical Simulation of multiphase flows with multiple rheologies: from viscoelastic flows to elastic solids **Alexandre Caboussat**
	12h15 *20m + 5m*	On the development of a numerical model for the simulation of air flow in the human airways **Anna Lancmanová**

Monday, September 4th

ROOM /TIMETABLE	MINISYMPOSIA
VA3	**MS37 - part 1 | Diseases, Diagnosis, Treatment: Mathematical Modeling and Numerical Analysis** **Chair:** Giuseppe Romanazzi
11h00 *20m + 5m*	Learning stable cross-diffusion with reaction systems for image restoration **Sílvia Barbeiro**
11h25 *20m* + 5m	Numerical Analysis of Drug Release from Viscoelastic Polymers **Geovan Carlos Mendonça Campos**
11h50 *20m + 5m*	Drug delivery enhanced by external stimuli: modelling, simulation and numerical analysis **José Augusto Ferreira**
12h15 *20m + 5m*	Controlled drug delivery enhanced by temperature **Elías Gudiño**
VA4	**MS25 - part 1 | Transport at multiple scales in medical processes: from modelling to simulation** **Chair:** Florin A. Radu
11h00 *20m + 5m*	A fast front-tracking approach for a temporal multiscale blood flow problem with a fractional boundary growth **Ping Lin**
11h25 *20m + 5m*	Hybridized discontinuous Galerkin/hybrid mixed methods for a multiple network poroelasticity model with application in biomechanics **Johannes Kraus**
11h50 *20m + 5m*	Exploring the Multiscale Dynamics of Cancer Invasion in Fibrous Environment in the Presence of Tumour Associated Macrophages **Dumitru Trucu**
01.1	**MS14 - part 1 | Goal-oriented Error Estimation and Adaptivity** **Chair:** Bernhard Endtmayer
11h00 *20m + 5m*	Goal-oriented error estimates for nonlinear PDEs including linearization and algebraic error **Vít Dolejší**
11h25 *20m* + 5m	Using Neural Networks to Estimate Errors Generated by Uncertain Data in the Poisson Equation **Vilho Halonen**
11h50 *20m + 5m*	Rate-optimal goal-oriented adaptive FEM for semilinear elliptic PDEs **Maximilian Brunner**
12h15 *20m + 5m*	Cost-optimal goal-oriented AFEM for linear elliptic PDEs **Julian Streitberger**

Monday, September 4th

ROOM /TIMETABLE	MINISYMPOSIA
02.1	**MS15 - part 1 | Mathematical and computational models of cells, cell-populations, and applications thereof** **Chair:** Stefan Engblom
11h00 *20m + 5m*	Bridging the gap between individual-based and continuum models of growing cell populations **Fiona Macfarlane**
11h25 *20m* + 5m	Morphological stability for in silico models of avascular tumors **Erik Blom**
11h50 *20m + 5m*	Numerical simulation of active cell surfaces - from pattern formation to cell division **Sebastian Aland**
12h15 *20m + 5m*	Towards a full digital liver twin of drug-induced damage, regeneration and disease progression **Jieling Zhao**
02.2	**MS01 - part 1 |Multilevel and Multiscale Methods for PDEs** **Chair:** Roland Maier
11h00 *20m + 5m*	Iterative solution of spatial network models by subspace decomposition **Axel Målqvist**
11h25 *20m* + 5m	Enhancing wave propagation simulations with deep learning and the parareal algorithm **Richard Tsai**
11h50 *20m + 5m*	Multiscale finite element methods for advection-diffusion problems **Frédéric Legoll**
12h15 *20m + 5m*	A super-localized generalized finite element method **Philip Freese**
02.3	**MS21 - part 1 | Surface geometry approximation and vector-valued PDEs** **Chair:** Simon Praetorius
11h00 *20m + 5m*	Solving higher-order tensor-valued partial differential equations on curved and deforming surfaces **Daniel-Santos-Oliván**
11h25 *20m* + 5m	A mesh-free collocation method for vector surface differential operators **Alejandra Foggia**
11h50 *20m + 5m*	Intrinsic surface VEM for vector Laplacian **Elena Bachini**
12h15 *20m + 5m*	Global polynomial level sets for numerical differential geometry of smooth closed surfaces **Michael Hecht**

12h40 - 14h00 | Lunch

Monday, September 4th

14h00 - 15h40 | Minisymposia

ROOM /TIMETABLE		MINISYMPOSIA
AF		**MS31- part2 | Advances in polytopal methods for multiphysics problems** **Chair:** Ivan Fumagalli
	14h00 *20m + 5m*	Virtual Element Method for the Navier–Stokes Equation coupled with the Heat Equation **Marco Verani**
	14h25 *20m* + 5m	A Mixed Virtual Element Formulation of the Biot Poroelastic Model with Strong Symmetric Stresses **Daniele Prada**
	14h50 *20m + 5m*	Improving high-order VEM stability on badly-shaped elements **Gioana Teora**
	15h15 *20m + 5m*	The Bulk-Surface Virtual Element Method in 3D and applications in battery modeling **Massimo Frittelli**
VA1		**MS02- part2 | Mixed Precision Computations in Theory and Practice** **Chair:** Eda Oktay
	14h00 *20m + 5m*	A backward error analysis framework for GMRES **Bastien Vieuble**
	14h25 *20m* + 5m	Algorithms for mixed precision recycling on GPUs **Eric de Sturler**
	14h50 *20m + 5m*	Mixed precision randomized preconditioners for regression problems on GPUs **Vasileios Georgiou**
	15h15 *20m + 5m*	Precision auto-tuning of high-performance neural networks **Quentin Ferro**
VA2		**MS08 - part2 | Problems in biomedical fluid mechanics** **Chair:** Tomáš Bodnár
	14h00 *20m + 5m*	Application of finite element method for approximation of fluid-structure-acoustic interactions related to human phonation process **Petr Sváček**
	14h25 *20m* + 5m	On interpolation between finite element meshes in simulation of human vocal fold vibrations **Jan Valášek**
	14h50 *20m + 5m*	Numerical study of generalized Newtonian fluids flow in bypass **Radka Keslerová**
	15h15 *20m + 5m*	Study of blood flows in the aortic root by means of direct three-dimensional numerical simulations **Karel Tuma**

Monday, September 4th

ROOM /TIMETABLE	MINISYMPOSIA
VA3	**MS37 - part 2 | Diseases, Diagnosis, Treatment: Mathematical Modeling and Numerical Analysis** **Chair:** Elías Gudiño
14h00 *20m + 5m*	Solvability and numerical solution of a cross-diffusion cancer invasion model **Petr Knobloch**
14h25 *20m* + 5m	Controlled Transdermal Drug Delivery **Luís Pinto**
14h50 *20m + 5m*	Modeling and Numerical Analysis of Doxorubicin Transport and Uptake in Tumors **Giuseppe Romanazzi**
15h15 *20m + 5m*	Challenges in modelling light propagation in the human cornea **Milene Santos**
VA4	**MS20 - part 1 | Modern simulation & data science techniques for computational fluid dynamics problems in the exascale range** **Chair:** Axel Klawonn
14h00 *20m + 5m*	Massively Parallel & Low Precision Accelerator Hardware as Trends in HPC and its Application to CFD **Stefan Turek**
14h25 *20m* + 5m	On the design of global-in-time Navier-Stokes solvers **Christoph Lohmann**
14h50 *20m + 5m*	Space-time multigrid methods for stabilized convection-diffusion equations arising from flow problems **Jonas Dünnebacke**
15h15 *20m + 5m*	Fast semi-iterative finite element Poisson solvers for Tensor Core GPUs **Dustin Ruda**
01.1	**MS14 - part 2 | Goal-oriented Error Estimation and Adaptivity** **Chair:** Dirk Praetorius
14h00 *20m + 5m*	MORe DWR: Space-time goal-oriented error control for incremental POD-based ROM **Henrik Fischer**
14h25 *20m* + 5m	Space-time goal-oriented error control for incremental POD-ROM using MORe DWR and temporal multirate FEM applied to porous media **Julian Roth**
14h50 *20m + 5m*	Goal-oriented multirate techniques for coupled flow and transport and their challenges **Marius P. Bruchhäuser**
15h15 *20m + 5m*	Efficiency and Reliability for Adjoint Based Error Estimates using Interpolations **Bernhard Endtmayer**

