

**IMACS2023**    Wednesday 09/13/2023    **PLENARY ROOM #38**

**9:00 - KEYNOTE LECTURE**

Chair: *Thiab Taha*

Arbitrarily High Order Finite Element Methods for Arbitrarily Shaped Domains with Automatic Mesh Generation

*Zhiming Chen*

**10:00 – SS3**

DELAY DIFFERENTIAL EQUATIONS AND APPLICATIONS

Organizer: *Eva Kaslik, Mihaela Neamtu*

10:00 - Dynamics Analysis of a Socioecological System

*Andreea Maria Ardeuan, Eva Kaslik, Mihaela Neamtu*

10:20 - A Time-Delayed System of Identical Theta Neurons

*Lavinia Birdac, Eva Kaslik*

10:40 - A Mixed Oligopoly Model with Time Delays

*Loredana Camelia Cuda, Eva Kaslik, Mihaela Neamtu*

**11:00 – COFFEE BREAK**

**11:30 – SS3**

11:30 - Coupled Wilson-Cowan Systems with Distributed Delays

*Eva Kaslik, Emanuel-Attila Kokovics, Anca Radulescu*

11:50 - Dynamics of a pituitary-adrenal model with distributed time delays

*Eva Kaslik, Maria Roxana Matei, Mihaela Neamtu*

12:10 - Stability and Hopf Bifurcation Analysis of an Unemployment Model with Distributed Time Delays

*Eva Kaslik, Mihaela Neamtu, Loredana Vesa*

**12:30 – SS6**

MATHEMATICS OF EMERGING AND RE-EMERGING HUMAN INFECTIOUS DISEASES OF MAJOR PUBLIC HEALTH IMPORTANCE

Organizer: *Jean Lubuma*

12:30 - Mathematical Analysis of the Impact of the Face Mask on COVID-19

*Mahmoud H. DarAssi*

12:50 - Some Qualitatively Reliable Models for Epidemic Spread

*Istvan Faragó*

13:10 - Age-structured Mathematical Models based on Nonlinear ODEs to Study the Optimality of Vaccination Strategies for COVID-19 Pandemic

*Gilberto Gonzalez-Parra, Giulia Luebben, Bhumika Bhakta, Bishop Cervantes*

**13:30 - LUNCH TIME**

**IMACS2023**    Wednesday 09/13/2023    **PLENARY ROOM #38**

**15:00 – SS6**

15:00 - A Metapopulation Model for the 2014-2016 West Africa Ebola Virus Disease Outbreak, Part I: Exit Screening and Quarantine Measures

*Jean M-S Lubuma, Arsene Jaures Ouemba Tasse, Berge Tsanou, Jean Louis Woukeng*

15:20 - A Metapopulation Model for the 2014-2016 West Africa Ebola Virus Disease Outbreak, Part II: Optimal Control Strategies

*Vuyiswa B Kubalasa, Jean M-S Lubuma, Arsene Jaures Ouemba Tasse, Berge Tsanou, Jean Louis Woukeng*

15:40 - SEIR Epidemic Mathematical Model in the Presence of Hoax

*Asep Kuswandi Supriatna, Hennie Husniah, Yedi Purwanto, Ahmad S. Indrapriyatna*

16:00 - Positivity Preserving Numerical Methods Applied to Epidemic Models

*Bálint Máté Takács, István Faragó, Gabriella Svantnerné Sebestyén*

**16:20 – SS5**

MATHEMATICAL AND COMPUTATIONAL METHODS FOR MIGRATION, AGGREGATION AND INTERACTION OF CELL POPULATIONS

Organizers: *Gabriella Bretti, Marta Menci*

16:20 - Dynamics of Circulating Tumor Cells in Blood Vessels: Mathematical Modeling and Data Assimilation

*Giorgia Ciavolella, Annabelle Collin, Christèle Etchegaray, Jacky Goetz, Julien Granet, Nael Osmani*

