

W O N A P D E 2 0 1 3

FOURTH CHILEAN WORKSHOP ON NUMERICAL
ANALYSIS OF PARTIAL DIFFERENTIAL EQUATIONS

P R O G R A M M E

Universidad de Concepción, Concepción, Chile, January 14 - 18

INTRODUCTION

The conference **WONAPDE 2013** 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 campus maps in the next three pages):

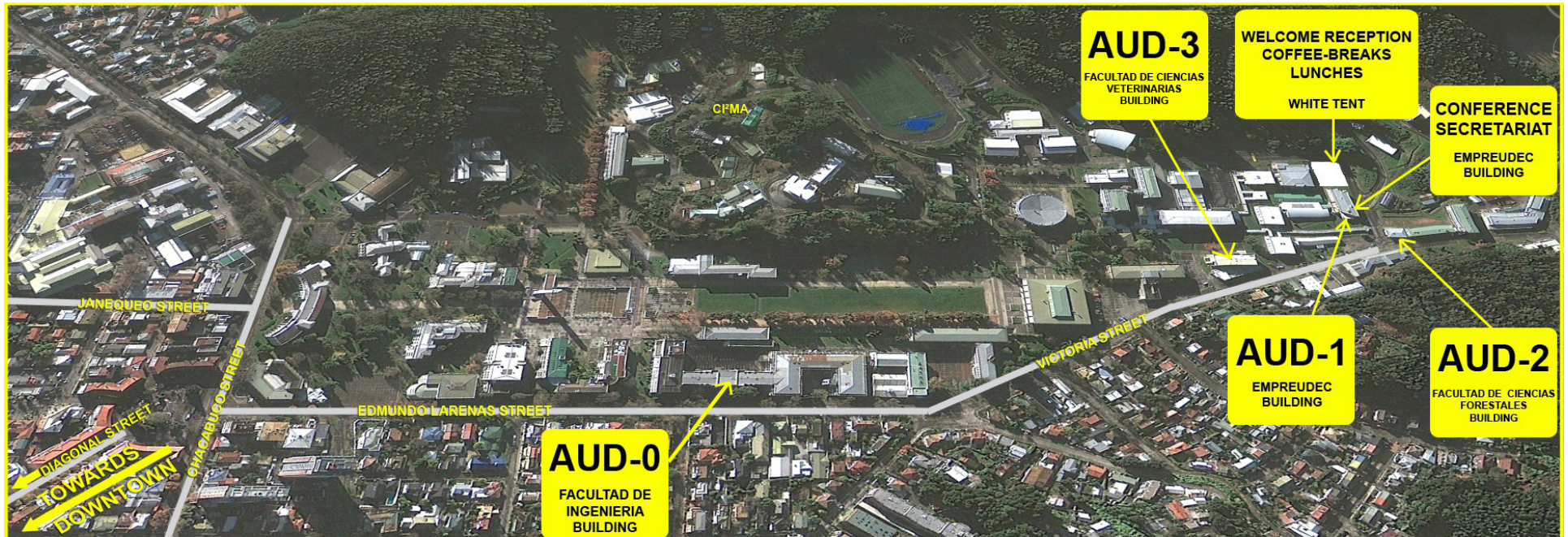
AUD-0	AUDITORIUM, FACULTAD DE INGENIERÍA BUILDING
AUD-1	AUDITORIUM, EMPREUDEC BUILDING
AUD-2	AUDITORIUM, FACULTAD DE CIENCIAS FORESTALES BUILDING
AUD-3	AUDITORIUM, FACULTAD DE CIENCIAS VETERINARIAS BUILDING
WHITE TENT	TENT LOCATED IN THE PARKING LOT OF THE EMPREUDEC BUILDING

Please, bear in mind that:

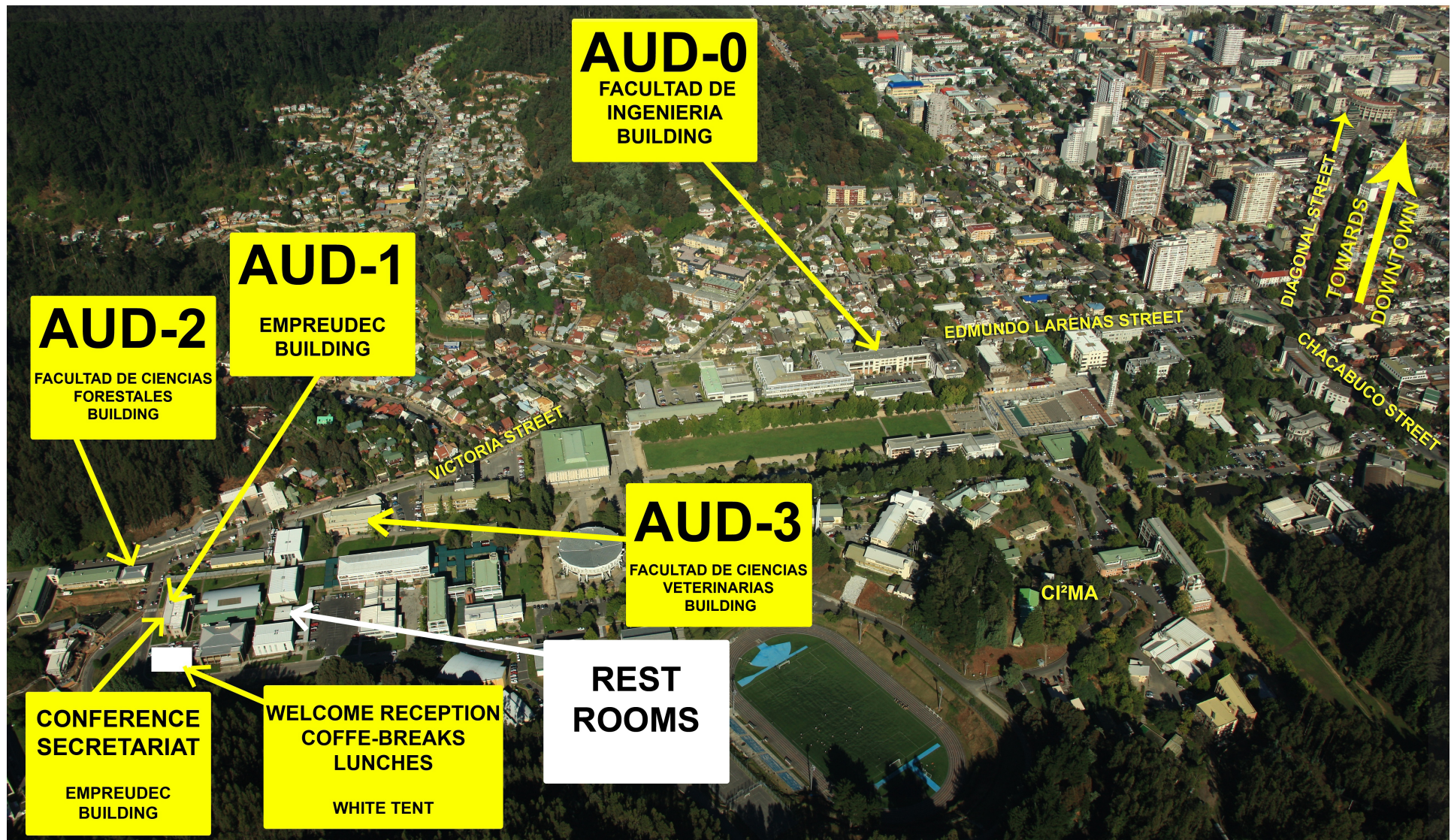
- The CONFERENCE SECRETARIAT is located in the entrance hall of the EMPREUDEC BUILDING.
- You can **register** on Monday 14, from **10.00** to **13.00** and from **14.00** to **18.00**. Nevertheless, the CONFERENCE SECRETARIAT will also remain open during the rest of the week.
- All the Plenary Lectures 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**, and **AUD-3**. 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.



2.5D CAMPUS MAP



2.5D CAMPUS MAP (ROTATED 180 DEGREES)



