

# Monday 8

8:30–9:30. **Collection of badges** ..... *Patio*

10:00–11:00. **Plenary Session 1. A. Quarteroni. “Reduced order models: algorithms and applications”** ..... **Aula Magna**

11:00–11:30. **Coffee break** ..... *Patio*

## 11:30–14:00. Special Sessions

[11:30–13:30] **S16: “Application of Numerical Modelling in Oceanography and Meteorology”** (Lectures 1–4) ..... **Sala Bolívar**

[11:30–13:30] **S13: “Optimal Control of Partial Differential Equations”** (Lectures 1–4) ..... **Sala Argüelles**

[11:30–14:00] **S3: “Applied Mathematics in Architecture”** (Lectures 1–5) ..... **Aula 2**

[12:00–14:05] **S2: “Analysis of mathematical models applied to epidemiological processes”** (Lectures 1–4) ..... **Sala Lequerica**

[11:30–14:00] **S17: “Reductions of Differential Equations”** (Lectures 1–5) ..... **Sala de Teledocencia**

14:00–15:30. **Lunch** ..... *Patio*

## 15:30–17:30. Communications

	<b>Sala Bolívar</b>	<b>Sala Argüelles</b>	<b>Aula 2</b>	<b>Sala Lequerica</b>	<b>Sala de Teledocencia</b>
	<b>PDEs 1</b>	<b>PDEs 3</b>	<b>ODEs and DSs 1</b>	<b>NA and NS 1</b>	<b>NA and NS 3</b>
15:30–15:50	1	11	1	1	10
15:50–16:10	2	12	2	2	11
16:10–16:30	3	13	3	3	12
16:30–16:50	4	14	4	4	13
16:50–17:10	5	15	5	5	14
17:10–17:30	6	16	6	6	

17:30–18:00. **Coffee break** ..... *Patio*

## 18:00–19:20. Communications

	<b>Sala Bolívar</b>	<b>Sala Argüelles</b>	<b>Aula 2</b>	<b>Sala Lequerica</b>	<b>Sala de Teledocencia</b>
	<b>PDEs 2</b>	<b>PDEs 4</b>	<b>ODEs and DSs 2</b>	<b>NA and NS 2</b>	<b>OTs</b>
18:00–18:20	7	17	7	7	1
18:20–18:40	8	18	8	8	2
18:40–18:00	9	19	9	9	3
19:00–19:20	10	20	10		

19:20–20:20. **SEMA Awards** ..... **Sala Lequerica**

- 19:20–19:50. **Young Researcher Antonio Valle Award**
- 19:50–20:20. **SEMA Journal Best Paper Award**

20:30–21:30. **Welcome reception** ..... *Patio*

# Tuesday 9

9:00–10:00. **Plenary Session 2. L. Vega González. “The Vortex Filament Equation for regular polygons”** ..... **Aula Magna**

10:00–11:00. **Plenary Session 3. K. Kunisch. “Optimal Control of Partial Differential Equations with Nonsmooth Cost Functionals”** ..... **Aula Magna**

11:00–11:30. **Coffee break** ..... *Patio*

## 11:30–14:00. Special Sessions

[11:30–13:30]	<b>S5:</b> “Continuous and Discrete Dynamical Systems” (Lectures 1–4)	Sala Bolívar
[12:00–14:00]	<b>S13:</b> “Optimal Control of Partial Differential Equations” (Lectures 5–8)	Sala Argüelles
[11:30–13:00]	<b>S3:</b> “Applied Mathematics in Architecture” (Lectures 6–8)	Aula 2
[13:00–14:00]	<b>S10:</b> “Modeling and Simulation in Sedimentary Processes” (Lectures 1–2)	Aula 2
[11:30–14:00]	<b>S12:</b> “Numerical Acoustics” (Lectures 1–5)	Sala Lequerica
[12:00–14:00]	<b>S15:</b> “Some Successful Collaborations with Industry Developed by Math-In Members” (Lectures 1–4)	Sala de Teledocencia
14:00–15:30.	Lunch	Patio
15:30–17:30.	<b>Communications</b>	

	Sala Bolívar	Sala Argüelles	Aula 2	Sala Lequerica
	PDEs 5	CO	ODEs and DSs 3	NA and NS 4
15:30–15:50	21	1	11	15
15:50–16:10	22	2	12	16
16:10–16:30	23	3	13	17
16:30–16:50	24	4	14	18
16:50–17:10	25	5	15	19
17:10–17:30	26	6	16	20

17:30–18:00.	Coffee break	Patio
18:00.	<b>Sema Assembly</b>	Sala Lequerica

## Wednesday 10

9:00–10:00.	Plenary Session 4. <b>H. W. Broer.</b> “Near-horizon celestial phenomena, a study in geometric optics”	Aula Magna
10:00–11:00.	Plenary Session 5. <b>M. J. Castro Díaz.</b> “Multi-level Monte Carlo Finite volume method: an efficient method for uncertainty quantification in geophysical flows”	Aula Magna
11:00–11:30.	Coffee break	Patio
11:30–14:00.	<b>Special Sessions</b>	

