

24th Conference on Applications of Computer Algebra

Santiago de Compostela. June 18-22, 2018

Plenary Session

| Aula Magna | title | Invited speaker |
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Tuesday 19th

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| 9:30 - 10:30 | Dealing with real algebraic curves and surfaces for discovery: from experiments to theory and applications | Laureano González-Vega |
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Wednesday 20th

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| 9:00 - 10:00 | Applications of Computer Algebra to Verification and Satisfiability Checking | James H. Davenport |
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Thursday 21st

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| 9:00 - 10:00 | SAT Solvers and Computer Algebra Systems: A Powerful Combination for Mathematics | Vijay Ganesh |
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Friday 22nd

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| 9:30 - 10:30 | Automatic Geometric Theorem Proving and Discovering Using (Comprehensive) Groebner Bases | Dingkang Wang |
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S 01 General Session

| Aula 1 | title | speaker |
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Thursday 21st

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| 16:30 - 17:00 | Randomized Algorithms for Normal Basis in Characteristic Zero | Armin Jamshidpey |
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coffee break

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| 17:30 - 18:00 | Computer Algebra and Computer Science | Gereon Kremer |
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| 18:00 - 18:30 | Conversion of element representations in Galois rings | Juan Carlos Ku-Cauch |
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| 18:30 - 19:00 | Automatic generation of diagrammatic subway maps for any date with Maple | Eugenio Roanes-Lozano |
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| 19:00 - 19:30 | Detecting truth, just on parts, in automated reasoning in geometry | Pilar Vélez |
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S 02 Computer Algebra Modeling in Science and Engineering

Aula 7

title

speaker

Thursday 21st

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|---------------|---|----------------|
| 10:00 - 10:30 | Leap-Frog Algorithm for interpolating reduced sparse data | Ryszard Kozera |
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| 10:30 - 11:00 | Reparameterization and piecewise cubics for interpolating reduced data | Ryszard Kozera |
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coffee break

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| 11:30 - 12:00 | Visualization of Planetary Motions Using KeTCindy | Satoshi Yamashita |
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| 12:00 - 12:30 | Computing Perturbations in Two-Planetary Three-Body Problem with Masses Varying Non-Isotropically at Different | Mukhtar Minglibayev |
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| 12:30 - 13:00 | Motion of two bodies coupled by a spring on a rough plane with variable coefficient of friction: simulation with | Alexander N. Prokopenya |
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lunch

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| 16:30 - 17:00 | A study of sensitivity of nonlinear oscillations of a CLD parallel circuit to parametrization of Esaki diode | Haiduke Sarafian |
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coffee break

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| 17:30 - 18:00 | Numerical study of multiphase flow and viscous fingering in a heterogeneous porous medium | Hassane Djebouri |
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| 18:00 - 18:30 | 3D Stress analysis of a loaded birefringent sphere by photoelastic experiment and finite elements method | Kamel Touahir |
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| 18:30 - 19:00 | Fluid/Particles Flow Simulation by Finite Volume Method —Hybrid Approach— | Salah Zouaqui |
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S 03 Computer Algebra in Education

Aula 8

title

speaker

Tuesday 19th

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| 10:30 - 11:00 | About the Bulgarian experience in organizing National Student Olympiad in Computer Mathematics | Penka Georgieva |
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coffee break

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| 11:30 - 12:00 | Student Attitudes toward Technology Use in Math Education | Karsten Schmidt |
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| 12:00 - 12:30 | Technology enhanced e-assessments in Calculus courses with application of CAS | Elena Varbanova |
| 12:30 - 13:00 | Analyzing the "Calculator Effect" of Different Kinds of Software for School Arithmetics and Algebra | Rein Prank |
| 13:00 - 13:30 | Dynamic visualizations for network flow optimizations problems with Mathematica | Włodzimierz Wojas - Jan Krupa |

lunch

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| 15:30 - 16:00 | Using TI-Nspire for the financial education of future engineers | Hanan Smidi |
| 16:00 - 16:30 | Accurate plotting in 3D: how to choose the mesh | David G. Zeitoun |
| 16:30 - 17:00 | Addressing discrete mathematics problems in the classroom | Anouk Bergeron-Brlek |

coffee break

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| 17:30 - 18:00 | Introducing parametric curves with CAS | Louis-Xavier Proulx |
| 18:00 - 18:30 | New rules for improving Cas capabilities when computing improper integrals. Applications in Math Education | José Luis Galán-García |
| 18:30 - 19:00 | Teaching Partial Differential Equations with CAS | José Luis Galán-García |