GENERAL SCHEDULE OF THE MINISYMPOSIA

ORGANIZERS	Part I	Part II	Part III	Part IV
R. DONAT, P. MULET	Tuesday: 15.00 - 16.40	Wednesday: 15.00 - 16.40		
N. MORAGA, M. ROJAS-MEDAR	Wednesday: 11.20 - 13.00	Thursday: 11.20 - 13.00	Friday: 15.00 - 16.40	
N. HEUER, F.-J. SAYAS	Tuesday: 15.00 - 16.40	Wednesday: 15.00 - 16.40	Thursday: 15.00 - 16.40	
A. BERMÚDEZ, R. RODRÍGUEZ	Tuesday: 11.20 - 13.00	Wednesday: 11.20 - 13.00	Thursday: 11.20 - 13.00	Friday: 11.20 - 12.35
A. CHERNOV, H. HARBRECHT	Tuesday: 11.20 - 13.00	Wednesday: 11.20 - 13.00	Wednesday: 17.35 - 18.50	
S. DIEHL	Tuesday: 11.20 - 13.00	Wednesday: 18.00 - 18.50		
R. DURÁN	Tuesday: 15.00 - 16.40	Wednesday: 17.10 - 18.00		
E.-J. PARK	Tuesday: 17.10 - 18.50	Wednesday: 15.00 - 16.40	Wednesday: 17.10 - 17.35	
H. ANTIL, Y. MADAY, R.H. NOCHETTO	Thursday: 17.10 - 18.50			
E. TORO	Tuesday: 17.10 - 18.25			
N. NIGAM	Wednesday: 17.10 - 18.50			
J.C. DE LOS REYES, E. HERNÁNDEZ	Thursday: 15.00 - 16.40	Friday: 15.00 - 17.05		
C. CHALONS	Tuesday: 17.10 - 18.50	Thursday: 17.10 - 18.50		
R. RUIZ	Thursday: 11.20 - 13.00	Friday: 11.20 - 12.35		
M. SEPÚLVEDA	Thursday: 17.10 - 18.50	Friday: 11.20 - 13.00	Friday: 16.15 - 17.05	
G. BARRENECHEA, F. VALENTIN	Thursday: 15.00 - 16.40	Friday: 15.00 - 16.15		

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

MONDAY, JANUARY 14 / MORNING

10.00 - 13.00 REGISTRATION [EMPREUDEC BUILDING]

MONDAY, JANUARY 14 / AFTERNOON

14.00 - 18.00 REGISTRATION [EMPREUDEC BUILDING]

18.15 - 19.20 OPENING CEREMONY [AUD-O]

18.15 - 18.30 WELCOME ADDRESS BY THE RECTOR

18.30 - 19.20 OPENING PLENARY LECTURE

[Chairman: G.N. GATICA]

Susanne C. Brenner: C^0 interior penalty methods.

19.30 - 21.00 WELCOME RECEPTION [WHITE TENT]

TUESDAY, JANUARY 15

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

Chi-Wang Shu: *Discontinuous Galerkin method for hyperbolic equations with singularities.*

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

Kai Schneider: *Modelling flows in complex geometries: Analysis of the penalized Laplace and Stokes operators and application to the Navier-Stokes equations.*

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] **Computational electromagnetism**
(Part I) [A. BERMÚDEZ, R. RODRÍGUEZ]

D. BOFFI: *Finite element approximation of Maxwell's eigenvalues on general meshes of quadrilaterals and cubes.*

C. JEREZ-HANCKES, J.-C. NÉDÉLEC, S. ROJAS: *Existence and uniqueness of Maxwell harmonic waves for an impedance half-space.*

A. BERMÚDEZ, D. GÓMEZ, R. RODRÍGUEZ, P. VENEGAS: *Error estimates for an axisymmetric eddy-current problem in conductive non-linear magnetic media.*

G.R. BARRENECHEA, L. BOULTON, N. BOUSSAID: *Eigenvalue enclosures for the Maxwell operator.*

[AUD-2] **Efficient approximation methods for high ... (Part I)** [A. CHERNOV, H. HARBRECHT]

I.H. SLOAN: *QMC lattice methods for PDE with random coefficients.*

C. KETELSEN, R. SCHEICHL, A.L. TECKENTRUP, P.S. VASSILEVSKI: *Multilevel Markov chain Monte Carlo with applications in subsurface flow.*

H. HARBRECHT, M. PETERS, M. SIEBENMORGEN: *On multilevel quadrature for elliptic stochastic partial differential equations.*

C. BIERIG, A. CHERNOV: *Numerical methods for stochastic obstacle problems.*

[AUD-3] **Inverse problems, parameter identification, and applicative ... (Part I)** [S. DIEHL]

R. BÜRGER, I. KRÖKER, C. ROHDE: *A hybrid stochastic Galerkin method for a clarifier-thickener model with random feed.*

F. BETANCOURT, F. CONCHA, D. SBÁBARO: *A simple mass balance controller for continuous sedimentation.*

S. DIEHL, S. FARÅS: *Control of an ideal activated sludge process in wastewater treatment via an ODE-PDE model.*

E. CARIAGA, R. MARTÍNEZ, M. SEPÚLVEDA: *Estimation of hydraulic parameters under unsaturated flow conditions in heap leaching.*

13.00 - 15.00 LUNCH [WHITE TENT]

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

[AUD-1] Boundary element methods in theory and practice (Part I) [N. HEUER, F.-J. SAYAS]

