European Conference on High Order Nonlinear Numerical Methods for Evolutionary PDEs: Theory and Applications

HONOM 2015

March 16 – March 20, 2015
University of Trento and CIRM-FBK, Italy

Conference Program

Timetable of the European Conference on High Order Nonlinear Numerical Methods for Evolutionary PDEs: Theory and Applications - HONOM 2015

	Monday, 16.03.2015	Tuesday, 17.03.2015	Wednesday, 18.03.2015	Thursday, 19.03.2015	Friday, 20.03.2015
9:00-9:05	Armanini				
9:05-10:05	Yee	Remacle	Larsson	Donat	Guermond
10:05-10:35	Toro	Tugnoli	Kucera	Buchmüller	Titarev
10:30-11:00	*Coffee Break*	*Coffee Break*	*Coffee Break*	*Coffee Break*	*Coffee Break*
11:00-12:00	Schütz	Maire	Gassner	Balsara	Drikakis
12:00-12:30	Lerat	Boscheri	Sorgentone	Nkonga	Haider
12:30-14:00	*Lunch*	*Lunch*	*Lunch*	*Lunch*	*Lunch*
14:00-14:30	Clain	Cheng	Bui-Thanh	Kim	Montecinos / Nigro
14:30-15:00	Costa	Hu	Zudrop	Schmidtmann	Contarino / Giorgiani
15:00-15:30	*Coffee Break*	*Coffee Break*	*Coffee Break*	*Coffee Break*	*Coffee Break*
15:30-16:00	Bonaventura / Tamaki	Klimach / Belozerov	Loubère / Borsche	Aristova / Tavelli	Tokareva
16:00-16:30	Diba / Kholodov	Hindenlang / Hoffmann	Fambri / Kall	Bragin / Ioriatti	Kozubskaya
16:30-16:45	*Break for Discussion*	*Break for Discussion*	*Break for Discussion*	*Break for Discussion*	Goetz
16:45-17:15	Kaiser / Ortwein	Toulorge / Kummer	Zanotti / Perrier	Semplice / Bankole	*Closing Remarks*
17:15-17:45	Massa / Renac	Krämer-Eis / Li	Atak / Klein	Mengaldo / Dumbser	
20:00				***Conference Dinner***	

Monday, 16.03.2015

09:00-9:05 **Aronne Armanini (Rector of the University of Trento)**
Welcome address

09:05-10:05 **Helen Yee (NASA Ames, USA) - Invited Plenary Lecture**
Spurious numerics in high order method simulations for flows with stiff source terms and discontinuities

10:05-10:35 E.F. Toro (University of Trento, Italy)
A flux vector splitting method for the multidimensional Euler equations with general equation of state and high-order extensions

10:35-11:00 ***Coffee break***

11:00-12:00 **Jochen Schütz (RWTH Aachen, Germany) - Invited Plenary Lecture**
Hybrid methods for the compressible Navier-Stokes equations

12:00-12:30 A. Lerat (ENSAM, France)
New developments on high-order RBC schemes for the simulation of unsteady compressible flows

12:30-14:00 ***Lunch***

14:00-14:30 S. Clain (University of Minho, Portugal)
Sixth-order finite volume approximations with smooth curved boundary domains

14:30-15:00 R. Costa (University of Minho, Portugal)
A sixth-order finite volume scheme for the steady-state incompressible Stokes equations on staggered unstructured meshes

15:00-15:30 ***Coffee break***

Afternoon parallel sessions

	Conference hall "L. Stringa"	**Room A203 "Polo F. Ferrari"**
15:30-16:00	L. Bonaventura (Politecnico di Milano, Italy) *Local Exponential Methods: a domain decomposition approach to exponential time integration of PDEs*	Y. Tamaki (University of Tokyo, Japan) *Higher-Order Flux Quadrature Scheme for Finite-Volume Methods with MUSCL-type Interpolation*
16:00-16:30	V. Diba (University of Kassel, Germany) *New Efficient Time Integration of IMEX Type for Compressible, Viscous Flow Simulation on Triangular Grids*	Y. Kholodov (Moscow Inst.Phys.Tech., Russia) *Developing of High Order Nonlinear Numerical Methods for Hyperbolic Type Equations*
16:30-16:45	***Break for discussion***	
16:45-17:15	K. Kaiser (RWTH Aachen, Germany) *IMEX splittings for singularly perturbed equations*	P. Ortwein (University Stuttgart, Germany) *A Curvilinear Particle-in-Cell Code on Arbitrary Unstructured Grids*
17:15-17:45	F. Massa (University of Bergamo, Italy) *High-order time integration schemes in a DG solver for compressible and incompressible unsteady flow simulations*	F. Renac (ONERA Chatillon, France) *Unstable discontinuous Galerkin discrete shock profiles for steady scalar conservation laws*

