# Program of the 2019 International Conference on Computational & Mathematical Methods in Science & Engineering

**Costa Ballena, Cádiz, Spain**
**June 30 – July 6, 2019**

- **All the posters are outside (July 2 & 4).**
- **All the talks 20 min + questions (except Prof. Schwerdtfeger & Hamilton session, 45 min)**
- **Special Session in memoriam of Alexander (Prof. A. Buslaev), July 2 in the evening.**
- **Reception Desk in the first floor.**
- **Registration OPEN:**

  - ✓ **June 30:**
    **20:40 – 21:00**
  - ✓ **July 1:**
    **9:30 – 10:45 & 20:00 – 20:30**
  - ✓ **July 2 & 3:**
    **8:30 – 9:45 & 20:00 – 20:30**
  - ✓ **July 4 & 5:**
    **8:30 – 9:45**

## Monday, July 1, 2019

# Registration: 9:30 – 10:45

**Room 1: Plenary Lecture 11:00 – 11:55**

*"Mathematics: a useful tool in farming & ecosystems management".*

**Ezio Venturino,** University of Torino. Italy

Chair: Bruce Wade

**Parallel Sessions: 12:00 – 14:00**

| | ***Room 1:*** | ***Mathematical Modeling & Numerical Simulation of Geophysical Flows*** ***Chair: Macias J.*** |
|---|---|---|
| **Prof.** | Gallardo | Genuinely 2D Incomplete Riemann Solvers For Hyperbolic Systems |
| **Prof.** | Martínez-Moreno | A Reliable Numerical Model For Flow Through Porous Media Under Coffer Dams |
| **Prof.** | Martínez-Moreno | Network Method: A Different Approach Using The Continuity Equation in Seepage Scenarios |
| **Prof.** | Salhi | A Galerkin-Characteristic Unified FEM For Dispersion in Darcian Flows |
| **Prof.** | Fomin | Approximate Solution of The Tsunami Run-Up on a Sloping Beach |
| **Prof.** | Macías | Multilayer-HySEA model validation for landslide generated tsunamis by granular slides |

| | ***Room 2:*** | ***Mathematical & computational methods in chemistry*** ***(45 min talks)*** ***Chair: Jerzy Ciosłowski*** |
|---|---|---|
| **Prof.** | Sundholm | Molecules in Weak & Strong Magnetic Fields |
| **Prof.** | Schwerdtfeger | On The Problem of Sticky Hard Spheres |
| **Prof.** | Hamilton | Chirality & Magnetism For Small Gold Nanostructures |
| **Prof.** | Karton | A brief history of computational chemistry: Applications from molecular modelling to materials and enzymes |

| | ***Room 3:*** | ***Computational Algebra*** ***Chair: Peter Alonso*** |
|---|---|---|
| **Prof.** | Ceballos | A Note on (Pseudo)Digraphs Associated with Evolution Algebras |
| **Prof.** | Falcón | Computing Autotopism Groups of Partial Latin Rectangles: A Pilot Study |
| **Prof.** | Carriegos | A Proposal For Data-Driven Cybersecurity Linear Models |
| **Prof.** | Tomás Dominguez | Tall-And-Skinny Qr Factorization with Approximate Householder Reflectors on Graphics Processors |

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|---|---|---|
| ***Room 4:*** | | ***Mathematical Models for Computer Science*** <br> ***Chair: M. Ojeda-Aciego*** |
| **Prof.** | García Zapata | Classification of Maps on A Finite Set Under Permutation |
| **Prof.** | López | Recommendations in CDSS using Fuzzy Formal Concept Analysis |
| **Prof.** | Rodriguez Jimenez | Analyzing Patterns in False Documents with Formal Concept Analysis To Detect Forgers |
| **Prof.** | Muñoz Castañeda | Rhoaso: An Automatic Early Stop Hyper-Parameter Optimization Method |
| **Prof.** | Lobo | Towards The Use of Bipolar Fuzzy Relation Equations in Abductive Reasoning |

**LUNCH BREAK 14:00 – 16:00**

## Parallel Sessions 16:00 – 20:30

| | | |
|---|---|---|
| ***Room 1:*** | | ***Mathematical & computational methods in chemistry.*** ***(45 min talks)*** <br> ***Chair: P. Schwerdtfeger*** |
| **Prof.** | Martínez | A Unified Approach to Bounds For Topological Indices on Trees Ii |
| **Prof.** | Pestana | Relations Between Some Topological Indices & The Line Graph |
| **Prof.** | Datsko | Mathematical Modeling of Complex Pattern Formation in Autocatalytic Reaction-Diffusion Systems with Anomalous Diffusion |
| **Prof.** | Cioslowski | Unoccupied Natural Orbitals in Atoms & Molecules |
| **Prof.** | Ferreira | Lqta-Qsar: A New 4D-Qsar Methodology |