Monday, September 4th

ROOM /TIMETABLE		MINISYMPOSIA
02.1		**MS15 - part 2 | Mathematical and computational models of cells, cell-populations, and applications thereof** **Chair:** Fred Vermolen
	14h00 *20m + 5m*	Blocked Gibbs Particle Smoothing Algorithm for Jump-Diffusion Approximations of Biochemical Reaction Networks **Derya Altintan**
	14h25 *20m* + 5m	Modelling the transport of radiative particles: The impact of tumour heterogeneous properties **Victor Ogesa Juma**
	14h50 *20m + 5m*	Model selection identifies proliferative heterogeneity in mouse microglia development **Duncan Martinson**
02.2		**MS01 - part 2 | Multilevel and Multiscale Methods for PDEs** **Chair:** Roland Maier
	14h00 *20m + 5m*	Super-localized numerical stochastic homogenization **Hannah Mohr**
	14h25 *20m* + 5m	A mixed multiscale spectral generalized finite element method **Christian Alber**
	14h50 *20m + 5m*	Multi-scale finite element method for incompressible flow in perforated domain **Loïc Balazi**
	15h15 *20m + 5m*	Optimal approximation of break-of-scale embeddings **Markus Weimar**
02.3		**MS21 - part 2 | Surface geometry approximation and vector-valued PDEs** **Chair:** Hanne Hardering
	14h00 *20m + 5m*	An Eulerian finite element method for tangential Navier-Stokes equations on evolving surfaces **Paul Schwering**
	14h25 *20m* + 5m	Finding equilibrium states of fluid membranes **Maxim Olshanskii**
	14h50 *20m + 5m*	Distributional curvature approximations with applications to shells **Michael Neunteufel**
	15h15 *20m + 5m*	The broken Bramble–Hilbert lemma for differential forms and its applications **Martin Licht**

15h40 - 16h10 | Coffee Break

Monday, September 4th

16h10 - 17h50 | Minisymposia

ROOM /TIMETABLE		MINISYMPOSIA
AF		**MS06 - part 1 | Theoretical and computational aspects of the discontinuous Galerkin method** **Chair:** Vadym Aizinger
	16h10 *20m + 5m*	Quasi-Monte Carlo and discontinuous Galerkin **Andreas Rupp**
	16h35 *20m* + 5m	Convergence Analysis of DG for Time-Dependent Navier-Stokes Equations **Beatrice Riviere**
	17h00 *20m + 5m*	A priori error analysis of a Local Discontinuous Galerkin time-continuous scheme for a nonlinear degenerate parabolic equation modeling porous media flows **Sunčica Sakić**
	17h25 *20m + 5m*	Discrete hybrid finite elements on hypergraphs **Hanz M. Cheng**
VA1		**MS19 - part 1 | Addressing Industrial Challenges in The Numerical Modeling of Flow and Geomechanics in Porous Media** **Chair:** Tameem Almani & Kundan Kumar
	16h10 *20m + 5m*	Disorder: An Innovative numerical algorithm for randomness estimation in seismic exploration **Saleh Al-Dossary**
	16h35 *20m* + 5m	Mixed discretization for coupled flow and mechanics in a fractured porous medium **Kundan Kumar**
	17h00 *20m + 5m*	A Priori Error Estimates for a Discretized Multirate Fixed-Stress Split Poro-Elastic System **Tameem Almani**
	17h25 *20m + 5m*	Solving Groundwater Flow Equation using Physics-Informed Neural Networks **Salvatore Cuomo**
VA2		**MS25 - part 2 | Transport at multiple scales in medical processes: from modelling to simulation** **Chair:** Dumitru Trucu
	16h10 *20m + 5m*	Multi-dimensional modelling of drug resistance & therapeutic outcomes in melanoma **Arran Hodgkinson**
	16h35 *20m* + 5m	An adaptive solution strategy for Richards' equation **Jakob Stokke**
	17h00 *20m + 5m*	The interplay between cross-adhesion and cross-diffusion in cancer dynamic **Zhihao Tao**

Monday, September 4th

ROOM /TIMETABLE	MINISYMPOSIA
VA3	**MS10 - part 1 | Entropy/energy-stable methods for time evolution problems** **Chair:** Mária Lukácová-Medvidová
16h10 *20m + 5m*	Lax equivalence principle in the context of problems in fluid dynamics **Eduard Feireisl**
16h35 *20m* + 5m	Approximating dynamic phase-field fracture with a first-order formulation for velocity and stress **Christian Wieners**
17h00 *20m + 5m*	Variational modeling and structure-preserving approximation of a non-isothermal phase-field model for sintering **Aaron Brunk**
17h25 *20m + 5m*	Approximation of Classical Two-Phase Flows by a Navier-Stokes/Allen-Cahn System **Maximilian Moser**
VA4	**MS20 - part 2 | Modern simulation & data science techniques for computational fluid dynamics problems in the exascale range** **Chair:** Stefan Turek
16h10 *20m + 5m*	Numerical Analysis of a Time-Simultaneous Multigrid Solver for Stabilized Convection-Dominated Transport Problems **Wiebke Drews**
16h35 *20m* + 5m	Nonlinear FETI-DP domain decomposition methods combined with deep learning **Axel Klawonn**
17h00 *20m + 5m*	Robust nonlinear two-level Schwarz domain decomposition methods **Martin Lanser**
17h25 *20m + 5m*	Parallel Scalable Domain Decomposition Methods for Incompressible Fluid Flow Problems **Lea Saßmannshausen**
01.1	**MS30 - part 1 | Robust Numerical Methods for Nonlinear and Coupled Diffusion Problems in Biology** **Chair:** Qiyao Peng
16h10 *20m + 5m*	Discrete and continuum modeling of robust biological transportation networks **Jan Haskovec**
16h35 *20m* + 5m	On Effcient implementation of trigonometric integrators in molecular dynamics **Tobias Kliesch**
17h00 *20m + 5m*	Preliminary numerical results in the optimization of bioenergy-intended raceway ponds **Aurea Martínez**

Monday, September 4th

ROOM /TIMETABLE	MINISYMPOSIA
02.1	**MS32 - part 1 | Numerical methods for perturbed saddle-point formulations arising in coupled problems and applications to poromechanics** **Chair:** Jakub Both
16h10 *20m + 5m*	Contact problems in porous media **Lothar Banz**
16h35 *20m* + 5m	A projection scheme for a nearly incompressible soft material poromechanics model **Mathieu Barré**
17h00 *20m + 5m*	How to deal with the coupling term in the approximation of fluid structure interactions with Lagrange multiplier **Daniele Boffi**
17h25 *20m + 5m*	A comparison of unfitted techniques for coupled problems across non-matching interfaces **Marco Feder**
02.2	**MS37 - part 3 | Diseases, Diagnosis, Treatment: Mathematical Modeling and Numerical Analysis** **Chair:** Elías Gudiño
16h10 *20m + 5m*	A porous-elastic model for convection enhanced drug delivery: stability and numerical approximation **Rafael Santos**
16h35 *20m* + 5m	Simulation of the trajectory of respiratory particles in violent events and ventilation of spaces **Pascoal Silva**
17h00 *20m + 5m*	Analysis and application of a kinetic framework modeling the immune system interactions **Ana Jacinta Soares**
17h25 *20m + 5m*	Computational hemodynamics in vascular disease **Jorge Tiago**
02.3	**MS05 | Stable multiderivative time-integrators for Differential Equations** **Chair:** Jeremy Chouchoulis & Eleni Theodosiou
16h10 *20m + 5m*	Compact implicit numerical methods for conservation laws **Peter Frolkovič**
16h35 *20m* + 5m	An explicitness-preserving IMEX-split multiderivative method **Eleni Theodosiou**
17h00 *20m + 5m*	High order strong stability preserving multi-derivative implicit and IMEX Runge–Kutta methods with asymptotic preserving properties **Zachary J. Grant**
17h25 *20m + 5m*	Jacobian-free implicit multiderivative Runge-Kutta methods **Jeremy Chouchoulis**

19h30 | Welcome Reception

Tuesday, September 5th

9h00 - 10h30 | Plenary Lectures

ROOM/TIMETABLE		PLENARY LECTURES
	AUD	**Chair:** Christian Wieners
	9h00 *40m + 5m*	Multithreaded Multilevel Spectral Domain Decomposition **Peter Bastian** (IWR, University of Heidelberg, Germany)
	9h45 *40m + 5m*	What is a limit of numerical methods for compressible flows? **Mária Lukácová-Medvidová** (Institute of Mathematics, University of Mainz, Germany)