A. COSTEA, H. GIMPERLEIN, E.P. STEPHAN: *Boundary elements and a smoothed Nash-Hörmander iteration for the Molodensky problem.*

M. FEISCHL, T. FÜHRER, M. KARKULIK, M. MELENK, D. PRAETORIUS: *Novel inverse estimates for non-local operators.*

N. HEUER, S. MEDDAHI: *Discontinuous Galerkin hp-BEM with quasi-uniform meshes.*

M. FEISCHL, T. FÜHRER, M. KARKULIK, D. PRAETORIUS: *Quasi-optimal adaptive BEM.*

[AUD-2] Adaptive numerical techniques for partial ... (Part I) [R. DONAT, P. MULET]

E. BLANC, G. CHIAVASSA, B. LOMBARD: *Numerical modelisation of transient poroelastic waves.*

R. BÜRGER, R. RUIZ-BAIER, K. SCHNEIDER, H. TORRES: *Adaptive multiresolution methods for the simulation of sedimentation processes.*

N. HOVHANNISYAN, S. MÜLLER, R. SCHÄFER: *Adaptive multiresolution discontinuous Galerkin schemes for conservation laws.*

M. DOMINGUES, A.K. GÓMES, S. GÓMES, O. MENDES, K. SCHNEIDER: *Adaptive multiresolution methods for magnetohydrodynamics with parabolic-hyperbolic divergence cleaning.*

[AUD-3] Mathematical aspects of finite element methods (Part I) [R. DURÁN]

S. MEDDAHI, D. MORA, R. RODRÍGUEZ: *Finite element spectral analysis for the mixed formulation of the elasticity equations.*

A. BUREL, M. DURUFLÉ, S. IMPERIALE, P. JOLY: *Using potentials in linear elastodynamics: A challenge for finite element methods ?*

J. GUZMÁN, M. NEILAN: *The construction of conforming divergence-free Stokes elements using rational functions.*

M. AINSWORTH, A. ALLENDES, G.R. BARRENECHEA, R. RANKIN: *Fully computable a posteriori error bounds for stabilized FEM approximations of convection-reaction-diffusion problems in three dimensions.*

16.40 - 17.10 COFFEE BREAK [WHITE TENT]

TUESDAY: 17.10 - 17.35 | 17.35 - 18.00 | 18.00 - 18.25 | 18.25 - 18.50 PARALLEL SESSIONS

[AUD-1] Mixed finite element and hybridized discontinuous ... (Part I) [E.-J. PARK]

Y. JEON, E.-J. PARK: *New hybrid discontinuous Galerkin methods.*

Y. JEON, E.-J. PARK, D.W. SHIN: *A hybrid discontinuous Galerkin method for convection-diffusion-reaction problems.*

R. ARAYA, C. HARDER, D. PAREDES, F. VALENTIN: *A multiscale hybrid-mixed finite element method for advection-diffusion problems.*

C. CARSTENSEN, D. KIM, E.-J. PARK: *A posteriori error estimates based on the spaces for the Raviart-Thomas element for the Stokes problem.*

[AUD-2] Numerical methods for stiff sources and multiscale problems (Part I) [C. CHALONS]

J. DUPAYS, F. LAURENT, M. MASSOT, A. SIBRA: *Splitting method for hyperbolic systems with stiff relaxation source terms: analysis and application to polydisperse sprays in solid rocket motors.*

F. COQUEL: *Capturing phase boundaries through defect measure corrections in relaxation approximate Riemann solvers.*

F. FILBET, A. RAMBAUD: *Analysis of an asymptotic preserving scheme for relaxation systems.*

D. KOTOV, C.-W. SHU, W. WANG, H.M. YEE: *Spurious behavior of shock-capturing methods: problems containing stiff source terms and discontinuities.*

[AUD-3] Models and numerical methods for vascular physiology [E. TORO]

L. MUELLER, E. TORO: *Modelling of chronic cerebro spinal venous insufficiency (CCSVI).*

A. HIDALGO, L. TELLO, E. TORO: *Numerical simulation of an atherosclerosis model.*

A. HIDALGO, L. TELLO, E. TORO: *Some connections between numerical and analytical studies of atherosclerosis model.*

WEDNESDAY, JANUARY 16

09.00 - 09.50 PLENARY LECTURE [AUD-0]

[Chairman: N. HEUER]

Ralf Hiptmair: *Sparse tensor edge elements.*

09.55 - 10.45 PLENARY LECTURE [AUD-0]

[Chairman: N. HEUER]

Francisco J. Sayas: *Discrete Huygens potentials, A.K.A. time-domain acoustics with BEM.*