16:40 - Kinetic models for cell migration in the microenvironment: from the microscopic to the macroscopic scale

*Nadia Loy, Martina Conte*

**17:00 - COFFEE BREAK**

**17:30 – SS5**

17:30 - GPU Parallel Numerical Simulations of the Gatenby-Gawliniski Model with Anisotropic, Heterogeneous Acid Diffusion

*Mascia Corrado, Donato Pera, Chiara Simeoni*

17:50 - Modelling Cell Migration: a Hybrid Approach for Cancer-on-chip Experiment

*Marta Menci*

18:10 - Large-scale Dynamics of Self-propelled Particles Moving through Obstacles: How Environment Affects Particle Swarms

*Diane Peurichard*

**18:30 – IMACS GENERAL ASSEMBLY**

**10:00 – MS5**

MODELING, DESIGN OPTIMIZATION AND CONTROL IN SMART GRIDS

Organizers: *Dhaker Abbes, Benoit Robyns*

10:00 - A Cooperative Distributed Droop Gains Adjustment in DC Microgrid  
*Youssef Alidrissi, Houda El Ouadoud, Serge Pierfederici, Matthieu Urbain, Radouane Ouladsine, Mohamed Bakhouya*

10:20 - Short-term Electricity Price Forecasting through Demand and Renewable Generation Prediction  
*Enrique Belenguer, Jorge Segarra-Tamarit, Emilio Pérez, Ricardo Vidal*

10:40 - Coalitional Game-Based Gain Generation and Distribution for Collective Self-Consumption in an Energy Community  
*Adrien Bossu, Benoit Durillon, Arnaud Davigny, Herve Barry, Sabine Kazmierczak, Christophe Saudemont, Fateh Belaid, Benoît Robyns*

**11:00 – COFFEE BREAK****11:30 – MS5**

11:30 - Exploration and optimisation of voltages patterns provided by a Multi-Active-Bridge with n ports  
*Ismael Chirino Aguinaga, Nicolas Patin, Vincent Lanfranchi, Patrice Gomez, Jeanne-Marie Dalbavie*

11:50 - Modeling, Optimization and Management Strategies for a Microgrid with Integrated Thermal Energy Storage  
*Paolo D'Angelo, Fulvio Bassetti, Antonio Scafuri, Walter Zamboni*

12:10 - Artificial Intelligence and Blockchain for Decentralized Energy Management in an Energy Community of Smart Buildings  
*Amira Dhorbani, Dhaker Abbes, Kahina Hassam, Benoit Robyns*

12:30 - Optimizing Electric Bus Charging: Dynamic Tariffs in a Bi-level Framework Considering Weather Conditions and Energy Storage  
*Jônatas Augusto Manzolli, João Pedro Trovão, Carlos Henggeler Antunes*

12:50 - Aerodynamic models for wind turbines that contribute to grid frequency control  
*Pau Martinez-Ortuno, Nestor Aparicio*

13:10 - Multi-Agent Reinforcement Learning for Strategic Bidding in the Electricity Market  
*Francesco Morri, Hélène Le Cadre, Luce Brotcorne, Pierre Gruet*

**13:30 – LUNCH TIME**

**15:00 – MS5**

15:00 - Frequency Response of a 15 MW Offshore Wind Turbine for Low Frequency Stability Analysis

*Gala Navarro-Martinez, Jaime Martinez-Turegano, Ramon Blasco-Gimenez*

15:20 - Pitch control design for black-start operation of a 15MW offshore wind turbine

*Gala Navarro-Martinez, Jaime Martinez-Turegano, Ramon Blasco-Gimenez*

15:40 - Analysis of Non-uniform Grid-forming Control Techniques for the HVDC Connection of Renewable Energy

*Patricia Penades-Huesca, Adrian Beneit-Barajas, Jaime Martinez-Turegano, Ramon Blasco-Gimenez*