10h30 - 11h00 | Coffee Break

Tuesday, September 5th

11h00 - 12h40 | Minisymposia

ROOM /TIMETABLE		MINISYMPOSIA
AUD		**MS13 - part 1 | Nonlinear problems in fluid mechanics and related problems** **Chair:** Lars Diening
	11h00 *20m + 5m*	Convergence Analysis for Pseudomonotone Parabolic Problems **Michael Růžička**
	11h25 *20m* + 5m	Structure preserving finite element schemes for a non-Newtonian flow **Gabriel Barrenechea**
	11h50 *20m + 5m*	Numerical investigation of blood flows with general boundary conditions **Jaroslav Hron**
	12h15 *20m + 5m*	Temporal regularity of power-law fluids under stochastic perturbations **Jörn Wichmann**
VA1		**MS14 - part 3 | Goal-oriented Error Estimation and Adaptivity** **Chair:** Bernhard Endtmayer
	11h00 *20m + 5m*	A posteriori error estimates robust with respect to the strength of nonlinearities **Martin Vohralik**
	11h25 *20m* + 5m	Goal-oriented error control for the finite cell method **Andreas Schröder**
	11h50 *20m + 5m*	Adaptive Mixed Finite Element Methods based on Goal Oriented A Posteriori Error Estimates **Dominika Thiede**
	12h15 *20m + 5m*	Goal-Oriented Adaptive Space-Time Finite Element Methods for Regularized Parabolic p-Laplace Problems **Andreas Schafelner**
VA2		**MS16 - part 1 | Theoretical and numerical developments for high-dimensional parametric PDEs** **Chair:** Tommaso Vanzan
	11h00 *20m + 5m*	Bifurcation diagrams of PDEs with parametric uncertainty **Chiara Piazzola**
	11h25 *20m* + 5m	High-dimensional and adapti ve approximati on of micromagnetics **Michael Feischl**
	11h50 *20m + 5m*	Isogeometric analysis of rough random acoustic scattering **Wei Huang**
	12h15 *20m + 5m*	Density estimati on in RKHS with application to Korobov spaces in high dimensions **Yoshihito Kazashi**

Tuesday, September 5th

ROOM /TIMETABLE	MINISYMPOSIA
VA3	**MS17 - part 1 | Analysis and Numerics for Systems of Nonlinear PDEs in Mathematical Biology** **Chair:** Mariya Ptashnyk
11h00 *20m + 5m*	Bridging modelling and numerical simulations **Christian Engwer**
11h25 *20m* + 5m	Fast numerical solvers for pattern formation problems in mathematical biology **Karolína Benková**
11h50 *20m + 5m*	Stokes-flow models of tissue growth **Chandrasekhar Venkataraman**
12h15 *20m + 5m*	Curvotaxis - How does curvature influence cellular motion? **Lea Happel**
VA4	**MS30 - part 2 | Robust Numerical Methods for Nonlinear and Coupled Diffusion Problems in Biology** **Chair:** Koondanibha Mitra
11h00 *20m + 5m*	Model selection for reaction-diffusion equations using rare data in life-sciences **Cordula Reisch**
11h25 *20m* + 5m	PDE modelling and simulation of intracellular signalling pathways **Sofie Verhees**
11h50 *20m + 5m*	A numerical method for simulating cell membrane and cytosolic dynamics **Davide Cussedu**
01.1	**MS26 | Multiscale and reduced-order modeling for poroelasticity** **Chair:** Alfonso Caiazzo
11h00 *20m + 5m*	A Novel Iterative Time Integration Scheme for Linear Poroelasticity **Matthias Deiml**
11h25 *20m* + 5m	Semi-explicit time discretization schemes for poroelasticity problems **Roland Maier**
11h50 *20m + 5m*	Multiscale immersed modelling of vascular tissues **Camilla Belponer**
12h15 *20m + 5m*	Multilevel methods for nearly-singular problems in mixed dimensions **Ludmil Zikatanov**

Tuesday, September 5th

ROOM /TIMETABLE	MINISYMPOSIA
02.1	**MS09 - part 1 | Non-homogeneous and multicomponent fluids for environmental applications** **Chair:** Šárka Nečasová
11h00 *20m + 5m*	Numerical investigation of turbulent stratified flows in ocean and atmosphere **Philippe Fraunié**
11h25 *20m* + 5m	Stably stratified turbulence: second-order closure scheme without critical Richardson number **Matteo Caggio**
11h50 *20m + 5m*	Influence of city trees on dustiness inside urban boundary layer computed by LES model PALM for different stratifications **Hynek Řezníček**
12h15 *20m + 5m*	Numerical analysis of flow phenomena in discharge objects with siphon using Smoothed Particle Hydrodynamics Method **Luděk Beneš**
02.2	**MS01 - part 3 | Multilevel and Multiscale Methods for PDEs** **Chair:** Andreas Rupp
11h00 *20m + 5m*	Homogeneous multigrid method for hybridizable discontinuous Galerkin methods **Peipei Lu**
11h25 *20m* + 5m	The effect of approximate coarsest-level solves on the convergence of multilevel V-cycle methods **Petr Vacek**
11h50 *20m + 5m*	PDEs with variable coefficients on locally adaptive sparse grids **Riccarda Scherner-Grießhammer**
12h15 *20m + 5m*	Homogenization of foil windings with globally supported polynomials and including capacitive effects **Jonas Bundschuh**
02.3	**MS12 - part 1 | Structure-Preserving and Efficient Neural Networks for Scientific Machine Learning** **Chair:** Philipp Horn
11h00 *20m + 5m*	Learning a Lattice Boltzmann Collisional operator using Physics Constrained Neural Networks **Giulio Ortali**
11h25 *20m* + 5m	Preserving physical-invariances in the closure of Reynolds-averaged Navier-Stokes equations with neural-networks **Davide Oberto**
11h50 *20m + 5m*	Learning a Mesh Motion Technique with Application to Fluid-Structure Interaction and Shape Optimization **Ottar Hellan**
12h15 *20m + 5m*	Hybrid integration of the gravitational N -body problem with Artificial Neural Networks **Veronica Saz Ulibarrena**

12h40 - 14h00 | Lunch

Tuesday, September 5th

14h00 - 15h40 | Minisymposia

ROOM /TIMETABLE		MINISYMPOSIA
Abreu Faro		**MS06 - part 2 | Theoretical and computational aspects of the discontinuous Galerkin method** **Chair:** Andreas Rupp
	14h00 *20m + 5m*	Parameter free adaptivity indicator for a p-adaptive discontinuous Galerkin method for the shallow water equations **Vadym Aizinger**
	14h25 *20m* + 5m	Spectrally deferred time integration for compressible flows **Jochen Schütz**
	14h50 *20m + 5m*	A filtering monotonization technique for DG discretizations of hyperbolic problems **Giuseppe Orlando**
	15h15 *20m + 5m*	On Slope Limiters in Discontinuous Galerkin Discretizations of Convection-Diffusion Problems **Volker John**
VA1		**MS19 - part 2 | Addressing Industrial Challenges in The Numerical Modeling of Flow and Geomechanics in Porous Media** **Chair:** Tameem Almani & Kundan Kumar
	14h00 *20m + 5m*	A linear iterative scheme for nonlinear, degenerate parabolic equations modelling unsaturated flow in porous media **Iuliu Sorin Pop**
	14h25 *20m* + 5m	Parallel multiscale methods on High-Performace-Computing (HPC) Architectures: Design aspects and performance analysis **Abdulrahman Manea**
	14h50 *20m + 5m*	Comparison of the different CFD coupled DEM models for polymer flooding **Yerlan Amanbek**
VA2		**MS16 - part 2 | Theoretical and numerical developments for high-dimensional parametric PDEs** **Chair:** Yoshihito Kazashi
	14h00 *20m + 5m*	Dimension truncation error analysis for high-dimensional numerical integration: lognormal setting and beyond **Philipp A. Guth**
	14h25 *20m* + 5m	An adaptive finite element stochastic Galerkin method based on multi level expansions **Henrik Eisenmann**
	14h50 *20m + 5m*	A dimension-adaptive sparse grid method for random elliptic PDEs using adaptive finite elements **Uta Seidler**
	15h15 *20m + 5m*	Multilevel quadrature rules for optimal control problems under uncertainty **Tommaso Vanzan**