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] **Computational electromagnetism (Part II)**
[A. BERMÚDEZ, R. RODRÍGUEZ]

A. ALONSO, E. BERTOLAZZI, R. GHILONI, A. VALLI: *Finite element construction of discrete harmonic fields.*

H. HADDAR, A. LECHLEITER, S. MARMORAT: *An improved time domain linear sampling method for Robin and Neumann obstacles.*

R. MUÑOZ-SOLA, C. REALES, R. RODRÍGUEZ: *An existence result for an electromagnetic levitation model in cylindrical coordinates.*

I. MUGA, D. PARDO, C. TORRES-VERDÍN: *Recent advances on the simulation and inversion of resistivity logging measurements for enhanced reservoir characterization.*

[AUD-2] **Efficient approximation methods for high ... (Part II)**
[A. CHERNOV, H. HARBRECHT]

R. SCHNEIDER: *Advances in recent tensor formats.*

M. BEBENDORF: *Adaptive cross approximation in higher dimensions.*

D. KRESSNER, M. STEINLECHNER, B. VANDEREYCKEN: *Low-rank tensor completion by Riemannian optimization.*

J. TAUSCH: *Best N-term Chebyshev approximations of multivariate Gaussians.*

[AUD-3] **Applied computation for engineering ... (Part I)**
[N. MORAGA, M. ROJAS-MEDAR]

N. MORAGA, C. ZAMBRA: *A novel PDE system for coupled flow of heat and mass: waste piles with chemical and biological reaction and soil below them.*

J. E. PAZ, L.A. SEGURA: *Nanopore-level modeling of the transport of water and oxygen in polymeric films.*

R. LEMUS-MONDACA, N. MORAGA: *Numerical simulation of 3d food dehydration in turbulent forced convection by FVM.*

C. CARLESI, D. CARVAJAL, M. IRRAZABAL: *Computational fluid dynamic simulation of a high viscosity bubble column for CO₂ removal.*

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

13.10 - 15.00 LUNCH [WHITE TENT]

WEDNESDAY: 15.00 - 15.25 | 15.25 - 15.50 | 15.50 - 16.15 | 16.15 - 16.40 PARALLEL SESSIONS

[AUD-1] **Boundary element methods in theory and practice (Part II)** [N. HEUER, F.-J. SAYAS]

M. FEISCHL, T. FÜHRER, M. KARKULIK, M. MELENK, D. PRAETORIUS: *Convergence of adaptive FEM-BEM coupling.*

B. COCKBURN, F.-J. SAYAS, M. SOLANO: *Coupling at a distance HDG and BEM.*

G. OE, O. STEINBACH: *On the ellipticity of the Johnson-Nédélec coupling of finite and boundary element methods for boundary value problems.*

B. KAGER, M. SCHANZ, T. TRAUB: *Fast methods for time domain BEM: two approaches.*

[AUD-2] **Mixed finite element and hybridized discontinuous ... (Part II)** [E.-J. PARK]

D. BOFFI, N. CAVALLINI, F. GARDINI, L. GASTALDI: *Mass conservation of Stokes finite elements.*

R. OYARZÚA, D. SCHÖTZAU: *An exactly divergence-free finite element method for the generalized Boussinesq equations.*

C. CARSTENSEN, D. PETERSEIM, M. SCHEDENSACK: *Comparison results of first-order finite element methods for the Poisson model problem.*

J. GOPALAKRISHNAN, I. MUGA, N. OLIVARES: *Dispersion of the lowest order DPG method for acoustics.*

[AUD-3] **Adaptive numerical techniques for partial ... (Part II)** [R. DONAT, P. MULET]

P. DEVLOO, S. GÓMES, J. GONCALVES: *Goal-oriented hp-adaptive strategy for the discontinuous Galerkin method.*

R. BÜRGER, P. MULET, L.M. VILLADA: *Spectral WENO schemes with adaptive mesh refinement for multi-species kinematic flow models.*

P. MULET, F. VECIL: *A semi-Lagrangian AMR scheme for 2D transport problems in conservation form.*

P. FROLKOVIČ: *Adaptive numerical techniques for flux-based level set method.*

16.40 - 17.10 COFFEE BREAK [WHITE TENT]

WEDNESDAY: 17.10 - 17.35 | 17.35 - 18.00 | 18.00 - 18.25 | 18.25 - 18.50 PARALLEL SESSIONS

[AUD-1] **Mathematical aspects of finite element methods (Part II)** [R. DURÁN]

