

### 4th September

#### PLENARY SESSIONS

9h00 - 9h45 AUD	<b>Opening Session</b>
9h45 - 10h30 AUD	<b>Luis Oliveira e Silva</b> <i>(Department of Physics, IST, University of Lisbon, Portugal)</i>  Challenges in numerical modeling of extreme plasma physics in the laboratory and in astrophysics
10h30-11h00	Coffee break

#### MINISYMPOSIA SESSIONS

11h00 - 12h40	Room: <b>AUD</b>	MS31 - part 1   Advances in polytopal methods for multiphysics problems
	Room: <b>VA1</b>	MS02 - part 1   Mixed Precision Computations in Theory and Practice
	Room: <b>VA2</b>	MS08 - part 1   Problems in biomedical fluid mechanics
	Room: <b>VA3</b>	MS37 - part 1   Diseases, Diagnosis, Treatment: Mathematical Modeling and Numerical Analysis
	Room: <b>VA4</b>	MS25 - part 1   Transport at multiple scales in medical processes: from modeling to simulation
	Room: <b>01.1</b>	MS14 - part 1   Goal-oriented Error Estimation and Adaptivity
	Room: <b>02.1</b>	MS15 - part 1   Mathematical and computational models of cells, cell-populations, and applications thereof
	Room: <b>02.2</b>	MS01 - part 1   Multilevel and Multiscale Methods for PDEs
Room: <b>02.3</b>	MS21 - part 1   Surface geometry approximation and vector-valued PDEs	

12h40-14h00 Lunch

14h00 - 15h40	Room: <b>AF</b>	MS21 - part 2   Advances in polytopal methods for multiphysics problems
	Room: <b>VA1</b>	MS02 - part 2   Mixed Precision Computations in Theory and Practice
	Room: <b>VA2</b>	MS08 - part 2   Problems in biomedical fluid mechanics
	Room: <b>VA3</b>	MS37 - part 2   Diseases, Diagnosis, Treatment: Mathematical Modeling and Numerical Analysis
	Room: <b>VA4</b>	MS20 - part 1   Modern simulation & data science techniques for computational fluid dynamics problems in the exascale range
	Room: <b>01.1</b>	MS14 - part 2   Goal-oriented Error Estimation and Adaptivity
	Room: <b>02.1</b>	MS15 - part 2   Mathematical and computational models of cells, cell-populations, and applications thereof
	Room: <b>02.2</b>	MS01 - part 2   Multilevel and Multiscale Methods for PDEs
Room: <b>02.3</b>	MS21 - part 2   Surface geometry approximation and vector-valued PDEs	

15h40-16h10 Coffee break

16h10 - 17h50	Room: <b>AF</b>	MS06 - part 1   Theoretical and computational aspects of the discontinuous Galerkin method
	Room: <b>VA1</b>	MS19 - part 1   Addressing Industrial Challenges in The Numerical Modeling of Flow and Geomechanics in Porous Media
	Room: <b>VA2</b>	MS25 - part 2   Transport at multiple scales in medical processes: from modeling to simulation
	Room: <b>VA3</b>	MS10 - part 1   Entropy/energy-stable methods for time evolution problems
	Room: <b>VA4</b>	MS20 - part 2   Modern simulation & data science techniques for computational fluid dynamics problems in the exascale range
	Room: <b>01.1</b>	MS30 - part 1   Robust Numerical Methods for Nonlinear and Coupled Diffusion Problems in Biology
	Room: <b>02.1</b>	MS32 - part 1   Numerical methods for perturbed saddle-point formulations arising in coupled problems and applications to poromechanics
	Room: <b>02.2</b>	MS37 - part 3   Diseases, Diagnosis, Treatment: Mathematical Modeling and Numerical Analysis
Room: <b>02.3</b>	MS05   Stable multidervative time-integrators for Differential Equations	