16:00 - Multi-Objective Model for Residential Energy Management in Context of Renewable Communities

*Sergio Ramos, Luis Roque, Joao Soares, Antonio Gomes, José Calvo Rolle, Zita Vale*

16:20 - Machine Learning Algorithms Applied to Smart Buildings with High Penetration of Electric Vehicles

*Joao Soares, Thiago Cesar Rosa, Sergio Ramos, Bruno Canizes, Zita Vale*

16:40 - Standby Thermal Management Methods and Hybrid Configuration for a Large Scale Vanadium Flow Battery

*Andrea Trovò, Giacomo Marini, Jianyu Zhang, Walter Zamboni, Massimo Guarnieri*

**17:00 COFFEE BREAK****17:30 – MS5**

17:30 - Sizing of Storage under Uncertainty

*Xin Wen, Dhaker Abbas, Bruno Francois*

**17:50 – TC ELECTRIMACS Meeting**

**10:00 – MS1**

ADAPTED TIME-INTEGRATORS FOR DIFFERENTIAL AND INTEGRAL PROBLEMS WITH APPLICATIONS

*Organizers: Angelamaria Cardone, Dajana Conte, Severiano Gonzalez Pinto, Beatrice Paternoster*

10:00 - Numerical Issues Arising in the Equation for the Unsaturated Flow in Porous Media

*Marco Berardi*

10:20 - Accurate Simulation of the NLS Equations via Multiple-Relaxation ImEx Methods

*Abhijit Biswas, David I. Ketcheson*

10:40 - The Class of Implicit-explicit General Linear Methods for Ordinary Differential Equations

*Michał Braś*

**11:00 – COFFEE BREAK****11:30 – MS1**

11:30 - An Efficient Gauss-Newton Method for Non-linear Inverse Problems via Generalized Krylov Subspaces

*Alessandro Buccini, Patricia Diaz de Alba, Federica Pes, Lothar Reichel*

11:50 - Exponential Integrators for Problems with d-Dimensional Kronecker Structure

*Marco Caliari, Fabio Cassini*

12:10 - A class of Nystrom type methods for the numerical integration of second order differential equations

*Manuel Calvo, Juan Ignacio Montijano, Luis Randez*

12:30 - Modified Singly-RKTASE methods for the solution of stiff problems

*Manuel Calvo, Juan Ignacio Montijano, Luis Randez*

12:50 - A Magnus integrator for stochastic oscillators

*Raffaele D'Ambrosio, Hugo de la Cruz Cancino, Carmela Scalone*

13:10 - Numerical Conservation Issues for Stochastic PDEs

*Raffaele D'Ambrosio, Stefano Di Giovacchino*

**13:30 – LUNCH TIME**

**15:00 – MS1**

15:00 - Numerical and parallel issues for cellular behavior prediction

*Pasquale De Luca, Ardelio Galletti, Livia Marcellino*

15:20 - Boundary corrections for splitting methods in the time integration of multidimensional parabolic problems

*Severiano Gonzalez Pinto, Domingo Hernandez-Abreu, Soledad Perez-Rodriguez*

15:40 - Efficient Numerical Methods for High-dimensional Stochastic Differential Equations

*Yoshio Komori, Kevin Burrage*

16:00 - Space-time Parallel Solvers for the Solution of Parabolic Problems

*Laura Portero, Iñigo Jimenez, Andres Arraras, Francisco Gaspar*

16:20 - On the stability of IMEX-theta methods for parabolic PDEs with delay

*Alejandro Rodríguez-Fernández, Jesus Martin-Vaquero*

16:40 - A Numerical Method for Time-fractional Sub-diffusion Problems

*Hanna Britt Soots*

**17:00 COFFEE BREAK****17:30 – MS1**

17:30 - Application of Exponential Integrators for a Phase-Field Dendritic Crystal Growth Model