D. BOFFI, R. DURÁN, F. GARDINI, L. GASTALDI: *A posteriori error estimates for nonconforming approximation of Laplace eigenproblem with multiple eigenvalues.*

R.H. NOCHETTO, E. OTÁROLA, A.J. SALGADO: *A PDE approach to fractional diffusion: a priori and a posteriori error analyses.*

[AUD-1] **Inverse problems, parameter identification, and applicative ... (Part II)** [S. DIEHL]

A. SOPASAKIS: *Stochastic dynamic mechanisms for traffic flow modeling.*

R. BÜRGER, S. DIEHL: *Convexity-preserving flux identification for scalar conservation laws modelling sedimentation.*

[AUD-2] **Mixed finite element and hybridized discontinuous ... (Part III)** [E.-J. PARK]

J.M. MELENK, A. PARSANIA, S. SAUTER: *Generalized DG-methods for highly indefinite Helmholtz problems.*

[AUD-2] **Efficient approximation methods for high ... (Part III)** [A. CHERNOV, H. HARBRECHT]

L.E. FIGUEROA, E. SÜLI: *Concrete greedy algorithms approximating high-dimensional PDE.*

O. BOKANOWSKI, J. GARCKE, M. GRIEBEL, I. KLOMPMAKER: *An adaptive sparse grid semi-Lagrangian scheme for first order Hamilton-Jacobi Bellman equations.*

H. WOŹNIAKOWSKI: *Tractability of the Fredholm problem of the second kind.*

[AUD-3] **Numerical methods for boundary value problems on manifolds** [N. NIGAM]

C.B. MACDONALD, B. MERRIMAN, S.J. RUUTH: *Simple computation of reaction-diffusion processes on point clouds.*

Q.T. LE GIA: *Radial basis functions methods for boundary value problems on local spherical regions.*

S. GEMMRICH, M.C. KROPINSKI, N. NIGAM: *BIE methods for the Laplace-Beltrami boundary value problems on the sphere.*

R. CUNDERLÍK, K. MIKULA: *Nonlinear diffusion filtering of data on the earth's surface.*

THURSDAY, JANUARY 17

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

Oscar Bruno: *Fast spectral frequency and time domain PDE solvers.*

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

Patrick Joly: *Mathematical and numerical modeling of a grand piano.*

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] **Computational electromagnetism**
(Part III) [A. BERMÚDEZ, R. RODRÍGUEZ]

B. DESPRÉS, L.-M. IMBERT-GÉRARD: *Generalized plane wave methods for Maxwell's equation modelling reflectometry in fusion plasmas.*

A. BERMÚDEZ, B. LÓPEZ-RODRÍGUEZ, R. RODRÍGUEZ, P. SALGADO: *Numerical solution of a transient 3D eddy current model with moving conductors.*

T. CHEN, T. KANG: *The $A-\phi$ finite element method with composite grids for a transient eddy current problem.*

M. GANESH, J.S. HESTHAVEN, B. STAMM: *A reduced basis method for electromagnetic scattering by multiple particles in three dimensions.*

[AUD-2] **Numerical methods for the simulation of cardiac mechanics ... (Part I)** [R. RUIZ]

N.A. TRAYANOVA: *Modeling cardiac function and dysfunction.*

K. KUNISCH, C. NAGAIAH, G. PLANK: *Boundary control of bidomain equations in cardiac electrophysiology.*

C. CORRADO, J.-F. GERBEAU, P. MOIREAU: *Identification of an electrophysiological model from combined ecg and MRI.*

A. LAADHARI, A. QUARTERONI, S. ROSSI, R. RUIZ BAIER: *Numerical simulation of active mechanics in the heart: Muscle and cell scales.*

[AUD-3] **Applied computation for engineering ... (Part II)** [N. MORAGA, M. ROJAS-MEDAR]

P. RESZKA, R. SUAREZ, R. VALENZUELA, C. VOLKWEIN: *Performance of vortex generators as passive snow removal devices for buildings.*

R. CABRALES, N. MORAGA: *A control volume finite element method for simulate macrosegregation in binary alloys.*

N. MORAGA, D. VASCO: *On improving numerical simulations of solid-liquid phase change processes with FVM.*

S. ABRIGO, D. FOLMER, R. PRADO: *Simulation of petroleum flow through a reservoir of cylindrical geometry and variable radial permeability.*

13.00 - 15.00 LUNCH [WHITE TENT]

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

[AUD-1] Boundary element methods in theory and practice (Part III) [N. HEUER, F.-J. SAYAS]

