W O N A P D E 2 0 1 6

FIFTH CHILEAN WORKSHOP ON NUMERICAL ANALYSIS OF PARTIAL DIFFERENTIAL EQUATIONS

PROGRAMME

Universidad de Concepción, Concepción, Chile, January 11 - 15

INTRODUCTION

The conference **WONAPDE 2016** has been organized in: Plenary Lectures, Minisymposia, and Sessions of Communications.

- Each Plenary Lecture lasts **50 minutes** including questions and comments.
- Each Contribution at a Minisymposium or Session of Communications lasts **25 minutes** including questions and comments.

The following notation is used to identify the places where the conference is carried on (see included campus map):

AUD-0	Auditorium, Facultad de Ingeniería Building
AUD-1	Auditorium, Empreudec Building
AUD-2	Auditorium, Facultad de Ciencias Forestales Building
AUD-3	Auditorium, Facultad de Ciencias Veterinarias Building
AUD-4	Auditorium, Emprendo Incuba Building
WHITE TENT	Tent located in the parking lot of the Empreudec Building

Please bear in mind that:

- The Conference Secretariat is located in the entrance hall of the Empreudec Building.
- You can **register** on Monday 11, from **10.00** to **13.00** and from **14.00** to **18.00**. Nevertheless, the Conference Secretariat will also remain open during the rest of the week.
- All the Plenary Lectures will be held in **AUD-0**, except the Closing Plenary Lecture in **AUD-1**. In turn, all the Parallel Sessions will be held in **AUD-1**, **AUD-2**, **AUD-3** and **AUD-4**. Rest rooms can be found near each auditorium.
- The Welcome Reception and all the Coffee Breaks and Lunches will be held in the **WHITE TENT**. We kindly request to wear the badges during these activities.

GENERAL SCHEDULE OF THE MINISYMPOSIA

ORGANIZERS	Part I	Part II	Part III	Part IV
K. Schneider	Wednesday: 15.00 - 16.40	Wednesday: 17.10 - 18.00		
P. Morin	Wednesday: 11.20 - 13.00	Thursday: 15.00 - 16.40	Thursday: 17.10 - 17.35	
M. Neilan, F.-J. Sayas	Tuesday: 11.20 - 13.00	Wednesday: 11.20 - 13.00	Thursday: 11.20 - 13.00	Friday: 15.00 - 17.05
N. Heuer	Tuesday: 17.10 - 18.50	Wednesday: 17.10 - 18.50	Thursday: 17.10 - 18.25	
A. Bermúdez, R. Rodríguez	Tuesday: 15.00 - 16.40	Wednesday: 15.00 - 16.40	Thursday: 15.00 - 16.40	Friday: 15.00 - 17.05
R. Ruiz-Baier, S. Scacchi	Thursday: 11.20 - 13.00	Thursday: 15.00 - 16.40		
M. Discacciati, R. Oyarzúa	Tuesday: 11.20 - 13.00	Tuesday: 15.00 - 16.40		
P. Mulet	Thursday: 11.20 - 13.00	Friday: 11.20 - 13.00		
N. Nigam	Thursday: 17.10 - 18.50			
E. Toro	Tuesday: 11.20 - 13.00	Wednesday: 11.20 - 13.00	Thursday: 15.00 - 16.40	Thursday: 17.10 - 18.00
S. Diehl, I. Nopens	Tuesday: 15.50 - 16.15	Tuesday: 17.10 - 18.50	Wednesday: 17.10 - 18.50	
J. Guzmán, M. Sarkis	Friday: 11.20 - 12.35			
H. Antil, E. Otárola, A. Salgado	Tuesday: 11.20 - 13.00	Tuesday: 15.00 - 16.40		
B. Cockburn, J. Gopalakrishnan, M. Solano	Tuesday: 17.10 - 18.50	Thursday: 17.35 - 18.50		
G. Albi, D. Kalise, F. Silva	Wednesday: 18.00 - 18.50	Thursday: 11.20 - 12.35		
L. Figueroa	Friday: 15.00 - 17.05			
S. Ruuth	Tuesday: 15.00 - 15.50	Wednesday: 15.00 - 16.40		

THE CHAIRPERSONS OF MINISYMPOSIA SESSIONS WILL BE ASSIGNED BY THE RESPECTIVE ORGANIZERS

MONDAY, JANUARY 11 / MORNING

10.00 - 13.00 REGISTRATION [**EMPREUDEC BUILDING**]

MONDAY, JANUARY 11 / AFTERNOON

14.00 - 18.00 REGISTRATION [**EMPREUDEC BUILDING**]

18.15 - 19.20 OPENING CEREMONY [**AUD-O**]

18.15 - 18.30 WELCOME ADDRESS BY THE VICE-RECTOR

18.30 - 19.20 OPENING PLENARY LECTURE [*Chairman*: G.N. Gatica]

Bernardo Cockburn: *The HDG Methods: An Overview.*

19.30 - 21.00 WELCOME RECEPTION [**WHITE TENT**]