[11:30–14:00]	<b>S5:</b> “Continuous and Discrete Dynamical Systems” (Lectures 5–9)	Sala Bolívar
[11:30–13:30]	<b>S6:</b> “Evolution models with nonlocal terms: theory and numerical approximation” (Lectures 1–4)	Sala Argüelles
[12:00–14:00]	<b>S10:</b> “Modeling and Simulation in Sedimentary Processes” (Lectures 3–6)	Aula 2
[11:30–13:30]	<b>S4:</b> “Boundary Conditions for Flow Problems” (Lectures 1–4)	Sala Lequerica
[11:30–14:00]	<b>S14:</b> “Structured Matrices and Numerical Linear Algebra” (Lectures 1–5)	Sala de Teledocencia
14:00–15:30.	Lunch	Patio
15:30.	<b>Social Events</b>	

## Thursday 11

9:00–10:00.	Plenary Session 6. <b>J. A. Lozano Alonso.</b> “Mathematics for Big Data”	Aula Magna
10:00–11:00.	Plenary Session 7. <b>D. Hömberg.</b> “Modelling, Analysis and Simulation of Multifrequency Induction Hardening”	Aula Magna
11:00–11:30.	Coffee break	Patio
11:30–14:00.	<b>Special Sessions</b>	
[11:30–13:30]	<b>S11:</b> “Non-Autonomous Dynamical Systems and Applications” (Lectures 1–4)	Sala Bolívar
[11:30–13:30]	<b>S6:</b> “Evolution models with nonlocal terms: theory and numerical approximation” (Lectures 5–8)	Sala Argüelles

[11:30–13:30] <b>S8:</b> “Hyperbolic PDEs: Numerical Methods and Applications” (Lectures 1–4) .....	<b>Aula 2</b>
[11:30–13:30] <b>S4:</b> “Boundary Conditions for Flow Problems” (Lectures 5–8) .....	<b>Sala Lequerica</b>
[11:30–13:30] <b>S1:</b> “Advances in Time Stepping Methods” (Lectures 1–4) .....	<b>Sala de Teledocencia</b>
13:30–15:00. <i>Lunch</i> .....	<i>Patio</i>
15:00–17:30. <b>Communications</b>	

	<b>Sala Bolívar</b>	<b>Sala Argüelles</b>	<b>Aula 2</b>	<b>Sala Lequerica</b>
	<b>PDEs 6</b>	<b>NLA</b>	<b>NA and NS 5</b>	<b>NA and NS 6</b>
15:00–15:20	27	1	21	27
15:20–15:40	28	2	22	28
15:40–16:00	29	3	23	29
16:00–16:20	(*)	4	24	30
16:20–16:40	(*)	5	25	31
16:40–17:00	(*)	6	26	32

(\*) [16:00–17:00] **S9:** “Mathematical Models for Computer Science” (Lectures 1–2) ..... **Sala Bolívar**

21:00. **Official Dinner**

## Friday 12

9:00–10:00. <i>Plenary Session 8. T. Sauer. “Modelling, Analysis and Simulation of Multifrequency Induction Hardening”</i> .....	<b>Aula Magna</b>
10:00–11:00. <i>Plenary Session 9. E. Vázquez Cendón. “Paths already covered and to be covered from the problem to the mathematical technology transfer together with finite volume methods”</i> .....	<b>Aula Magna</b>
11:00–11:30. <i>Coffee break</i> .....	<i>Patio</i>
11:30–14:00. <b>Special Sessions</b>	
[11:30–13:30] <b>S11:</b> “Non-Autonomous Dynamical Systems and Applications” (Lectures 5–7) .....	<b>Sala Bolívar</b>
[12:00–13:30] <b>S7:</b> “Homogenization of Elliptic Equations” (Lectures 1–3) .....	<b>Sala Argüelles</b>
[11:30–13:30] <b>S8:</b> “Hyperbolic PDEs: Numerical Methods and Applications” (Lectures 5–8) .....	<b>Aula 2</b>
[11:30–13:30] <b>S9:</b> “Mathematical Models for Computer Science” (Lectures 3–6) .....	<b>Sala Lequerica</b>
[11:30–13:30] <b>S1:</b> “Advances in Time Stepping Methods” (Lectures 5–7) .....	<b>Sala de Teledocencia</b>
13:30. <b>Closure</b> .....	<i>Patio</i>

## List of Special Sessions

XXIV CEDYA / XIV CMA, Cádiz June 8–12 2015

### S1. Advances in Time Stepping Methods

Thursday 11, 11:30–13:30

S1 – **Sala de Teledocencia**

- Andrés Arrarás, Laura Portero** (Universidad Pública de Navarra) “Reducing the splitting error of time-splitting methods for parabolic problems”
- Fernando Casas** (Universitat Jaume I) “High order splitting methods for the Vlasov-Poisson equation”
- Teo Roldán** (Universidad Pública de Navarra) “Implicit-explicit Runge-Kutta methods with low-storage requirements”
- Juan Ignacio Montijano** (Universidad de Zaragoza) “Exponential fitting techniques for the solution of stiff problems with a gap”

Friday 12, 11:30–13:00

S1 – **Sala de Teledocencia**

- Soledad Pérez-Rodríguez** (Universidad de La Laguna) “Some interesting 3-stage ROW methods”
- Luis Rández** (Universidad de Zaragoza) “On the construction of Hermite-Birkhoff-Taylor schemes”
- Inmaculada Higueras** (Universidad Pública de Navarra) “Efficient strong stability preserving IMEX Runge-Kutta methods”