Tuesday, September 5th

ROOM /TIMETABLE	MINISYMPOSIA
VA3	**MS34 - part 1 | Efficient Solvers for Coupled Problems in Porous Media** **Chair:** Arne Naegel
14h00 *20m + 5m*	Numerical Simulation of Propagation of Uncertainties in Coastal Aquifers **Dmitry Logashenko**
14h25 *20m* + 5m	Simulation of phreatic surface movement in unsaturated density driven flow **Niklas Conen**
14h50 *20m + 5m*	Fractures as Wentzell Interface Conditions for Darcy flow and Biot's equations **Marco Favino**
15h15 *20m + 5m*	On multipreconditioning Conjugate Gradient method with the additive multigrid for solving highly anisotropic problems **Hardik Kothari**
VA4	**MS30 - part 3 | Robust Numerical Methods for Nonlinear and Coupled Diffusion Problems in Biology** **Chair:** Tobias Koeppl
14h00 *20m + 5m*	A multi-physics reduced order model for the vascular microenvironment **Piermario Vitullo**
14h25 *20m* + 5m	Discontinous Galerkin methods on polytopal grids for multiphysics modeling of the cerebrospinal fluid **Ivan Fumagalli**
14h50 *20m + 5m*	Multiscale modelling and simulations of plant tissues **Mariya Ptashnyk**
15h15 *20m + 5m*	A level-set approach for a multiscale cancer invasion model **Ulrike Kochan-Eilers**
01.1	**MS40 - part 1 | Multi-scale mathematical modeling of human diseases** **Chair:** Miroslaw Lachowicz
14h00 *20m + 5m*	Epidemiological data assimilation for the assessment of the COVID 19 vaccination campaign in Italy **Damiano Pasetto**
14h25 *20m* + 5m	An integral boundary fractional model to the world population growth **Om Kalthoum Wanassi**
14h50 *20m + 5m*	Complex network near-synchronization for Lotka-Volterra predator-prey models **Cristiana J. Silva**

Tuesday, September 5th

ROOM /TIMETABLE	MINISYMPOSIA
02.1	**MS09 - part 2 | Non-homogeneous and multicomponent fluids for environmental applications** **Chair:** Philippe Fraunié
14h00 *20m + 5m*	The nematic liquid crystal-colloidal interaction model **Arnab Roy**
14h25 *20m* + 5m	Weak solutions to the heat conducting compressible self-gravitating flow in time-dependent domains **Kuntal Bhandari**
14h50 *20m + 5m*	Existence of a weak solution for a compressible multicomponent fluid-structure interaction problem **Šárka Nečasová**
02.2	**MS11 - part 1 | Reducing the irreducible: model reduction for transport-dominated problems** **Chair:** Monica Nonino
14h00 *20m + 5m*	Registration of coherent structures in bounded domains: mathematical analysis and application to model reduction **Tommaso Taddei**
14h25 *20m* + 5m	Registration-based nonlinear model order reduction for transport-dominated problems using geodesic shooting **Hendrik Kleikamp**
14h50 *20m + 5m*	Non-intrusive model order reduction of a 2D wildland fire model with topological changes **Shubhaditya Burela**
15h15 *20m + 5m*	Towards an Arbitrary-Lagrangian-Eulerian MOR framework for advection dominated problems: calibration, optimization and regression **Davide Torlo**
02.3	**MS12 - part 2 | Structure-Preserving and Efficient Neural Networks for Scientific Machine Learning** **Chair:** Veronica Saz Ulibarrena
14h00 *20m + 5m*	Structure-preserving neural networks for coupled dissipative systems **Quercus Hernández**
14h25 *20m* + 5m	Dynamic Neural Networks **Chinmay Datar**
14h50 *20m + 5m*	On the influence of hyperparameters on the convergence of adaptive gradient methods **Lu Xia**
15h15 *20m + 5m*	A Generalized Framework of Neural Networks for Hamiltonian Systems **Philipp Horn**

15h40 - 16h10 | Coffee Break

Tuesday, September 5th

16h10 - 17h50 | Minisymposia

ROOM /TIMETABLE		MINISYMPOSIA
AF		**MS06 - part 3 | Theoretical and computational aspects of the discontinuous Galerkin method** **Chair:** Vadym Aizinger
	16h10 *20m + 5m*	Dissipation-based WENO stabilization of high-order discontinuous Galerkin methods for hyperbolic problems **Dmitri Kuzmin**
	16h35 *20m* + 5m	A local dG-method for composite finite elements applied to convection-dominated problems **Friedhelm Schieweck**
	17h00 *20m + 5m*	A Discontinuous Galerkin Approach for Moist Air and Rain with Implicit Condensation **Henry von Wahl**
	17h25 *20m + 5m*	Discontinuous Galerkin Methods for Modeling Hurricane Storm Surge **Jennifer Proft**
VA1		**MS20 - part 3 | Modern simulation & data science techniques for computational fluid dynamics problems in the exascale range** **Chair:** Stefan Turek
	16h10 *20m + 5m*	Lineal: An Efficient, Hybrid-Parallel Linear Algebra Library **Kurt Böhm**
	16h35 *20m* + 5m	Towards performance portable algorithms for shallow water equations on unstructured grids **Markus Büttner**
	17h00 *20m + 5m*	Algorithm re-design and code generation for performance improvements of a discontinuous Galerkin shallow water model on CPUs, GPUs, FPGAs and heterogeneous systems **Sara Faghih-Naini**
	17h25 *20m + 5m*	Benchmarking Hybrid Finite Element/Deep Neural Networks and ClassicalFinite Element Methods in 3D **Nils Margenberg**
VA2		**MS34 - part 2 | Efficient Solvers for Coupled Problems in Porous Media** **Chair:** Gabriel Wittum
	16h10 *20m + 5m*	Scalable and Adaptive Multigrid Methods for Coupling Flow, Geomechanics and Transport **Arne Nägel**
	16h35 *20m* + 5m	Application of fully implicit Nested Newton solvers to multicomponent multiphase flow in porous media and to elastoplastic deformations of biological tissue **Markus Knodel**
		MS10 - part 2 | Entropy/energy-stable methods for time evolution problems **Chair:** Mária Lukácová-Medvidová
	17h00 *20m + 5m*	Lagrangian particle schemes for porous media flows using semi-discrete optimal transport **Andrea Natale**

Tuesday, September 5th

ROOM /TIMETABLE		MINISYMPOSIA
VA3		**MS41 - part 1 | Finite Element Methods for Constrained Problems** **Chair:** Rolf Stenberg
	16h10 *20m + 5m*	The augmented Lagrangian method as a framework for stabilised methods in computational mechanics **Mats Larson**
	16h35 *20m* + 5m	Least-squares finite elements for distributed optimal control problems **Thomas Fuehrer**
	17h00 *20m + 5m*	Nitsche-based finite element method for dynamic unilateral contact problems **Hao Huang**
	17h25 *20m + 5m*	Inf-sup condition of the P1_nc – (P0 + P1) mixed finite element **Erell Jamelot**
VA4		**MS31 - part 3 | Advances in polytopal methods for multiphysics problems** **Chair:** Alessio Fumagalli
	16h10 *20m + 5m*	A mass conservative scheme for the coupled Brinkman-Darcy flow and transport **Lina Zhao**
	16h35 *20m* + 5m	Free convection in porous media: the impact of fracture networks **Anna Scotti**
	17h00 *20m + 5m*	A polyhedral DivDiv complex **Marien-Lorenzo Hanot**
01.1		**MS23 - part 1 | Multiscale methods for wave propagation problems** **Chair:** Marcella Bonazzoli
	16h10 *20m + 5m*	Efficient discretization of nonlinear Schrödinger equations by localized orthogonal decomposition **Christian Döding**
	16h35 *20m* + 5m	An extension of the approximate component mode synthesis method to the heterogeneous Helmholtz equation **Elena Giammatteo**
	17h00 *20m + 5m*	Perfectly Matched layers for wave propagation problems with heterogeneous microstructure **Filip Marttala**

Tuesday, September 5th

ROOM /TIMETABLE	MINISYMPOSIA
02.1	**MS17 - part 2 | Analysis and Numerics for Systems of Nonlinear PDEs in Mathematical Biology** **Chair:** Christian Engwer
16h10 *20m + 5m*	Active contraction of axons: Mathematical modelling, numerical implementation and comparison with experiments **Giulio Lucci**
16h35 *20m* + 5m	Asymptotic study of a neuroscience PDE model with singular boundary condition **Elena Ambrogi**
17h00 *20m + 5m*	Simulation of Post Burned Skin using Principles from Morphoelasticity **Fred Vermolen**
17h25 *20m + 5m*	Toward Bayesian models of growing tumors **Stefan Engblom**
02.2	**MS11 - part 2 | Reducing the irreducible: model reduction for transport-dominated problems** **Chair:** Davide Pradovera
16h10 *20m + 5m*	Model Reduction on Polynomially Mapped Manifolds **Silke Glas**
16h35 *20m* + 5m	Gradient-preserving adaptive model order reduction of parametric conservative dynamical systems **Cecilia Pagliantini**
17h00 *20m + 5m*	Dynamical low-rank approximation for Burgers' equation with uncertainty **Gianluca Ceruti**
17h25 *20m + 5m*	SUPG-stabilised Dynamical Low Rank Methods for Advection-Dominated Problems **Thomas Trigo Trindade**
02.3	**MS32 - part 2 | Numerical methods for perturbed saddle-point formulations arising in coupled problems and applications to poromechanics** **Chair:** Fleurianne Bertrand
16h10 *20m + 5m*	Robust solvers for multiphase poroelasticity **Jakub Both**
16h35 *20m* + 5m	Least-Squares Finite Element Methode for a non-linear Sea-Ice problem **Henrik Schneider**
17h00 *20m + 5m*	A parallel solver for fluid-structure interaction problems with Lagrange multiplier **Fabio Credali**
17h25 *20m + 5m*	Stabilization free virtual element method and discrete compactness property: the acoustic problem **Linda Alzaben**