TUESDAY, JANUARY 12

09.00 - 09.50 PLENARY LECTURE **[AUD-0]** [*Chairman*: R. Bürger]

Giovanni Russo: *Semi-Implicit IMEX Schemes for Evolutionary PDE's.*

09.55 - 10.45 PLENARY LECTURE **[AUD-0]** [*Chairman*: R. Bürger]

Martin Vohralík: *Guaranteed and Robust a Posteriori Bounds for Laplace Eigenvalues and Eigenvectors.*

10.50 - 11.20 COFFEE BREAK **[WHITE TENT]**

TUESDAY: **11.20 - 11.45 | 11.45 - 12.10 | 12.10 - 12.35 | 12.35 - 13.00** PARALLEL SESSIONS

[AUD-1] Advances in Finite and Boundary Elements (Part I) [M. Neilan, F.-J. Sayas]

H. Antil, M. Hintermüller, R. Nochetto, T. M. Surowiec, D. Wegner: *Finite Horizon Model Predictive Control of Electrowetting on Dielectric With Pinning*

E. van 't Wout, T. Betcke, P. Gélat, S. Arridge: *Efficient Boundary Element Methods for Focused Ultrasound Treatment Planning*

D. Gallistl, D. Peterseim: *Multiscale Petrov-Galerkin Finite Element Method for Acoustic Scattering*

T. Sanchez-Vizuet, F.-J. Sayas: *BEM/FEM Coupling for Transient Acoustic Scattering by Piezoelectric Obstacles*

[AUD-2] Non-Linear Numerical Methods for Evolutionary PDEs (Part I) [E. Toro]

E. Toro: *The ADER Approach for Constructing Non-Linear Schemes of Arbitrary Accuracy for Solving Evolutionary PDEs*

A. Coronel, A. Tello, M. Sepúlveda: *A Systematic Construction of the Solution for the Riemann Problem for the Burgers Equation With Discontinuous Source Term*

G. Montecinos, J. Lopez, R. Lecaros, J. Ortega, E. Toro: *An ADER-type Scheme for a Class of Equations Arising From the Water-Wave Theory*

D. Balsara: *Multidimensional, Self-Similar, Strongly-Interacting, Consistent (MuSIC) Riemann Solvers—Applications to Divergence-Free MHD and ALE Schemes*

[AUD-3] Numerical Methods for Non-Local Problems (Part I) [H. Antil, E. Otárola, A. Salgado]

M. Actis, M. Carena, P. Morin: *Nonlocal Diffusions on Fractals. Qualitative Properties and Numerical Approximations*

A. Bouharguane, R. Carles: *Numerical Methods for a Nonlocal Conservation Law*

B. Cockburn, K. Mustapha: *HDG Methods for Fractional Diffusion*

M. D'Elia, P. Bochev: *A Coupling Strategy for Nonlocal and Local Diffusion Models With Mixed Volume Constraints and Boundary Conditions*

[AUD-4] Discretization and Solution Techniques for the Coupling of Fluid Flows With Porous Media (Part I) [M. Discacciati, R. Oyarzúa]

V. Ervin, W. Layton, M. Kubacki, M. Moraiti, Z. Si, C. Trenchea: *Partitioned Penalty Method for Contaminant Transport Models in Coupled Groundwater-Surface Water Flows*

A. Loula, A. Amad, I. Igreja: *Stabilized Hybrid Finite Element Formulations for Coupled Flow Problems*

M. Alvarez, G. Gatica, R. Ruiz-Baier: *A Mixed-Primal Finite Element Approximation of a Sedimentation-Consolidation System*

S. Caucao, G. Gatica, R. Oyarzúa, I. Šebestová: *A Fully-Mixed Formulation for the Navier–Stokes/Darcy Coupled Problem With Nonlinear Viscosity*

13.00 - 15.00 L U N C H **[WHITE TENT]**

TUESDAY: **15.00 - 15.25 | 15.25 - 15.50 | 15.50 - 16.15 | 16.15 - 16.40** PARALLEL SESSIONS

[AUD-1] Computational Electromagnetism (Part I) [A. Bermúdez, R. Rodríguez]

A. Alonso Rodríguez, E. Bertolazzi, R. Ghiloni, R. Specogna: *Construction of Homological Seifert Surfaces and Some Applications in Electromagnetism*

H. Antil, R. Nochetto, P. Venegas: *Optimizing the Kelvin Force in a Subdomain*

É. Bécache, P. Joly, M. Kachanovska: *Stable Perfectly Matched Layers for Cold Plasmas in Strong Magnetic Fields*

A. Alonso Rodríguez, J. Camaño, R. Rodríguez, A. Valli, P. Venegas: *Numerical Approximation of the Spectrum of the Curl Operator in Multiply Connected Domains*

[AUD-2] Time Integration of Partial Differential Equations (Part I) [S. Ruuth]

U. Ascher: *Data Completion and Manipulation: When Can We Get Away With It?*

Y. Hadjimichael, D. Ketcheson: *Strong-Stability-Preserving Additive Linear Multistep Methods*

[AUD-2] Numerical Methods for Water Resources (Part I) [S. Diehl, I. Nopens]

