



Research Report 2005

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Preface

In the fifteenth year of the publication of this report we reassert its original goals:

The Department of Mathematics regards the annual publication of this research report as an important instrument of scientific policy. The report fulfills simultaneously two complementary purposes. Internally, it highlights the research publications by department members and their involvement in international scientific exchange as a public statement of the importance we attach to them. Externally, it provides information to interested people outside the department about our current research work. Reflecting the scientific activity developed by its members, the research report is a helpful way of assessing the level of achievement of the objectives embraced by the department. These include the pursuit of internationalization as a way to achieve recognition as a mathematics research department.

The Department of Mathematics has at present 108 members holding Ph.D. degrees and is the largest mathematics department in the country. All information regarding the department and its own graduate and undergraduate programs is available through the Internet (<http://www.math.ist.utl.pt>).

The department experienced a fast development since it embraced the goal of becoming a research department about 20 years ago. Its members obtained Ph.D. degrees from a diversified group of leading universities in mathematics while their relative youth accounts for an energetic environment and provides a good opportunity for innovative and challenging research projects.

In 1996, 1999 and 2002 the activities of the research centers that involve the department members were subjected to external international reviews within the overall Research Units Assessment scheme established, at internal level, by the Science and Technology Foundation, the public agency responsible for promoting, funding and evaluating research in Portugal. The research centers related to our department received very high ratings, acknowledging the high international value of the research performed. The organization of this report reflects the activities of the centers associated to our department. However, only the research carried out by the department members is included in this report.

We would like to thank everyone who was involved in the organization of this issue, especially Prof. José Natário, who coordinated the production of the report. We are also grateful to Margarida Silva Carvalho for her work in the compilation of information and \LaTeX processing of this issue.

Lisbon, July, 2006

The Department Chairman,

Prof. Carlos J. S. Alves

Research centers

Most of the research activities in the Department are organized in research centers approved and regularly assessed by international evaluation panels within a scheme of national scope established by the Science and Technology Foundation, the public agency responsible for promoting, funding and evaluating research in Portugal.

The majority of the Department staff belongs to one of the following Centers:

- Center for Logic and Computation, coordinated by C. Sernadas, with 15 Ph.D. members.
URL: <http://www.math.ist.utl.pt/clc/>
- Center for Mathematical Analysis, Geometry, and Dynamical Systems, coordinated by C. Rocha, with 54 Ph.D. members.
URL: <http://www.math.ist.utl.pt/cam/>
- Center for Mathematics and its Applications, coordinated by A. Sequeira, with 43 Ph.D. members.
URL: <http://www.math.ist.utl.pt/cma/>

Other Centers, mainly based on researchers of other departments, count with one or two members of the Department of Mathematics, namely:

- Center for Mathematics and Fundamental Applications, CMAF (Lisbon University), coordinated by L. Sanchez.
URL: <http://cmf.lmc.fc.ul.pt/>
- Center for Plasma Physics, coordinated by J. T. Mendonça.
URL: <http://cfp.ist.utl.pt/>
- Mathematical Physics Group, Lisbon University, coordinated by J.-C. Zambrini.
URL: <http://gfm.cii.fc.ul.pt/>
- Research Unit of Marine Technology and Engineering, coordinated by C. G. Soares.
URL: <http://mar.ist.utl.pt/uetrn/>

Research areas

The research activity mentioned above is developed in the following main areas:

Dynamical Systems and Differential Equations

The dominant research in this area falls within the general field of mathematical analysis with an emphasis on nonlinear problems whose interest in applications is well known. The activities cover the following subjects: dynamical systems and ergodic theory, ordinary, partial and functional differential equations, calculus of variations and optimization, geometric, topological and algebraic methods in nonlinear analysis, control theory and mechanics of continuous media. The research follows five lines of work: qualitative theory of dynamical systems; geometric mechanics and Hamiltonian systems; methods of nonlinear analysis in mechanics of continuous media; methods of nonlinear systems analysis in control theory; ergodic theory and dynamical systems.

Geometry and Topology

The work in these areas addresses several topics which can be divided into five main fields as follows: i) symplectic geometry, including the study of topological invariants of groups of symplectomorphisms, presymplectic invariants, Poisson manifolds and Hamiltonian circle actions; ii) algebraic geometry, covering the theory of algebraic curves and surfaces, moduli of instantons and vector bundles, spaces of algebraic cycles and pluricanonical maps to projective space; iii) algebraic topology, including elliptic cohomology, algebraic K-theory, equivariant homotopy theory and homological algebra; iv) differential geometry, involving Lie groupoids and algebroids, Kähler geometry, geometric quantization, gerbes, noncommutative geometry and infinite dimensional differential geometry; v) discrete geometry, with emphasis on oriented matroids and arrangements of hyperplanes. The research in geometry and topology also addresses applications to problems motivated from areas of mathematical-physics such as general relativity, symmetries of dynamical systems, Yang-Mills and Chern-Simons theory, string theory and quantum topology.

Operator Theory and Integral Equations

The work in this area is focused on classes of linear operators like Toeplitz, Carleman-Shift singular integral operators and pseudo-differential operators. Current problems under investigation include factorization of (semi)-almost periodic matrix-valued symbols, diffraction problems with approximate boundary conditions of arbitrary order, normalizations problems, symbol calculi, index theory and methods for classes of convolution type operators. C^* algebras of operators on Hardy and Bergman spaces and invertibility theory for non local C^* algebras are other research topics. Applications of the above topics to elliptic boundary-value problems, in particular, problems in diffraction theory are being studied. Applications to other problems in Mathematical Physics such as integrable systems are also of interest to members of the research group.

Probability, Statistics and Applications

The research in this general area has focused on queuing theory and quality control, multivariate analysis, stochastic optimization, categorical data analysis and statistical inference. In queuing theory and quality control interest is concentrated on order relations, transient behavior, threshold problems, and on control charts. In the area of multivariate analysis, topics of interest are factor analysis and related models, multidimensional scaling and discriminant analysis. Particular attention is given to the study of the robustness of these methods. In categorical data analysis and statistical inference, emphasis has been given to incomplete data and statistical theory advanced topics relying on measure and integration.

Numerical Analysis and Applications in Continuum Mechanics

Research in this area has been focused on mathematical and numerical problems in differential and integral equations with applications in continuum mechanics. More precisely:

- (i) mathematical and numerical analysis of models in haemodynamics, analysis of the motion of rigid bodies in viscous fluids, analysis of thin flows in lubrication and oceanography;
- (ii) singular boundary value problems for second order nonlinear ordinary differential equations, mathematical analysis and numerical methods for Volterra integral equations with singular kernels;
- (iii) mathematical and numerical analysis for direct and inverse problems in acoustic and elastic scattering, meshless methods for partial differential equations.

Logic and Computation

Research in this area is concentrated on four main topics: (i) abstract deductive systems, with emphasis on analysis and synthesis of logic systems, including modal logic, hybrid logic, paraconsistent logic, observational logic, probabilistic logic, algebraic logic, higher-order logic and categorical logic, with applications in knowledge representation, software engineering and security; (ii) probabilistic and quantum computation and information, including probabilistic models of computation, quantum computation and quantum cryptography, with applications in security; (iii) dynamical systems and computational complexity, including digital and analog computation, physical realizability of analog computational classes, recursive functions over the reals, analog characterization of low time complexity classes, links between computational complexity and dynamical systems, neural networks, brain modeling with dynamical systems, and applications in classification of spatial data; (iv) type theory, constructive mathematics and mobile computation, including higher-order logics and type systems applied to constructive mathematics and to provably correct concurrent and distributed mobile systems.

Other Areas

There are also some members of the department working in other areas, including operations research and the theory of distributions.

Research seminars

During 2005 the Department of Mathematics at Instituto Superior Técnico ran regular sessions of the following seminars:

- CEMAT's Open Seminar (4 sessions).
Organizer: Adélia Sequeira.
- Seminar on Algebra (6 sessions).
Organizers: Pedro Ferreira dos Santos, Pedro Resende and Maria Vaz Pinto.
- Seminar on Analysis, Geometry, and Dynamical Systems (28 sessions).
Organizer: Luis Barreira.
- Seminar on Applied Mathematics and Numerical Analysis (24 sessions).
Organizer: Adélia Sequeira.
- Seminar on Functional Analysis and Applications (19 sessions).
Organizer: Frank-Olme Speck.
- Seminar Geometria em Lisboa (14 sessions).
Organizer: Sílvia Anjos.
- Seminar on Logic and Computation (32 sessions).
Organizer: Amílcar Sernadas.
- Seminar on Mathematical Physics (2 sessions).
Organizers: Carlos Florentino, José Natário.
- Seminar on Mathematics, Systems and Robotics, in collaboration with ISR (16 sessions).
Organizers: Diogo Gomes and João Xavier (ISR).
- Seminar on Partial Differential Equations (15 sessions).
Organizers: Diogo Gomes.
- Seminar on Probability and Statistics (8 sessions).
Organizer: Ana Maria Pires.
- Seminar on Quantum Computation and Information (24 sessions), in collaboration with the Department of Physics.
Organizer: Ana Maria Martins (Department of Physics), Jorge Buescu and Paulo Mateus.
- Seminar on Topological Quantum Field Theory Club (6 sessions).
Organizers: José Mourão and Roger Picken.

Colloquium: the department also runs a Colloquium, jointly sponsored by the Center for Logic and Computation, the Center for Mathematical Analysis, Geometry, and Dynamical Systems, and the Center for Mathematics and its Applications, with 3 session in 2005. The organizer was Ana Bela Cruzeiro.

1 Publications

1.1 Publications in 2005

1.1.1 Books (authored or edited)

- **Center for Logic and Computation (CLC)**

A. Cannas da Silva, L. Cruz-Filipe, R. Gonçalves, J. Pimentel Nunes, A.R. Pires, T. Reis. P.M. Resende, J. Silva (Eds.), *Seminário Diagonal, Proceedings II*, IST (2005).

W. A. Carnielli and P. Mateus (Eds.) *Selected papers from CombLog'04*, Vol. 13(6), Special issue of Logic Journal of the IGPL (2005).

- **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

A. Cannas da Silva, L. Cruz-Filipe, R. Gonçalves, J. Pimentel Nunes, A.R. Pires, T. Reis. P.M. Resende, J. Silva (Eds.), *Seminário Diagonal, Proceedings II*, IST (2005).

J. Labastida, M. Marino, *Topological quantum field theory and four manifolds*, Mathematical Physics Studies, 25, Springer (2005).

M. Marino, Chern-Simons *Theory, Matrix Models, and Topological Strings*, International Series of Monographs on Physics, Oxford Univ. Press (2005).

- **Center for Mathematics and its Applications (CEMAT)**

V.M.A. Leitão C.J.S. Alves and C.A. Duarte, *Proceedings of the ECCOMAS*, Thematic Conference on Meshless Methods. ISBN 972-99289-1-6, IST, Lisboa (2005).