## S2. Analysis of mathematical models applied to epidemiological processes

Monday 8, 12:00–14:05

S2 – Sala Lequerica

1. **Santiago Alonso-Quesada** (Universidad del País Vasco) “Analysis of a discrete-time SEIR epidemic model under a periodic impulse vaccination”
2. **Joan Saldaña** (Universidad de Girona) “Preventive behavioural responses and information dissemination in network epidemic models”
3. **A. Benjamin Ivorra, B. Diène Ngom and C. Ángel M. Ramos** (Universidad Complutense de Madrid) “Be-CoDiS: A deterministic mathematical model to predict the risk of human diseases spread between countries. Application to the 2014-15 Ebola Virus Disease epidemic”
4. **Begoña Cantó, Carmen Coll y Elena Sánchez** (Universitat Politècnica de València) “On the equilibrium points in process of indirect transmission”
5. **Begoña Cantó, Carmen Coll y Elena Sánchez** (Universitat Politècnica de València) “Analysis of infections in seasonal epidemiological models”

## S3. Applied Mathematics in Architecture

Monday 8, 11:30–14:00

S3 – Aula 2

1. **Antonio Domínguez Delgado** (Universidad de Sevilla) “Numerical evaluation of ventilated facades energy efficiency in Southern Spain”
2. **M. Lourdes Tello Del Castillo** (Universidad Politécnica de Madrid) “On a green roof mathematical model”
3. **Macarena Gómez Mármol** (Universidad de Sevilla) “Reduced Bases Methods. Application to thermal resolution into the walls”
4. **Francisco Ortega Riejos** (Universidad de Sevilla) “Determining efficient routes of ecotourism in nature parks under environmental constraints”
5. **Francisco Padial Molina** (Universidad Politécnica de Madrid) “Modeling a double-glass windows with a water-flow inside”

Tuesday 9, 11:30–13:00

S3 – Aula 2

6. **Enrique Rodríguez Jara** (Universidad de Cádiz) “Building and surroundings Thermal and Aeraulic coupling”
7. **José Sánchez de la Flor** (Universidad de Cádiz) “Potential energy savings in air-conditioning building systems, due to the improvement of outdoor air”
8. **Carmen Galán Marín/Juan Rojas Fernández** (Universidad de Sevilla) “Microclimatic simulation using Freefem++ for the desing of Eco-Eficient building”

## S4. Boundary Conditions for Flow Problems

Wednesday 10, 11:30–13:30

S4 – Sala Lequerica

1. **Roland Becker** (Université Pau, France)
2. **Rodolfo Bermejo** (Universidad Politécnica de Madrid) “On the influence of slip-no slip and different outflow boundary conditions on high Reynolds number flows”
3. **Franck Boyer** (Aix-Marseille Université) “”
4. **Malte Braack** (Universität Kiel, Germany) “Stability of outflow conditions for Navier-Stokes”

Thursday 11, 11:30–13:30

S4 – Sala Lequerica

5. **Alfonso Caiazzo** (Weierstraß-Institute für Angewandte Analysis und Stochastik, Berlin) “A Stokes-consistent backflow stabilization for incompressible flows”
6. **Juan Casado Díaz** (Universidad de Sevilla) “”
7. **Giulia Deolmi** (RWTH Aachen) “Effective boundary conditions for compressible flows over a rough surface”
8. **Tomáš Neustupa** (Czech Technical University in Prague, Czech Republic) “Stationary flow through a cascade of profiles with an arbitrarily large inflow - The mathematical model, existence of a weak solution”

## S5. Continuous and Discrete Dynamical Systems

Tuesday 9, 11:30–13:30

S5 – Sala Bolívar

1. **Francisco Balibrea Gallego** (Universidad de Murcia) “Generation and results on difference equations of Thue-Morse, Fibonacci and Shapiro”
2. **Victoriano Carmona** (Universidad de Sevilla) “Periodic orbits and global connections in reversible piecewise linear systems”
3. **Isaac García** (Universitat de Lleida) “Cyclicity of nilpotent centers with homogeneous nonlinearities”
4. **Pedro Torres** (Universidad de Granada) “Stability and chaos in the Kepler problem with variable mass”

Wednesday 10, 11:30–14:00

S5 – **Sala Bolívar**

5. **Eduardo Liz** (Universidade de Vigo) “*The importance of harvest timing: Dynamic analysis of a discrete model*”
6. **Teresa Martínez-Seara** (Universitat Politècnica de Catalunya) “*Regularization of local bifurcations in Filippov systems*”
7. **Rafael Obaya** (Universidad de Valladolid) “*Linear-quadratic control processes with time-dependent coefficients*”
8. **Cristóbal García García** (Universidad Huelva) “*Integrability of degenerate vector fields*”
9. **Emilio Freire** (Universidad de Sevilla) “*Singularity of Teixeira: a nonlinear analysis of the bifurcation behavior*”