E. Torfs, S. Diehl, I. Nopens: *PDEs in the Modelling of Wastewater Treatment Processes and the Need for Reliable Simulation Tools*

[AUD-3] Numerical Methods for Non-Local Problems (Part II) [H. Antil, E. Otárola, A. Salgado]

B. Jin, R. Lazarov, Z. Zhou: *Petrov–Galerkin Finite Element Method for Fractional Convection-Diffusion Equations*

C. Acosta, M. Echeverry, E. Guevara, C. Mejía, A. Piedrahita: *Discrete Mollification for Inverse Problems Based on Time-Fractional Differential Equations*

R. Nochetto, E. Otárola, A. Salgado: *A PDE Approach to Space–Time Fractional Parabolic Problems*

P. Seleson: *Multiscale Coupling Methods in Peridynamics*

[AUD-4] Discretization and Solution Techniques for the Coupling of Fluid Flows With Porous Media (Part II) [M. Discacciati, R. Oyarzúa]

G. Kanschat: *A Conservative Discretization for Linear Poroelasticity*

M. Correa, M. Murad: *A New One-Way Conservative Numerical Model for Three-Phase Flow in Poroelastic Media*

V. Anaya, D. Mora, R. Oyarzúa, R. Ruiz-Baier: *A Mixed FEM for a Vorticity Based Formulation of the Brinkman Problem*

R. Oyarzúa, R. Ruiz-Baier: *Locking-Free Finite Element Methods for Poroelasticity*

16.40 - 17.10 COFFEE BREAK **[WHITE TENT]**

[AUD-1] Advances in Least-Squares and Galerkin Methods (Part I) [N. Heuer]

J. Melenk, B. Pichler, C. Xenophontos: *hp-FEM for Singular Perturbations: Balanced Norms and Multiple Scales*

N. Heuer, M. Karkulik: *A Robust DPG Method for Singularly Perturbed Reaction-Diffusion Problems*

T. Führer, N. Heuer, M. Karkulik: *On the Coupling of DPG and BEM*

I. Muga, K. van der Zee: *Optimal Discretization in Banach Spaces*

[AUD-2] Numerical Methods for Water Resources (Part II) [S. Diehl, I. Nopens]

I. Nopens, M. Singh, S. Mortier, J. Kumar: *Numerical Solution of 2D Population Balance Models for Wastewater Treatment*

R. Bürger, S. Diehl, C. Mejías: *On Time Discretizations for the Simulation of the Batch Settling-Compression Process in One Dimension*

A. Barth, R. Bürger, I. Kröker, C. Rohnde: *A Hybrid Stochastic Galerkin Method for Uncertainty Quantification Applied to Clarifer-Thickener Model With Several Random Perturbations*

F. Betancourt, R. Bürger, C. Chalons, S. Diehl, S. Farås: *A Random Sampling Approach for a Family of Temple-Class Systems of Conservation Laws*

[AUD-3] Recent Advances in Discontinuous Galerkin Methods (Part I) [B. Cockburn, J. Gopalakrishnan, M. Solano]

Y. Chen, B. Cockburn, B. Dong: *Superconvergent HDG Methods for Linear Third-Order Equations in One-Space Dimension*

N. Chalmers, L. Krivodonova: *A Characteristic-Based CFL Condition for the Discontinuous Galerkin Method on Triangular Meshes*

J. Gopalakrishnan, P. Monk, P. Sepúlveda: *A Scheme With Discontinuous and Conforming Spaces for the Wave Equation*

A. Hungria, D. Prada, F.-J. Sayas: *Hybridizable Discontinuous Galerkin Methods for Elastodynamics*

WEDNESDAY, JANUARY 13

09.00 - 09.50 PLENARY LECTURE **[AUD-0]** [*Chairman*: N. Heuer]

Jay Gopalakrishnan: *Advances in DPG Methods.*

09.55 - 10.45 PLENARY LECTURE **[AUD-0]** [*Chairman*: N. Heuer]

Alberto Valli: *Solving the Curl-Div System Using Divergence-Free or Curl-Free Finite Elements.*

10.50 - 11.20 COFFEE BREAK **[WHITE TENT]**

WEDNESDAY: **11.20 - 11.45 | 11.45 - 12.10 | 12.10 - 12.35 | 12.35 - 13.00** PARALLEL SESSIONS

[AUD-1] Advances in Finite and Boundary Elements (Part II) [M. Neilan, F.-J. Sayas]

A. Demlow, N. Kopteva: *Maximum-Norm a Posteriori Error Control for Singularly Perturbed Elliptic Reaction-Diffusion Equations*

C. Jerez-Hanckes, G. Silva: *Wave Scattering by Randomly Perturbed Periodic Gratings via Sparse Tensor BEM*

A. Salgado, W. Zhang: *Finite Element Approximation of the Isaacs Equation*

T. Führer, J. Melenk, D. Praetorius, A. Rieder: *Optimal Additive Schwarz Preconditioning for the hp-BEM: The Hypersingular Integral Operator in 3D*