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|---|---|---|
| ***Room 2:*** | | ***HPC*** <br> ***Chair: D. Llanos*** |
| **Prof.** | Rodríguez | Design, Implementation & Use Ofintra-Routine Malleabilityin Blis |
| **Prof.** | Costero | Providing On-Demand Quality & Resources For Malleable Applications |
| **Prof.** | Cámara | Hierarchical Automatic Optimization of High & Medium Level Linear Algebra Routines |
| **Prof.** | Belloch Rodriguez | Approaching the Use of Heterogeneous Systems For Signal Processing Operations in Space Environments |
| **Prof.** | Gonzalez | Acceleration of Radio Frequency Propagation with General Purpose GPU Computing |
| **Prof.** | Romero | Time Series Heterogeneous Co-Execution on CPU+GPU |
| **Prof.** | Gonzalez | Acceleration of Mri Analysis Using Multicore & Manycore Paradigms |

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|---|---|---|
| **Prof.** | Moreno Riado | High-Performance Techniques To Accelerate The Radiotherapy Planning Based on Singleobjective Evolutionary Optimization |
| **Prof.** | González-Briones | Use of Distributed Platforms To Develop Smart Cities: Citizen-Oriented Case Studiesy |
| **Prof.** | Cuenca | Combining Hybrid & Heterogeneous Parallelism in the Application of Hybrid Metaheuristics |

CAPAP-H Network Meeting at 19:20

| | ***Room 3:*** | ***Bio-Mathematics*** ***Chair: E. Venturino*** |
|---|---|---|
| **Prof.** | Halfar | Block Detection of Dynamical Invariants in The Data |
| **Prof.** | Il'Ichev | Dynamical Stability of Running Solitary Waves in Fluid-Filled Elastic Membrane Tubes |
| **Prof.** | Al-Rashidi | Modelling The Spread of Hcv Amongst People Who Inject Drugs |
| **Prof.** | Kozlov | Biodiversity & Stability of Ecosystems with Extinctions |
| **Prof.** | Greenhalgh | A Differential Equation Epidemic Model For Hiv/Aids Amongst Intravenous Drug Injectors with Disease Awareness |
| **Prof.** | Christen | Asymptotic Behavior of a Stochastic Epidemic Model Si with Linear Transmission Rate |
| **Prof.** | Alsakaji | Dynamics of A Delayed Predator Prey System with Stochastic Fluctuation |

| | ***Room 4:*** | ***Interpolation & Approximation*** ***Chair: D. Barrera*** |
|---|---|---|
| **Prof.** | Sánchez Gil | A Fuzzy Dea Slacks-Based Approach |
| **Prof.** | Kouibia | Filling Holes of Generalized Offset Surfaces By Biquadratic Splines |
| **Prof.** | Miana Sanz | Cardinal B-Splines & Convolutions |
| **Prof.** | Phairatchatniyom | The Modified Inertial Algorithm For Solving Split Inclusion Variational Problem |
| **Prof.** | Jirakitpuwapat | Quantum Renyi Entropy with Application in Image Processing |
| **Prof.** | Jafari | A Numerical Method For Solving Variable Order Integro-Differential Equations |
| **Prof.** | Yordsorn | Modified Popov'S Subgradient Extragradient Algorithm For Equilibrium Problems |

## Tuesday, July 2, 2019

### Room 1: Plenary Lecture 09:00 – 09:55

*"Mathematical Challenges Advancing Quantum Computing for Chemical Sciences".*
**Bert De Jong, Lawrence** Berkeley National Laboratory USA.