## S6. Evolution models with nonlocal terms: theory and numerical approximation

Wednesday 10, 11:30–13:30

S6 – **Sala Argüelles**

1. **Francisco Javier Sayas** (University of Delaware) “*Time domain coupling of finite and boundary elements*”
2. **Angel Castro** (Universidad Autónoma de Madrid) “*V-States for the SQG equation*”
3. **Francisco Gancedo** (Universidad de Sevilla) “*Finite time blow-up for the incompressible Navier-Stokes with a free boundary*”
4. **César Palencia** (Universidad de Valladolid) “*Time Runge-Kutta discretizations of abstract parabolic Volterra equations with bad initial data*”

Thursday 11, 11:30–13:30

S6 – **Sala Argüelles**

5. **Jerónimo Rodríguez** (Universidad de Santiago de Compostela) “*Integral equations for 1D transient wave propagation*”
6. **Miguel Ángel López Marcos** (Universidad de Valladolid) “*Second-order numerical integration of a size-structured cell population model with equal fission*”
7. **Óscar Angulo** (Universidad de Valladolid) “*Second-order numerical integration of a size-structured cell population model with asymmetric division*”
8. **Eduardo Cuesta** (Universidad de Valladolid) “*Linear Volterra equations. Applications in satellite image classification*”

## S7. Homogenization of Elliptic Equations

Friday 12, 12:00–13:30

S7 – **Sala Argüelles**

1. **Juan Casado** (Universidad de Sevilla) “*Two-scale convergence and random homogenization*”
2. **Daniela Giachetti** (Sapienza Università di Roma) “*Homogenization of semilinear elliptic problems singular at  $u=0$* ”
3. **François Murat** (Laboratoire Jacques-Louis Lions, Université Pierre et Marie Curie, Paris VI) “*Homogenization of the brush problem with a source term in  $L^1$* ”

## S8 Hyperbolic PDEs: Numerical Methods and Applications

Thursday 11, 11:30–13:30

S8 – **Aula 2**

1. **Antonio Baeza Manzanares** (Universitat de València) “*Finite difference WENO and Adaptive Mesh Refinement techniques for Vlasov-Maxwell equations*”
2. **Isabel Cordero Carrión** (Universitat de València) “*Minimally implicit Runge-Kutta methods for hyperbolic equations with stiff source terms*”
3. **José Manuel González Vida** (Universidad de Málaga) “*Efficient GPU implementation of a two waves TVD-WAF method for the two-dimensional one layer shallow water system and its validation for tsunami forecasting*”
4. **Enrique Fernández Nieto** (Universidad de Sevilla) “*A coupled duality/finite volume method for 2D shallow viscoplastic avalanches models*”

Friday 12, 11:30–13:30

S8 – **Aula 2**

5. **Cipriano Escalante Sánchez** (Universiad de Málaga) “*Weakly dispersive shallow water flows: hybrid finite-volume finite-difference schemes*”
6. **Pep Mulet** (Universitat de València) “*Finite difference WENO schemes for multi-dimensional porous media flows*”
7. **Arturo Hidalgo** (Universidad Politécnica de Madrid) “*ADER-WENO Finite Volume Schemes with Adaptive Mesh Refinement for Hyperbolic Problems*”
8. **David Zorío Ventura** (Universitat de València) “*Boundary extrapolation techniques for finite difference schemes for complex geometries*”

## S9. Mathematical Models for Computer Science

Thursday 11, 16:00–17:00

S9 – **Sala Bolívar**

1. **Nicolás Madrid** (University of Ostrava, Czech Republic) “*Idempotent Morphology Dilations*”
2. **María Eugenia Cornejo, Jesús Medina Moreno y Eloísa Ramírez-Poussa** (Universidad de Cádiz) “*Reducing concept lattices by cuts*”

3. **M. Romero and Juan Luis Castro** (Universidad de Granada) “From tags cloud to concepts cloud”
4. **Juan Moreno** (Universidad de Castilla-La Mancha, Spain) “Efficient representation of fuzzy membership functions for applications”
5. **Manuel Ojeda-Aciego** (Universidad de Málaga) “On the definition of suitable orderings to generate adjunctions over an unstructured codomain”
6. **Pablo Cordero** (Universidad de Málaga) “Multilattices and residuated multilattices: generalizing lattice theory”

## S10. Modeling and Simulation in Sedimentary Processes

Tuesday 9, 12:00–14:00

S10 – Aula 2

1. **E.D. Fernández-Nieto, J. Garres-Díaz, A. Mangeney and G. Narbona Reina** (Universidad de Sevilla) “A  $\nu(I)$ -rheology multilayer model for dry granular flows and application to granular collapse over an inclined plane”
2. **Tomás Morales de Luna** (Universidad de Córdoba) “Sediment transport in shallow water: improvement of bedload and suspended transport”

Wednesday 10, 11:30–14:00

S10 – Aula 2

3. **Pep Mulet** (Universidad de Valencia) “Implicit-Explicit Runge-Kutta methods for polydisperse sedimentation models with compression”
4. **Gladys Narbona Reina** (Universidad de Sevilla) “On a new derivation of the Saint-Venant-Exner model with energy balance”
5. **Carmen Zarzuelo** (Andalusian Institute for Earth System Research, Granada) “Modeling sediment transport induced by tidal currents and wind waves in Cádiz Bay”
6. **Marc de la Asunción** (Universidad de Málaga) “Efficient implementation of bedload sediment transport finite volume models over non-structured meshes”