[AUD-2] Non-Linear Numerical Methods for Evolutionary PDEs (Part II) [E. Toro]

J.-L. Guermond, B. Popov: *Fast Estimation of the Maximum Speed of Propagation in the Riemann Problem for the Euler Equations*

E. Toro: *A Novel Flux Vector Splitting for a Class of PDEs*

S. Tokareva, E. Toro: *Flux Splitting Schemes for the Model Equations of Compressible Multiphase Flow*

S. Dallet: *A Staggered Scheme Using Discretization of Internal Energy Equations for a Two-Phase Flow Model*

[AUD-3] Adaptivity in Numerical PDE (Part I) [P. Morin]

A. Buffa, E. Garau: *A Posteriori Error Estimators for HB-spline Discretizations*

P. Morin, R. Nochetto, S. Pauletti: *Adaptativity in Hierarchical Splines Spaces*

J. Calvo, O. Widlund: *An Adaptive Choice of Primal Constraints for BDDC Domain Decomposition Algorithms*

A. Allendes, H. Antil, E. Otárola, R. Rankin, A. Salgado: *Adaptive Finite Element Methods for an Optimal Control Problems Involving Dirac Measures*

13.00 - 13.10 OFFICIAL PHOTO **[in front of the EMPREUDEC BUILDING]**

13.10 - 15.00 L U N C H **[WHITE TENT]**

[AUD-1] Computational Electromagnetism (Part II) [A. Bermúdez, R. Rodríguez]

X. Claeys, V. Dolean, M. Gander: *Block-Jacobi Preconditioners for Local Multi-Trace Formulations*

A. Erdozain, V. Péron, H. Barucq, D. Pardo: *Derivation and Validation of Impedance Transmission Conditions for the Electric Potential Across a Highly Conductive Casing*

J. Etcheverry: *Modeling and Solving Problems on Electromagnetic Non-Destructive Testing of Steel Pipes*

D. Hewett: *Hybrid Numerical-Asymptotic Boundary Element Methods for High Frequency Wave Scattering*

[AUD-2] Time Integration of Partial Differential Equations (Part II) [S. Ruuth]

I. Higueras, D. Ketcheson, T. Kocsis: *Monotonicity–Preserving Perturbations of Runge-Kutta Schemes*

C. Milani, J. Bevilacqua, O. Rodrigues Jr.: *Numerical Simulation of the Difusion of Ferric Ions in Fricke-Gel Dosimeters*

A. Preuss, R. Spiteri, J. Wiens: *A Massively Parallel, Variable Time-Step, Multi-GPU Solver for the Incompressible Navier–Stokes Equations*

A. Sandu: *Solving the Time Dimension in Multiphysics Multiscale PDE Simulations*

[AUD-3] Adaptive Discretization Methods for PDEs Using Cartesian Grids (Part I) [K. Schneider]

R. Deiterding, M. Domingues, K. Schneider: *Application of Multiresolution Smoothness Detection in the Block-Based Adaptive Mesh Refinement Method: Preliminary Results*

N. Gerhard, S. Müller: *Numerical Simulation of Tsunamis Using Adaptive Multiresolution Discontinuous Galerkin Schemes*

P. Devloo, C. Faria, A. Farias, S. Gomes, A. Loula, S. Malta: *Continuous, Mixed and Primal Hybrid Finite Element Methods for Elliptic Problems With hp-Adaptivity: Numerical Comparative Studies*

R. Pereira, R. Nguyen van yen, K. Schneider, M. Farge: *Dissipation in Adaptive Wavelet Discretizations*

16.40 - 17.10 COFFEE BREAK [**WHITE TENT**]

[AUD-1] Advances in Least-Squares and Galerkin Methods (Part II) [N. Heuer]

N. Heuer, G. Salmerón: *A Non-Conforming Domain Decomposition Approximation for the Helmholtz Screen Problem With Hypersingular Operator*

M. Feischl, T. Führer, G. Gantner, A. Haberl, D. Praetorius: *Optimal Convergence Rates for Goal-Oriented Adaptivity*

J. Sen Gupta, R. Sinha, G. Reddy, J. Jain: *A Posteriori Error Analysis of Linear Parabolic Interface Problems: A Reconstruction Approach*

E. Stephan, L. Banz: *hp-Adaptive Interior Penalty FEM for Elliptic Obstacle Problems DG for Laplace, C^0 for Bi-Laplace*

[AUD-2] Numerical Methods for Water Resources (Part III) [S. Diehl, I. Nopens]

R. Bürger, J. Careaga, S. Diehl, C. Mejías, I. Nopens, P. Vanrolleghem: *A Reduced Model and Simulations of Reactive Settling of Activated Sludge*

R. Bürger, S. Diehl, C. Mejías: *A System of Convection-Diffusion-Reaction PDEs Modelling Continuous Sedimentation With Reactions*

C. Demay, C. Bourdarias, B. de Laage de Meux, S. Gerbi, J.-M. Hérard: *A Compressible Two-Layer Model for Transient Two-Phase Flows in Pipes*