19h00 ISEG Welcome Reception

### 5th September

#### PLENARY SESSIONS

9h00 - 9h45 AUD	<b>Peter Bastian</b> <i>(IWR, University of Heidelberg, Germany)</i>  Multithreaded Multilevel Spectral Domain Decomposition
9h45 - 10h30 AUD	<b>Mária Lukáčová-Medvidová</b> <i>(Institute of Mathematics, University of Mainz, Germany)</i>  What is a limit of numerical methods for compressible flows?
10h30-11h00	Coffee break

#### MINISYMPOSIA SESSIONS

11h00 - 12h40	Room: <b>AUD</b>	MS13 - part 1   Nonlinear problems in fluid mechanics and related problems
	Room: <b>VA1</b>	MS14 - part 3   Goal-oriented Error Estimation and Adaptivity
	Room: <b>VA2</b>	MS16 - part 1   Theoretical and numerical developments for high-dimensional parametric PDEs
	Room: <b>VA3</b>	MS17 - part 1   Analysis and Numerics for Systems of Nonlinear PDEs in Mathematical Biology
	Room: <b>VA4</b>	MS30 - part 2   Robust Numerical Methods for Nonlinear and Coupled Diffusion Problems in Biology
	Room: <b>01.1</b>	MS26   Multiscale and reduced-order modeling for poroelasticity
	Room: <b>02.1</b>	MS09 - part 1   Non-homogeneous and multicomponent fluids for environmental applications
	Room: <b>02.2</b>	MS01 - part 3   Multilevel and Multiscale Methods for PDEs
Room: <b>02.3</b>	MS12 - part 1   Structure-Preserving and Efficient Neural Networks for Scientific Machine Learning	

12h40-14h00 Lunch

14h00 - 15h40	Room: <b>AF</b>	MS06 - part 2   Theoretical and computational aspects of the discontinuous Galerkin method
	Room: <b>VA1</b>	MS19 - part 2   Addressing Industrial Challenges in The Numerical Modeling of Flow and Geomechanics in Porous Media
	Room: <b>VA2</b>	MS16 - part 2   Theoretical and numerical developments for high-dimensional parametric PDEs
	Room: <b>VA3</b>	MS34 - part 1   Efficient Solvers for Coupled Problems in Porous Media
	Room: <b>VA4</b>	MS30 - part 3   Robust Numerical Methods for Nonlinear and Coupled Diffusion Problems in Biology
	Room: <b>01.1</b>	MS40 - part 1   Multi-scale mathematical modeling of human diseases
	Room: <b>02.1</b>	MS09 - part 2   Non-homogeneous and multicomponent fluids for environmental applications
	Room: <b>02.2</b>	MS11 - part 1   Reducing the irreducible: model reduction for transport-dominated problems
Room: <b>02.3</b>	MS12 - part 2   Structure-Preserving and Efficient Neural Networks for Scientific Machine Learning	

15h40-16h10 Coffee break

16h10 - 17h50	Room: <b>AF</b>	MS06 - part 3   Theoretical and computational aspects of the discontinuous Galerkin method
	Room: <b>VA1</b>	MS20 - part 3   Modern simulation & data science techniques for computational fluid dynamics problems in the exascale range
	Room: <b>VA2</b>	MS34 - part 2   Efficient Solvers for Coupled Problems in Porous Media + MS10 - part 2   Entropy/energy-stable methods for time evolution problems
	Room: <b>VA3</b>	MS41 - part 1   Finite Element Methods for Constrained Problems
	Room: <b>VA4</b>	MS31 - part 3   Advances in polytopal methods for multiphysics problems
	Room: <b>01.1</b>	MS23 - part 1   Multiscale methods for wave propagation problems
	Room: <b>02.1</b>	MS17 - part 2   Analysis and Numerics for Systems of Nonlinear PDEs in Mathematical Biology
	Room: <b>02.2</b>	MS11 - part 2   Reducing the irreducible: model reduction for transport-dominated problems
Room: <b>02.3</b>	MS32 - part 2   Numerical methods for perturbed saddle-point formulations arising in coupled problems and applications to poromechanics	