Wednesday, September 6th

9h00 - 10h30 | Plenary Lectures

ROOM/TIMETABLE	PLENARY LECTURES
AUD	**Chair:** Adélia Sequeira
9h00 *40m + 5m*	Mathematical and numerical modeling of neurodegenerative diseases **Paola Francesca Antonietti** (MOX, Department of Mathematics, Politecnico di Milano, Italy)
9h45 *40m + 5m*	The Role of Applied Mathematics in the Design of Coronary Stents **Alessandro Veneziani** (MATHCS, University of Emory, USA)

10h30 - 11h00 | Coffee Break + Poster Presentations

Posters: (PP3), (PP4), (PP7), (PP9)

11h00 - 12h30 | Plenary Lectures

ROOM/TIMETABLE	PLENARY LECTURES
AUD	**Chair:** Christian Wieners
11h00 *40m + 5m*	Conservative Cut Finite Element Methods **Sara Zahedi** (KTH Royal Institute of Technology, Sweden)
11h45 *40m + 5m*	Numerical solution of nonlinear eigenvector problems **Daniel Peterseim** (Institute of Mathematics, University of Augsburg, Germany)

16h50 | Tagus River Cruise

19h30 | Conference Dinner

Thursday, September 7th

9h00 - 10h30 | Plenary Lectures

ROOM/TIMETABLE	PLENARY LECTURES
AUD	**Chair:** Ana L. Silvestre
9h00 *40m + 5m*	From condensed matter theory to sub-wavelength physics **Habib Ammari** (Department of Mathematics, ETH, Zurich, Switzerland)
9h45 *40m + 5m*	Discretization of anisotropic PDEs using Voronoi's reduction of positive quadratic forms **Jean-Marie Mirebeau** (Department of Mathematics, University of Paris-Sud, France)

10h30 - 11h00 | Coffee Break + Poster Presentations

Posters: (PP2), (PP5), (PP6), (PP10)

Thursday, September 7th

11h00 - 12h40 | Minisymposia

ROOM /TIMETABLE		MINISYMPOSIA
AUD		**MS35 - part 1 | Solving Multiphysics/Multiscale Problems: A Challenge between (Reduced) Model-Driven and Data-Driven approaches** **Chair:** Gianluigi Rozza
	11h00 *20m + 5m*	Data-driven modelling of turbulent reacting flows: from physics-based models to digital twins **Alberto Procacci**
	11h25 *20m* + 5m	State estimation for brain poro-elastography data **Felipe Galarce Marin**
	11h50 *20m + 5m*	Samplets-Kernel Method in Computational Learning **Davide Baroli**
	12h15 *20m + 5m*	Error bounds for PDE-regularized learning **Carsten Gräser**
VA1		**MS04 - part 1 | Approximated boundary methods: modelling, mathematical analysis and simulations** **Chair:** Michel Duprez
	11h00 *20m + 5m*	Elliptic Interface Problems with Jump Coefficients: A Fictitious Domain Approach with Distributed Lagrange Multiplier **Najwa Alshehri**
	11h25 *20m* + 5m	Local flux recovery for an elliptic interface problem using CutFEM **Aimene Gouasmi**
	11h50 *20m + 5m*	Towards robust immersed interface methods for fluid-structure interaction **Boyce Griffith**
	12h15 *20m + 5m*	Weak prescription of Dirichlet conditions in the finite element approximation of Maxwell's problem **Onder Turk**
VA2		**MS07 - part 1 | Space-time methods for evolutionary PDEs** **Chair:** Gregor Gantner
	11h00 *20m + 5m*	A space-time fast boundary element method for the heat equation with temporal nearfield compression **Günther Of**
	11h25 *20m* + 5m	Shape optimization for parabolic problems on time-dependent domains **Helmut Harbrecht**
	11h50 *20m + 5m*	Thermo-elastic coupling with finite elements in space-time: modeling and simulation for multiphysics systems **Michael Reichelt**
	12h15 *20m + 5m*	Space-time virtual elements for the heat equation **Ilaria Perugia**

Thursday, September 7th

ROOM /TIMETABLE	MINISYMPOSIA
VA3	**MS41 - part 2 | Finite Element Methods for Constrained Problems** **Chair:** Juha Videman
11h00 *20m + 5m*	Error estimates for a pointwise tracking optimal control problem of a semilinear elliptic equation **Francisco Fuica**
11h25 *20m* + 5m	Recent extensions of efficient numerical iterative solvers for constrained variational phase-field fracture problems **Leon Kolditz**
11h50 *20m + 5m*	On discrete ground states of rotating Bose–Einstein condensates **Mahima Yadav**
VA4	**MS24 - part 1 | Structure-preserving unfitted finite element discretizations** **Chair:** Sara Zahedi
11h00 *20m + 5m*	Unfitted finite element methods for axisymmetric two-phase flow **Robert Nürnberg**
11h25 *20m* + 5m	Divergence preserving cut finite element methods for Stokes flow **Erik Nilsson**
11h50 *20m + 5m*	Cut FEM meets Finite Differences **Gunilla Kreiss**
01.1	**MS03 - part 1 | Numerical methods for fractional-derivative problems** **Chair:** Martin Stynes
11h00 *20m + 5m*	Numerical methods for nonlocal and nonlinear parabolic equations with applications in hydrology and climatology **Lukasz Plociniczak**
11h25 *20m* + 5m	A generalised distributed-order Maxwell model **Magda Rebelo**
11h50 *20m + 5m*	Two kinds of numerical algorithms for ultra-slow diffusion equations **Changpin Li**
12h15 *20m + 5m*	Numerical approximation of the fractional material derivative and its link to Lévy walks **Marek Teuerle**

Thursday, September 7th

ROOM /TIMETABLE		MINISYMPOSIA
02.1		**MS22 - part 1 | Model reduction and efficient linear algebra techniques for direct and inverse problems** **Chair:** Cecilia Pagliantini
	11h00 *20m + 5m*	Sketched and truncated polynomial Krylov subspace methods **Davide Palitta**
	11h25 *20m* + 5m	Leveraging low-rank approximation and interpolation in parallel-in-time integration **Stefano Massei**
	11h50 *20m + 5m*	Stable low-rank tensor representation and approximation for the efficient discretization and solution of PDE problems **Vladimir Kazeev**
	12h15 *20m + 5m*	The finite element method with neural networks to reconstruct the mechanical properties of an elastic medium **Rafael Henriques**
02.2		**MS13 - part 2 | Nonlinear problems in fluid mechanics and related problems** **Chair:** Christian Kreuzer
	11h00 *20m + 5m*	Finite element approximation for fluids with non-standard boundary conditions **Tabea Tscherpel**
	11h25 *20m* + 5m	Boundary regularity for nonlinear systems depending on the symmetric gradient **Linus Behn**
	11h50 *20m + 5m*	Relaxed Kacanov scheme for the p-Laplacian **Anna Balci**
	12h15 *20m + 5m*	A modified Kačanov iteration scheme for the numerical solution of quasilinear elliptic diffusion equations **Pascal Heid**
02.3		**MS28 - part 1 | Reduced-order modeling and learning of parameterized dynamical systems: state-of-the-art vs. avant-garde methods** **Chair:** Charles Poussot-Vassal
	11h00 *20m + 5m*	Data-driven adaptive approximation of parametric dynamical systems with pole bifurcations **Davide Pradovera**
	11h25 *20m* + 5m	Order reduction of dissipative parameterized LTI systems via constrained multivariate rational fitting **Tommaso Bradde**
	11h50 *20m + 5m*	Parametric Low-Order State-Space Modeling of MIMO Systems in the Loewner Framework **Tea Vojkovic**
	12h15 *20m + 5m*	Data-driven parametric reduced-order modeling in the Loewner framework: some new considerations **Ion Victor Gosea**