Chair: Peter Schwerdtfeger

### Parallel Sessions: 10:00 – 14:00

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|---|---|---|
| | ***Room 1:*** | ***Numerical Methods for Solving Nonlinear Problems*** <br> ***Chair: I. Argyros*** |
| **Prof.** | Ezquerro | A new concept of convergence for iterative methods: restricted global convergence |
| **Prof.** | Romero | Solving Wiener-Hopf problems via an efficient iterative scheme |
| **Prof.** | Torregrosa | Iterative Methods with Memory For Solving Nonlinear Matrix Equations |
| **Prof.** | Magreñan | A New Technique For Studying The Convergence of Newton's Method Solver with Applications |
| | **11:30 — 12:00 COFFEE BREAK & POSTER SESSION I** | |
| | ***Room 1:*** | ***Processing, Modelling, & Statistics //Mathematical Education*** <br> ***Chair: J. Moreno*** |
| **Prof.** | Moreno Garcia | A technique based on deep learning for the detection of anomalies in time series of electricity consumption |
| **Prof.** | Tomčala | Supercomputer power consumption predictions using machine learning, nonlinear algorithms, and statistical methods |
| **Prof.** | Martinovč | Bounding Box Computation of the 0-1 Test for Chaos |
| **Prof.** | Reboredo | Price connectedness between green bond and financial markets |
| **Prof.** | Orcos | Different Methods For Solving Problems in Advance Mathematics |
| **Prof.** | Valongo | Building the Continuity & The Limit Concepts |

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| | ***Room 2:*** | ***HPC***<br>***Chairs: Pedro Alonso-Jordá*** |
| **Prof.** | Espinosa | Impact of Mixed Precision in Forest Fire Spread Simulators: A Quantitative Analysis |
| **Prof.** | Paoletti | Scalable Recurrent Neural Network For Spectral-Spatial Classification of Hyperspectral Images |
| **Prof.** | Solé Farré | Analyzing Political Trends in A Multiple Political Party Environment Based on Twitter Users Interaction |
| **Prof.** | Cabrera Perez | Analyzing The Energy Efficiency of Parallel Applications Using The Intel Power Cap Technology |
| | | **11:30 — 12:00 COFFEE BREAK & POSTER SESSION I** |
| **Prof.** | Cecilia Canales | Evaluation of Different Edge-Computing Platforms For The Prediction of Low Temperatures in Agriculture |
| **Prof.** | Constanti nescu | Solving Large-Scale Markov Decision Processes on Low-Power Heterogeneous Platforms |
| **Prof.** | Pérez-Sánchez | Development & Application of Structural Bioinformatics Methods on High Performance Computing Architectures |
| **Prof.** | Laso | Load Balanced Heterogeneous Parallelism For Finite Difference Problems on Image Denoising |
| **Prof.** | García Lucas | Rate-Distortion/Complexity Analysis Between Hevc, Jem & Av1 Video Codecs |
| **Prof.** | Vera | A new definition of the distortion matrix for an audio-to-score alignment system |

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|---|---|---|
| | ***Room 3:*** | ***Mathematical Models for Computer Science***<br>***Chair: A. Aledo*** |
| **Prof.** | Ojeda-Aciego | Relational Galois Connections Between Fuzzy T-Digraphs |
| **Prof.** | Rabanal | Cryptography For Big Data Environments: Current Status, Challenges & Opportunities |
| **Prof.** | Romance | From Google to Hashimoto: alpha-non backtracking PageRank |
| **Prof.** | Valverde | Non-Periodic Orbits Behavior in Graph Dynamical Systems |
| | | **11:30 — 12:00 COFFEE BREAK & POSTER SESSION I** |
| **Prof.** | Ruiz Cueva | Development of An Automated Learning Model Based on Multiple Variables To Forecast A Global Customers' Service Demand |
| **Prof.** | Madrid | Toward a measure of inclusion from the index of inclusion between fuzzy sets. |
| **Prof.** | Decastro-García | Machine Learning For Automatic Assignment of The Severity of Cybersecurity Incidents |
| **Prof.** | Rodriguez | Applications of Gromov Hyperbolicity To Directed Networks |
| **Prof.** | Aledo | Scalable Algorithms To Aggregate Weak Rankings |

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| | ***Room 4:*** | ***Integral Methods in Science & Engineering*** <br> ***Chair: C. Constanda*** |
| **Prof.** | Bodmann | On A Parametric Representation of The Angular Neutron Flux in The Energy Range From 1 Ev To 10 Mev |
| **Prof.** | Campos Velho | Damage Identification on Aerospace Structure By Hybrid Optimization Approach |
| **Prof.** | Gómez | Local Effects For Some Spectral Problems in Domains Surrounded By Thin Stiff & Heavy Bands |
| **Prof.** | Pires | Two-Phase Three-Component Flow in Porous Media: Mathematical Modeling of Dispersion Free Pressure Behavior |
| | **11:30 — 12:00 COFFEE BREAK & POSTER SESSION I** | |
| **Prof.** | Kleefeld | Mixed Interior Transmission Eigenvalues |
| **Prof.** | Pérez-Martínez | Homogenization of Spectral Problems in Linear Elasticity with Rapidly Alternating Boundary Conditions |
| **Prof.** | Zubik-Kowal | Design of Dynamic Iteration Schemes To Optimize Convergence Rates |
| **Prof.** | Harris | Modeling Cell Motion Due To Chemotaxis |
| **Prof.** | Lanza De Cristoforis | An Inequality For Holder Continuous Functions, in The Wake of The Work of Carlo Miranda |

**LUNCH BREAK 14:00 – 16:00**

## Room 1: Plenary Lecture 16:00 – 16:55

*"Generalized Fourier Series for Thin Plates in an Infinite Domain"*.
**C. Constanda, University** of Tulsa USA.