Wednesday 20th

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| 10:00 - 10:30 | Do we take advantage of ICT when teaching maths at primary and secondary education levels? Do we teach mathematics with computers? | Eugenio-Roanes Lozano |
| 10:30 - 11:00 | Visualizations of the nondominated set and the efficient set in multicriteria optimization problems using Mathematica | Włodzimierz Wojas - Jan Krupa |

coffee break

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| 11:30 - 12:00 | Analyzing discrete suspended chains using computer algebra | Gilbert Labelle |
| 12:00 - 12:30 | Fractals and tessellations: from K's to cosmology | Thierry Dana-Picard |
| 12:30 - 13:00 | Periodic and Nontrivial Periodic Input in Linear ODEs (Part I) | Michel Beaudin |
| 13:00 - 13:30 | Periodic and Nontrivial Periodic Input in Linear ODEs (Part II) | Michel Beaudin |

Thursday 21st

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| 10:00 - 10:30 | Consolidation of abstract knowledge in the process of confronting errors using digital tools: The case of the inflection point | Anatoli Kouropatov |
| 10:30 - 11:00 | The Runge Example for Interpolation and Wilkinson's Examples for Rootfinding | Leili Rafiee Sevyeri |

coffee break

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|---------------|--|------------------|
| 11:30 - 12:00 | A non-iterative method for solving nonlinear equations | Michael Xue |
| 12:00 - 12:30 | What is the integral of x^n ? | David J. Jeffrey |
| 12:30 - 13:00 | CAS in Teaching Basics of Stereoscopy | Benjamin Jurell |

lunch

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| 16:30 - 17:00 | Familiarizing students with definition of Lebesgue measure using Mathematica - some examples of calculation directly from its definition | Włodzimierz Wojas - Jan Krupa |
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S 04 Applied and Computational Algebraic Topology

Aula 9

title

speaker

Tuesday 19th

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|---------------|--|--------------------------|
| 10:30 - 11:00 | Reductions of monomial resolutions for the computation of high dimensional simplicial homology | Eduardo Sáenz-de-Cabezón |
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coffee break

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| 11:30 - 12:00 | New algorithms for computing homology of finite topological spaces | Julián Cuevas-Rozo |
| 12:00 - 12:30 | Computing Homotopy Information of 4D Digital Objects in Parallel | Pedro Real |
| 12:30 - 13:00 | Maximal Stable Homological Regions and AT-models | Pedro Real |

S 05 Computer Algebra for Dynamical Systems and Celestial Mechanics

Aula 10

title

speaker

Tuesday 19th

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| 10:30 - 11:00 | On the Numerical Analysis and Visualisation of Implicit Ordinary Differential Equations | Werner M. Seiler |
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coffee break

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| 11:30 - 12:00 | Singular Initial Value Problems for Quasi-Linear Ordinary Differential Equations | Werner M. Seiler |
| 12:00 - 12:30 | The construction of averaged semi-analytical planetary motion theory up to the third degree of planetary masses by means CAS Piranha | Alexander Perminov |
| 12:30 - 13:00 | Local and Global Properties of ODEs | Victor Edneral |

lunch

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| 15:30 - 16:00 | Nonlinear Oscillations of a Spring Pendulum at the 1 : 1 : 2 Resonance by Normal Form Method | Victor Edneral |
| 16:00 - 16:30 | Schutzenberger transformation on the three-dimensional Young graph | Vasillii Duzhin |
| 16:30 - 17:00 | On the estimation of complexity of trajectories in the equal-mass free-fall three-body problem | Aleksandr Mylläri |

coffee break

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| 17:30 - 18:00 | The modeling of the effect of velocity of breakup in osculating orbital elements of the young asteroid family | Alexey Rosaev |
| 18:00 - 18:30 | Searching for periodic solutions with central symmetry in Hill problem | Alexander Batkhin |

S 06 Computational Differential and Difference Algebra

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| Aula 9 | title | speaker |
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Thursday 21st

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|---------------|--|--------------|
| 11:30 - 12:00 | Bounds for Proto-Galois Groups | Eli Amzallag |
| 12:00 - 12:30 | The global dimension of the algebras of integro-differential operators and their factor algebras | V. V. Bavula |
| 12:30 - 13:00 | Effective calculation in studying the Jacobian Conjecture | Paweł Bogdan |

lunch

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| 16:30 - 17:00 | Dimension Polynomials and the Einstein's Strength of Some Systems of Quasi-linear Algebraic Difference Equations | Alexander Levin |
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coffee break

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| 17:30 - 18:00 | Formal Power Series Solutions of First Order Autonomous Algebraic Ordinary Differential Equations | Sebastian Falkensteiner |
| 18:00 - 18:30 | Computation of differential Chow forms for ordinary prime differential ideals | Wei Li |
| 18:30 - 19:00 | Group Classification of ODEs: a Challenge to Differential Algebra? | Dmitry Lyakhov |
| 19:00 - 19:30 | Power series solutions of systems of nonlinear PDEs | Daniel Robertz |