12h40 - 14h00 | Lunch

Thursday, September 7th

14h00 - 15h40 | Minisymposia

ROOM /TIMETABLE		MINISYMPOSIA
AF		**MS35 - part 2 | Solving Multiphysics/Multiscale Problems: A Challenge between (Reduced) Model-Driven and Data-Driven approaches** **Chair:** Alessandro Veneziani
	14h00 *20m + 5m*	Physics-based reduced order modelling for efficient urban air pollution prediction **Gianluigi Rozza**
	14h25 *20m* + 5m	Physics-informed deep learning for viscoelastic flows **Birane Kane**
	14h50 *20m + 5m*	Analysis of Endovascular and Open Surgery Repair for Descending Thoracic Aortic Aneurysms using Multiscale 0D-1D Fluid-Structure Interaction **Leonardo Molinari**
VA1		**MS24 - part 2 | Structure-preserving unfitted finite element discretizations** **Chair:** Gunilla Kreiss
	14h00 *20m + 5m*	Bound preserving cut discontinuous Galerkin methods for hyperbolic conservation laws **Pei Fu**
	14h25 *20m* + 5m	A cut finite-element method for fracture and contact problems in large-deformation solid mechanics **Mikhail Poluektov**
	14h50 *20m + 5m*	A cut finite element method based on Hermite interpolation polynomials **Ivy Weber**
VA2		**MS36 part 1 | Special Session: Meshfree methods for direct and inverse problems in partial differential equations. In memoriam of Prof. Carlos J.S. Alves** **Chair:** Adélia Sequeira
	14h00 *20m + 5m*	Introduction **Adélia Sequeira**
	14h25 *20m* + 5m	Elasticity Imaging - In memory of Carlos Alves **Habib Ammari**
	14h50 *20m + 5m*	Accelerated iterative MFS algorithms for the Cauchy problem in steady-state anisotropic heat conduction **Liviu Marin**
	15h15 *20m + 5m*	A Localized Multi-Level Method of Fundamental Solutions for Inhomogeneous Problems **Csaba Gaspar**

Thursday, September 7th

ROOM /TIMETABLE		MINISYMPOSIA
VA3		**MS07 - part 2 | Space-time methods for evolutionary PDEs** **Chair:** Rob Stevenson
	14h00 *20m + 5m*	On a space-time first-order system least-squares formulation of parabolic PDEs **Gregor Gantner**
	14h25 *20m* + 5m	Interpolation operators for parabolic problems **Johannes Storn**
	14h50 *20m + 5m*	Towards space-time finite elements for the wave equation **Michael Karkulik**
	15h15 *20m + 5m*	Space-time continuous and coercive formulation for the wave equation **Paolo Bignardi**
VA4		**MS39 - part 1 | Numerical methods for nonlinear and coupled processes (flow, reactive transport and deformation) in porous media** **Chair:** Martin Vohralik
	14h00 *20m + 5m*	Structure preserving discontinuous Galerkin approximation of dynamic poroelasticity **Markus Bause**
	14h25 *20m* + 5m	Numerical analysis of a mixed-dimensional poromechanical model with frictionless contact at matrix-fracture interfaces **Francesco Bonaldi**
	14h50 *20m + 5m*	Efficient splitting schemes for coupled problems **Florin Radu**
	15h15 *20m + 5m*	P1-bubble VEM method for a mixed-dimensional poromechanical model with frictional contact at matrix-fracture interfaces **Ali Haidar**
01.1		**MS40 - part 2 | Multi-scale mathematical modeling of human diseases** **Chair:** Ana Jacinta Soares
	14h00 *20m + 5m*	Modelling Self–organization or Disorder **Miroslaw Lachowicz**
	14h25 *20m* + 5m	Fully 3D spatio-temporal resolved models of virus replication evaluated at realistic reconstructed cell geometries **Gabriel Wittum**
	14h50 *20m + 5m*	Spatio-temporal models for immunological disorders leading to pattern formation **Romina Travaglini**
	15h15 *20m + 5m*	Variable size player game theory and the evolution of eusociality **Fabio Chalub**

Thursday, September 7th

ROOM /TIMETABLE	MINISYMPOSIA
02.1	**MS22 - part 2 | Model reduction and efficient linear algebra techniques for direct and inverse problems** **Chair:** Cecilia Pagliantini
14h00 *20m + 5m*	Parametric PDE solvers for parameter estimation and Uncertainty Quantification **Damiano Lombardi**
14h25 *20m* + 5m	Dynamical adaptive state estimation of Hamiltonian systems **Federico Vismara**
14h50 *20m + 5m*	Time-limited Balanced Truncation for Data Assimilation Problems **Josie König**
15h15 *20m + 5m*	Balanced truncation for Ensemble Kalman Inversion **Elizabeth Qian**
02.2	**MS13 - part 3 | Nonlinear problems in fluid mechanics and related problems** **Chair:** Michael Růžička
14h00 *20m + 5m*	Pressure robust discretisations of the nonlinear Stokes equations **Christian Kreuzer**
14h25 *20m* + 5m	Convergence rate for a space-time discretization for incompressible generalized Newtonian fuids: the Dirichlet problem for p > 2 **Mirjam Hoferichter**
14h50 *20m + 5m*	Quasioptimal nonconforming discretisations of the p-Laplace equation **Alexei Gazca Orozco**
15h15 *20m + 5m*	Error analysis for a local discontinuous Galerkin approximation for systems of p-Navier–Stokes type **Alex Kaltenbach**
02.3	**MS28 - part 2 | Reduced-order modeling and learning of parameterized dynamical systems: state-of-the-art vs. avant-garde methods** **Chair:** Ion Victor Gosea
14h00 *20m + 5m*	Parametric Reduced-order Modeling via Nonlinear Least Square **Petar Mlinaric**
14h25 *20m* + 5m	Point-set registration-based model applied to parametrized porous media flows **Birgul Koc**
14h50 *20m + 5m*	Model reduction for stochastic systems with nonlinear drift **Martin Redmann**
15h15 *20m + 5m*	A parametric data-driven time-domain one- or two-sided moment matching method **Giordano Scarciotti**

15h40 - 16h10 | Coffee Break

Thursday, September 7th

16h10 - 17h50 | Minisymposia and Special Sessions

ROOM /TIMETABLE		MINISYMPOSIA
Abreu Faro		**MS29 - part 1 | Efficient numerical methods in computational biomechanics** **Chair:** Stefan Frei & Qiyao Peng
	16h10 *20m + 5m*	Numerical modeling of cardiac derived stem cells and isogeometric simulation of an engineered tissue **Sofia Botti**
	16h35 *20m* + 5m	Modeling of Patient-specific Blood Flows and Clinical Validation **Xiao-Chuan Cai**
	17h00 *20m + 5m*	Calibration of Windkessel parameters for 1D-0D coupled blood flow models using kernel methods and quantum algorithms **Tobias Köppl**
	17h25 *20m + 5m*	Efficient Monolithic Methods for Fluid-Structure Interaction Applied to Flapping Membranes **Thomas Wick**
VA1		**MS04 - part 2 | Approximated boundary methods: modelling, mathematical analysis and simulations** **Chair:** Alexei Lozinski
	16h10 *20m + 5m*	φ-FEM: a immersed finite element method on domains defined by level-sets to solve elliptic PDEs **Michel Duprez**
	16h35 *20m* + 5m	A φ-FEM approach with deep learning and varying geometry **Vanessa Lleras**
		MS23 - part 2 | Multiscale methods for wave propagation problems **Chair:** Elena Giammatteo
	17h00 *20m + 5m*	Towards a matrix-free parallel scalable multi-level deflation preconditioning for heterogeneous time-harmonic wave problems **Jinqiang Chen**
	17h25 *20m + 5m*	Preconditioning with locally harmonic spectral coarse spaces **Arne Strehlow**
VA2		**MS36 - part 2 | Special Session: Meshfree methods for direct and inverse problems in partial differential equations. In memoriam of Prof. Carlos J.S. Alves** **Chair:** Liviu Marin
	16h10 *20m + 5m*	Applications and numerical solution of vibrations of the elastic membrane by using a meshless method of lines **Arshad Hussain**
	16h35 *20m* + 5m	A well-conditioned Method of Fundamental Solutions for Laplace equation **Pedro R. S. Antunes**
	17h00 *20m + 5m*	Meshfree methods with particular solutions for nonhomogeneous Stokes and Brinkman systems **Nuno M. F. Martins**
	17h25 *20m + 5m*	A meshfree alternating Schwarz method for elliptic BVP **Svilen S. Valtchev**