Chair: Bruce Wade

## Parallel session 17:00-20:00

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|---|---|---|
| | ***Room 1:*** | ***Trends in the analysis & simulation of nonlinear partial differential equations*** <br> ***Chairs: J. Macías-Diaz*** |
| **Prof.** | Vargas Rodriguez | Exact Solutions of Some Cylindrical Non-Linear Wave Equations with Non-Constant Coefficients Throug The Trial Equation Method |
| **Prof.** | Jaimes-Reategui | Deterministic Coherence Resonance in A Network of Chaotic Oscillators with Frequency Mismatch |

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|---|---|---|
| **Prof.** | Barba Franco | On The Lagrangians & Potentials of A Two Coupled Damped Duffing Oscillators System & Their Application on Three-Node Motif Networks |
| **Prof.** | Tosyali | A Study on The Chaotic Solutions of Bec |
| **Prof.** | Tosyali | The Dynamics of Gursey Solitons |
| **Prof.** | Herrera Serrano | A Computationally Efficient Algorithm To Solve Some Systems of Nonlinear Fractional Partial Differential Equations |
| **Prof.** | Rivera | A Novel Discrete Energy Method For Super-Diffusive Wave Systems Using Grünwald Differences |
| **Prof.** | Gallegos | An Explicit Finite-Difference Method For Riesz Space-Fractional Reaction-Diffusion Equations |

| | ***Room 2:*** | ***Computational Statistics*** <br> ***Chair: F. Marques*** |
|---|---|---|
| **Prof.** | Santos | Roc Curve Analysis For Classification Methodologies Based on Group Testing |
| **Prof.** | Caeiro | Minimum Variance Reduced Bias Estimation of Tail Related Parameters |
| **Prof.** | Reyes-Santias | Economical Evaluation of Computed Tomography Angiography (Cta) Versus Conventional Angiography (Ca) To Diagnose Coronary Ischemia. |
| **Prof.** | Barranco-Chamorro | Some New Uses of Orthogonal Polynomials in Statistical Inference |
| **Prof.** | Mateus | A New Class of Estimators For The Shape Parameter of A Pareto Model |
| **Prof.** | Nunes | Mixed Effects Anova with Stability: An Extension To Samples with Random Size |
| **Prof.** | Ferreira | Multivariate Accelerated Shelf-Life Testing |
| **Prof.** | Felgueiras | Gaussian Mixtures & Deconvolution Problems |
| **Prof.** | Marques | Testing The Independence of Two Sets of Random Variables For Random Size Samples |

| | ***Room 3:*** | ***Transport Systems -- Special Session in memoriam of Prof. A. Buslaev*** <br> ***Chair: M. Yashina*** |
|---|---|---|
| **Prof.** | Yashina | Spectral Cycles & Average Velocity of Particles in Discrete Two Contours System |
| **Prof.** | Taddele | Information Theory & Entropy |
| **Prof.** | Fomina | Simulation of The Spectra of Cellular Automata of Wolfram on Hamming Spaces |
| **Prof.** | Moseva | Pattern Recognition Algorithms in Traffic Problems |
| **Prof.** | Churbanova | Simulation & Visualization of Vehicular Traffic on Road Networks Using High Performance Computing Systems |
| **Prof.** | Trapeznikova | An Explicit Algorithm For The Simulation of Non-Isothermal Multiphase Multicomponent Flow in A Porous Medium |
| **Prof.** | Kuteynikov | Modeling of Infection Propagation Processes on Buslaev Regular Contour Networks |
| **Prof.** | Gorodnichev | Machine Learning To Detect The Dangerous Movement |

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| **Prof.** | Tatashev | Stationary State Probabilities & Reversibility of Discrete System on Contour |
| **Prof.** | Dotkulova | Methods for evaluating a testing system for analyzing the behavioral characteristics of drivers |