G.P. Galdi and A. Sequeira (Eds.), *Special Issue dedicated to Prof. Hugo Beirão da Veiga on his 60th. birthday*, Journal of Mathematical Fluid Mechanics, Birkhäuser Verlag AG, vol. 7, sup. 2 (2005).

- **Other Research Units**

M. F. Ramalhoto (Associate Editor), Samuel Kotz, W. L. Pearn and Evdokia Xekalaki (Editors-in-Chief), *Quality Technology and Quantitative Management*, QTQM, Vol.2, Nos. 1-2 (2005).

M. F. Ramalhoto (Member of the Editorial Board Committee), Jean-Michel (Principal Editor), *European Journal of Engineering Education*, Vol. 30, Nos. 1-4 (2005).

1.1.2 Chapters/articles in books with international refereeing

- **Center for Logic and Computation**

C. Caleiro and R. Gonçalves, *Equipollent logical systems*, In J.-Y. Béziau (Editor), *Logica Universalis*, Birkhäuser Verlag, 2005, 99-112.

C. Caleiro, W. A. Carnielli, M. E. Coniglio, and J. Marcos, *Two's company: The humbug of many logical values*. In J.-Y. Béziau (Editor), *Logica Universalis*, Birkhäuser Verlag (2005), 169-189.

C. Caleiro, A. Sernadas, and C. Sernadas. *Fibering logics: Past, present and future*, in S. Artemov, H. Barringer, A. S. d'Avila Garcez, L. C. Lamb, and J. Woods (Eds), *We Will Show Them: Essays in Honour of Dov Gabbay*, Vol. One, College Publications (2005), 363-388

C. Caleiro, W. A. Carnielli, J. Rasga, and C. Sernadas, *Fibering of logics as a universal construction*. In D. Gabbay and F. Guenther (Eds.), *Handbook of Philosophical Logic*, 2nd Edition, Vol. 13, Springer (2005), 123-187.

F.-M. Dionísio, P. Gouveia and J. Marcos, *Defining and using deductive systems with Isabelle*, Computing, Philosophy and Cognition, L. Magnani and R. Dossena (Eds.), King's College Publications (2005), 271–293

- **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

L. Barreira, *Hiperbolicidade, recorrência e dimensão*, Supplement of the translation to Portuguese of the book by A. Katok and B. Hasselblatt, Introduction to the Modern Theory of Dynamical Systems, Cambridge University Press, 1995, Fundação Calouste Gulbenkian, 2005, 665–724.

M. Crainic, R.L. Fernandes, *Exotic Characteristic Classes of Lie Algebroids*, in Quantum Field Theory and Noncommutative Geometry, Lecture Notes in Physics, Ursula Carow-Watamura, Yoshiaki Maeda, Satoshi Watamura (Eds.), Vol. 662, Springer-Verlag, Berlin (2005).

R. Picken, *A Cohomological Description of Abelian Bundles and Gerbes*, in Twenty Years of Białowieża: A Mathematical Anthology. Aspects of Differential Geometric Methods in Physics, World Scientific Monograph Series in Mathematics, S. Twareque Ali, Gerard G. Emch, Anatol Odziejewicz, Martin Schlichenmaier, Stanislaw L. Woronowicz (Eds.), World Scientific, New Jersey, London, Singapore 2005, Vol.8, Chapter 10, 217–228. ISBN: 981-256-146-3.

- **Center for Mathematics and its Applications (CEMAT)**

V. M. A Leitão, C.J.S. Alves and C.A. Duarte, *Proceedings of the ECCOMAS, Thematic Conference on Meshless Methods*, ISBN 972-99289-1-6, IST, Lisboa (2005).

- **Other Research Units**

R. Coutinho, B. Fernandez, *Spatially extended monotone mappings*, in Dynamics of coupled map lattices and of related spatially extended systems, J.-R. Chazottes e B. Fernandez (Eds.), Lecture Notes in Physics 671, Springer-Verlag (2005), 265–284.

M. F. Ramalhoto and R. Goeb, *An Innovative Strategy to Put Integrated Maintenance, Reliability and Quality Improvement Concepts Into Action*, in Safety and Reliability 2, K. Kolowrocki (Ed.), Balkema (2005), 1655–1660.

1.1.3 Articles in international serials

- **Center for Logic and Computation**

C. Caleiro and J. Ramos, *Cryptomorphisms at work*, in Recent Trends in Algebraic Development Techniques in Selected Papers, J. Fiadeiro, P. Mosses, and F. Orejas (Eds.), Lecture Notes in Computer Science, Vol. 3423, Springer-Verlag (2005), 45–60.

P. Mateus, A. Sernadas, and C. Sernadas, *Exogenous semantics approach to enriching logics*, in G. Sica (Editor), Essays on the Foundations of Mathematics and Logic, volume 1 of Advanced Studies in Mathematics and Logic, Polimetrica (2005), 165–194.

- **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

J. Buescu, D. Graça, M. Campagnolo, *Robust Simulations of Turing Machines with Analytic Maps and Flows*, in Lecture Notes in Computer Science, 3526 (2005), 169 – 179.

- **Center for Mathematics and its Applications (CEMAT)**

L. Castro, R. Duduchava and F.-O. Speck, *Finite interval convolution operators with transmission property*, Integr. Equ. Oper. Theory Vol. 52 (2005), 165–179.

L. Castro, F.-O. Speck and F.S. Teixeira, *Mixed boundary value problems for the Helmholtz equation in a quadrant*, Integr. Equ. Oper. Theory, online publ. DOI 10.1007/s00020-005-1410-4 (2005), 1–44.

P. M. Lima, N. B. Konyukhova, N. V. Chemetov and A. I. Sukov, *Mathematical analysis and numerical solution of a singular problem in nonlinear physics*, Vestnik Nizhegorodskogo Universiteta, in Mathematical Modeling and Optimal Control (28) 1 (2005), 162–171.

• **Other Research Units**

R. Kenett, M.F. Ramalhoto and J. Shade, *Statistical Practitioners: A New Profession in Business and Industry*, Scientific Computing World, Issue 81 (2005), 41–42.

J. Mycka and J. Félix Costa, *The computational power of continuous dynamic systems, Machines, Computations, and Universality* (MCU 2004), Lecture Notes in Computer Science 3354, Springer-Verlag (2005), 163–174.

1.1.4 Articles in international journals

• **Center for Logic and Computation (CLC)**

C. Caleiro, L. Viganò and D. Basin, *Deconstructing Alice and Bob*. *Electronic Notes in Theoretical Computer Science* (1) 135 (2005), 3–22.

C. Caleiro, L. Viganò, and D. Basin, *Metareasoning about security protocols using distributed temporal logic*, *Electronic Notes in Theoretical Computer Science* (1) 125 (2005), 67–89.

C. Caleiro, L. Viganò, and D. Basin, *Relating strand spaces and distributed temporal logic for security protocol analysis*, *Logic Journal of the IGPL* (6) 13 (2005), 637–664.

P. Mateus, J. Rasga, and C. Sernadas, *Modal sequent calculi labelled with truth values: Cut elimination*, *Logic Journal of the IGPL* (2) 13 (2005), 173–199.

• **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

M. Abreu, G. Granja, N. Kitchloo, *Moment Maps, Symplectomorphism Groups and Compatible Complex Structures*, *Journal of Symplectic Geometry*, Vol. 3, Issue 4 (2005).

M. Aganagic, A. Klemm, M. Mariño, C. Vafa, *The topological vertex*, *Comm. Math. Phys.* 254 (2005), 425–478.

J. F. Alves, M. M. Graça, M. E. Sousa Dias and J. Sousa Ramos, *A linear algebra approach to the conjecture of Collatz*, *Linear Algebra Appl.* 394 (2005), 277–289.

J. F. Alves, R. Hric and J. Sousa Ramos, *Topological entropy, homological growth and zeta functions on graphs*. *Nonlinearity* (2) 18 (2005), 591–607.

J. F. Alves, J. L. Fachada and J. Sousa Ramos, *Detecting topological transitivity of piecewise monotone interval maps*, *Topology and its Applications* (5–6) 153 (2005), 680–697.

L. Barreira and C. Silva, *Lyapunov exponents for continuous transformations and dimension theory*, *Discrete Contin. Dyn. Syst.* 13 (2005), 469–490.

L. Barreira and C. Valls, *Higher regularity of invariant manifolds for nonautonomous equations*, *Nonlinearity* 18 (2005), 2373–2390.

L. Barreira and C. Valls, *Smoothness of invariant manifolds for nonautonomous equations*, *Comm. Math. Phys.* 259 (2005), 639–677.

- L. Barreira and C. Valls, *Stability of nonautonomous differential equations in Hilbert spaces*, J. Differential Equations 217 (2005), 204–248.
- L. Barreira and C. Valls, *Center manifolds for nonuniformly partially hyperbolic diffeomorphisms*, J. Math. Pures Appl. 84 (2005), 1693–1715.
- A. C. Barroso e J. Matias, *Necessary and Sufficient Conditions for Existence of Solutions of a Variational Problem Involving the Curl*, Discrete and Continuous Dynamical Systems Series A, 1 (12) (2005), 97–114.
- J. Bojarczuk, P. Lopes, *Quandles at finite temperatures III*, J. Knot Theory Ramifications 14, 3 (2005), 275–373.
- V. Bouchard, B. Florea, M. Mariño, *Topological open string amplitudes on orientifolds*, J. High. Energy Phys. 002 (2005), 35
- R. Cordovil and David Forge, *Gröbner and diagonal bases in Orlik-Solomon type algebras*, Cubo Journal 7 (2005), 1–20.
- J. Costa and J. Natário, *Homogeneous cosmologies from the quasi-Maxwell formalism*, J. Math. Phys. 46 (2005) 082501 (17 pages).
- M. Crainic, R.L. Fernandes, *Rigidity and flexibility in Poisson geometry*, Trav. Math. XVI (2005), 53–68.
- J. Duarte, J. Sousa Ramos, *Topological invariants in forced piecewise-linear FitzHug-Nagumo-like systems*, Chaos, Solitons & Fractals (5) 23 (2005), 1553–1565.
- J. M. Ferreira, *Nonoscillations in Retarded Systems*, J. Math. Anal. and Appl. Vol. 308 (2005), 714–729.
- C. Florentino, P. Matias, J. Mourão e J. P. Nunes, *Geometric quantization, complex structures and the coherent state transform*, J. Funct. Anal. (2) 221 (2005), 303–322.
- J. O. Freitas and J. Sousa Ramos, *Star-product on Newton map for quintic polynomials*, Int. J. Pure Appl. Math. (4) 20 (2005), 437–447.
- D. Gomes, R. Iturriaga, K. Khanin e P. Padilla, *Convergence of Viscosity Solutions of Burgers equation with Random Forcing*, Moscow Mathematical Journal (3) 5 (2005), 1–19
- D. Gomes, *Viscosity Solution Methods and the Discrete Aubry-Mather Problem*, Discrete and Continuous Dynamical Systems (1) 13 (2005), 103–116.
- J. P. Lampreia, R. Severino and J. Sousa Ramos, *Irreducible complexity of iterated symmetric bimodal maps*, Discrete Dyn. Nat. Soc. 1 (2005), 69–85.
- P. Lopes, C. A. Morales, *The knot group and the fundamental group of the embedding 3-manifold*, J. Knot Theory Ramifications 14, 2 (2005), 265–273.
- M. Mariño, *Chern-Simons theory and topological strings*, Rev. Modern Phys. 77 (2005), 675–720.
- M. Mariño, *Chern-Simons theory, matrix integrals, and perturbative three-manifold invariants*, Comm. Math. Phys. 253 (2005), 25–49.
- P. Martins Rodrigues and J. Sousa Ramos, *Bowen-Franks groups as conjugacy invariants for T^n -automorphisms*. Aequationes Math. (3) 69 (2005), 231–249.