## S11. Non-Autonomous Dynamical Systems and Applications

Thursday 11, 11:30–13:30

S11 – Sala Bolívar

1. **María José Garrido Atienza** (Universidad de Sevilla) “Random attractors for retarded stochastic PDEs”
2. **Marta Herrera Cobos** (Universidad de Sevilla) “Non-autonomous nonlocal parabolic equations”
3. **Antonio Miguel Márquez Durán** (Universidad Pablo de Olavide, Sevilla) “Asymptotic behavior for a non-classical and non-autonomous diffusion equation containing some hereditary characteristic”
4. **Francisco Morillas Jurado** (Universidad de Valencia) “Graduation of life tables: from static to dynamic application”

Friday 12, 11:30–13:00

S11 – Sala Bolívar

5. **Sylvia Novo** (Universidad de Valladolid) “Uniform persistence for monotone skew-product semiflows with applications to neural networks”
6. **Rosana Rodríguez López** (Universidad de Santiago de Compostela) “On the existence of solutions to fractional differential equations with unbounded nonlinearity”
7. **José Valero** (Universidad Miguel Hernández, Elche) “Structure and regularity of attractors for reaction-diffusion equations”

## S12. Numerical Acoustics

Tuesday 9, 11:30–14:00

S12 – Sala Lequerica

1. **Julien Diaz** (INRIA, France) “High-order Discontinuous Galerkin approximations for elasto-acoustic scattering problems”
2. **Víctor Domínguez** (Universidad Pública de Navarra, Spain) “High order Nystrom methods for transmission problems for Helmholtz Equation”
3. **Andrea Moiola** (University of Reading, U. K.) “Trefftz-discontinuous Galerkin methods for the wave equation”
4. **Peter Monk** (University of Delaware, USA) “Time dependent scattering from diffraction gratings”
5. **Daniel Peterseim** (Universität Bonn, Germany) “Eliminating the pollution effect in Helmholtz problems by local subscale correction”

## S13. Optimal Control of Partial Differential Equations

Monday 8, 11:30–13:30

S13 – Sala Argüelles

1. **Eduardo Casas** (Universidad de Cantabria) “The Velocity Tracking Control Problem for the Evolutionary Navier-Stokes Equations”
2. **Enrique Fernández-Cara** (Universidad de Sevilla) “Three results concerning the controllability of PDEs”
3. **Francisco Javier Fernández Fernández** (Centro Universitario de la Defensa, Universidade de Vigo) “Optimal control of urban heat islands”
4. **Carlos N. Rautenberg** (Technische Universität Berlin) “On the optimal sensor placement problem”

5. **Mariano Mateos** (Universidade Oviedo) “Numerical approximation of state constrained Dirichlet control problems”
6. **Ira Neitze** (Technische Universität München) “Finite element error estimates for nonconvex parabolic control problems with gradient constraints”
7. **Arnd Rösch** (Universität Duisburg-Essen) “Optimal control of a chemotaxis problem”
8. **Konstantinos Chrysafinos** (National Technical University of Athens) “Stability estimates for fully-discrete approximations of the Allen-Cahn equations and applications to optimal control”

## S14. Structured Matrices and Numerical Linear Algebra

Wednesday 10, 13:30–14:00

S14 – Sala de Teledocencia

1. **Pedro Alonso** (Universidad de Oviedo) “Characterizations of Almost Strictly Sign Regular matrices and some particular cases”
2. **Rafael Bru** (Universitat Politècnica de València) “Preconditioners and iterative methods for solving linear systems”
3. **Yasmina Khier** (Universidad de Zaragoza) “Matrix analysis of the Newton interpolation formula”
4. **José Javier Martínez** (Universidad de Alcalá) “Polynomial least squares fitting by using the Bernstein basis”
5. **Ana María Urbano** (Universitat Politècnica de València) “An application of the Modified Gram-Schmidt Algorithm”

## S15. Some Successful Collaborations with Industry Developed by Math-In Members

Tuesday 9, 12:00–14:00

S15 – Sala de Teledocencia

1. **Peregrina Quintela Estévez** (Red Española Matemática-Industria (Math-In)) “Numerical simulation of lashing for granite sheets ensuring the safety in marine transport”
2. **Dolores Gómez Pedreira** (Universidade de Santiago de Compostela) “Thermo-electromagneto-hydrodynamic numerical simulation of the removal of volatile impurities in molten silicon”
3. **José Durany Castrillo** (Universidade de Vigo) “A new low-cost technology for biothermal behavior of human foot and footwear through mathematical models”
4. **Carlos Vázquez Cendón** (Universidade da Coruña) “Mathematical transfer to life insurance companies: ALM modelling and its implementation in GPUs”

## S16. Application of Numerical Modelling in Oceanography and Meteorology

Monday 8, 11:30–13:30

S16 – Sala Bolívar

1. **Emma Reyes Reyes** (Universidad de Cádiz) “Oceanuca-Maps: an effective tool to reinforce oil spill response in Andalusia”
2. **Carlos José González Mejías** (Universidad de Cádiz) “D numerical modeling of the peculiarities of the baroclinic M2 tide in the Strait of Gibraltar and Algeciras Bay”
3. **José Manuel González Vida** (Universidad de Málaga) “TSUNAMI-HYSEA: A GPU-based model for tsunami early warning systems”
4. **Jorge Macías Sánchez** (Universidad de Málaga) “Shallow water models as tool for tsunami current predictions in ports and harbors. Validation with Tohoku 2011 field data”