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| | ***Room 4:*** | ***Analytical & Numerical solution of Differential Equations*** <br> ***Chair: C. Clavero*** |
| **Prof.** | Wade | Operator Splitting with Some Exponential Time Differencing Schemes For Reaction-Diffusion Systems |
| **Prof.** | Bui | Boundary Treatment For Smoothed Particle Hydrodynamics Method with Implicit Surfaces |
| **Prof.** | Castro | Commutator-free Magnus Propagators for Quantum-Classical Molecular Dynamics |
| **Prof.** | Jaworska | Solving Nonlinear Boundary Value Problems by the Multipoint Meshless Method |
| **Prof.** | Podila | A Numerical Scheme For A Weakly Coupled System of Singularly Perturbed Delay Differential Equations on An Adaptive Mesh |
| **Prof.** | Kumar | A Discrete Schwarz Waveform Relaxation Method For Singularly Perturbed Parabolic Reaction-Diffusion Problems |
| **Prof.** | Sekhar | Numerical Simulation of MHD flow around a sphere considering induced magnetic field in the entire domain |
| **Prof.** | Clavero | A Uniformly Convergent Scheme To Solve 2D Parabolic Singularly Perturbed Systems of Reaction-Diffusion Type with Multiple Diffusion Parameters |

**22:15 TRADITIONAL SHERRY DEGUSTATION at the Garden:**

**After dinner, we will taste three different types of Sherry: dry Sherry, Sweet Sherry (a dry Sherry that has been sweetened with Pedro Ximénez grapes that have been dried like raisins) and pure Pedro Ximénez. A professional cellar master will serve all the wines.**

**A renowned Spanish guitar player will act during the cocktail party**

## Wednesday, July 3, 2019

# EXCURSION (Breakfasts will open at 7:00)

- Gibraltar Excursion at 7:45 at the main door. (Before leaving Participants will be provided with a bag of food and drink to take in Gibraltar. Participants who opt for free time at the hotel will have their food at the hotel restaurant.)

22:30 FLAMENCO SHOW.

Andalusian Style: singing, guitar playing, dance, vocalizations, handclapping and finger snapping

**The organization invites a drink during the show, please pick up your ticket during the show**.

## Thursday, July 4, 2019

**Room 1: Plenary Lecture 09:00 – 09:55**

*Iterative processes for nonlinear problems: from Newton to nowadays*
**Alicia Cordero, M. Hernández-Verón, J. R. Torregrosa**
Chair: Bruce Wade

**Parallel Sessions: 10:00 – 14:00**

| | ***Room 1:*** | ***Numerical Methods for Solving Nonlinear Problems*** <br> ***Chairs: J.R. Torregrosa*** |
|---|---|---|
| **Prof.** | Argyros | Extended & Unified Local Convergence of K-Step Solvers For Equations with Applications |
| **Prof.** | Martínez-Moreno | A Numerical Tool To Solve Non-Linear Soil Consolidation Scenarios Including Viscous Deformation Effects |
| **Prof.** | Martínez-Moreno | Network Models For Non-Linear Soil Consolidation Problems with Constitutive Relations & Deformations Hypotheses of Different Nature |
| **Prof.** | Garrido Saez | On The Improvement of The Order of Iterative Methods For Nonlinear Systems By Means of Memory |

| 11:30 — 12:00 COFFEE BREAK & POSTER SESSION II | | |
|---|---|---|
| **Prof.** | Moysi | On The Local Convergence & The Dynamics of An Eighth-Order Method For Solving Nonlinear Equations |
| **Prof.** | Arora | A Novel Scheme Having Seventh-Order Convergence For Nonlinear Systems |
| **Prof.** | Bergamaschi | Recent advances in low-rank corrections of preconditioners for sequences of linear systems |
| **Prof.** | Chicharro López | Iterative Methods Based on Different Means |
| **Prof.** | Cordero | A Fractional Newton Method with 2Ath-Order of Convergence |
| **Prof.** | Bakirova | Solving Nonlinear Boundary Value Problem with Parameter For A Loaded Differential Equation |