R. Bürger, S. Kumar, S. Kenettinkara, R. Ruiz-Baier: *Discontinuous Approximation of Viscous Two-Phase Flow in Heterogeneous Porous Media*

[AUD-3] Adaptive Discretization Methods for PDEs Using Cartesian Grids (Part II) [K. Schneider]

R. Galagusz, D. Shirokoff, J.-C. Nave: *High Order Penalty Methods: A Fourier Approach to Solving Wave Equations on Domains With Curved Boundaries.*

C. Mimeau, I. Mortazavi, G.-H. Cottet: *Three-Dimensional Hybrid Vortex-Penalization Method With Application to Passive Flow Control*

[AUD-3] Recent Developments in Numerical Methods for Hamilton–Jacobi–Bellman Equations and Multi-Agent System (Part I) [G. Albi, D. Kalise, F. Silva]

G. Albi: *Multi-Scale Modeling and Control of Self-Organizing Systems*

A. Festa, A. Tosin, M.-T. Wolfram: *Collision Avoidance and Pedestrian Dynamics*

THURSDAY, JANUARY 14

09.00 - 09.50 PLENARY LECTURE **[AUD-0]** [*Chairman*: R. RODRÍGUEZ]

Pavel Bochev: *Optimization-Based Property Preserving Methods, or Going Boldly Beyond Compatible Discretizations.*

09.55 - 10.45 PLENARY LECTURE **[AUD-0]** [*Chairman*: R. RODRÍGUEZ]

Olaf Steinbach: *Space–Time Finite and Boundary Element Methods for Parabolic Problems.*

10.50 - 11.20 COFFEE BREAK **[WHITE TENT]**

THURSDAY: **11.20 - 11.45 | 11.45 - 12.10 | 12.10 - 12.35 | 12.35 - 13.00** PARALLEL SESSIONS

[AUD-1] Advances in Finite and Boundary Elements (Part III) [M. Neilan, F.-J. Sayas]

M. Tabata: *Some Applications of the Lagrange–Galerkin Method in Flow Problems*

M. Feischl, G. Gantner, A. Haberl, D. Praetorius: *A Posteriori Error Estimation for Adaptive IGA Boundary Element Methods*

N. Nigam: *A Modification of Schiffer's Conjecture, and a Proof via Finite Elements.*

C. Urzúa-Torres, R. Hiptmair, C. Jerez-Hanckes: *Operator Preconditioning for the Hypersingular Operator Over 3D Screens.*

[AUD-2] High Order Methods for Hyperbolic Systems of PDE (Part I) [P. Mulet]

A. Bermúdez, X. López, M. E. Vázquez-Cendón: *Numerical Solution of Euler Equations With Source Terms*

C. Goetz, M. Dumbser: *An ADER Scheme With a New Solver for the Generalized Riemann Problem and Local Space-Time DG Flux Integration*

M. Castro Díaz, J. M. Gallardo Molina, A. Marquina: *Approximate Osher–Solomon Schemes for Hyperbolic Systems*

C. Castro: *Study of Riemann Solvers for Euler Equation With General Equation of State*

[AUD-3] Recent Developments in Numerical Methods for Hamilton–Jacobi–Bellman Equations and Multi-Agent System (Part II) [G. Albi, D. Kalise, F. Silva]

A. Picarelli, C. Reisinger: *Duality-Based Error Estimates for Some Approximation Schemes for Optimal Investment Problems*

L. Briceño-Arias, D. Kalise, F. Silva: *A Proximal Splitting Method to Solve Some Stationary Mean Field Game Systems*

O. Bokanowski, E. Bourgeois, A. Désilles, H. Zidani: *Trajectory Optimization for a Heavy Launcher: A Hamilton–Jacobi Approach*

[AUD-4] Computational Cardiac Biomechanics (Part I) [R. Ruiz-Baier, S. Scacchi]

P. Colli Franzone, L. Pavarino, S. Scacchi: *Effects of Mechano-Electric Feedbacks on the Cardiac Bioelectrical Activity: A Simulation Study*

D. Hurtado, D. Henao, N. Cornejo, W. Ramirez: *Variational Principle for the Bidomain Electrophysiology Model: Theory and Numerical Applications*

C. Jerez-Hanckes, C. Cortínez: *Multiple Traces Formulation for Multiple Biological Cells Electrically Excited*

M. Favino, E. Foster, S. Pezzuto, S. Pozzi, F. Prinzen, A. Auricchio, R. Krause: *Coupling Strategies for Electro–Mechanics in the Heart*

13.00 - 15.00 L U N C H **[WHITE TENT]**

THURSDAY: **15.00 - 15.25 | 15.25 - 15.50 | 15.50 - 16.15 | 16.15 - 16.40** PARALLEL SESSIONS

[AUD-1] Computational Electromagnetism (Part III) [A. Bermúdez, R. Rodríguez]

D. Hömberg: *Modelling and Simulation of Multi-Frequency Induction Hardening*

S. Ambikasaran, C. Borges, L.-M. Imbert-Gérard, L. Greengard: *Volume Integral Methods for the Helmholtz Equation With Variable Coefficients.*