## S17. Reductions of Differential Equations

Tuesday 9, 11:30–14:00

S17 – Sala de Teledocencia

1. **Paola Morando** (University of Milan) “Solvable structures in determination of invariant solution to PDEs”
2. **M<sup>a</sup> Concepción Muriel Patino** (University of Cádiz) “Some connections between generalized symmetries and lambda-symmetries for second-order ordinary differential equations”
3. **Adrián Ruíz Serván** (University of Cádiz) “Solvable structures and integrability by quadratures of third-order ordinary differential equations admitting the non-solvable symmetry algebra  $sl(2, R)$ ”
4. **José Ramírez Labrador** (University of Cádiz) “A reduction method for polynomial ordinary differential equations and applications”
5. **Juan Manuel Vidal Pérez** (University of Cádiz) “A lambda-symmetry algorithm in Maple for the integrability of second-order ordinary differential equations”

- PDEs 1** (Monday 8, 15:30–17:30) ..... **Sala Bolívar**
1. *G. Castiñeira and J. M. Rodríguez*, “Asymptotic analysis of a viscous flow in a curved pipe with elastic walls”
  2. *M. Á. Burgos-Pérez, J. García-Melián and A. Quaas*, “Classification of supersolutions and Liouville theorems for elliptic equations with gradient terms”
  3. *M. Loayza, M. A. Rojas-Medar*, “A weak- $L^p$  Prodi-Serrin type regularity criterion for the micropolar fluid equations”
  4. *M. Latorre and S. Segura de León*, “Elliptic equations involving the 1-Laplacian and a total variation term with  $L^{N,\infty}$ -data”
  5. *A. Martín, E. Schiavi and S. Segura de León*, “Positive minimizers of a non-convex functional involving the Total Variation and lower order terms”
  6. *M. Rosa, M. S. Bruzón and M. L. Gandarias*, “Symmetry analysis for a mathematical model of malignant gliomas”
- PDEs 2** (Monday 8, 18:00–19:20) ..... **Sala Bolívar**
7. *R. de la Rosa, M. L. Gandarias and M. S. Bruzón*, “Exact solutions of a generalized variable-coefficient Gardner equation by using equivalence transformations”
  8. *E. Notte-Cuello, E. Ortega-Torres and M. A. Rojas-Medar*, “On the stability of magneto-micropolar fluids”
  9. *U. Brauer and L. Karp*, “Local Existence Theorems for the Einstein-Euler system using fractional Besov and Sobolev spaces”
  10. *G. Vigliani*, “Explicit blow-up time for complete porous medium problems”
- PDEs 3** (Monday 8, 15:30–17:30) ..... **Sala Argüelles**
11. *J. Arrieta and M. Villanueva-Pesqueira*, “Unfolding operator in thin domains with an oscillatory boundary”
  12. *M. Briane, J. Casado, M. Luna-Laynez and A. J. Pallares-Martín*, “ $\Gamma$ -convergence of functionals depending on vector-valued functions”
  13. *M. Sattari and J. Tuomela*, “Patterns on evolving surface”
  14. *J. I. Díaz, D. Gómez-Castro and C. Timofte*, “On some of the principles of Nanotechnology and its application to the effectiveness factor in chemical reactions”
  15. *J. Carmona, A. Molino and L. Moreno-Mérida*, “A continua of solutions for a quasilinear elliptic singular problem”
  16. *C. Calvo-Jurado and W. J. Parnell*, “On the the construction of bounds for the effective transport properties of a two-phase transversely isotropic composite material”
- PDEs 4** (Monday 8, 18:00–19:20) ..... **Sala Argüelles**
17. *J. Sabina de Lis*, “A weak form of the boundary point lemma”
  18. *J. Carmona, P. J. Martínez-Aparicio and A. Suárez*, “Sub-supersolution method for elliptic systems with quadratic gradient lower order terms and singularities”
  19. *J. Carmona, P. J. Martínez-Aparicio and A. Suárez*, “Existence of positive solutions for nonlinear elliptic singular systems with natural growth via sub-supersolution method”
  20. *J. Casado-Díaz, M. Luna-Laynez and F. J. Suárez-Grau*, “A decomposition result for the pressure of a fluid in a thin domain and some applications”
- PDEs 5** (Tuesday 9, 15:30–17:30) ..... **Sala Bolívar**
21. *C. Morales-Rodrigo, T. F. Sousa and A. Suárez*, “Existence of positive solutions for nonlinear elliptic equations with a nonlocal diffusion coefficient”
  22. *R. Pardo and A. Castro*, “A priori bounds for positive solutions to a class of subcritical elliptic equations”
  23. *A. Rodríguez-Bernal, S. Sastre-Gómez*, “Instability results for equilibria of nonlocal reaction-diffusion problem”
  24. *B. M. R. Calsavara and F. Guillén-González*, “A Caginalp model with convection for solidification processes in 3D domain”
  25. *L. S. Costa Filho, M. Delgado and A. Suárez*, “A Nonlinear Elliptic Problem With Non-Local Boundary Condition”
  26. *B. Climent-Ezquerria and F. Guillén-González*, “Analysis of a Cahn-Hilliard Navier-Stokes vesicle-fluid interaction model”
- PDEs 6** (Thursday 11, 15:00–14:00) ..... **Sala Bolívar**
27. *L. Moreno-Mérida*, “On some classes of quasilinear problems with quadratic growth respect to the gradient”
  28. *A. Carpio and G. Duro*, “Well posedness of an angiogenesis related integrodifferential diffusion model”
  29. *C. Quesada González and A. Rodríguez Bernal*, “Fourth order linear and nonlinear parabolic equations in Banach Nspaces in  $\mathbb{R}^n$  with low regularity initial data”