C. J. Mulvey, P. Resende, *A noncommutative theory of Penrose tilings*, Internat. J. Theoret. Phys. 44 (2005), 655–689.

J. E. Nelson and R. F. Picken, *Constant connections, quantum holonomies and the Goldman bracket*, Adv. Theor. Math. Phys. 9 (2005), 407–433.

J. P. Santos, *Framed holomorphic bundles on rational surfaces*, J. Reine Angew. Math. 589, (2005), 129–158.

A. Serra, *New examples of non-complete Pick kernels*, Integral Equations Operator Theory (4) 53 (2005), 553–572.

M. Stosic and R. F. Picken, *Parasupersymmetric Quantum Mechanics of Order 3 and a Generalized Witten Index*, Mod. Phys. Lett. A 20 (2005) 1395–1407.

J. Ventura, *Homological algebra for the representation Green functor for abelian groups*, TAMS (6) 357 (2005), 2253–2289.

S. Vinagre, R. Severino and J. Sousa Ramos, *Topological invariants in nonlinear boundary value problems*. Chaos, Solitons & Fractals (1) 25 (2005), 65–78.

• **Center for Mathematics and its Applications (CEMAT)**

C. J. S. Alves and C. S. Chen, *A new method of fundamental solutions applied to nonhomogeneous elliptic problems*, Adv. Comp. Math. 23 (2005), 125–142.

C. J. S. Alves and S. S. Valtchev, *Numerical comparison of two meshfree methods for acoustic wave scattering*, Eng. Analysis Bound. Elements (4) 29 (2005), 371–382 .

C. J. S. Alves and P. R. S. Antunes, *The method of fundamental solutions applied to the calculation of eigenfrequencies and eigenmodes of 2D simply connected shapes*, Comp. Mat. and Continua (4) 2 (2005), 251–266.

J. A. Amaral, E. P. Pereira and M. T. Paixão, *Data and Projections of HIV/AIDS Cases in Portugal: An Unstoppable Epidemic?*, Journal of Applied Statistics (2) 32 (2005), 127–140.

N. Antunes, C. Nunes and A. Pacheco, *Functionals of Markovian Branching Processes*, Stoch. Models (2–3), 21 (2005), 261–278.

N. Cirilo António and N. Manojlovic, *\mathfrak{sl}_2 Gaudin Model With Jordanian Twist*, J. Math. Phys. 46, 102701 (2005).

N. Arada and A. Sequeira, *Existence results for steady flows of quasi-Newtonian fluids using weak monotonicity*, J. Math. Fluid Mech. (7) 2 (2005), 273–288.

N. Arada and A. Sequeira, *Steady flows of Oldroyd-B fluids with shear-dependent viscosity around an obstacle*, J. Math. Fluid Mech., (7) 3 (2005), 1–33.

N. Arada, M. Pires and A. Sequeira, *Numerical simulations of shear-thinning Oldroyd-B fluids in curved pipes*, IASME Transactions, Issue (2) 6 (2005), 948–959.

M.A. Bastos, C.A. Fernandes and Yu. I. Karlovich, *C^* algebras of integral operators with piecewise slowly oscillating coefficients and shifts acting freely*, Integral Equations Operator Theory, On Line First (2005) (49 pages).

L. Castro and F.-O. Speck, *Inversion of matrix convolution type operators with symmetry*, Portugaliae Mathematica Vol. 62 (2005), 193–216.

- N. Antunes, C. Nunes, and A. Pacheco, *Functionals of Markovian Branching Processes*, Stoch. Models (2-3) 21 (2005), 261–278.
- F. Ferreira and A. Pacheco, *Level-crossing ordering of skip-free to the right continuous time Markov chains*, J. Appl. Probab. (1) 42 (2005), 52–60.
- F. Ferreira and A. Pacheco, *Level-crossing ordering of semi-Markov processes and Markov chains*, J. Appl. Probab. (4) 42 (2005), 989–1002.
- G.P. Galdi and A. L. Silvestre, *Strong Solutions to the Navier-Stokes Equations Around a Rotating Obstacle*, Arch. Ration. Mech. Anal. (3) 176 (2005), 331–350.
- A. Karlovich and P. A. Santos, *On Asymptotics of Toeplitz Determinants with Symbols of Nonstandard Smoothness*, Journal of Fourier Analysis and Applications (1) 11 (2005), 43–72.
- Yu. I. Karlovich and L. Pessoa, *Algebras generated by Bergman and anti-Bergman projections and by multiplications by piecewise continuous coefficients*, Integral Equations and Operator Theory 52 (2005), 219–270.
- C. M. Marques, V. J. Carocha, A. R. Pereira de Sá, M. R. Oliveira, A. M. Pires, N. M. G. Borralho and R. Sederoff, *Verification of QTL linked markers for propagation traits in Eucalyptus*, Tree Genetics & Genomes (3) 1 (2005), 103–108.
- C. M. Santos-Pereira and A. M. Pires, *On optimal reject rules and ROC curves*, Pattern Recognition Letters (7) 26 (2005), 943–952.
- C. D. Paulino, G. L. Silva, and J. Achcar, *Bayesian analysis of correlated misclassified binary data*, Computational Statistical and Data Analysis 49 (2005), 1120–1131.
- A. E. Pinto, P. Monteiro, G. L. Silva, J. V. Ayres and J. Soares, *Prognostic Biomarkers in Renal Cell Carcinoma: Relevance of DNA Ploidy in Predicting Disease-Related Survival*, The International Journal of Biological Markers 20 (2005), 249–256.
- A. M. Robertson and A. Sequeira, *A director theory approach for modeling blood flow in the arterial system: an alternative to classical 1-D models*. Math. Models & Methods in Appl. Sci.–M3AS (15) 6 (2005), 871–906.
- **Other Research Units**
- A. B. Cruzeiro, F. Cipriano, *Flows associated with irregular \mathbb{R}^d -vector fields*, J. Diff. Equations (1) 219 (2005), 183–201.
- J. Félix Costa and J. Mycka, *What lies beyond the mountains, computational systems beyond the Turing limit*, Bulletin of the European Association for Theoretical Computer Science 85 (2005), 181–189.
- M. I. Santos and A. Porta Nova, *Estimation of nonlinear simulation metamodels using control variates*, Journal of Statistical Computation and Simulation 75 (2005) 959–973.

1.1.5 Articles/communication in proceedings of international conferences

• **Center for Logic and Computation (CLC)**

- S. Costa, C. Cardeira, J. Pargana, F.M. Dionísio and P.A. Santos, *Systems and signals online questions and grading*, in Lucia lo Bello and Thile Sauter, Eds., Proceedings of the 10th IEEE International Conference on Emerging Technologies and Factory Automation (2005), 41–47.

F. M. Dionísio, P. Gouveia and J. Marcos, *Defining and using deductive systems with Isabelle*, in L. Magnani and R. Dossena Eds., *Computing, Philosophy and Cognition*, King's College Publications, London (Proceedings of the conference E-CAP2004) (2005).

P. Mateus and A. Sernadas, *Complete exogenous quantum propositional logic*, Short presentation at LICS, Chicago, USA, June 26–29, 2005.

J.áRasga, *Cut elimination in propositional based logics*, in P.áBruscoli, F.áLamarche, and C.áStewart, Eds., *Proceedings of Structures and Deduction – the Quest for the Essence of Proofs* (satellite workshop of ICALP'05), 205–214.

• **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

J. F. Alves, J. L. Fachada and J. Sousa Ramos, *A condition for transitivity of Lorenz maps*, Proceedings of the Eighth International Conference on Difference Equations and Applications, Chapman & Hall/CRC, Boca Raton, FL (2005), 7–13.

L. Barreira, *Poincaré recurrence: old and new*, XIV International Congress on Mathematical Physics (Lisboa, 2003), World Scientific (2005) 415–422.

J. Duarte, L. Silva and Sousa Ramos, *Symbolic dynamics in the study of bursting electrical activity*, in *Difference Equations and Discrete Dynamical Systems*, Proc. of the 9th. International Conference (Los Angeles, August 2–7 2004), World Scientific (2005).

D. Evans and P. Pinto, *Modular invariants and the double of the Haagerup subfactor*, in *Advances in Operator Algebras and Mathematical Physics*, Edited by F. Boca, O. Bratteli, R. Longo and H. Siedentop, Theta Series in Advanced Mathematics, distributed by AMS, Sinaia, June 26–July 4, 2003 (2005) 67–88.

R. L. Fernandes, *A note on proper Poisson actions*, in Proceedings of the 10th International Conference in Modern Group Analysis, (Oct. 2004), N. H. Ibragimov, C. Sophocleous, P. A. Damianou (Eds.), Larnaca, Cyprus (2005), 77–84.

S. Fernandes and J. Sousa Ramos, *Second smaller zero of kneading determinant for iterated maps*. Proceedings of the Eighth International Conference on Difference Equations and Applications, Chapman & Hall/CRC, Boca Raton, FL (2005), 137–144.

D. Gomes, A. Oberman, *Computing the effective Hamiltonian using a variational approach*, Proceedings of the Joint 44th IEEE Conference on Decision and Control and European Control Conference (CDC-ECC'05), Seville, Spain, December 12–15 2005, 2574–2579.

J. E. Nelson and R. F. Picken, *Classical and quantum geometry of moduli spaces in three-dimensional gravity*, Proceedings of the XIII Fall Workshop on Geometry and Physics, Murcia (Sept. 20–22, 2004), L. J. Alías Linares et al (Eds.), RSME, Vol. 9 (2005), 104–114.

H. Oliveira and J. Sousa Ramos, *Iterates of the tangent map—the bifurcation scheme*, Proceedings of the Eighth International Conference on Difference Equations and Applications, Chapman & Hall/CRC, Boca Raton, FL (2005), 209–217.

C. Rocha, *Transversality in Semilinear Parabolic Equations on the Circle*, Equadiff 2003 – Proceedings of the International Conference on Differential Equations, F. Dumortier, H. Broer, J. Mawhin, A. Vanderbauwhede and S. V. Lunel (Eds.), Hasselt 2003, World Scientific (2005), 672–677.