| ***Room 2:*** | | ***PDE & Mathematical Applications*** <br> ***Chair: J. Macías Díaz*** |
|---|---|---|
| **Prof.** | Vargas Rodriguez | A Numerical Model For Hyperbolic Diffusive Systems in Population Dynamics: Efficiency & Pattern Formation |
| **Prof.** | Hendy | A Fully-Discrete Scheme For After-Effected Multi-Term Time-Space Fractional Advection-Diffusion Equations |
| **Prof.** | Martinez-Jimenez | An Efficient Energy-Preserving Discrete Model For A Fractional Klein-Gordon-Zakharov System |
| **Prof.** | Macias-Diaz | Existence of Solutions & Simulation of A Conservative Fractional Klein-Gordon-Zakharov System |
| **11:30 — 12:00 COFFEE BREAK & POSTER SESSION II** | | |
| **Prof.** | Macias-Diaz | A Discrete Monotone Iterative Method For Fractional Advection-Diffusion Equations with Nonlinear Reaction |
| **Prof.** | Urenda-Cázares | A Mathematical Model That Combines Chemoterapy & Oncolytic Virotherapy As An Alternative Treatment Against Cancer |
| **Prof.** | Casas | A Numerical Study on Electrohydrodynamic Droplet Interactions: Coalescence & Break-Up |
| **Prof.** | Loginova | Conservative Finite-Difference Scheme For Computer Simulation of Contrast 3D Spatial-Temporal Structures Induced By Laser Pulse in Semiconductor |

| ***Room 3:*** | | ***Computational Optimization & Networks*** <br> ***Chair: M. Dupac*** |
|---|---|---|
| **Prof.** | Abubakar | Cayley Graphs of Γ1-Non-Deranged Permutations |
| **Prof.** | Criado | A line graph approach of eigenvector centrality |
| **Prof.** | Roldán | A fuzzy Delphi consensus method based on a fuzzy ranking |
| **Prof.** | Martins | Low Prevalence Rate Estimation |

| 11:30 — 12:00 COFFEE BREAK & POSTER SESSION II | | |
|---|---|---|
| **Prof.** | Chand | Quantum $\Alpha$-Fractal Approximation |
| **Prof.** | Abubakar | A Descent Modified Three-Term Conjugate Gradient Projection Algorithm & Its Global Convergence with Applications To Signal Recovery |
| **Prof.** | Shariatmadar | Linear Programming Under \Epsilon-Contamination Uncertainty |
| **Prof.** | Roldán | Multi-criteria decision making involving uncertain information via fuzzy ranking & fuzzy aggregation functions |

| ***Room 4:*** | | ***Fixed Point Theory & related applications.*** ***Chair: P. Kumam*** |
|---|---|---|
| **Prof.** | Mohammed | New Approach To Find Multi- Fractal Dimension |
| **Prof.** | Muangchoo | A New Hybrid Iterative Method For Solving Mixed Equilibrium Problem & A Fixed Point Problem For A Bregman Relatively Nonexpansive Mapping |
| **Prof.** | Pakkaranang | Superiorization Methodology & Perturbation Resilience of Inertial Proximal Gradient Algorithm with Application To Signal Recovery |
| **11:30 — 12:00 COFFEE BREAK & POSTER SESSION II** | | |
| **Prof.** | Yordsorn | Modified Popov'S Subgradient Extragradient Algorithm For Equilibrium Problems |
| **Prof.** | Kitkuan | The Halpern-Type Approximation Three Operator Splitting Method For Convex Minimization Problems & Its Applications |
| **Prof.** | Yusuf | Fixed Point Results on Quantum Operations Using Trace Distance |

**LUNCH BREAK 14:00-16:00**

## Room 1: Plenary Lecture 16:00 – 16:55

*Algorithms for convex minimization problems with convergence analysis with Applications*

**Poom Kumam, TaCS Center & KMUTT -- Thailand**

Chair: Bruce Wade

## Parallel Sessions: 17:00 – 19:30

| ***Room 1:*** | | ***Numerical Methods for Solving Nonlinear Problems*** ***Chairs: A. Cordero*** |
|---|---|---|
| **Prof.** | Datsko | Explicit High-Order One-Step Methods For Singular Initial-Value Problems |
| **Prof.** | Khammahawong | On The Convergence of Splitting Algorithm For Mixed Equilibrium Problems on Hadamard Manifolds |

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|---|---|---|
| **Prof.** | Jumabayev | New General Solutions To Ordinary Differential Equations & Their Applications in Solving Boundary Value Problems |
| **Prof.** | Sarría | Local Convergence of Fourth & Fifth Order Parametric Family of Iterative Methods in Banach Spaces |
| **Prof.** | Martínez | A Reliable Treatment To Solve Nonlinear Fredholm Integral Equations with Non-Separable Kernel |
| **Prof.** | Ayoub | Analytical Discrete Hodge Operator For Discrete Exterior Calculus |
| **Prof.** | Argyros | An Iteration Function Having Optimal Eighth-Order of Convergence For Multiple Zeros & Local Convergence |