S 07 Algebraic and Algorithmic Aspects of Differential and Integral Operators

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| Aula 9 | title | speaker |
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Tuesday 19th

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| 15:30 - 16:00 | The Jacobian algebras, their ideals and automorphisms | Vladimir Bavula |
| 16:00 - 16:30 | On the Parameter Estimation Problem for Integro-Differential Models | François Boulier |
| 16:30 - 17:00 | Parametric b-functions for some hypergeometric ideals | Francisco-Jesus Castro-Jimenez |
| <i>coffee break</i> | | |
| 17:30 - 18:00 | Reduction operators and completion of linear rewriting systems | Cyrille Chenavier |
| 18:00 - 18:30 | Desingularization in the q-Weyl algebra | Yi Zhang |
| 18:30 - 19:00 | Solution of non-homogenous Ordinary Differential Equations using Parametric Integral Method | David G. Zeitoun |

Wednesday 20th

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| 10:00 - 10:30 | Low-Order Recombinations of C-finite Sequences | Maximilian Jaroschek |
| 10:30 - 11:00 | Some Properties and Invariants of Multivariate Difference-Differential Dimension Polynomials | Alexander Levin |
| <i>coffee break</i> | | |
| 11:30 - 12:00 | Computer algebra and the Lanczos problems in arbitrary dimensions | Jean-François Pommaret |
| 12:00 - 12:30 | Symbolic computation for integro-differential-time-delay operators with matrix coefficients | Jamal Hossein Poor |
| 12:30 - 13:00 | Algebraic proofs of operator identities | Clemens Raab |
| 13:00 - 13:30 | Definite Integration of D-finite Functions via Generalized Hermite Reduction | Bruno Salvy |

Thursday 21st

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| 10:00 - 10:30 | Effective criterion to test differential transcendence of special functions | Thomas Dreyfus |
| <i>coffee break</i> | | |
| 10:30 - 11:00 | Observability and orders of derivatives of data | Sette Diop |

S 08 Dynamic Geometry and Mathematics Education

Aula 10

title

speaker

Wednesday 20th

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| 10:00 - 10:30 | A new approach to automated study of isoptic curves | Thierry Dana-Picard |
| 10:30 - 11:00 | Exploration of dual curves using dynamic geometry and computer algebra system | Roman Hašek |
| <i>coffee break</i> | | |
| 11:30 - 12:00 | Programming in KeTCindy with Combined Use of Cinderella and Maxima | Setsuo Takato |
| 12:00 - 12:30 | Discovering properties of bar linkage mechanisms based on partial Latin squares by means of Dynamic Geometry | Raúl M. Falcón |
| 12:30 - 13:00 | Issues and challenges about instrumental proof | Philippe R. Richard |
| 13:00 - 13:30 | Dynamic Geometry and Computer Algebra Systems in Mathematics instruction | Round table |

S 09 Computer Algebra in Coding Theory and Cryptography

| Aula 7 | title | speaker |
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Tuesday 19th

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| 10:30 - 11:00 | On varieties and codes defined by quadratic equations | Ruud Pellikaan |
| <i>coffee break</i> | | |
| 11:30 - 12:00 | Cyclic structures in convolutional codes and free distance | F. Javier Lobillo |
| 12:00 - 12:30 | On additive cyclic codes over chain rings | Edgar Martínez-Moro |
| 12:30 - 13:00 | Computer algebra tales on Goppa codes and McEliece cryptography | Narcís Sayols |
| 13:00 - 13:30 | Satisfiability modulo theory in finding the distance distribution of binary constrained arrays | Putranto Utomo |
| lunch | | |
| 15:30 - 16:00 | Binary Isodual Codes Having an Automorphism of Odd Prime Order | Stefka Bouyuklieva |
| 16:00 - 16:30 | Quantum codes from constacyclic codes over the finite ring $F_p + uF_p + vF_p$ | Abdullah Dertli |
| 16:30 - 17:00 | Constacyclic and Cyclic Codes over the Class of Finite Rings $F_{2k} + uF_{2k} + u^2F_{2k} + vF_{2k}$ | G.Gözde Güzel |
| <i>coffee break</i> | | |

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| 17:30 - 18:00 | On the skew cyclic codes and the reversibility problem for DNA 4-bases | Yasemin Çengellenmis |
| 18:00 - 18:30 | The enumeration of Hermitian self-dual cyclic codes over finite chain rings | Arunwan Boripan |

Wednesday 20th

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| 10:00 - 10:30 | Multiplying Dimension in Abelian Codes | Diana H. Bueno-Carreño |
| 10:30 - 11:00 | Self-dual codes over chain rings | Simon Eisenbarth |

coffee break

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| 11:30 - 12:00 | On the rank and kernel of new HFP-codes | Emilio Suárez-Canedo |
| 12:00 - 12:30 | Generalized HammingWeights of Binary Linear Codes | Irene Márquez-Corbella |