### 6th September

#### PLENARY SESSIONS

9h00 - 9h45 AUD	<b>Paola Francesca Antonietti</b> <i>(MOX, Department of Mathematics, Politecnico di Milano, Italy)</i>  Mathematical and numerical modeling of neurodegenerative diseases
9h45 - 10h30 AUD	<b>Alessandro Veneziani</b> <i>(MATHCS, University of Emory, USA)</i>  The Role of Applied Mathematics in the Design of Coronary Stents
10h30-11h00	Coffee break
11h00 - 11h45 AUD	<b>Sara Zahedi</b> <i>(Department of Mathematics, KTH, Stockholm, Sweden)</i>  Conservative Cut Finite Element Methods
11h45 - 12h30 AUD	<b>Daniel Peterseim</b> <i>(Institute of Mathematics, University of Augsburg, Germany)</i>  Numerical solution of nonlinear eigenvector problems

FREE AFTERNOON

17h00 Tagus River Cruise

19h30 SUD Lisboa Conference Dinner

### 7th September

#### PLENARY SESSIONS

9h00 - 9h45 AUD	<b>Habib Ammari</b> <i>(Department of Mathematics, ETH, Zurich, Switzerland)</i>  From condensed matter theory to sub-wavelength physics
9h45 - 10h30 AUD	<b>Jean-Marie Mirebeau</b> <i>(Department of Mathematics, University of Paris-Sud, France)</i>  Discretization of anisotropic PDEs using Voronoi's reduction of positive quadratic forms
10h30-11h00	Coffee break

#### MINISYMPOSIA/ SPECIAL SESSIONS

11h00 - 12h40	Room: <b>AUD</b>	MS35 - part 1   Solving Multiphysics/Multiscale Problems: A Challenge between (Reduced) Model-Driven and Data-Driven approaches
	Room: <b>VA1</b>	MS04 - part 1   Approximated boundary methods: modelling, mathematical analysis and simulations
	Room: <b>VA2</b>	MS07 - part 1   Space-time methods for evolutionary PDEs
	Room: <b>VA3</b>	MS41 - part 2   Finite Element Methods for Constrained Problems
	Room: <b>VA4</b>	MS24 - part 1   Structure-preserving unfitted finite element discretizations
	Room: <b>01.1</b>	MS03 - part 1   Numerical methods for fractional-derivative problems
	Room: <b>02.1</b>	MS22 - part 1   Model reduction and efficient linear algebra techniques for direct and inverse problems
	Room: <b>02.2</b>	MS13 - part 2   Nonlinear problems in fluid mechanics and related problems
Room: <b>02.3</b>	MS28 - part 1   Reduced-order modeling and learning of parameterized dynamical systems: state-of-the-art vs. avant-garde methods	

12h40-14h00 Lunch

14h00 - 15h40	Room: <b>AF</b>	MS25 - part 2   Solving Multiphysics/Multiscale Problems: A Challenge between (Reduced) Model-Driven and Data-Driven approaches
	Room: <b>VA1</b>	MS24 - part 2   Structure-preserving unfitted finite element discretizations
	Room: <b>VA2</b>	MS36 - part 1   <b>Special Session:</b> Meshfree methods for direct and inverse problems in partial differential equations. <i>In memoriam of Prof. Carlos J.S. Alves</i>
	Room: <b>VA3</b>	MS07 - part 2   Space-time methods for evolutionary PDEs
	Room: <b>VA4</b>	MS39 - part 1   Numerical methods for nonlinear and coupled processes (flow, reactive transport and deformation) in porous media
	Room: <b>01.1</b>	MS40 - part 2   Multi-scale mathematical modeling of human diseases
	Room: <b>02.1</b>	MS22 - part 2   Model reduction and efficient linear algebra techniques for direct and inverse problems
	Room: <b>02.2</b>	MS13 - part 3   Nonlinear problems in fluid mechanics and related problems
Room: <b>02.3</b>	MS28 - part 2   Reduced-order modeling and learning of parameterized dynamical systems: state-of-the-art vs. avant-garde methods	