C. Jerez-Hanckes, C. Schwab: *Electromagnetic Wave Scattering by Random Surfaces: Shape Holomorphy*

F. Kretzschmar, A. Moiola, I. Perugia, S. Schnepp: *Space-Time Trefftz Discontinuous Galerkin Methods for Wave Problems*

[AUD-2] Non-Linear Numerical Methods for Evolutionary PDEs (Part III) [E. Toro]

F. Coquel: *Jin-Xin's Relaxation Solvers With Defect Measure Corrections*

A. Adimurthi, A. Aggarwal, G. D. V. Gowda: *Godunov-Type Numerical Scheme for a Model of Granular Flow for Partially Open Tables*

L. Müller, P. Blanco, S. Watanabe, R. Feijóo: *A Local Time Stepping Solver for 1D Blood Flow: Application to the ADAN Model*

R. Cabrales, F. Guillén-González, J. Gutiérrez-Santacreu: *A Projection-Based Time-Splitting Finite Element Method for the Numerical Approximation of Nematic Liquid Crystals Flows*

[AUD-3] Adaptivity in Numerical PDE (Part II) [P. Morin]

N. Kopteva, T. Linss: *Maximum-Norm a Posteriori Error Estimates for Parabolic Equations*

E. Georgoulis, O. Lakkis, C. Makridakis, J. Virtanen: *Aposteriori Error Analysis of Timestepping Schemes for the Wave Equation*

A. Ern, M. Vohralík: *Polynomial-Degree-Robust a Posteriori Estimates for Elliptic PDEs*

A. Demlow: *Optimality of Adaptive FEM for Eigenvalue Clusters*

[AUD-4] Computational Cardiac Biomechanics (Part II) [R. Ruiz-Baier, S. Scacchi]

A. Nagler, C. Bertoglio, C. Stoeck, S. Kozerke, W. Wall: *Maximum Likelihood Estimation of Cardiac Fibers From In-Vivo DMRI and Influence on Biomechanical Heart Simulations*

S. Pezzuto, P. Kalavsky, M. Potse, A. Auricchio, R. Krause: *Inverse Modeling for Cardiac Electrophysiology With Fast Eikonal Approximation*

R. Ruiz-Baier: *A Primal-Mixed Finite Element Method for the Electromechanics of the Heart*

J. Sotelo, S. Uribe, D. Hurtado: *Tridimensional Quantification of Cardiovascular Hemodynamics Parameter Using Finite Element Methods From 4D Flow MRI Data*

16.40 - 17.10 COFFEE BREAK **[WHITE TENT]**

[AUD-1] Advances in Least-Squares and Galerkin Methods (Part III) [N. Heuer]

G. Acosta, J. P. Borthagaray: *A Fractional Laplace Equation: Regularity of Solutions and Finite Element Approximations*

A. Jawtuschenko, A. Lombardi: *Interpolation Error Estimates for Vectorial Finite Elements on General Polyhedral Anisotropic Meshes*

H. Chen, W. Qiu: *a First Order System Least Squares Method for the Helmholtz Equation*

[AUD-2] Non-Linear Numerical Methods for Evolutionary PDEs (Part IV) [E. Toro]

S. Tokareva, R. Abgrall, M. Ricchiuto, P. Bacigaluppi: *How to Avoid Mass Matrix Inversion in Continuous Finite Elements: Application to Lagrangian Hydrodynamics*

A. Ávila, D. Soto: *Time Splitting With Finite Element Method for Solving a Nonlinear Schrödinger Equation*

[AUD-3] Adaptivity in Numerical PDE (Part III) [P. Morin]

R. Rodríguez, I. Šebestová: *Residual-Based a Posteriori Error Estimator for the Maxwell's Eigenvalue Problem*

[AUD-3] Recent Advances in Discontinuous Galerkin Methods (Part II) [B. Cockburn, J. Gopalakrishnan, M. Solano]

S. Lanteri, R. Léger, D. Paredes, C. Scheid, F. Valentin: *A Multiscale Hybrid-Mixed Method for the Maxwell Equations in Time Domain*

M. Louaked, N. Seloula: *Discontinuous Galerkin Method for the Stokes Equations With Mixed Boundary Conditions*

M. Zakerzadeh, G. May: *Convergence Analysis of a Shock-Capturing Discontinuous Galerkin Scheme for Hyperbolic Conservation Laws*

[AUD-4] High Accuracy Methods for Eigenvalue Problems [N. Nigam]

O. Steinbach, M. Zank: *Generalized Steklov Eigenvalue Problems*

O. Bruno, E. Garza-Gonzalez: *Windowed Green Function Method and Maxwell Eigenfunctions for Open Waveguide Problems*

X. Feng, M. Neilan: *Finite Element Methods and Analysis for Elliptic Problems in Non–Divergence Form*

S. Dominguez, N. Nigam, B. Shahriari: *On the Global Optimality of the Regular Pentagon for the Dirichlet Eigenvalue Problem*