| | ***Room 2:*** | ***Mathematical Modeling & Computational ODE & PDE*** <br> ***Chair: Jorge Macias*** |
|---|---|---|
| **Prof.** | Nagyová | Dynamics of The Belousov-Zhabotinsky Reaction Model Revised |
| **Prof.** | Simonenko | Modeling the behavior of screw piles in heterogeneous soils subject to construction loads with mesh free RBF method |
| **Prof.** | Uzal | On Attractors For Impulsive Dynamical Systems |
| **Prof.** | Skakauskas | Solvability of A Model For Catalytic Reactions Proceeding Over Inhomogeneous Surfaces |
| **Prof.** | Borisut | Nonlocal Riemann-Liouville Fractional Integral Condition & Nonlinear Caputo Fractional Differential Equation |
| **Prof.** | Lampart | Collisions of A Constrained Body on A Moving Belt |
| **Prof.** | Reyes | On The Conformable Fractional Logistic Models |

| | ***Room 3:*** | ***Lie Symmetry & Conservation Laws for Nonlinear Differential Equations & Applications*** <br> ***Chair: M. S. Bruzón*** |
|---|---|---|
| **Prof.** | Chulián | Symmetries & Solutions For A Fisher Equation with A Proliferation Term Involving Tumor Development |
| **Prof.** | Márquez | Conservation Laws & Symmetry Analysis For A Quasi-Linear Strongly-Damped Wave Equation |
| **Prof.** | Suazo | On Explicit & Numerical Solutions For Partial Differential Equations with Variable Coefficients: Fisher–Kpp, Burgers & Telegraph Type Equations. |
| **Prof.** | Garrido | (3+1) Kadomtsev-Petviashvili-Boussinesq Equation: Symmetries, Solutions & Conservation Laws |
| **Prof.** | Recio | Symmetry Analysis of A Generalized P-Laplacian Equation with Gradient-Dependent Diffusivity |
| **Prof.** | Sáez | Lie Symmetry Analysis & Conservation Laws For A Generalized (2+1)-Dimensional Nonlinear Evolution Equations |
| **Prof.** | De La Rosa | On A Variable-Coefficient (3+1)-Dimensional Kp Equation |
| **Prof.** | Bruzon | Symmetries, Conservation Laws & Potential Systems For A Buckley-Leverett Equation |

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| | ***Room 4:*** | ***Numerical PDE & Mathematical Modelling*** <br> ***Chair: M. Dupac.*** |
| **Prof.** | Trucchia | Uncertainty Quantification & Sensitivity Analysis For Macro & Meso-Scale Factors in Fire-Spotting Generated Fires. |
| **Prof.** | Fomin | Inverse Problem of Obtaining Thermo-physical Properties of Contacting Solids |
| **Prof.** | Dupac | Mathematical Based Control Method & Performance Analysis of A Novel Hydromechatronics Driving System Micro-Independent Metering |

**Friday, July 5, 2019**

**10:00 – 12:50**

- **Excursion to Morocco: (7:30 at Main Door)**

USEFUL INFORMATION
Approximate duration of the cultural tour of one day to Tangier 6 hours, including the round trip and restaurant (drinks are on your own)

- Customs controls: during the ferry crossing, inside the boat, you must go to the police counter to show them the yellow and white sheets they provide, filled out. White is for the arrival and yellow for the exit of the country.

• Fast Ferry departure 11:00 with return from Tangier 17:00 (local hours of each port).
• Meeting with the guide in the Port of Tangier.
• Panoramic tour of the modern city in Tangier.
• Visit Cabo Espartel and the Grottos de Hércules, Sultan's Palace and Craft Assembly
• Camel zone stop
• Walking tour through Kasbah, Medina, Souk.
• Lunch in typical Moroccan restaurant (drinks are on your own)
• Transfer to the port of Tangier.
• Travel insurance included (Mapfre)