Tuesday, 17.03.2015

09:00-10:00 **Jean-François Remacle (UC Louvain, Belgium) - Invited Plenary Lecture**
GPU accelerated adaptive spectral finite elements on all-hex meshes

10:00-10:30 M. Tugnoli (Politecnico di Milano, Italy)
Large Eddy Simulation of compressible flows with high order discontinuous Galerkin discretization and anisotropic dynamic model

10:30-11:00 ***Coffee break***

11:00-12:00 **Pierre-Henri Maire (CEA Bordeaux, France) - Invited Plenary Lecture**
Cell-centered finite volume methods for solving the Lagrangian form of gas dynamics and solid mechanics equations on unstructured grids

12:00-12:30 W. Boscheri (University of Trento, Italy)
High-order Arbitrary Lagrangian Eulerian ADER-WENO Finite Volume Schemes on Moving Unstructured Meshes

12:30-14:00 ***Lunch***

14:00-14:30 J.B. Cheng (Institute of Applied Physics and Computational Mathematics, China)
Second-order cell-centered Lagrangian scheme for two-dimensional elastic-plastic problems

14:30-15:00 X. Hu (TUM Munich, Germany)
A family of high-order targeted ENO schemes for compressible fluid simulations

15:00-15:30 ***Coffee break***

Afternoon parallel sessions

	Conference hall "L. Stringa"	**Room A218 "Polo F. Ferrari"**
15:30-16:00	H. Klimach (University of Siegen, Germany) *Providing Material Geometries for High Order Schemes*	A. Belozerov (Novosibirsk State Uni., Russia) *The Runge-Kutta-WENO method for compressible multiphase pipe flow modelling*
16:00-16:30	F. Hindenlang (MPI Plasma Physics, Germany) *Generation of non-conforming curved hexahedral meshes for DG-SEM simulations*	M. Hoffmann (University Stuttgart, Germany) *A DG-SEM approach for complex industrial real gas applications*
16:30-16:45	***Break for discussion***	
16:45-17:15	T. Toulorge (UC Louvain, Belgium) *High-Order Mesh Generation: Geometrical Accuracy And Numerical Properties*	F. Kummer (TU Darmstadt, Germany) *High order discretizations for two-phase flow: spatial discretization, curvature evaluation and solver strategies*
17:15-17:45	S. Krämer-Eis (TU Darmstadt, Germany) *Optimally convergent Discontinuous Galerkin methods for problems with immersed interfaces*	T. Li (University of Florida, USA) *Observable regularization technique for two phase flow simulation*

Wednesday, 18.03.2015

09:00-10:00 **Johan Larsson (USA) - Invited Plenary Lecture**
Large-scale simulations of compressible turbulence with shocks

10:00-10:30 V. Kucera (Charles University Prague, Czech Republic)
DG Solution of a Hydrodynamic Model of Flocking Dynamics

10:30-11:00 ***Coffee break***

11:00-12:00 **Gregor Gassner (University of Köln, Germany) - Invited Plenary Lecture**
Entropy Stable and Skew-Symmetric Nodal Discontinuous Galerkin Schemes

12:00-12:30 C. Sorgentone (KTH Stockholm, Sweden)
A New High Order Energy and Enstrophy Conserving Arakawa-like Jacobian Differential Operator

12:30-14:00 ***Lunch***

14:00-14:30 T.B. Thanh (University of Texas in Austin, USA)
A Unified Hybridized Discontinuous Galerkin Framework and Its Application to Hydrostatic and Non-hydrostatic Atmospheric Flows

14:30-15:00 J. Zudrop (University of Siegen, Germany)
On High Order Discontinuous Galerkin Methods for Hyperbolic Conservation Laws with Discontinuous Solutions

15:00-15:30 ***Coffee break***

Afternoon parallel sessions

	Conference hall "L. Stringa"	**Room A212 "Polo F. Ferrari"**
15:30-16:00	R. Loubère (University of Toulouse, France) *MOOD: An a posteriori paradigm to stabilize Finite Volume high-order numerical schemes*	R. Borsche (University of Kiel, Germany) *ADER schemes on networks of hyperbolic conservation laws*
16:00-16:30	F. Fambri (University of Trento, Italy) *An a posteriori subcell limiting of the DG finite element method for hyperbolic conservation laws*	J. Kall (University of Kiel, Germany) *High order numerics for networks of hyperbolic PDEs with lumped parameter models*
16:30-16:45	***Break for discussion***	
16:45-17:15	O. Zanotti (University of Trento, Italy) *ADER Finite Volume and DG Schemes with Space-Time Adaptive Mesh Refinement*	V. Perrier (INRIA, France) *Behaviour of discontinuous Galerkin methods for steady and unsteady compressible flow in the low Mach regime*
17:15-17:45	M. Atak (University Stuttgart, Germany) *Discontinuous Galerkin Methods and Complex High-Speed Turbulent Flows*	B. Klein (TU Darmstadt, Germany) *A segregated implicit high-order DG solver for variable density flows at low Mach numbers*