THURSDAY, JANUARY 14 / EVENING

20.30 CONFERENCE DINNER
[CASINO LLACOLÉN]

*At **19.30 hrs.** there will be four buses waiting in front of the* EMPREUDEC BUILDING. *They will leave to **Casino Llacolén** at **20.00 hrs.***

Please, notice that:

- *those people* **not planning** *to attend,*
- *those people planning to attend that are* **vegetarians**,
- *and the* **accompanying persons** *who also plan to attend,*

should let us know at the Conference Secretariat no later than **Monday, January 11.**

FRIDAY, JANUARY 15

09.00 - 09.50 PLENARY LECTURE **[AUD-0]** [*Chairman*: P. MULET]

Christophe Chalons: *On All-Regime Lagrange-Remap Numerical Schemes for Compressible Fluids Systems.*

09.55 - 10.45 PLENARY LECTURE **[AUD-0]** [*Chairman*: P. MULET]

Daniele Boffi: *Adaptive Finite Element Methods for Eigenvalue Problems.*

10.50 - 11.20 COFFEE BREAK **[WHITE TENT]**

[AUD-1] Numerical Methods for Interface Problems [J. Guzmán, M. Sarkis]

P. Bochev, P. Kuberry: *Variations on an Interface Theme*

D. Boffi, L. Gastaldi: *A Fictitious Domain Approach With Distributed Lagrange Multiplier for Fluid-Structure Interactions*

W. Qiu, M. Solano, P. Vega: *A High Order HDG Method for Curved-Interface Problems*

[AUD-2] High Order Methods for Hyperbolic Systems of PDE (Part II) [P. Mulet]

P. Devloo, A. Farias, S. Gomes, O. Triana, J. Villegas: *Conservative High Order Coupled Mixed Finite Element-Finite Volume Method for Two-Phase Flows in Heterogeneous Media*

E. Fernández-Nieto, J. Garres-Díaz, A. Mangeney, G. Narbona-Reina: *A Splitting High Order/Multilayer Approach for Dry Granular Flows*

R. Bürger, F. Guerrero, M. C. Martí, P. Mulet: *Finite Difference WENO Schemes for Multi-Dimensional Multiphase Flows in Porous Media*

S. Boscarino, R. Bürger, P. Mulet, G. Russo, L. Villada: *On Nonlinearly and Linearly Implicit IMEX Runge-Kutta Methods for a Class of Degenerate Convection-Diffusion Problems.*

13.00 - 15.00 L U N C H **[WHITE TENT]**

FRIDAY: **15.00 - 15.25 | 15.25 - 15.50 | 15.50 - 16.15 | 16.15 - 16.40 | 16.40 - 17.05** PARALLEL SESSIONS

[AUD-1] Computational Electromagnetism (Part IV) [A. Bermúdez, R. Rodríguez]

H. Barucq, J. Chabassier, M. Duruflé, V. Péron: *On a Boundary Layer Phenomenon in Acoustic Media*

A. Bermúdez, M. Piñeiro, R. Rodríguez, P. Salgado: *A $\boldsymbol{T}-\phi,\phi$ Formulation for an Eddy Current Problem*

X. Claeys, R. Hiptmair, E. Spindler: *A Well-Conditioned Boundary Integral Formulation for Electromagnetic Scattering at Composite Objects*

D. Tagami: *An Iterative Domain Decomposition Method for Eddy Current Problems Adapted to the Gauge Condition*

T. Kang, T. Chen: *Fully Discrete $\mathbf{A}-\phi$ Finite Element Method for Maxwell's Equations With Nonlinear Conductivity*

[AUD-2] Advances in Finite and Boundary Elements (Part IV) [M. Neilan, F.-J. Sayas]

E. Colmenares, G. Gatica, R. Oyarzúa: *Fixed Point Strategies for Mixed Variational Formulations of the Stationary Boussinesq Problem*

P. Cantin, E. Burman, A. Ern: *A Compact-Stencil Scheme of Order $\frac{3}{2}$ on Polyhedral Meshes for Advection-Reaction Equations*

E. Cáceres, G. Gatica, F. Sequeira: *A Mixed Virtual Element Method for Quasi-Newtonian Stokes Flow*

S. Uchiumi, M. Tabata: *Exactly Computable Lagrange–Galerkin Schemes for Flow Problems*

M. Pinedo, M. Correa: *Mixed-Hybrid Finite Element Methods for a Non-Linear Diffusion-Reaction Equation*

[AUD-3] Session of Communications [L. Figueroa]

E. Hingant, M. Sepúlveda: *Convergence of a Finite Volume Scheme for a Sorption-Coagulation Equation*

V. Anaya, M. Bendahmane, M. Langlais, M. Sepúlveda: *Finite Volume Discretization for a Reaction Diffusion System Modelling an Indirectly Transmitted Disease*

D. Barreiro, C. Faria, J. Filho, A. Loula, S. Malta: *A Stabilized Hybrid Finite Element Method for Parabolic Problems*

S. Leite, S. Oliveira: *Error Analysis of Acoustic Wave Equation With Non-Constant Coefficients by Spectral Element Methods*