S 10 Parametric Polynomial Systems

| Aula 10 | title | speaker |
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Thursday 21st

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| 16:30 - 17:00 | Presentation of "The Gröbner Cover" | Antonio Montes |
| <i>coffee break</i> | | |
| 17:30 - 18:00 | A canonical representation of continuity of the roots of a parametric zero dimensional multi-variate polynomial ideal | Yosuke Sato |
| 18:00 - 18:30 | Fitting a Sphere to Point Cloud Data via Computer Algebra | Robert H. Lewis |
| 18:30 - 19:00 | Resultants, Implicit Parameterizations, and Intersections of Surfaces | Robert H. Lewis |
| 19:00 - 10:30 | An overview on marked bases and applications | Cristina Bertone |

Friday 22nd

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| 10:30 - 11:00 | Computation methods of b-functions associated with μ -constant deformations —Case of inner modality 2— | Katsusuke Nabeshima |
| <i>coffee break</i> | | |
| 11:30 - 12:00 | An effective method for computing Grothendieck point residues | Shinichi Tajima |
| 12:00 - 12:30 | An algorithm for computing Grothendieck local residues II —general case— | Katsuyoshi Ohara |

S 11 Algorithms for Zero-Dimensional Ideals

| Aula 1 | title | speaker |
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Tuesday 19th

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| 10:30 - 11:00 | Fast Gröbner basis computation and polynomial reduction in the generic bivariate case | Robin Larrieu |
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coffee break

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| 11:30 - 12:30 | Special Properties of Zero-Dimensional Ideals: new Algorithms | Lorenzo Robbiano |
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| 12:30 - 13:00 | Computing Subschemes of the Border Basis Scheme | Martin Kreuzer |
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| 13:00 - 13:30 | On the computation of algebraic relations of bivariate polynomials | Simone Naldi |
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| 15:30 - 16:30 | On the decoding of interleaved and folded Reed-Solomon codes | Daniel Augot |
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| 16:30 - 17:00 | Solving and bonding 0-dimensional ideals: Möller Algorithm and Macaulay Bases | Teo Mora |
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coffee break

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| 17:30 - 18:00 | Combinatorics of ideals of points: a Cerlienco-Mureddu-like approach for an iterative lex game | Michela Ceria |
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| 18:00 - 18:30 | Computing Recurrence Relations of n -dimensional Sequences Using Dual of Ideals | Hamid Rahkooy |
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Wednesday 20th

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| 10:00 - 11:00 | Border basis, Hilbert Scheme of points and flat deformations | Mariemi Alonso |
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coffee break

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| 11:30 - 12:00 | De Nugis Groebnerialium 5: Noether, Macaulay, Jordan | Teo Mora |
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| 12:00 - 12:30 | Signature-based Criteria for Möller's Algorithm for Computing Gröbner Bases over PIDs | Thibaut Verron |
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| 12:30 - 13:00 | Computing and using minimal polynomials | Anna M. Bigatti |
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S 12 Numerical Differential and Polynomial Algebra

| Aula 9 | title | speaker |
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Friday 22nd

coffee break

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| 11:30 - 12:00 | Symbolic-numeric methods for simulation of cosserat rods | Dmitry Lyakhov |
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| 12:00 - 12:30 | A symbolic-numeric method to determine symmetry of approximate differential equations | Zahra Mohammadi |
| 12:30 - 13:00 | Challenges in Numerical Differential Algebra | Greg Reid |

Sponsor Session

Aula Magna

speaker

Thursday 21st

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| 15:30 - 16:30 | New features in Maple 2018 | Daniel Skoog |
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Business meeting

Aula Magna

Thursday 21st

13:00 - 13:30

ACA 2018 information

Registration:

The secretariat is in Aula 5, located in level 2 (entering the math building through the main door, at the rhs.)

Talks:

The plenary talks and the Business meeting will be in the **Aula Magna** located in the **level 3** (entering the math building through the main door, up the stairs.)

Aula 1 is located in level 2 (opposite to the secretariat). Aulas 7, 8, 9 and 10 are all located in level 4.

Internet:

There will be access to internet via wi-fi.

Lunch:

With the conference documentation you will get 4 vouchers (one per each day) for lunch. As we are a lot of people, in order to avoid long waiting lines, we offer you three possible options (see the location in the map):

1. (*The biggest*) The University Restaurant "Monte da Condesa". A 6-7 minute walk, leaving the math building through the back door.
2. (*The closest*) The Math and Biology Canteen. Just outside the main door, on the right.
3. (*Another one*) The Engineering School Canteen. A 3-4 minute walk, leaving the math building through the front door.

The three of them are self-service and the daily menu includes 2 courses (with several choices for each of them), mineral water, bread and dessert.

Group picture:

Wednesday, 13:30, in front of the Math building.