M. DARBAS, E. DARRIGRAND, Y. LAFRANCHE: *A spectral analysis of the combination of OSRC preconditioner and fast multipole method for 3-D high-frequency scattering.*

O. BRUNO, S. SHIPMAN, C. TURC, S. VENAKIDES: *Efficient solution of acoustic and electromagnetic scattering problems in three-dimensional periodic media.*

C. JEREZ-HANCKES, C. A. URZUA: *Operator preconditioning for two-dimensional screen and fracture problems using boundary elements.*

A. BANTLE, M. BANTLE, S. FUNKEN: *EPS-BEM: efficient p -stable boundary element methods. A Matlab software package.*

[AUD-2] Stabilized and multiscale finite ... (Part I) [G. BARRENECHEA, F. VALENTIN]

R. SCHEICHL, P. VASSILEVSKI, L. ZIKATANOV: *Approximation and stability properties of multiscale discretisation schemes.*

R. ARAYA, C. HARDER, D. PAREDES, F. VALENTIN: *Multiscale hybrid-mixed finite element methods.*

F. MORALES, R. SHOWALTER: *Interface perturbation analysis for coupled systems of multiple scale flow in mixed formulation.*

D. PETERSEIM: *Computational homogenization of multiscale elliptic problems.*

[AUD-3] Numerical methods for optimization ... (Part I) [J.C. DE LOS REYES, E. HERNÁNDEZ]

E. CASAS, C. CLASON, K. KINISCH: *Error estimates for the numerical approximation of parabolic control problems in measure spaces.*

J.C. DE LOS REYES, V. DHAMO: *Error estimates for optimal control problems of a class of quasilinear equations arising in variable viscosity fluid flow.*

H. ANTIL, R.H. NOCHETTO, P. SODRÉ: *Optimal control of a free boundary problem with surface tension effects.*

G. GARCÍA, A. OSSES, M. TAPIA: *Reconstruction formula for an inverse parabolic source problem using a family of exact controls.*

16.40 - 17.10 COFFEE BREAK [WHITE TENT]

THURSDAY: 17.10 - 17.35 | 17.35 - 18.00 | 18.00 - 18.25 | 18.25 - 18.50 PARALLEL SESSIONS

[AUD-1] Numerical methods for stiff sources and multiscale problems (Part II) [C. CHALONS]

C. ZEILER: *A multiscale method for compressible liquid-vapor flow with surface tension.*

C. BERTHON: *Asymptotic preserving schemes to approximate long time behaviour of relaxation models.*

F. FILBET, C. YANG: *Asymptotic preserving scheme for kinetic equations for complex geometry.*

C. CHALONS, M. GIRARDIN, S. KOKH: *Large time step and asymptotic preserving numerical schemes for hyperbolic systems with sources.*

[AUD-2] Model reduction for nonlinear problems ... [H. ANTIL, Y. MADAY, R.H. NOCHETTO]

H. ANTIL, S. FIELD, F. HERRMANN, R.H. NOCHETTO, M. TIGLIO: *Two-step greedy for reduced order quadratures.*

K. STEIH, K. URBAN: *On space-time approaches in reduced basis methods for time-periodic PDEs.*

M. GREPL, M. KÄRCHER: *A certified reduced basis approach for parametrized linear-quadratic optimal control problems.*

Y. MADAY, B. STAMM: *Locally adaptive greedy approximations for anisotropic parameter reduced basis spaces.*

[AUD-3] Session of Communications (Part I) [M. SEPÚLVEDA]

S. BERRES, H. SCHWANDT: *A multi-phase transport model for pedestrian movement.*

A. BOURCHTEIN, L. BOURCHTEIN: *A time-splitting scheme for nonhydrostatic atmospheric model.*

K. MIKULA: *Computational reconstruction of Zebrafish embryogenesis by nonlinear PDE methods of image processing.*

P. LEFLOCH, H. MAKHLOF, B. OKUTMUSTUR: *Derivation and numerical study of relativistic Burgers equations on a curved spacetime.*

THURSDAY, JANUARY 17 / EVENING

20.30 C O N F E R E N C E D I N N E R
[C A S I N O L L A C O L É N]

At 19.30 hrs. there will be 4 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 **Tuesday, January 15.**

FRIDAY, JANUARY 18

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

Yvon Maday: *A priori and a posteriori analysis for electronic structure calculation.*

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

Alfredo Bermúdez: *Lagrangian and semi-Lagrangian Galerkin methods for solving partial differential equations.*

10.50 - 11.20 COFFEE BREAK [WHITE TENT]