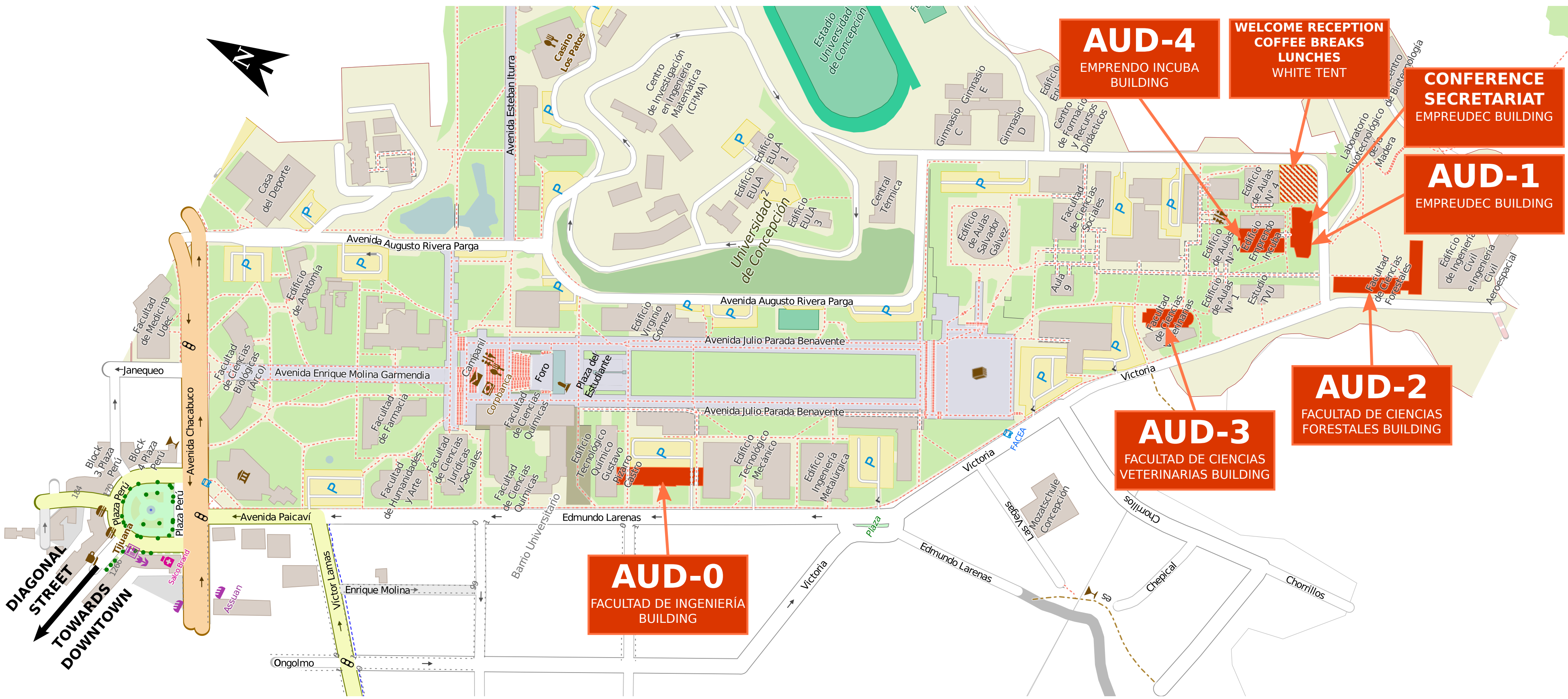
L. Figueroa: *On Spectral Differentiation on the Disk*

17.05 - 17.35 COFFEE BREAK [**WHITE TENT**]

17.35 - 18.25 CLOSING PLENARY LECTURE [**AUD-1**] [*Chairman*: L. Figueroa]

Alexandre Ern: *Finite Element Quasi-Interpolation and Best Approximation.*

CAMPUS MAP


AUD-4
EMPRENDO INCUBA BUILDING
WELCOME RECEPTION
COFFEE BREAKS
LUNCHES
WHITE TENT
CONFERENCE SECRETARIAT
EMPREUDEC BUILDING
AUD-1
EMPREUDEC BUILDING
AUD-2
FACULTAD DE CIENCIAS FORESTALES BUILDING
AUD-3
FACULTAD DE CIENCIAS VETERINARIAS BUILDING
AUD-0
FACULTAD DE INGENIERÍA BUILDING
DIAGONAL STREET
TOWARDS DOWNTOWN
Avenida Augusto Rivera Parga
Avenida Julio Parada Benavente
Avenida Enrique Molina Garmendia
Avenida Chacabuco
Avenida Paicaví
Edmundo Larenas
Victoria
Chorrillos
Avenida Esteban Iturra
Universidad de Concepción
Estadio Universidad de Concepción
Plaza Perú
Janequeo
Enrique Molina
Ongolmo
Víctor Lamas
Barrio Universitario