15h40-16h10 Coffee break

16h10 - 17h50	Room: <b>AF</b>	MS29 - part 1   Efficient numerical methods in computational biomechanics
	Room: <b>VA1</b>	MS04 - part 2   Approximated boundary methods: modelling, mathematical analysis and simulations + MS23 - part 2   Multiscale methods for wave propagation problems
	Room: <b>VA2</b>	MS36 - part 2   <b>Special Session:</b> Meshfree methods for direct and inverse problems in partial differential equations. <i>In memoriam of Prof. Carlos J.S. Alves</i>
	Room: <b>VA3</b>	MS18 - part 1   Efficient numerical methods for direct or inverse wave propagation problems
	Room: <b>VA4</b>	MS39 - part 2   Numerical methods for nonlinear and coupled processes (flow, reactive transport and deformation) in porous media
	Room: <b>01.1</b>	MS27 - part 1   Novel numerical methods for the solution of nonlinear hyperbolic PDE's
	Room: <b>02.1</b>	CT1 Special Session
	Room: <b>02.3</b>	CT2 Special Session

### 8th September

#### PLENARY SESSIONS

9h00 - 9h45 AUD	<b>Carola-Bibiane Schönlieb</b> <i>(DAMTP, University of Cambridge, UK)</i>  From differential equations to deep learning for image analysis
9h45 - 10h30 AUD	<b>José Carillo de la Plata</b> <i>(Mathematical Institute, University of Oxford, UK)</i>  Primal Dual methods for Wasserstein gradient flows
10h30-11h00	Coffee break

#### MINISYMPOSIA/ SPECIAL SESSIONS

11h00 - 12h40	Room: <b>AUD</b>	CT3 Special Session
	Room: <b>VA1</b>	MS03 - part 2   Numerical methods for fractional-derivative problems
	Room: <b>VA2</b>	MS29 - part 2   Efficient numerical methods in computational biomechanics
	Room: <b>VA3</b>	MS18 - part 2   Efficient numerical methods for direct or inverse wave propagation problems
	Room: <b>VA4</b>	MS04 - part 3   Approximated boundary methods: modelling, mathematical analysis and simulations
	Room: <b>01.1</b>	MS22 - part 3   Model reduction and efficient linear algebra techniques for direct and inverse problems
	Room: <b>02.1</b>	MS38 - part 1   Optimal control and parameter estimation problems with applications in biomedicine
	Room: <b>02.2</b>	MS27 - part 2   Novel numerical methods for the solution of nonlinear hyperbolic PDE's
Room: <b>02.3</b>	CT4 Special Session	

12h40-14h00 Lunch

14h00 - 15h40	Room: <b>VA1</b>	MS03 - part 3   Numerical methods for fractional-derivative problems
	Room: <b>VA2</b>	MS29 - part 3   Efficient numerical methods in computational biomechanics
	Room: <b>VA3</b>	MS18 - part 3   Efficient numerical methods for direct or inverse wave propagation problems
	Room: <b>VA4</b>	MS39 - part 3   Numerical methods for nonlinear and coupled processes (flow, reactive transport and deformation) in porous media
	Room: <b>02.1</b>	MS42   Nonsmooth and nonconvex optimization
	Room: <b>02.2</b>	MS38 - part 2   Optimal control and parameter estimation problems with applications in biomedicine
	Room: <b>02.3</b>	MS27 - part 3   Novel numerical methods for the solution of nonlinear hyperbolic PDE's

15h40-16h00 Closing Session and Poster Awards

16h00 Farewell coffee