Sandra Vinagre and J. Sousa Ramos, *Symbolic dynamics generated by an idealized time-delayed Chua's circuit*, Proceedings of the Eighth International Conference on Difference Equations and Applications, Chapman & Hall/CRC, Boca Raton, FL (2005), 273–280.

A. Sharkovsky, J. Sousa Ramos and S. Berezovsky, *Attractors of one-dimensional maps generated by boundary value problems*, Conference in Physics and Control, St.-Petersburg, 23–28 August 2005.

• **Center for Mathematics and its Applications (CEMAT)**

C.J.S. Alves and S.S. Valtchev, *A Kansa type method using fundamental solutions applied to elliptic PDEs*, in Proceedings of the ECCOMAS Thematic Conference on Meshless Methods. B43.1–6, Instituto Superior Técnico, Lisboa, 2005.

C.J.S. Alves and P.R.S. Antunes, *The method of fundamental solutions applied to the numerical calculation of eigenfrequencies and eigenmodes of 3D simply connected domains*, in Proceedings of the ECCOMAS, Thematic Conference on Meshless Methods. B34.1–6, Instituto Superior Técnico, Lisboa, 2005.

N. Arada, M. Pires and A. Sequeira, *Secondary flows of shear-thinning generalized Newtonian fluids in curved pipes*, Proceedings of the 3rd IASME/WSEAS Int. Conf. on Fluid Mechanics and Aerodynamics, Corfu Island, Greece (August 20–22, 2005), 118–123.

F. Carapau and A. Sequeira, *Axisymmetric Flow of a Generalized Newtonian Fluid in a Straight Pipe Using a Director Theory Approach*, Proceedings of the 8th WSEAS International Conference on Applied Mathematics (December 16–18, 2005), Tenerife, Spain, 303–308.

T. Diogo, P.M. Lima and M.S. Rebelo, *Computational methods for a nonlinear Volterra integral equation*, Proceedings of the 7th Hellenic European Conference on Computer Mathematics and its Applications, September 22–24, 2005, Athens, HERCMA Conference Series, LEA Publishers, 100–107, ISBN: 960-87275-8-8.

F. Ferreira and A. Pacheco, *Analysis of Pareto-Type/M/s/c finite buffer queues*, in Procs, Second Workshop on New Trends in Modelling, Quantitative Methods and Measurements, Aveiro, Portugal (November 24–25 2005).

F. Ferreira and A. Pacheco, *Some results for $GI^X/M/s/c$ queues*, Procs. of the 2005 International Symposium on Applications and the Internet (SAINT 2005 Workshops), Trento, Italy, (January 31–February 04, 2005), 2005, 252–255.

F. Ferreira and A. Pacheco, *An Efficient Approach to Analyze Finite Buffer Queues with Generalized Pareto Interarrival Times and Exponential Service*, Procs. International Workshop on Recent Advances in Stochastic Operations Research – RASOR 2005, Canmore, Canada (August 2005), 2005, T. Dohi, S. Osaki, and K. Sawaki (Eds.), 34–41.

F. Ferreira and A. Pacheco, *Simulation of semi-Markov processes and Markov chains ordered in level crossing*, in Procs. (NGI 2005), First Conference on Next Generation Internet Networks, Rome, Italy, (April 2005), 2005.

A. Nogueira, M.R. de Oliveira, P. Salvador, R. Valadas, and A. Pacheco, *Classification of Internet Users using Discriminant Analysis and Neural Networks*, in Procs. (NGI 2005), 1st Conference on Next Generation Internet Networks, Rome, Italy (April 2005), 2005.

A. Nogueira, P. Salvador, R. Valadas, and A. Pacheco, *Multilayer Markov modulated Poisson process for modeling self-similar traffic*, in Procs. 5th, Conference on Telecommunications, Tomar, Portugal, (April 2005), 2005.

M. R. de Oliveira, L. Sertório, R. Valadas, and A. Pacheco, *On the Structure of Network Traffic Flows*, in Procs. Second Workshop on New Trends in Modelling, Quantitative Methods and Measurements, Aveiro, Portugal (November 2005), 2005.

A. Pacheco and H. Ribeiro, *Bursts and gaps of Markov renewal arrival processes*, in Procs. International Workshop on Recent Advances in Stochastic Operations Research – (RASOR 2005), Canmore, Canada, (August 2005), T. Dohi, S. Osaki, and K. Sawaki (Eds.), 2005, 211–218.

A. Pacheco and H. Ribeiro, *Cumulative rewards and states visited over Markov-reward sequences*, in Procs. Second Workshop on New Trends in Modelling, Quantitative Methods and Measurements, Aveiro, Portugal (November 2005), 2005.

• **Other Research Units**

A. B. Cruzeiro, *On some probabilistic estimates of heat kernels and applications*, Publicaciones de la Real Sociedad Matemática Española, vol 9, Proceedings of the XIII Fall Workshop on Geometry and Physics, Murcia (2005).

J. Félix Costa and J. Mycka, *Polynomial complexity for analog computation* (abstract), in S. Barry Cooper, Benedikt Löwe, and Leen Torenvliet (Eds.), CiE 2005, New Computational Paradigms, Institute for Logic, Language and Computation (June 2005), 59.

1.1.6 Other publications

• **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

M. J. Borges, N. Martins, V. Neves, J. Teixeira, M. Wolff, *Mountain Pass Theorems without the Deformation Lemma*, I. Finite dimensional spaces, Cadernos de Matemática CM05/I-36, Departamento de Matemática da Universidade de Aveiro (2005).

M. Mercês Ramos and J. Sousa Ramos, *O contínuo (espaço-tempo relativo) e o discreto (quântico), o caos e a ordem*, revista da APM, Educação e Matemática 82 (2005), 15–18.

P. Resende, *Quantales as geometric objects: symmetry beyond groupoids?* (Feature article), CIM Bull. 18 (2005), 11–15.

• **Center for Mathematics and its Applications (CEMAT)**

M. Baía, PhD thesis, *Variational multiscale problems and applications to thin films*, May 2005. Adviser Irene Fonseca.

M. Baía and I. Fonseca, *Convergence of functionals with periodic integrands via 2-scale convergence*, CNA Preprint No. 05–CNA–010.

L. Castro and F.-O. Speck, *Convolution operators on intervals and their use in diffraction theory*, Bulletin of the International Center for Mathematics 19 (2005), 10–18.

F. Ferreira and A. Pacheco, *Ordenação estocástica em excedência de nível de processos semi-markovianos* (Level-crossing ordering of semi-Markov processes), in Estatística Jubilar, C. A. Braumann, P. Infante, M. M. Oliveira, R. Alpizar-Jara, and F. Rosado, Eds., Edições SPE, Lisboa (2005), 281–292.

G. L. Silva, C. B. Dean, J. Courteau, T. Niyonsenga e A. Vanasse, *Análise espacial de admissão de pacientes com enfarte do miocárdio em Quebeque*, Em Estatística Jubilar, C. A. Braumann, P. Infante, M. M. Oliveira, R. Alpizar-Jara e F. Rosado, Eds. (2005), Edições SPE, 717–722.

G. Jacinto, A. Pacheco, and N. Antunes, *Avaliação de medidas de controlo de redes de comunicação sem fios* (Performance evaluation of control measures in wireless communication networks), in Estatística Jubilar, C. A. Braumann, P. Infante, M. M. Oliveira, R. Alpizar-Jara, and F. Rosado, Eds., Edições SPE, Lisboa, 2005, 379–390.

A. Pacheco and H. Ribeiro, *Visitas a conjuntos de estados em processos semi-markovianos* (Visits to sets of states of semi-Markov processes), in *Estatística Jubilar*, C. A. Braumann, P. Infante, M. M. Oliveira, R. Alpizar-Jara, and F. Rosado, Eds., Edições SPE, Lisboa, 2005, 537–548.

C. D. Paulino, *A Evolução da Estatística Bayesiana em Portugal*, in *Memorial da Sociedade Portuguesa de Estatística*, F. Rosado, Eds., SPE (2005), Lisboa, 215 – 218.

E. Pereira, A. Silva, P. A. Santos, *O Fénix como ferramenta pedagógica*, VII jornadas pedagógicas do IST, IST, Lisboa, 2005.

N. Sepúlveda, C. D. Paulino and C. Penha-Gonçalves, *Modelos de interação genética em fenótipos binários complexos: nova modelação estatística e aplicação de metodologia bayesiana*, in *Estatística Jubilar*, C. Braumann, P. Infante, M. Oliveira, R. Alpizar-Jara e F. Rosado, Eds., SPE (2005), 703–716.

N. Sepúlveda, C. D. Paulino and C. Penha-Gonçalves, *Modelos de interação genética em fenótipos binários complexos*, in *Proceedings of I Congresso de Estatística e Investigação Operacional da Galiza e Norte de Portugal* (on-line), Universidade do Minho.

• Other Research Units

F. A. Dória and J. Félix Costa, *Introduction to the special issue on hypercomputation*, Editorial, *Applied Mathematics and Computation* 178(1) (2006) 1–3.

1.2 Publications accepted or submitted in 2005

• Center for Logic and Computation (CLC)

P. Adão and P. Mateus, *A process algebra for reasoning about quantum security*, *Electronic Notes in Theoretical Computer Science*, to appear. Preliminary version to be presented at 3rd International Workshop on Quantum Programming Languages, June 30 – July 1, 2005, Chicago, Affiliated Workshop of LICS 2005.

C. Caleiro and J. Ramos, *From fibring to cryptofibring: a solution to the collapsing problem*, CLC, Department of Mathematics, Instituto Superior Técnico, Portugal (2005). Submitted for publication.

C. Caleiro, P. Mateus, A. Sernadas and C. Sernadas, *Quantum institutions*, Preprint, CLC, Department of Mathematics, Instituto Superior Técnico, Portugal (2005), Submitted for publication.

C. Caleiro, L. Viganò, and D. Basin, *On the expresiveness of a message sequence formalism for security protocols*, CLC, Department of Mathematics, Instituto Superior Técnico, Portugal (2005). Submitted for publication.

R. Chadha, P. Mateus, A. Sernadas and C. Sernadas, *Extending classical logic for reasoning about quantum systems*, Preprint, CLC, Department of Mathematics, Instituto Superior Técnico, Portugal, 2005. Submitted for publication.

L. Cruz-Filipe, A. Sernadas and C. Sernadas, *Heterogeneous fibring of deductive systems via abstract proof systems*, Preprint, CLC, Department of Mathematics, Instituto Superior Técnico, Portugal (2005). Submitted for publication.

L. Cruz-Filipe and C. Sernadas, *Sequent calculi based on derivations*, Preprint, CLC, Department of Mathematics, Instituto Superior Técnico, Portugal (2005). Submitted for publication.