Thursday, September 7th

ROOM /TIMETABLE	MINISYMPOSIA
VA3	**MS18 - part 1 | Efficient numerical methods for direct or inverse wave propagation problems** **Chair:** Ivan Fumagalli
16h10 *20m + 5m*	A p-version of convolution quadrature in wave propagation **Alexander Rieder**
16h35 *20m* + 5m	Convergence analysis of semi-implicit multi-step one-shot methods for regularized linear inverse problems **Tuan Anh Vu**
17h00 *20m + 5m*	Automated approach for source location in shallow waters **Angèle Niclas**
17h25 *20m + 5m*	Simultaneous interface identification and soundspeed reconstruction of layered media using acoustic wave **Huidong Yang**
VA4	**MS39 - part 2 | Numerical methods for nonlinear and coupled processes (flow, reactive transport and deformation) in porous media** **Chair:** Iuliu Sorin Pop
16h10 *20m + 5m*	A high order, finite volume, multilevel WENO scheme for multidimensional problems **Todd Arbogast**
16h35 *20m* + 5m	A Lattice Boltzmann Method for Darcy- and Biot-Type Models **Natalia Nebulishvili**
17h00 *20m + 5m*	Efficient and robust computation of speciation in aqueous solution **Clement Cances**
17h25 *20m + 5m*	A posteriori error estimates for the STDGM for solving the Richards equation **Hyun-Geun Shin**
01.1	**MS27 - part 1 | Novel numerical methods for the solution of nonlinear hyperbolic PDE's** **Chair:** Gabriella Puppo
16h10 *20m + 5m*	Semi-implicit fully well-balanced schemes for the 1D shallow-water system **Celia Caballero-Cárdenas**
16h35 *20m* + 5m	High-order methods that preserve all the hydrostatic stationary solutions for Ripa model and Euler with gravity **Irene Gómez-Bueno**
17h00 *20m + 5m*	Well-Balanced High-Order Discontinuous Galerkin Methods for Systems of Balance Laws **Ernesto Guerrero Fernández**
17h25 *20m + 5m*	Well balanced discontinuous Galerkin schemes with a~posteriori sub-cell limiter on moving Voronoi meshes with topology changes **Elena Gaburro**

Thursday, September 7th

ROOM /TIMETABLE	SPECIAL SESSIONS
02.1	**CT1 Special Session** **Chair:** Telma Guerra
16h10 *20m + 5m*	Imposing slip conditions on curved boundaries for 3D incompressible flows with a very high-order accurate finite volume scheme on polygonal meshes **Ricardo Costa**
16h35 *20m* + 5m	Semiclassical numerical modeling of gain materials with a high order Discontinuous Galerkin time-domain solver **Cedric Legrand**
17h00 *20m + 5m*	High-Order-Integration for Regular Closed Surfaces **Gentian Zavalani**
02.2	**CT2 Special Session** **Chair:** Juha Videman
16h10 *20m + 5m*	Model order reduction for reaction-advection problems using an optimally stable Petrov-Galerkin scheme **Lukas Renelt**
16h35 *20m* + 5m	Subgrid Artificial Viscosity Modelling Based Defect-Deferred Correction Method for Fluid-Fluid Interaction **Medine Demir**
17h00 *20m + 5m*	Adaptive solution of a model for the drying of porous solids **Maria Gonzalez Taboada**
17h25 *20m + 5m*	On the inf-sup compatibility of Raviart-Thomas elements combined with conforming nodal element **Pierre Alain Goulm**

Friday, September 8th

9h00 - 10h30 | Plenary Lectures

ROOM/TIMETABLE		PLENARY LECTURES
	AUD	Chair: Adélia Sequeira
	9h00 *40m + 5m*	From differential equations to deep learning for image analysis **Carola–Bibiane Schönlieb** (DAMTP, University of Cambridge, UK)
	9h45 *40m + 5m*	Primal Dual methods for Wasserstein gradient flows **José Carrillo de la Plata** (Mathematical Institute, University of Oxford, UK)

10h30 - 11h00 | Coffee Break + Poster Presentations

Posters: (PP1), (PP8), (PP11)

Friday, September 8th

11h00 - 12h40 | Minisymposia and Special Sessions

ROOM /TIMETABLE		MINISYMPOSIA / SPECIAL SESSIONS
AUD		**CT3 Special Session** **Chair:** Marília Pires
	11h00 *20m + 5m*	Low-Dissipation Central-Upwind Schemes **Alexander Kurganov**
	11h25 *20m* + 5m	Sound radiation from double wall structure with poroelastic layers: variational formulation and finite element results **Walid Larbi**
	11h50 *20m + 5m*	Space-time parallel methods for parabolic problems **Inigo Jimenez-Ciga**
VA1		**MS03 - part 2 | Numerical methods for fractional-derivative problems** **Chair:** Ercília Sousa
	11h00 *20m + 5m*	Generalized convolution quadrature for the fractional integral and fractional diffusion equations **Maria Lopez-Fernandez**
	11h25 *20m* + 5m	Efficient and stable implementation of higher order methods for time-dependent fractional parabolic equations **Sebastian Franz**
	11h50 *20m + 5m*	Error analysis of finite difference schemes on non-uniform meshes for distributed-order differential equations **Maria Luísa Morgado**
VA2		**MS29 - part 2 | Efficient numerical methods in computational biomechanics** **Chair:** Stefan Frei
	11h00 *20m + 5m*	Modeling Simulation Behavior: Error Balancing in a Multi-Scale Muscle Simulation using Bayesian Optimization **Felix Huber**
	11h25 *20m* + 5m	Numerical Simulation of Effective Models for Transport Processes in Deformable Porous Media within Mixed Eulerian/Lagrangian Framework **Jonas Knoch**
	11h50 *20m + 5m*	Computationally efficient simulation of multiple moving cells that release diffusing compounds in their environment **Qiyao Peng**
	12h15 *20m + 5m*	Temporal homogenisation and parallelisation for the numerical simulation of atherosclerotic plaque growth **Stefan Frei**

Friday, September 8th

ROOM /TIMETABLE	MINISYMPOSIA
VA3	**MS18 - part 2 | Efficient numerical methods for direct or inverse wave propagation problems** **Chair:** Marcella Bonazzoli
11h00 *20m + 5m*	Symplectic FEM–QTT solution of the acoustic wave equation **Sara Fraschini**
11h25 *20m* + 5m	Using spectral information for the robust solution of positive Maxwell problems via domain decomposition **Niall Bootland**
11h50 *20m + 5m*	Wave propagation in time-varying media **Barbara Verfürth**
12h15 *20m + 5m*	Adaptive Spectral Decompositions For Inverse Medium Problems **Marcus Grote**
VA4	**MS04 - part 3 | Approximated boundary methods: modelling, mathematical analysis and simulations** **Chair:** Vanessa Lleras
11h00 *20m + 5m*	A penalty-free Shifted Boundary Method of arbitrary order **Alexei Lozinski**
11h25 *20m* + 5m	An overview of the Transfer Path Method **Manuel Solano**
11h50 *20m + 5m*	Numerical Analysis of Stefan Problems for Embedded Computation of Moving Internal Boundaries **Tiffanie Carlier**
12h15 *20m + 5m*	Higher Order Unfitted Space-time Finite Element Methods for PDEs on Moving Domains **Fabian Heimann**
01.1	**MS22 - part 3 | Model reduction and efficient linear algebra techniques for direct and inverse problems** **Chair:** Stefano Massei
11h00 *20m + 5m*	Geometry-based approximation of waves propagating through complex domains **Monica Nonino**
11h25 *20m* + 5m	Acoustic full-waveform inversion for density and velocity variations using a FFT-accelerated scattering approach **Morten Jakobsen**
11h50 *20m + 5m*	A rational Krylov subspace method for ill-posed problems **Volker Grimm**
12h15 *20m + 5m*	Preconditioning of LSQR for the solution of large-scale discrete inverse problems **Eva Havelková**