## POSTER SESSION I -- Tuesday 2 ---- POSTER SESSION II -- Thursday 4,

**The posters will be presented during coffee breaks.**

***Poster format: approx. A0 (841mm x 1188mm)***

## POSTER SESSION I: Tuesday 2:

| | | |
|---|---|---|
| **P-1. Prof** | Moreno | Exploring Distributed Deep Network Training Accuracy & Performance on Heterogeneous Clusters |
| **P-2. Prof** | Bosque | Improving Load Balancing in Heterogeneous Clusters with Task Migration |
| **P-3. Prof** | Vidal | Multicore & GPU Implementations of Fhals Algorithm For NMF |
| **P-4. Prof** | Dolz | Convolutional Neural Networks For Estimating The Performance of The Sparse Matrix-Vector Multiplication |
| **P-5. Prof** | Blanco Heras | Exploring The Registration of Remote Sensing Images Using Hsi-Kaze in Graphical Units |
| **P-6. Prof** | Boratto | 3D Seismic Modeling on Multi-GPU Collectives with NCCL |
| **P-7. Prof** | Orduña Huertas | A Comparison Study of Wavelet Transforms For Detecting Dna Differentially Methylated Regions |
| **P-8. Prof** | Martín Garzón | An Unrelated Parallel Machine Scheduling of An Active Microrheology Problem |
| **P-9. Prof** | Muñoz-Montoro | Multichannel Extension For Score-Informed Source Separation Using Instrument Spectral Patterns |
| **P-10. Prof** | Muñoz-Montoro | A New Definition of The Distortion Matrix For An Audio-To-Score Alignment System |
| **P-11. Prof** | Llanos | Coarse-Grain Load Distribution in Heterogeneous Computing |
| **P-12. Prof** | Alonso | Computing Matrix Functions By Matrix Bernoulli Series |
| **P-13. Prof** | Bernabé | An Evaluation of The Software Tool For The Automatic Quantification in The Left Ventricle Myocardium Hyper-Trabeculation Degree For Hypertrophic Cardiomyopathy Patients |
| **P-14. Prof** | Díaz | Reliable Fast Multidatacenter Data Storage |
| **P-15. Prof** | Cores Prado | Redesigning The Blast Algorithm To Achieve High-Throughput & Full-Scalability Using Spark & Cassandra. |
| **P-16. Prof** | Ferreira | Revisiting Statistical Manifolds |
| **P-17. Prof** | Alruwaili | Numerical Approximation To The Stationary Solutions in Yip'S Formulation of The Regularized Ericksen's Bar Model. |

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| **P-18. Prof** | Álvarez-Bermejo | Towards the Characterization of Data-Centre Workflows through Process Mining: The Google Cluster Case |

## POSTER SESSION II: Thursday 4:

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| **P-19. Prof** | Bartolome | Easymodel: User-Friendly Tool For Building & Analysis of Simple Mathematical Models in Systems Biology |
| **P-20. Prof** | Christen | Quasi-Stationary Distribution of The Continuous Time Branching Process with Logistic Growth |
| **P-21. Prof** | Ferreira | Dengue'S Dmd Model |
| **P-22. Prof** | Navascués | Cubic Spline Fractal Solutions of Two-Point Boundary Value Problems |
| **P-23. Prof** | Suárez | Analytical Solution of Enzyme Reaction Equations in An Irreversible Linear Pathway |
| **P-24. Prof** | Ibáñez Pérez | A New Approximation-Based Functional Approach To Model Resistive Switching Memristors For Neuromorphic Applications |
| **P-25. Prof** | Barrera Rosillo | Do Gaussian Quadrature Formulas For Splines Produce Better Results Than Polynomials Formulas When Used in Combination with The Nyström Method To Numerically Solve Fredholm Integral Equations of The Second Kind? |
| **P-26. Prof** | Castillo-Gutiérrez | Influence of Plotting Positions on Confidence Bands Based in The Exact Distribution of The Order Statistics in Normal Q-Q Plots |
| **P-27. Prof** | Rueda | Optimal Quantile Estimators Based on Calibration |
| **P-28. Prof** | Olmo-Jiménez | An R Package For Complex Pearson Distributions |
| **P-29. Prof** | Alba-Fernández | Model Selection Based on Penalized Phi-Divergences For Multinomial Data |
| **P-30. Prof** | Alonso | Algorithmic Characterization of Pentadiagonal ASSR Matrices |
| **P-31. Prof** | Navarro | Escaping Orbits in The N-Body Ring Problem |
| **P-32. Prof** | Ramos | Solving A Coupled System of Singularly Perturbed 1D-Parabolic Reaction-Convection-Diffusion Equations with Discontinuous Source Terms |
| **P-33. Prof** | López Ortí | An Alternative Method To Construct A Consistent Second Order Theory About The Equilibrium Figures of Rotating Celestial Bodies |
| **P-34. Prof** | Behl | Efficient high order iterative scheme for large nonlinear systems with dynamics |
| **P-35. Prof** | Calvo-Jurado | Effective properties of pavements reinforced with geosynthetic materials |
| **P-36. Prof** | Ramos | Homotopy Perturbation Method For Solving Fractional Volterra Integro-Differential Equations of First Kind |