FRIDAY: 11.20 - 11.45 | 11.45 - 12.10 | 12.10 - 12.35 | 12.35 - 13.00 PARALLEL SESSIONS

[AUD-1] **Computational electromagnetism (Part IV)**
[A. BERMÚDEZ, R. RODRÍGUEZ]

R. ACEVEDO, G. LOAIZA: *A fully-discrete scheme for a nonlinear magnetic eddy current problem.*

A. ALONSO, J. CAMAÑO, R. RODRÍGUEZ, A. VALLI: *An a posteriori error estimator for the electrostatics problem with a current dipole source.*

A. BUFFA, G. SANGALLI, R. VÁZQUEZ: *Compatible discretizations in isogeometric analysis.*

[AUD-2] **Numerical methods for the simulation of cardiac mechanics ... (Part II)** [R. RUIZ]

P. COLLI FRANZONE, L. PAVARINO, S. SCACCHI: *Parallel multilevel solvers for the cardiac electromechanical coupling.*

S. GÖTSCHER, C. NAGAIH, M. WEISER: *Adaptivity and compression in optimal control of defibrillation.*

B. AINSEBA, M. BENDAHMANE, A. LÓPEZ: *Recent progresses in inverse problems in electrocardiology.*

[AUD-3] **Session of Communications (Part II)**
[M. SEPÚLVEDA]

A.I. ÁVILA, C. RAPIMÁN: *hp-FEM solutions for option price Bates' model.*

I.S. CIUPERCA, E. HINGANT, L.I. PALADE, L. PUJO-MENJOUET: *Mathematical and numerical aspect of a rigid-rod model for proteins polymers.*

V. ANAYA, M. BENDAHMANE, M. SEPÚLVEDA: *Numerical analysis of a three interacting species model with nonlocal and cross diffusion.*

F. MORALES, R. SHOWALTER: *On the construction of geometric parameters of mechanical energy dissipation and preferential fluid flow analysis in fissured media.*

13.00 - 15.00 LUNCH [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] Stabilized and multiscale finite ...
(Part II) [G. BARRENECHEA, F. VALENTIN]

J. GALVIS, H.M. VERSIEUX: *An iterative domain decomposition method for free boundary problems with nonlinear flux jump constraint.*

G.R. BARRENECHEA, V. JOHN, P. KNOBLOCH: *A local projection stabilization method with nonlinear crosswind diffusion.*

A. LOULA: *Stabilized hybrid and DG methods for second order elliptic problems.*

[AUD-1] Session of Communications (Part III)
[M. SEPÚLVEDA]

J. CLARKE, J. GARZON, S. TINDEL, S. TORRES: *Discrete time approximation of delay differential equations driven by fractional Brownian motion.*

G. GALIANO, V. SELGAS: *On a finite element approximation to a cross-diffusion segregation problem arising from a model of interacting particles.*

[AUD-2] Numerical methods for optimization ... (Part II) [J.C. DE LOS REYES, E. HERNÁNDEZ]

S. WALKER: *A new mixed formulation for a sharp interface model of Stokes flow and moving contact lines.*

P. MERINO, I. NEITZEL, F. TRÖLTZSCH: *On two adaptive numerical strategies for elliptic semi-infinite optimal control problems.*

A. KIMESWENGER, O. STEINBACH: *Coupled FE/BE approach for boundary control problems.*

M. HINTERMÜLLER: *A PDE-constrained generalized Nash equilibrium problem with pointwise control and state constraints.*

C. DOMÍNGUEZ, E. HERNÁNDEZ, R. PRATO: *On the error estimates for a class of approximation of Dirichlet boundary control problems.*

[AUD-3] Applied computation for engineering ... (Part III) [N. MORAGA, M. ROJAS-MEDAR]

J.-L. CONSALVI, R. DEMARCO, A. FUENTES: *Modeling radiative heat transfer and soot formation in laminar diffusion flames.*

J.C. ELICER, A. FUENTES, G. SEVERINO: *Two dimensional modeling of the heat released by a diffusion flame inside a scale tunne.*

D. BATISTA, O. JIMENEZ: *High quality unstructured mesh generation for oil reservoir simulation.*

F. CHARLES, C. COPOL, S. DELLACHERIE, J.-M. MOUNSAMY: *Numerical simulation by a random particle method of Deuterium-Tritium fusion reactions in a plasma.*

17.05 - 17.35 COFFEE BREAK [WHITE TENT]

17.35 - 18.25 CLOSING PLENARY LECTURE [AUD-1] [Chairman: R. RODRÍGUEZ]
Ricardo H. Nochetto: *Director fields on flexible surfaces.*