**ODEs and DSs 1** (Monday 8, 15:30–17:30) ..... **Aula 2**

1. A. Algaba, N. Fuentes, C. García and M. Reyes, “Existence of inverse integrating factor”
2. A. Álvarez Sánchez, J. L. Bravo Trinidad and M. Fernández García-Hierro, “Limit cycles of Abel equations of the first kind”
3. M. I. García-Planas and S. Tarragona, “On controllability of multi-agent linear systems”
4. A. Farrés, À. Jorba and M. Jorba-Cuscó, “On the Solar Sail periodic orbits near the Earth-Moon libration points”
5. A. Farrés and À. Jorba, “Dynamical System Tools to Navigate in the Earth-Sun System”
6. A. Algaba, I. Checa, E. Gamero and C. García, “Orbital-reversibility of planar dynamical systems”

**ODEs and DSs 2** (Monday 8, 18:00–19:20) ..... **Aula 2**

7. S. Maza, J. Llibre and I. García, “Center cyclicity of a family of quintic polynomial vector fields”
8. C. Pérez and F. Benítez, “Robust stabilization of second-order switched linear systems”
9. V. Carmona, F. Fernández-Sánchez and E. García-Medina, “Homoclinic connections and T-point heteroclinic cycles as particular solutions of the same global problem in PWLS”
10. J. Giné, M. Grau and X. Santallusia, “The composition condition for polynomial Abel differential equations”

**ODEs and DSs 3** (Tuesday 9, 15:30–17:30) ..... **Aula 2**

11. D. de la Fuente, “Completeness of the uniformly accelerated trajectories in General Relativity”
12. E. Freire, E. Ponce, F. Torres and A. Rivera, “Getting three limit cycles through simultaneous local and global bifurcations in piecewise linear Filippov systems”
13. M. Cauberg, “Separatrix skeleton and limit cycles in some 1-parameter families of planar vector fields”
14. M. Ordóñez and E. Ponce, “A simple characterization for a degenerate boundary equilibrium bifurcation in n-dimensional Filippov systems”
15. G. Cvetic, I. Kondrashuk, J. Navarette and P. Troncoso, “Explicit solution of the renormalization group equations in the field theory with an arbitrary number of the running couplings”
16. M. J. Álvarez, A. Gasull and R. Prohens, “Period Function for degenerate systems”

**NA and NS 1** (Monday 8, 15:30–17:30) ..... **Sala Lequerica**

1. F. Guillén-González and J. R. Rodríguez Galván, “Stabilizing the Hydrostatic Stokes Equations”
2. J. Mura and A. Caiazzo, “A two-scale homogenization approach for the estimation of porosity in elastic media”
3. J. V. Gutiérrez-Santacreu, “A saddle point approach for approximating heat flows of harmonic maps”
4. R. C. Cabrales and N. O. Moraga, “3D solidification with macrosegregation of a binary alloy”
5. M. C. Calvo-Garrido and C. Vázquez, “Pricing adjustable-rate mortgages with prepayment and default options”
6. L. Saavedra and R. Bermejo, “A second order local projection Lagrange-Galerkin method for Navier-Stokes equations at high Reynolds numbers”

**NA and NS 2** (Monday 8, 18:00–19:20) ..... **Sala Lequerica**

7. J. M. Rodríguez and R. Taboada-Vázquez, “LES using nonlinear viscosity and Clark model”
8. J. Málek and G. Tierra, “Numerical approximations for unsteady flows of incompressible fluids characterized by non-monotone implicit constitutive relations”
9. I. Cordero, D. F. Yáñez, “Signal Denoising using Local Polynomial Regression Harten’s Multiresolution”

**NA and NS 3** (Monday 8, 15:30–17:10) ..... **Sala de Teledocencia**

10. J. R. Fernández and M. Masid, “A porous thermoviscoelastic mixture problem”
11. J. R. Fernández and M. Masid, “Analysis of an osseointegration model”
12. M. J. Cano, E. Chacón Vera and F. Esquembre, “Generation of PDEs interactive simulations”
13. S. Busto and M.L. Seoane, “A piecewise linear approximation of a fourth order eigenvalue problem by a mixed finite element method”
14. R. Delussu, P. Díaz de Alba and G. Rodriguez, “Regularized solution of a nonlinear problem in applied Geophysics”