Friday, September 8th

ROOM /TIMETABLE	MINISYMPOSIA / SPECIAL SESSIONS
02.1	**MS38 - part 1 | Optimal control and parameter estimation problems with applications in biomedicine** **Chair:** Fabien Vergnet
11h00 *20m + 5m*	Optimal boundary control problem related to the time-dependent Navier-Stokes equations **Irene Marin-Gayte**
11h25 *20m* + 5m	Optimal design of an estuarine water health monitoring network by means of optimal control techniques **Lino Alvarez**
11h50 *20m + 5m*	Sensitivity analysis for incompressible Navier-Stokes equations **Nathalie Nouaime**
02.2	**MS27 - part 2 | Novel numerical methods for the solution of nonlinear hyperbolic PDE's** **Chair:** Stephane Clain
11h00 *20m + 5m*	An all-speed IMEX scheme for two-fluid flows **Andrea Thomann**
11h25 *20m* + 5m	A well-balanced all-Mach scheme for compressible multiphase flow **Sandro Malusà**
11h50 *20m + 5m*	High-order In-cell Discontinuous Reconstruction path-conservative methods for non conservative hyperbolic systems - DR.MOOD **Ernesto Pimentel-García**
12h15 *20m + 5m*	A New Locally Divergence-Free Path-Conservative Central-Upwind Scheme for Ideal and Shallow Water Magnetohydrodynamics **Alina Chertock**
02.3	**CT4 Special Session** **Chair:** João Janela
11h00 *20m + 5m*	Path Planning for Space Debris Removal through Reinforcement Learning **Simon Gottschalk**
11h25 *20m* + 5m	Graph Based Semi-supervised Learning Using Spatial Segregation Theory **Farid Bozorgnia**
11h50 *20m + 5m*	Data-parallelism based deep learning approach for the model order reduction of parametric partial differential equations **Nirav Vasant Shah**

12h40 - 14h00 | Lunch

Friday, September 8th

14h00 - 15h40 | Minisymposia

ROOM /TIMETABLE		MINISYMPOSIA
VA1		**MS03 - part 3 | Numerical methods for fractional-derivative problems** **Chair:** Maria Lopez-Fernandez
	14h00 *20m + 5m*	Fractional diffusion problems with absorbing boundaries **Ercília Sousa**
	14h25 *20m* + 5m	Optimal long-time decay rate of solutions of complete monotonicity-preserving schemes for nonlinear time-fractional evolutionary equations **Martin Stynes**
VA2		**MS29 - part 3 | Efficient numerical methods in computational biomechanics** **Chair:** Qiyao Peng
	14h00 *20m + 5m*	Flux-based error control for a Cahn-Hilliard system modelling tumour growth **Fleurianne Bertrand**
	14h25 *20m* + 5m	Modelling Spacial Heterogeneity in 3D tumour growth driven by oxygen mediated phenotypic changes **Alfonso Caiazzo**
	14h50 *20m + 5m*	Numerical approximations for solid Tumor growth model **Sonia Seyed Allaei**
	15h15 *20m + 5m*	Numerical approximation of a viscoelastic Cahn–Hilliard model for tumour growth **Dennis Trautwein**
VA3		**MS18 - part 3 | Efficient numerical methods for direct or inverse wave propagation problems** **Chair:** Marcella Bonazzoli
	14h00 *20m + 5m*	A paraxial approach for the inverse problem of vibroacoustic imaging in frequency domain **Teresa Rauscher**
	14h25 *20m* + 5m	Time-dependent electromagnetic scattering from dispersive material laws **Selina Burkhard**
	14h50 *20m + 5m*	Fast solution of time domain electromagnetic wave problems with spline differential forms **Bernard Kapidani**
	15h15 *20m + 5m*	Strong norm error bounds for quasilinear wave equations under weak CFL-type conditions **Benjamin Doerich**

Friday, September 8th

ROOM /TIMETABLE	MINISYMPOSIA
VA4	**MS39 - part 3 | Numerical methods for nonlinear and coupled processes (flow, reactive transport and deformation) in porous media** **Chair:** Martin Vohralik
14h00 *20m + 5m*	A robust two-level overlapping preconditioner for Darcy flow in high-contrast porous media **Eric Chung**
14h25 *20m* + 5m	Computational orders of convergence for Richards equation **Nicolae Suciu**
14h50 *20m + 5m*	Guaranteed, efficient, and robust a posteriori estimates for nonlinear elliptic/parabolic problems with applications in porous media flow **Koondanibha Mitra**
15h15 *20m + 5m*	Coupled flow and energy models in permafrost with ice wedges **Malgorzata Peszynska**
01.1	**MS42 | Nonsmooth and nonconvex optimization** **Chair:** Carsten Gräser
14h00 *20m + 5m*	First-order optimization without (much) geometry **Adrian Lewis**
14h25 *20m* + 5m	On Solving Constrained Abs-smooth Optimization Problems Using a Frank-Wolfe Approach **Timo Kreimeier**
14h50 *20m + 5m*	Generalizing Adam to Manifolds by identifying a Global Tangent Space Representation **Benedikt Brantner**
15h15 *20m + 5m*	Variational Formulations for Solving PDEs with Non-Smooth Solutions using Non-Linear Surrogates **Juan Esteban Suarez Cardona**
02.1	**MS38 - part 2 | Optimal control and parameter estimation problems with applications in biomedicine** **Chair:** Jorge Tiago
14h00 *20m + 5m*	A continuum active structure model for the interaction of cilia with a viscous fluid **Fabien Vergnet**
14h25 *20m* + 5m	Optimal control of the Navier-Stokes equations with regularized directional do-nothing open boundary conditions **Pedro Nogueira**
14h50 *20m + 5m*	Reconstruction of flow domain boundaries from velocity data via multi-step optimization of distributed resistance **Ondřej Pártl**
15h15 *20m + 5m*	Opytimal - A Python/FEniCS framework to solve PDE-based optimal control problems considering multiple controls in 2D and 3D domains **Natanael Quintino**

Friday, September 8th

ROOM /TIMETABLE	MINISYMPOSIA
02.2	**MS27 - part 3 | Novel numerical methods for the solution of nonlinear hyperbolic PDE's** **Chair:** Peter Frolkovič
14h00 *20m + 5m*	Quinpi: Implicit High-Order Schemes for Hyperbolic Systems **Giuseppe Visconti**
14h25 *20m* + 5m	Discontinuous Galerkin on curved boundary domain: the Reconstruction Off-site Data (ROD) method **Stéphane Clain**
14h50 *20m + 5m*	Relation between Riemann based schemes and additional diffusive terms in Smoothed Particle Hydrodynamics **Tomáš Halada**
15h15 *20m + 5m*	Upwind schemes for numerical approximation of the eikonal equation enhanced with a small curvature term **Katarína Lacková**

15h40 - 16h00 | Closing Session + Poster Awards - VA4

16h00 | Farewell coffee

Poster Presentations

(PP1) **Samuel Alegria**
Università della Svizzera Italiana, Switzerland and UniDistance Suisse, Switzerland
Parallel training of deep neural networks

(PP2) **Alessio Fumagalli**
MOX, Department of Mathematics, Politecnico di Milano, Italy
Surrogate models with local mass conservation

(PP3) **Lisa Grandjean**
Reims Mathematical Laboratory (LMR) - UMR CNRS 9008, University of Reims Champagne Ardenne, France
Modeling of the child's lower urinary system

(PP4) **Charlotte Milano**
Reims Mathematical Laboratory (LMR) - UMR CNRS 9008, University of Reims Champagne Ardenne, France
Numerical methods for electromagnetic cartography in medical imaging

(PP5) **Evie Nielen**
Department of Mathematics and Computer Science, Eindhoven University of Technology, Netherlands
Blocked sampling method

(PP6) **Annika Osmers**
Center for Industrial Mathematics (ZeTeM), University of Bremen, Germany
Parameter identification on time-dependent domains using adaptive finite cell methods

(PP7) **Jan Papež**
Institute of Mathematics of the Czech Academy of Sciences, Czech Republic
Accurate error estimation in CG and CG-like methods

(PP8) **Andrew Peitavy**
CEA, Service de Thermo-hydraulique et de Mécanique des Fluides, Université Paris-Saclay, France
Improved Crouzeix-Raviart scheme for the Stokes and Navier-Stokes problem

(PP9) **Teun van Roosmalen**
CASA, Department of Mathematics and Computer Science, Eindhoven University of Technology, Netherlands
Least-squares solutions to the Monge-Ampère equation in optical design

(PP10) **Magdalena Thode**
Center for Industrial Mathematics (ZeTeM), University of Bremen, Germany
Numerical identification of frictional parameters in contact problems

(PP11) **Karel Vacek**
Department of Technical Mathematics, Czech Technical University in Prague, Czech Republic
Approximating fluid-structure interaction using finite element method: a comparison of Taylor-Hood and Scott-Vogelius elements

https://enumath2023.com/

FCT project: UIDB/04621/2020 (CEMAT)