P. Mateus and A. Sernadas, *Weakly complete axiomatization of exogenous quantum propositional logic*, Information and Computation, in print. ArXiv math.LO/0503453.

P. Mateus and Y. Omar, *A quantum algorithm for closest pattern matching*, in D. Angelakis and M. Christandl, Eds., Proceedings of NATO ASI Quantum Computation and Information, Chania, Crete, Greece, May 2–13, in print. IOS Press.

A. Sernadas, P. Mateus, and Y. Omar, *Quantum computation and information*, In M. S. Pereira, editor, Symposium on Scientific Research at the Technical University of Lisbon, Springer-Verlag, in print.

A. Vallecillo, V. T. Vasconcelos, and A. Ravara, *Typing the behavior of software components using session types*, Fundamenta Informaticae, to appear.

• **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

M. Aganagic, R. Dijkgraaf, A. Klemm, M. Mariño, C. Vafa, *Topological strings and integrable hierarchies*, Comm. Math. Phys. 261 (2006), 451–516.

J. Agapito and L. Godinho, *New polytope decompositions and Euler-Maclaurin formulas for simple integral polytopes*, arXiv: math.CO/0512475, submitted.

X. Arsiwalla, R. Boels, M. Marino, A. Sinkovics, *Phase transitions in q -deformed 2d Yang-Mills theory and topological strings*, Phys. Rev. D73 (2006) 026005, 14.

S. Bandyopadhyay, B. Dacorogna, A. C. Barroso and J. Matias, *Differential Inclusions for Differential Forms*, accepted for publication in Calculus of Variations and Partial Differential Equations.

L. Barreira, *Nonadditive thermodynamic formalism: equilibrium and Gibbs measures*, Discrete Contin. Dyn. Syst., to appear.

L. Barreira and K. Gelfert, *Multifractal analysis for Lyapunov exponents on nonconformal repellers*, Comm. Math. Phys., to appear.

L. Barreira and G. Iommi, *Suspension flows over countable Markov shifts*, J. Statist. Phys., to appear.

L. Barreira and Ya. Pesin, *Smooth ergodic theory and nonuniformly hyperbolic dynamics*, with appendix by O. Sarig, Handbook of Dynamical Systems 1B, Elsevier, 57–263, to appear.

L. Barreira and L. Radu, *Multifractal analysis of nonconformal repellers: a model case*, Dyn. Syst., to appear.

L. Barreira and V. Saraiva, *Explicit formulas for the average density of conformal repellers*, Ergodic Theory Dynam. Systems, to appear.

L. Barreira and C. Valls, *Multifractal structure of two-dimensional horseshoes*, Comm. Math. Phys., to appear.

L. Barreira and C. Valls, *Stable manifolds for nonautonomous equations without exponential dichotomy*, J. Differential Equations, to appear.

L. Barreira and C. Valls, *Existence of stable manifolds for nonuniformly hyperbolic C^1 dynamics*, Discrete Contin. Dyn. Syst., to appear.

L. Barreira and C. Valls, *A Grobman-Hartman theorem for nonuniformly hyperbolic dynamics*, J. Differential Equations, to appear.

- L. Barreira and C. Valls, *Nonuniform exponential dichotomies and Lyapunov regularity*, J. Dynam. Differential Equations, to appear.
- L. Barreira and C. Valls, *Smooth invariant manifolds in Banach spaces with nonuniform exponential dichotomy*, J. Funct. Anal., to appear.
- L. Barreira and C. Wolf, *Dimension and ergodic decompositions for hyperbolic flows*, Discrete Contin. Dyn. Syst., to appear.
- L. Barreira and C. Wolf, *Pointwise dimension and ergodic decompositions*, Ergodic Theory Dynam. Systems, to appear.
- M. J. Borges, *Heteroclinic and Homoclinic solutions for a singular Hamiltonian system*, European Journal of Applied Math.
- J. Buescu, M. Kulczycki, I. Stewart, *Liapunov stability and adding machines revisited*, Dynamical Systems: an International Journal, accepted for publication.
- J. Buescu, A. C. Paixão, *Algebraic, differential, integral and spectral properties of Mercer-like kernels*, ISAAC 2005 Conference Proceedings, World Scientific, to appear.
- J. Buescu, A. C. Paixão, *Inequalities for differentiable reproducing kernels and an application to positive integral operators*, Journal of Inequalities and Applications, accepted for publication.
- J. Buescu, A. C. Paixão, *Eigenvalues of positive integral operators in unbounded intervals*, Positivity, accepted for publication.
- J. Buescu, A. C. Paixão, *Positive definite matrices and reproducing kernel inequalities*, J. Math. Anal. Appl., accepted for publication.
- J. Buescu, A. C. Paixão, *Positive definite matrices and integral equations on unbounded domains*, Differential and Integral Equations, accepted for publication.
- J. Buescu, A. C. Paixão, *A linear algebraic approach to holomorphic reproducing kernels in \mathbb{C}^n* , Linear Algebra and its Applications, accepted for publication.
- J. Buescu, A. C. Paixão, *Eigenvalue distribution of positive definite kernels on unbounded domains*, submitted.
- J. Buescu, A. C. Paixão, *Inequalities for holomorphic reproducing kernels*, submitted.
- J. Buescu, A. C. Paixão, *Eigenvalue distribution of Mercer-like kernels*, submitted.
- A. Calabri, C. Ciliberto, M. Mendes Lopes, *Numerical Godeaux surfaces with an involution*, to appear in Transactions of the AMS.
- A. Calabri, M. Mendes Lopes, R. Pardini, *Involutions on numerical Campedelli surfaces*, arXiv: math.AG/0501551, submitted for publication.
- M. C. Câmara, M. C. Martins, *Explicit almost-periodic factorization for a class of triangular matrix functions* (2005), submitted for publication.
- A. Cannas da Silva, *Symplectic geometry*, Handbook of Differential Geometry, F. Dillen and L. Verstraelen (Eds.), Elsevier (2006), 79–188.
- R. Cordovil and David Forge, *An Orlik-Solomon type algebra for matroids with a fixed linear class of circuits*, to appear.

- R. Cordovil and David Forge, *Flipping in acyclic and strongly connected graphs*, submitted.
- C. Correia Ramos, P. R. Pinto and J. Sousa Ramos, *Orbit equivalence and von Neumann algebras for piecewise linear unimodal maps*, ECIT2004, European Conference on Iteration Theory, Batschuns, Austria. 10 pp, Submitted in 2005.
- C. Correia Ramos, N. Martins, R. Severino and J. Sousa Ramos, *Noncommutative topological dynamics*, to appear in *Chaos Solitons & Fractals* 27 (2006), no. 1, 15–23.
- C. Correia Ramos, N. Martins and J. Sousa Ramos, *Conductance and noncommutative dynamical systems*, to appear in *Nonlinear Dynamics* (2006) Springer.
- C. Correia Ramos, N. Martins, P.R. Pinto and J. Sousa Ramos, *Orbit equivalence and von Neumann algebras for piecewise linear unimodal maps*, to appear in *Iteration Theory (ECIT'04)*, Grazer Math. Berichte 2006.
- A. Corso, P. Gimenez, M. Vaz Pinto and S. Zarzuela (Eds.), *Commutative Algebra – Geometric, Homological, Combinatorial and Computational Aspects*, Lecture Notes in Pure and Applied Mathematics, Volume 244, Chapman & Hall/CRC.
- J. Drumond Silva, *An accuracy improvement in Egorov's theorem*, to appear in *Publicacions Matemàtiques*.
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- J. Duarte, L. Silva, and J. Sousa Ramos, *Types of bifurcations of FitzHugh-Nagumo maps*, to appear in *Nonlinear Dynamics* (2006) Springer.
- J. Duarte, L. Silva and J. Sousa Ramos, *Computation of the topological entropy in chaotic biophysical bursting models for excitable cells*, to appear in *Discrete Dynamics in Nature and Society* (2006).
- J. Duarte, L. Silva and J. Sousa Ramos, *The influence of coupling on chaotic maps modelling bursting cells*, to appear in *Chaos, Solitons & Fractals*, 28 (2006), 1314–1326.
- S. Fernandes and J. Sousa Ramos, *Second eigenvalue of transition matrix associated to iterated maps*, to appear in *Chaos, Solitons & Fractals* (2006).
- S. Fernandes and J. Sousa Ramos, *Conductance, Laplacian and mixing rate in discrete dynamical systems*, to appear in *Nonlinear Dynamics* (2006) Springer.
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- J. M. Ferreira e S. Pinelas, *Oscillatory mixed difference systems*, *Advances in Difference Equations* (aceite para publicação).
- C. Florentino, P. Matias, J. Mourão and J. P. Nunes, *On the BKS pairing for Kähler quantizations of the cotangent bundle of a Lie group*, to appear in *J. Funct. Analysis*
- C. Florentino, J. Mourão and J. P. Nunes, *Theta functions, geometric quantization and unitary Schottky bundles*, in *The Geometry of Riemann Surfaces and Abelian Varieties*, AMS, *Contemp. Math.* 397 (2006) 55–72.
- P. Girão and T. Weth, *The shape of extremal functions for Poincaré-Sobolev-type inequalities in a ball*, to appear in *J. Funct. Anal.*

- L. Godinho, *Semifree symplectic circle actions*, to appear in Trans. Amer. Math. Soc.
- L. Godinho, *Equivariant cohomology of S^1 -actions on 4-manifolds*, to appear in Canad. Math. Bull.
- L. Godinho and M. E. Sousa-Dias, *The fundamental group of S^1 -manifolds*, arXiv:math/0505420, submitted.
- D. Gomes, *Hamilton-Jacobi Methods for Vakonomic Mechanics*, aceite para publicação NoDEA
- C. Grácio and J. Sousa Ramos, *The first eigenvalue of the Laplacian and the conductance of a compact surface*, to appear in Nonlinear Dynamics (2006) Springer.
- C. Grácio and J. Sousa Ramos, *Spectrum of the laplacian on hyperbolic surfaces*, to appear in Iteration Theory (ECIT'04), Grazer Math. Berichte 2006.
- C. Januário, C. Grácio and J. Sousa Ramos, *Chaotic behavior in a two-dimensional business cycle model*, to appear in ICDEA2005, Tenth International Conference on Difference Equations and Applications, Munich, Germany, 25 – 30 July 2005.
- L. Kauffman and P. Lopes, *Color spectra and coloring conjectures*, submitted.
- A. Klemm and M. Mariño, *Counting BPS states on the Enriques Calabi-Yau*, hep-th/0512227.
- P. Lopes and D. Roseman, *On finite racks and quandles*, Comm. Algebra 34 (2006), no. 1, 371–406.
- N. Martins, R. Severino and J. Sousa Ramos, *Bowen-Franks groups of reducible bimodal subshifts of finite type*, to appear in Linear Algebra and its Applications 414 (2006) 125–137.
- J. Matias, *Differential inclusions in $SBV_0(\Omega)$ and applications to the calculus of variations*, accepted for publication in Journal of Convex Analysis.
- M. Mendes Lopes and R. Pardini, *The degree of the bicanonical map of a surface with $p_g = 0$* , to appear in Proceedings of the AMS.
- M. Mendes Lopes, R. Pardini, *On the algebraic fundamental group of surfaces with $K^2 \leq 3\chi$* , arXiv:math.AG/0512483, submitted for publication.
- J. Natário, *Newtonian limits of warp drive spacetimes*, Gen. Rel. Grav. 38 (2006), 475 – 484.
- M. Panthee and Jorge Drumond Silva, *Well-posedness for the Cauchy problem associated to the Hirota-Satsuma equation; periodic case*, to appear in Journal of Mathematical Analysis and Applications.
- P. Resende, *Étale groupoids and their quantales*, Adv. Math., arXiv:math/0412478.
- P. Resende, *A note on infinitely distributive inverse semigroups*, Semigroup Forum, arXiv:math/0506454.
- C. Rocha, *Realization of Period Maps of Planar Hamiltonian Systems*, Preprint.
- R. Severino, A. Sharkovsky, J. Sousa Ramos and S. Vinagre, *Symbolic dynamics in boundary value problem for systems with two spatial variables*, to appear in Iteration Theory (ECIT'04), Grazer Math. Berichte 2006.
- R. Severino, A. N. Sharkovsky, J. Sousa Ramos and S. Vinagre, *Computing topological invariants in boundary value problems reducible to difference equations*, to appear in Tenth International Conference on Difference Equations, Special Functions and Applications, ICDEA2005, Munich, Germany, 25 – 30 July 2005.