**NA and NS 4** (Tuesday 9, 15:30–17:30) ..... **Sala Lequerica**

15. J. Albella, H. Ben Dhia, S. Imperiale and J. Rodríguez, “Improved Arlequin method for the transient wave equation”
16. F. Guillén-González, M. A. Rodríguez-Bellido and G. Tierra, “Linear stable splitting schemes for a mixture of Newtonian and nematic fluids with anchoring effects”
17. A. Martín, I. Chatnuntawech, B. Bilgic, K. Setsompop, E. Adalsteinsson and E. Schiavi, “Total Generalized Variation Based Multi-Contrast Magnetic Resonance Image Reconstruction”
18. M. Brovka, J. I. López, R. Montenegro and J. M. Escobar, “Some advances in open problems of isogeometric analysis”
19. T. Chacón-Rebollo, E. Delgado-Ávila and M. Gómez Mármol, “Reduced basis method of Smagorinsky turbulence model”
20. T. Chacón-Rebollo and D. Franco Coronil, “A Multilayer Approach for the Poisson Problem”

**NA and NS 5** (Thursday 11, 15:00–17:00) ..... **Aula 2**

21. *G. Maicas, A. I. Muñoz, G. Galiano, A. Ben Hamza and E. Schiavi*, "Spectral shape analysis of the hippocampal structure for Alzheimer's Disease diagnosis"
22. *A. M. Azaiez, F. Ben-Belgacem and T. Chacón Rebollo*, "On the convergence rate of the POD expansion for the parametrized heat equation"
23. *P. J. Pagola and J. L. López García*, "Asymptotic expansions of the Pearcey function"
24. *M. Azaiez, F. Ben Belgacem, T. Chacón Rebollo, M. Gómez Mármol and I. Sánchez Muñoz*, "Convergence in high order norms of the POD approximation for the heat equation"
25. *M. J. Castro, A. Marquina and J. M. Gallardo*, "Approximate Osher-Solomon schemes for hyperbolic systems"
26. *F. Morillas Jurado and I. Baeza Sampere*, "Life tables: a two-step method for graduation combining wavelets and PPH techniques"

**NA and NS 6** (Thursday 11, 15:00–17:00) ..... **Sala Lequerica**

27. *L. Hervella-Nieto, P. M. López-Pérez and A. Prieto*, "A Partition of the Unity Finite Element Method for heterogeneous media in underwater acoustics",
28. *M. I. Asensio, D. Prieto, L. Ferragut and J. M. Cascón* "Validation of a simplified physical wildland fire model"
29. *A. Baeza, P. Mulet and D. Zorío*, "High order boundary extrapolation technique for finite difference methods on complex domains with Cartesian meshes"
30. *A. Bermúdez, S. Busto, J. L. Ferrín and P. Fontán*, "A first approach to the design of tidal turbines"
31. *E. Cebrián, M. Álvaro, M. Carretero and L. L. Bonilla*, "Numerical methods for kinetic equations in semiconductor superlattices"
32. *P. Monk and V. Selgas*, "A time domain Linear Sampling Method for a wave guide"

**OTs** (Monday 8, 18:00–19:00) ..... **Sala de Teledocencia**

1. *A. Guterman, A. Herrero and N. Thome*, "A new characterization of the cn-partial ordering"
2. *M. I. García-Planas and M. D. Magret*, "Permutation non-isometric linear codes over a finite field"
3. *M. I. García-Planas and M. D. Magret*, "Eigenvalues and eigenvectors of monomial matrices"

**CO** (Tuesday 9, 15:30–17:30) ..... **Sala Argüelles**

1. *A. Doubova and E. Fernández-Cara*, "Geometric inverse problems for wave equation and Lamé system"
2. *M. Albarada-Sambola, L. I. Martínez-Merino and A. M. Rodríguez-Chía*, "Location of emergency facilities with uncertainty in the demands"
3. *E. Fernández-Cara and F. Maestre*, "Elastography: an inverse problem related to the Lamé System"
4. *A. Martín, E. Schiavi and S. Segura de León*, "A Proximal Primal Dual Algorithm for a Nonconvex Nonsmooth Energy Minimization Problem"
5. *B. Hernández-Jiménez, R. Osuna-Gómez, M. A. Rojas-Medar and L. Batista dos Santos*, "Characterization of solutions for non-regular optimization problems with conic constraints"
6. *M. Delgado, G. M. Figueiredo, I. Gayte and C. Morales-Rodrigo*, "An optimal control problem for a Kirchhoff-type equation"

**NLA** (Thursday 11, 15:00–17:00) ..... **Sala Argüelles**

1. *J. E. Adsuara, I. Cordero-Carrión, P. Cerdá-Durán and M. A. Aloy*, "Improvements in the Scheduled Relaxation Jacobi method"
2. *A. Vidal-Ferràndiz, S. González-Pintor, D. Ginestar, G. Verdú and C. Demazière*, "Substructuring preconditioners for the neutron diffusion equation"
3. *A. Barreras and J. M. Peña*, "Classes of structured matrices related with total positivity"
4. *F. Sosa and J. Moro*, "On first order expansions for multiplicative perturbation of eigenvalues"
5. *R. Bru, M. T. Gassó, I. Giménez and J. Scott*, "Iterative determination of H-matrix character and reducibility"
6. *F. De Terán*, "Low rank perturbation of canonical forms"