Thursday, 19.03.2015

09:00-10:00 **Rosa Donat (University of Valencia, Spain) - Invited Plenary Lecture**
Hyperbolicity of kinematic models: The secular equation and Block-characteristic schemes

10:00-10:30 P. Buchmüller (University of Düsseldorf, Germany)
Improved Accuracy of High-Order WENO Finite Volume Methods on Cartesian Grids with Adaptive Mesh Refinement

10:30-11:00 ***Coffee break***

11:00-12:00 **Dinshaw S. Balsara (University of Notre Dame, USA) - Invited Plenary Lecture**
Multidimensional, Self-similar, strongly-Interacting, Consistent (MuSIC) Riemann Solvers – Applications to Divergence-Free MHD and ALE Schemes

12:00-12:30 B. Nkonga (University of Nice, France)
A Two-Dimensional Riemann Solver with Self-Similar Sub-Structure – Alternative Formulation Based on Least Squares Projection.

12:30-14:00 ***Lunch***

14:00-14:30 J. Kim (University of Notre Dame, USA)
Subluminal relativistic magnetodynamics with multidimensional Riemann solvers

14:30-15:00 B. Schmidtmann (RWTH Aachen, Germany)
On the Relation between WENO3 and Third-Order Limiter Functions in Finite Volume Methods

15:00-15:30 ***Coffee break***

Afternoon parallel sessions

	Conference hall "L. Stringa"	**Room A218 "Polo F. Ferrari"**
15:30-16:00	E.N. Aristova (Moscow Inst. Phys., Russia) *Monotone bicompact high resolution schemes for solving linear multidimensional transport equation*	M. Tavelli (University of Trento, Italy) *A staggered Semi-Implicit Arbitrary High Order DG Method For The Two Dimensional Incompressible Navier-Stokes Equations*
16:00-16:30	M.D. Bragin (Moscow Inst. Phys., Russia) *Minimal dissipation hybrid bicompact schemes for multidimensional hyperbolic equations*	M. Ioriatti (University of Trento, Italy) *An efficient semi-implicit finite volume method for axially symmetric compressible flows in compliant tubes*
16:30-16:45	***Break for discussion***	
16:45-17:15	M. Semplice (University of Torino, Italy) *Compact WENO: a third order reconstruction for conservation and balance laws on locally refined grids*	A. Bankole (University of Hamburg, Germany) *A semi-implicit SPH method for free-surface hydrodynamics*
17:15-17:45	G. Mengaldo (Imperial College, UK) *Compact discontinuous spectral/hp element methods: Connections and dealiasing strategies*	M. Dumbser (University of Trento, Italy) *A conservative, weakly nonlinear semi-implicit FV scheme for the compressible Euler equations with general EOS*

20:00 ***Conference Dinner (Hotel Villa Madruzzo)***

Friday, 20.03.2015

09:00-10:00 **Jean-Luc Guermond (Texas A&M University) - Invited Plenary Lecture**
Finite element approximation and limitation on the p*-system*

10:00-10:30 V.A. Titarev (Dorodnicyn Computing Centre of the RAS, Russia)
Development of numerical methods for solving kinetic equations as applied to the problems of high-altitude flight of space vehicles

10:30-11:00 ***Coffee break***

11:00-12:00 **Dimitris Drikakis (University of Cranfield, UK) - Invited Plenary Lecture**
High-order turbulent flow simulations of wall-bounded and free-shear flows on structured and unstructured grids

12:00-12:30 F. Haider (ONERA, France)
An Efficient Algorithm for High Order Finite Volume Reconstruction on Unstructured Grids

12:30-14:00 ***Lunch***

Afternoon parallel sessions

	Conference hall "L. Stringa"	**Room A218 "Polo F. Ferrari"**
14:00-14:30	G. Montecinos (University of Chile, Chile) *An Implicit Solver for the Generalized Riemann Problem in the context of the ADER Schemes*	A. Nigro (University of Calabria, Italy) *Second Derivative Multistep Schemes For A Matrix-Free Discontinuous Galerkin Method*
14:30-15:00	C. Contarino (University of Trento, Italy) *ADER scheme with implicit solver for the generalized Riemann problem applied to blood flow*	G. Giorgiani (INRIA, France) *High-order CFD computations with stabilized Powell-Sabin elements*

15:00-15:30 ***Coffee break***

15:30-16:00 S. Tokareva (University of Zurich, Switzerland)
High order finite element approximations for scalar conservation laws: the impact of boundary approximation

16:00-16:30 T. Kozubskaya (Keldysh Institute of Applied Mathematics of the RAS, Russia)
Edge-Based Reconstruction schemes: quasi-1D WENO implementation and extension to hybrid unstructured meshes

16:30-17:00 C. Goetz (University of Trento, Italy)
A novel GRP solver for the ADER method based on a simplified Le Floch – Raviart expansion

17:00-17:15 ***Closing Remarks***