R. Severino, A. N. Sharkovsky, J. Sousa Ramos and S. Vinagre, *Topological invariants in a model of a time-delayed Chua's circuit*, to appear in Nonlinear Dynamics (2006) Springer.

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• **Center for Mathematics and its Applications (CEMAT)**

C.J.S. Alves and V.M.A. Leitão, *Crack analysis using an enriched MFS domain decomposition technique*, Eng. Analysis Bound. Elements, 30 (3), 160–166 (2006).

N. Arada, M. Pires and A. Sequeira, *Viscosity Effects on Flows of Generalized Newtonian Fluids through Curved Pipes*. Computers and Mathematics with Applications, in press.

A. M. Artoli and A. Sequeira, *Mesoscopic simulations of unsteady shear-thinning flows*, Computational Science - ICCS 2006, Springer Lecture Notes in Computer Science, vol 3992, in press.

J. F. Babadjian and M. Baía, *Multiscale nonconvex relaxation and applications to thin films*, to appear in Asymptotic Analysis.

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M. Baía and I. Fonseca, *The limit behavior of a family of variational multiscale problems*, to appear in Indiana University Mathematics Journal.

M. A. Bastos, P. A. Lopes and A. Moura Santos, *The two straight line approach and periodic diffraction boundary-value problems*, 23pp, submitted.

M. Bensaada, D. Esselaoui, P. Saramito and A. Sequeira, *Noncentered Second-order Galerkin-Lagrange Method for the Transient Navier-Stokes Equations*, submitted. á

G. Boente, A. M. Pires and I. M. Rodrigues, *Reweighted based estimators for the common principal components model: Influence functions and Monte Carlo study* (2005), submitted.

M. C. Câmara, *A new approach to factorization of a class of almost-periodic triangular symbols and related Riemann-Hilbert problems*, Journal of Functional Analysis 235, Issue 2 (2006), 559–592 .

F. Carapau and A. Sequeira, *1D Models for Blood Flow in Small Vessels Using the Cosserat Theory*, WSEAS Transactions on Mathematics, Issue 1, Vol. 5, in press.

C. Carvalho, *A K-theory proof of the cobordism invariance of the index*, arXiv.math.KT/0408260, accepted by K-theory.

M. Casquilho, M. Constantino and M. C. Morais, *Sobre a amostragem de aceitação para a variável gaussiana inversa* (On the acceptance sampling for the inverse gaussian distribution), submitted.

L. Castro, R. Duduchava and F.-O. Speck, *Asymmetric factorizations of matrix functions on the real line*, 22 pp, submitted to the Simonenko anniversary volume, OT: Advances and Applications, Birkhäuser, N. Vasilevskii et al (Eds.).

L. P. Castro, F.-O. Speck, and F. S. Teixeira, *Mixed Boundary Value Problems for the Helmholtz Equation in a Quadrant*, Preprint 6, Departamento de Matemática, Instituto Superior Técnico, Lisbon, Portugal (2005), accepted for publication in Integral Equations Operator Theory.

- T. Diogo, N. J. Ford, P. M. Lima and S. M. Thomas, *Solution of a singular integral equation by a split*, accepted for publication in Int. J. Numer. Anal. Mod.
- T. Diogo, P. M. Lima and M. S. Rebelo, *Numerical solution of a nonlinear Abel-type Volterra integral equation*, accepted for publication in Comm. Pure Appl. Anal.
- T. Diogo, N. J. Ford, P. M. Lima and S. S. Valtchev, *Numerical methods for a Volterra integral equations with non-smooth solutions*, accepted for publication in J. Comput. Appl. Math.
- G.P. Galdi and A.L. Silvestre, *On the steady motion of a Navier-Stokes liquid around a rigid body*, accepted for publication in Arch. Ration. Mech. Anal.
- M. Graça and P. Lima, *Matemática Experimental*, IST Press, Lisbon (accepted).
- Yu. I. Karlovich and L. Pessoa, *C^* Algebras of Bergman type operators with piecewise continuous coefficients on bounded domains*, Proceedings of the Fifth ISAAC Congress, 2005 (accepted).
- Yu. I. Karlovich and L. Pessoa, *C^* Algebras of Bergman type operators with piecewise continuous coefficients* (submitted).
- G. Kitzhofer, O. Koch, P. M. Lima and E. Weinmüller, *Efficient numerical solution of the density profile equation in hydrodynamics*, accepted for publication in J. Sci. Comput.
- V. G. Kravchenko, A. B. Lebre and J. S. Rodríguez, *The kernel of singular integral operators with a finite group of linear-fractional shifts*, accepted for publication in the volume of Operator Theory: Advances and Applications (Birkhäuser) containing the proceedings of OT20.
- V. G. Kravchenko, A. B. Lebre and J. S. Rodríguez, *Factorization of singular integral operators with a Carleman shift via factorization of matrix functions: the anticommutative case*, submitted.
- P. M. Lima, N. B. Konyukhova, N. V. Chemetov and A. I. Sukov, *Analytical-numerical investigation of bubble-type solutions of nonlinear singular problems*, accepted for publication in J. Comput. Appl. Math.
- P. M. Lima and L. Morgado, *Analysis of singular boundary value problems for an Emden-Fowler equation*, accepted for publication in Comm. Pure Appl. Anal.
- M. C. Morais and A. Pacheco, *Control schemes with variable sampling intervals revisited*, accepted for publication in Sequential Analysis.
- M. C. Morais and A. Pacheco, *Assessing the impact of head starts in the performance of one-sided Markov-type control schemes*, accepted for publication in Sequential Analysis.
- M. C. Morais and A. Pacheco, *Misleading signals in joint schemes for μ and σ* , in Frontiers in Statistical Quality Control 8, H. J. Lenz and P. Th. Wilrich (Eds.), Springer Verlag, Berlin (2006).
- L. Nadau and A. Sequeira, *Numerical simulations of shear dependent viscoelastic flows with a combined finite element – finite volume method*, Computers and Mathematics with Applications (2005), in press.
- S. T. Naique and A. F. dos Santos, *Polynomial almost periodic solutions for a class of Riemann-Hilbert problems with triangular symbols*, Journal Functional Analysis, to appear.
- P. A. Santos and B. Silbermann, *An approximation theory for operators generated by shifts*, accepted for publication in Numerical Functional analysis and Optimization.

N. Sepúlveda, C. D. Paulino and C. Penha-Gonçalves, *Bayesian Two-gene Interaction Models in Complex Binary Traits*, to appear in Proceedings of Workshop on Statistics in Genomics and Proteomics, Monte Estoril, Portugal (October 5–8, 2005), CIM.

N. Sepúlveda, C. D. Paulino, J. Carneiro and C. Penha-Gonçalves, *Bayesian Two-gene Interaction Models for Complex Binary Traits Based on the Allelic Penetrance Approach*, submitted.

K. D. Smith and A. Sequeira, *Micro-macro simulations of a shear-thinning viscoelastic kinetic model: applications to blood flow in a stenosed vessel*, submitted.

• **Other Research Units**

A. B. Cruzeiro, *Malliavin Calculus*, to appear in Encyclopedia of Mathematical Physics, Elsevier, ed. J. P. Francoise, G. Naber, T. S. Tsun (2006).

A. B. Cruzeiro and P. Malliavin, *Numerical approximation of diffusions in \mathbb{R}^d using normal charts of a Riemannian manifold*, to appear in Stoch. Proc. and Applic.

A. B. Cruzeiro and X. Zhang, *L^p -gradient estimates of symmetric Markov semigroups for $1 < p \leq 2$* , Acta Math. Sinica, Vol. 22, n°1 (2006), 101–104.

A. B. Cruzeiro and X. Zhang, *Bismut type formulae for diffusion semigroups on Riemannian manifolds*, to appear in Pot. Anal.

R. Coutinho, B. Fernandez, R. Lima and A. Meyroneinc, *Discrete time piecewise affine models of genetic regulatory networks*, J. Math. Biol. (2006).

J. Félix Costa and J. Mycka, *An analytic condition for $P \neq NP$* , submitted.

J. Félix Costa and J. Mycka, *The conjecture $P \neq NP$ presented by means of some classes of real functions*, accepted for presentation at Computability in Europe 2006: Logical Approaches to Computational Barriers, 30 June — 5 July, University of Swansea, in print.

R. Goeb, M. F. Ramalhoto and A. Pivatolo, *Variable Sampling Intervals in Shewhart Charts Based On Stochastic Failure Time Modelling*, Scientific Journal Quality Technology and Quantitative Management 3 (3) 2006.

R. Goeb, C. McCollin and M. F. Ramalhoto, *Ordinal Methodology In The Likert Scales*, accepted for publication in the Scientific Journal Quality and Quantity.

L. M. Gomes and J. Félix Costa, *Hybrid finite computation*, submitted.

H. Guerra and J. Félix Costa, *Processes with local and global liveness requirements*, submitted.

J. Mycka, F. Coelho and J. Félix Costa, *Euclid abstract machine: the trisection of the angle and the halting problem*, submitted.

J. Mycka and J. Félix Costa, *The $P \neq NP$ conjecture in the context of real and complex analysis*, Journal of Complexity (2) 22 (2006).

J. Mycka and J. Félix Costa, *Undecidability over continuous-time*, Logic Journal of the IGPL, Oxford University Press, in print.