*Rouhollah Tavakoli, Damien Tournet*

17:50 - A New Method to Solve the 2D Schrodinger Equation

*Marnix Van Daele, Toon Baeyens*

18:10 - Fighting Agroecosystems Pests with Operations Research Tools

*Ezio Venturino*

**10:00 – MS8**

RECENT ADVANCES ON NUMERICAL METHODS FOR FUNCTIONAL EQUATIONS AND APPLICATIONS

Organizers: *Concetta Laurita, Donatella Occorsio, Maria Grazia Russo*

10:00 - Generalized-Hypergeometric Solutions in the Context of Heun Equations  
*Clemente Cesarano*

10:20 - Adapted numerical methods for reaction-diffusion problems  
*Dajana Conte, Gianluca Frasca Caccia, Giovanni Pagano, Beatrice Paternoster, Carmine Valentino*

10:40 - Numerical Model for Data Railway Fusion: diagnostic applications  
*Salvatore Cuomo, Mariapia De Rosa, Aurelio Mannara, Giuseppina Mastellone, Francesco Piccialli*

**11:00 – COFFEE BREAK****11:30 – MS8**

11:30 - Enrichment Strategies of the Bernardi Raugel Finite Element  
*Francesco Dell'Accio, Filomena Di Tommaso, Allal Guessab, Federico Nudo*

11:50 - A Nyström method for Hammerstein integral equations on a closed interval  
*Luisa Fermo, Anna Lucia Laguardia, Concetta Laurita, Maria Grazia Russo*

12:10 - On Computing Modified Moments for Half--range Hermite and Pollaczek--Hermite Weights in Floating Point Arithmetic  
*Teresa Laudadio, Nicola Mastronardi, Donatella Occorsio, Paul Van Dooren*

12:30 - On the Stability of Recurrence Relations Arising in Orthogonal Polynomials Frameworks  
*Teresa Laudadio, Nicola Mastronardi, Paul Van Dooren*

12:50 - A Method for the Approximation of Hadamard Transforms on  $[-1,1]$   
*Domenico Mezzanotte, Donatella Occorsio*

13:10 - Filtered Integration Rules for the Hilbert Transform on  $(0,+\infty)$   
*Donatella Occorsio, Woula Themistoclakis*

**13:30 – LUNCH TIME**

**15:00 – MS8**

15:00 - On Solving Some CSIE by de la Vallée Poussin Filtered Approximation  
*Donatella Occorsio, Maria Grazia Russo, Woula Themistoclakis*

**15:20 – SS7**

MODELING HUMAN PERCEPTION OF VISUAL INFORMATION

Organizer: *Giuliana Ramella*

15:20 - An Image Segmentation Approach for Space Syntax and Urban Mobility  
*Alfonso Annunziata, Federico Romaniello*

15:40 - Hierarchical Segmentation of Cell Compartments in Electron Microscope Images

*Artur Bal, Marek Michalski, Łukasz Mielańczyk*

16:00 - A Perception-guided CNN for Grape Bunch Detection

*Vittoria Bruni, Giulia Dominijanni, Domenico Vitulano, Giuliana Ramella*

16:20 - Contrast-based Image Enhancement for Source Camera Identification

*Vittoria Bruni, Giuseppina Monteverde, Domenico Vitulano, Silvia Marconi*

16:40 - Application of Fractional Derivatives in Image Quality Assessment Indices

*Mariusz Frackiewicz, Henryk Palus*

**17:00 - COFFEE BREAK****17:30 – SS7**

17:30 - Regular Shapes on Surfaces: Angles, Lengths, and How They Are Perceived

*Claudio Mancinelli, Enrico Puppo*

17:50 - Advances in a Quantum Information-based Color Perception Theory

*Edoardo Provenzi*

**18:10 – General Session (4)**

Chair: *Francisco Dominguez-Mota*

18:10 - On some Oscillatory Properties of Finite Difference Methods for One-Dimensional Nonlinear Parabolic Problems

*Róbert Horváth*