J. Mycka and José Félix Costa, *A new conceptual framework for analog computation*, submitted.

M. F. Ramalhoto and A. Akay (Guest Editors), special issue on “*Globalization and Its Impact on Engineering Education and Research*”, European Journal of Engineering Education 31 (3) 2006.

M. F. Ramalhoto, *Transforming Academic Globalization Into Globalization For All*, European Journal of Engineering Education 31 (3) 2006.

2 Academic degrees awarded in 2005

2.1 Doutoramentos/Ph.D.'s

João Marcos de Almeida, Doutoramento em Matemática, Universidade de Campinas, Brasil, 18.02.05. *Thesis:* Logics of Formal Inconsistency. *Supervisors:* Carlos Caleiro, Instituto Superior Técnico, Universidade Técnica de Lisboa and W. A. Carnielli, Universidade de Campinas, Brasil.

Fernando Manuel Lucas Carapau, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 05.05.05. *Thesis:* Development of 1D fluid models using the Cosserat theory. Numerical simulations and applications to Haemodynamics. *Supervisor:* Adélia Sequeira.

Sara Luísa Dimas Fernandes, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 12.12.05. *Thesis:* Teoria Espectral e Sistemas Dinâmicos Discretos. *Supervisor:* José Sousa Ramos.

Diana Elisabeta Aldea Mendes, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 13.07.05. *Thesis:* Produtos tensoriais em dinâmicas de aplicações triangulares. *Supervisor:* José Sousa Ramos.

Marília da Conceição Valente de Oliveira Pires, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 13.07.05. *Thesis:* Mathematical and Numerical Analysis of Non-Newtonian Fluids in Curved Pipes. *Supervisor:* Adélia Sequeira.

Lucian Radu, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 23.09.05. *Thesis:* Teoria de Dimensão de Sistemas Dinâmicos: Medidas Invariantes e Análise Multifractal. *Supervisor:* Luís Barreira.

José Manuel Chagas Roquette, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 19.07.05. *Thesis:* Os infinitésimos actuais e a caracterização do contínuo conexo. *Supervisor:* Augusto Franco de Oliveira, Universidade de Évora.

Sandra Maria Santos Vinagre, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 19.04.05. *Thesis:* Soluções caóticas em equações às derivadas parciais. *Supervisor:* José Sousa Ramos.

2.2 Mestrados/M.A's/M.S.c.'s

Pedro Ricardo Simão Antunes, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 19.04.05. *Thesis:* Cálculo Numérico de Frequências de Ressonância e Modos de Vibração pelo Método das Soluções Fundamentais. *Supervisor:* Carlos Alves. *Co-supervisor:* Pedro Freitas.

Diogo Pedro Pereira Baptista, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 04.11.05. *Thesis:* Atractores estranhos em aplicações do plano no plano. *Supervisor:* José Sousa Ramos.

Albino António Dias do Carmo, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 03.06.05. *Thesis:* Símbolos de invertibilidade em Álgebras-Pi geradas por idempotentes. *Supervisor:* Paulo Lopes.

Lígia Isabel Marques de Carvalho, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 04.03.05. *Thesis:* Fibrados quase-parabólicos sobre a recta projectiva. *Supervisor:* Peter Gothen, Faculdade de Ciências, Universidade do Porto. *Co-supervisor:* Carlos Florentino.

Maria Isabel de Magalhães Colaço, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 30.03.05. *Thesis*: A variedade algébrica tórica de uma variedade simplética total. *Supervisor*: Miguel Abreu.

Gonçalo Nuno Rosado Morais, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 22.7.05. *Thesis*: Dimensão pontual e decomposições ergódicas. *Supervisor*: Luís Barreira.

Isabel Margarida Fialho Oliveira, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 13.01.05. *Thesis*: Problemas de Riemann-Hilbert e Polinómios Ortogonais. *Supervisor*: Amélia Bastos.

Bruno Miguel Almeida Martins Pereira, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 08.03.05. *Thesis*: Estudo da difracção de ondas acústicas por fissuras não planas com particularidades geométricas. *Supervisor*: Carlos Alves.

3 Research lectures by department members

- **Center for Logic and Computation (CLC)**

C. Caleiro,

- *Dyadic semantics for many-valued logics*, Invited Lecture, Colloquia Logicae, CLE, Universidade Estadual de Campinas, Brazil, 17.02.05.
- *Metareasoning about security protocols using distributed temporal logic*, Invited Lecture, Seminário de Ciência da Computação, IME, Universidade de São Paulo, Brazil, 18.02.05.
- *Combining logics*, Invited Tutorial, 1st World School on Universal Logic, Montreux, Switzerland, 26–30.03.05.
- *Equipollent logical systems*, Plenary Lecture, 1st World Congress on Universal Logic, Montreux, Switzerland, 31.03.05–03.04.05.
- *Deconstructing Alice and Bob*, Plenary Lecture, 2nd Workshop on Automated Reasoning for Security Protocol Analysis, Lisbon, Portugal, 16.07.05.

P. Mateus,

- *A process algebra for reasoning about quantum security*. Workshop on Classical and Quantum Information Security, California Institute of Technology, Pasadena, USA, December 15–18, 2005 (plenary).
- *Towards a logic for reasoning about quantum systems*. Security Lunch Seminar, Stanford University, USA, December 14, 2005.
- *Quantum adversaries for zero-knowledge proof systems*. Quantum Reading Group, University of Berkeley, USA, December 9, 2005.

J. Rasga,

- *Complexity analysis of cut elimination in first order based calculi*, Plenary Lecture, 4th International Workshop on Proof Theory, Computation, Complexity (Affiliated Workshop of ICALP 2005), Lisbon, July 16, 2005.
- *Cut elimination in propositional based sequent calculi, Structures and Deduction – The Quest for the Essence of Proofs* (Affiliated Workshop of ICALP 2005), Lisbon, July 17, 2005.
- *The complexity of cut elimination in a modal sequent calculus labelled with truth values*, Seminário de Ciência da Computação, IME, Universidade de São Paulo, Brazil, February 18, 2005.
- *The complexity of cut elimination in a modal sequent calculus labelled with truth values*, Colloquia Logicae, CLE, Universidade Estadual de Campinas, Brazil, February 17, 2005.

A. Sernadas,

- *Complete axiomatization of EQPL (Exogenous Quantum Propositional Logic)*, Seminário de Lógica Matemática, IST/FCUL, Lisboa, Portugal, October 25 and November 8, 2005.
- *Proof of the weak completeness of EQPL*, Seminário de Álgebra, CMUC, Coimbra, Portugal, March 15, 2005.

- **Center for Mathematical Analysis, Geometry and Dynamical System (CAMGSD)**

M. Abreu

- *Toric Kahler metrics in symplectic coordinates*, Workshop on Geometric Analysis, Tohoku University, Sendai, Japan, February 21–25, 2005.
- *Moment maps, symplectomorphism groups and compatible complex structures*, Geometry Seminar, Munich University, April 19, 2005.
- *Moment maps, symplectomorphism groups and compatible complex structures*, Workshop on Moment Maps in Various Geometries, Banff International Research Station, Banff, Canada, May 21–26, 2005.
- *Moment maps, pseudo-holomorphic curves and symplectomorphism groups*, XIV Fall Workshop on Geometry and Physics, Bilbao, Spain, September 14–16, 2005.
- *Moment maps, symplectomorphism groups and compatible complex structures*, Workshop on Recent Advances in Symplectic Geometry, on the occasion of Dusa McDuff's 60th birthday, Banff International Research Station, Banff, Canada, December 3–8,

J. Buescu

- *Positivity, reproducing kernels and integral equations*. Invited main lecture at ISAAC Conference, Catania, Julho 2005.
- *Eigenvalues of positive definite kernels on unbounded domains*. ISAAC Conference, Catania, Julho 2005.
- *Eigenvalue distribution for positive integral operators on unbounded domains*. Conference on Operator theory, Functional Analysis and Applications, Aveiro, July 2005.
- *Positivity and holomorphic reproducing kernels*. Faculdade de Ciências do Porto, April 2005.

A. Cannas da Silva, *Fold-forms for 4-folds*, Montréal Geometry and Topology seminar, Université de Montréal, Canadá, 15.4.05.

R. Cordovil

- *Kalai operations on (matroid) polytopes*, LRI, University of Orsay, France, 24.06.05.
- *An Orlik-Solomon type algebra for matroids with a fixed linear class of circuits*, Invited Lecture, 2nd Workshop on Tutte Polynomials and Applications, CRM, Barcelona, Spain, 04–07.10.05.

R. L. Fernandes,

- *Geometria de Poisson Global*, Algarve Workshop on Modern Mathematical Physics, Universidade do Algarve, October 2005.
- *Uma Breve Excursão à Rua das Matemáticas*, Course in the Summer School for the Gulbenkian Program 'Novos Talentos em Matemática', IST, September 2005.
- *Integrability of Lie algebroids: theory and applications*, 20th International Workshop on Differential Geometric Methods in Theoretical Mechanics, Ghent, Belgium, August 2005.
- *Integrability and Quantization*, Short Course (3 lectures) at the Séminaire Itinérant de Géométrie et Physique III, Perugia, Italy, July 2005.
- *Lie Algebroids and Lie Groupoids*, Short course (4 lectures) in the Summer School and Conference on Poisson Geometry, ICTP, Trieste, Italy, July 2005.
- *Moment maps in Poisson geometry*, Workshop on Moment maps in various geometries, Banff International Research Station, Banff, Canada, May 2005.
- *Linearization of Poisson brackets*, Symplectic Geometry Seminar, University of Toronto, Canada, May 2005.

- *Rigidity and flexibility in Poisson geometry*, Seminário do CMUP, Universidade do Porto, January 2005.

C. Florentino, *Geometry and quantization of the space of flat connections on a Riemann surface*, Mathematical Physics Group, Univ. of Lisbon, 11.05.2005

D. Gomes,

- *Stochastic Mather problem revisited*, MSRI workshop on Optimal Mass Transport and its Applications, Berkeley, EUA, Novembro 2005
- *A variational formulation for the Navier-Stokes equation*, International Conference on Mathematical Analysis of Random Phenomena Hammamet, Tunísia, Setembro 2005.
- *Effective Hamiltonians and Hamiltonian Dynamics Integrability*, Congress on the Homogenization in Random Media CIRM – Marseille-Luminy, Marselha, França, Julho 2005.
- *A variational formulation for the Navier-Stokes equation*, Recent and future developments in Hamiltonian Systems: theory and applications, Institut Henri Poincaré, Paris, Maio 2005.
- *Computing the effective Hamiltonian using a variational approach*, IEEE–CDC – 05, Sevilha, Espanha, Dezembro 2005.
- *Métodos variacionais em EDPs*, Escola Superior de Tecnologia, Instituto Politécnico de Setúbal, Novembro 2005.
- *Teoria de Aubry-Mather generalizada*, Grupo de Física-Matemática, Universidade de Lisboa.

P. Lopes,

- *Computing minima of colors: beyond the Kauffman-Harary conjecture*, Logic and Computation Seminar, IST, Lisbon, Portugal, October 28, 2005.
- *Beyond the Kauffman-Harary Conjecture*, 25^o Colóquio Brasileiro de Matemática, Sessão de Topologia e Singularidades, IMPA, Rio de Janeiro, RJ, Brazil, July 24–29, 2005.
- *Minima of Colors Using Linear Alexander Quandles*, Quantum Topology – Contemporary Issues and Perspectives, AMS–IMS–SIAM Conference, Snowbird, Utah, USA, June 5–9, 2005.
- *Para lá da conjectura de Kauffman-Harary*, Jornada de Topologia, Universidade Federal Fluminense, Niterói, RJ, Brazil, February 21, 22, 2005.

M. Mariño,

- *Topological strings on orientifolds*, Seminar, Institute for Theoretical Physics, Amsterdam, March 2005.
- *Gromov-Witten Invariants and Modular Forms*, Invited Lectures, CAMGSD Thematic Period, Lisbon, October 10, 2005, November 11, 2005.

J. Matias, *Inclusões diferenciais para formas diferenciais e aplicações ao Cálculo de Variações*, May 2005, IST, Seminário de Equações Diferenciais Parciais do CAMGSD.

J. Pimentel Nunes

- *Quantization and theta functions: old and new*, Schnitzerfest, Brandeis University, March 2005.
- *Non-abelian theta functions and geometric quantization*, Univ. Miami, March 2005.

R. Picken, *Gerbes, Dimensional Ladders and Applications*, Invited Talk, Problemi Attuali di Fisica Teorica, Vietri sul Mare, Italy, 18–24.3.05 (Session on Gerbes and Poisson Geometry, 24.3.05), invited lecture.

J. S. Ramos, *Dinâmica simbólica e sistemas dinâmicos algébricos*, Centro de Álgebra, 6 May 2005, Universidade de Lisboa.

P. Resende,

- *Quantale theory*, Invited Short Course, First Meeting of GAMAP: Geometric and Algebraic Methods of Physics and Applications, Antwerp, Belgium, 5–15.09.05.
- *Localic germ groupoids of inverse semigroups*, Workshop on Categorical Methods in Algebra, Geometry and Mathematical Physics, Australian National University, Canberra, 18–21.07.05.
- *Localic germ groupoids of inverse semigroups*, 81st Peripatetic Seminar on Sheaves and Logic (PSSL81), Univ. Coimbra, 9–10.04.05.
- *Étale groupoids and their quantales*, Algebra Seminar (Category Theory), CMUC, Coimbra, 18.03.05.
- *Supported quantales: an interface between modal logic and geometry*, Invited Lecture, Workshop on Logic from Quantales/OASIS seminar, Univ. Oxford, U.K., 21.01.05.

C. Rocha,

- *Semilinear Parabolic Equations and Meander Permutations*, Plenary lecture, The 6th North-eastern Symposium on Mathematical Analysis, Tohoku University, Japan, 17.03.05.
- *Attractors for Semilinear Parabolic Equations on the Circle*, Plenary lecture, The 6th North-eastern Symposium on Mathematical Analysis, Tohoku University, Japan, 18.02.05.
- *Attractors for Semilinear Parabolic Equations on the Circle*, Invited lecture, Workshop on Infinite-Dimensional Dynamical Systems: Structures and Patterns, LCDS, Brown University, 20.04.05.
- *Realization of Attractors for Semilinear Parabolic Equations on the Circle*, Invited lecture, Meeting Infinite-Dimensional Dynamical Systems, Luminy, 4.07.05.
- *Semilinear Parabolic Equations and Period Maps for Planar Hamiltonian Systems*, Invited lecture, Grupo de Análise Funcional e Aplicações, Universidade de Aveiro, 27.10.05.

J. Ventura, *The components of a variety with square zero and submaximal rank*, Topology seminar, University of Aberdeen, Scotland, 21.2.05

• **Center for Mathematics and its Applications (CEMAT)**

C. J. S. Alves,

- *Numerical determination of eigenfrequencies and eigenmodes using the method of fundamental solutions*, Keynote lecture, International Conference on Computational & Experimental Engineering and Sciences (ICCES'04), Madeira, 26–29.7.05.
- *Acoustic scattering by multicracks using a boundary finite element method*, 5th International Conference on Boundary Elements Techniques (BETEQ 2004), Lisboa, 21–23.7.05.

C. Amado,

- *Bootstrap Method*, Research course, Universidade de Buenos Aires, Facultad de Ciencias Exactas y Naturales, 5–9.12.05.
- *Análise discriminante robusta*, XIII Congresso Anual da Sociedade Portuguesa de Estatística, Ericeira, 28.9.05.

- *Robust bootstrap criterion for variable selection in LDA*, Poster, International Conference on Robust Statistics (ICORS 2005), Jyväskylä, Finland, 14.6.05.

M. Baía,

- *Convergence of functionals with multiscale and periodic integrands*, seminar at the Università degli Studi di Salerno, Italy, 1st. December, 2005.
- *The limit behavior of a family of variational multiscale problems*, seminar at the Università degli Studi di Tor Vergata, Italy, 22th. November, 2005.
- *Variational multiscale problems and applications to thin films*, AMS Sectional Meeting, University of Nebraska, Lincoln, USA, October 21–23, 2005.
- *Convergence of functionals with multiscale and periodic integrands*, Workshop on the Calculus of Variations in 2005, Carnegie Mellon University, Pittsburgh, USA, October, 17–20, 2005.

M.A. Bastos, *A non local C^* algebra with piecewise slowly oscillating coefficients*, Conference on Operator Theory, Function Spaces and Applications, 7–9 July, Aveiro, Portugal, 2005.

C. Câmara,

- *Factorization of a class of almost-periodic triangular symbols and related Riemann-Hilbert problems*, The first Czech-Catalan Conference in Mathematics, 27–28.05.05, Praga, Rep. Checa.
- *A new approach to the invertibility of a class of Wiener-Hopf operators*, 2nd Joint Meeting of AMS, DMV, ÖMG, 16–19.06.05., Mainz, Germany.
- *Factorization in a Riemann surface*, OFFTUSA 2005, Conference on Operator Theory, Function Spaces and Applications, 7–9.07.05, Aveiro, Portugal.

C. Carvalho,

- *L_2 -index theorems, K -theory and groupoids I & II*, Analysis Seminar, Radboud University, Nijmegen, The Netherlands, 05.05.
- *A K -theory proof of cobordism invariance of the index*, Joint meeting of AMS, DGV, OGV, Section of Differential Analysis, Mainz, Germany, 16.06.05–21.06.05 (invited).

T. Diogo,

- *Numerical methods for a nonlinear integral equation of Lighthill*, 21th Biennial Conference on Numerical Analysis, Dundee, United Kingdom, 28 June – 1st July 2005. (contributed talk).
- *Computational methods for a nonlinear Volterra integral equation*, 7th Hellenic European Conference on Computer Mathematics and its Applications (HERCMA 2005), Athens, Greece 22–24 September 2005. (invited lecture).
- *Convergence Properties of Collocation Methods for a Volterra Integral Equation with Weakly Singular Kernel*, Seminar of the Institute of Computational Mathematics and Scientific Engineering, Chinese Academy of Sciences, Pequim, 7 December 2005. (plenary lecture).
- *Numerical study of a nonlinear Volterra integral equation with weakly singular kernel*, 2nd International Conference on Scientific Computing and Partial Differential Equations (SCPDE 05), 12–16 December 2005, Hong Kong, China. (invited lecture).

P. Lima,

- *Analysis and Numerical Approximation of Singular Boundary Value Problems* (contributed talk), XXI Biennial Conference on Numerical Analysis, 28/6/05, Dundee, United Kingdom.

- *Numerical Approximation of Singular Boundary Value Problems for a Nonlinear Differential Equation* (contributed talk), International Conference on Differential Equations (Equadiff 11), 29/07/05, Bratislava, Slovakia.
- *Asymptotic Error Expansions and Extrapolation Methods for a Weakly Singular Volterra Integral Equation* (invited lecture), II International Conference on Scientific Computing and Partial Differential Equations (SCPDE 05), 13/12/05, Hong Kong, China.

A.B. Lebre, *Factorization of modified singular integral operators*, *Conferência Operator Theory, Function Spaces and Applications*, Universidade de Aveiro, de 7–9.7.05

M. C. Morais,

- *Shewhart schemes with VSI revisited*, Seminar, Europa Viadrina University, Frankfurt (Oder), Germany, 1.12.05.
- *Ordenação Estocástica: da curva de Lorenz ao controlo de qualidade* (Stochastic ordering: from the Lorenz curve to quality control) (Co-author: António Pacheco), Invited lecture, XIII Congresso Anual da Sociedade Portuguesa de Estatística, Hotel Vila Galé Ericeira, Portugal, 28.9.05–1.10.05.

C. D. Paulino, *Two-gene interaction models in complex binary traits*, Plenary Lecture, I Congresso de Estatística e Investigação Operacional da Galiza e Norte de Portugal, Guimarães, Portugal, 26.10.05.

A. M. Pires,

- *Delineamento Experimental e Análise Estatística de Resultados*, Short course, Departamento de Biotecnologia, Instituto Nacional de Engenharia e Tecnologia Industrial, Lisboa, 8.9.05.
- *Regressão linear múltipla com alguns erros correlacionados: métodos clássicos e robustos*, Seminar, Departamento de Matemática, Faculdade de Ciências e Tecnologia, Universidade de Coimbra, Coimbra, 24.5.05.
- *Using clustering and robust estimators to detect outliers in multivariate data*, Invited Lecture, International Conference on Robust Statistics (ICORS 2005), Jyväskylä, Finlândia, 17.6.05.
- *Characterizing putative CG for wood properties in eucalyptus*, Poster, IUFRO Tree Biotechnology 2005, Pretória, África do Sul, 7–11.11.05.
- *Multiple linear regression with some correlated errors: classical and robust methods*, DREaM 2005 Developments in Statistical Methodology: Diagnostics, Robustness, Exploration and Modelling, Milton Keynes, United Kingdom, 2.4.05.
- *Métodos robustos para regressão com erros autocorrelacionados*, XIII Congresso Anual da Sociedade Portuguesa de Estatística, Ericeira, 28.9.05.

I. M. Rodrigues,

- *Testes robustos para o modelo das componentes principais comuns*, Invited Lecture, 2do Encontro Regional de Probabilidade y Estadística Matemática, Buenos Aires, Argentina, 30.11.05.
- *Testes robustos para o modelo das componentes principais comuns*, Seminar, Departamento de Matemáticas/Instituto de Cálculo, Facultad de Ciencias Exactas y Naturales, Buenos Aires, Argentina, 11.11.05.
- *Testes robustos para o modelo das componentes principais comuns*, XIII Congresso Anual da Sociedade Portuguesa de Estatística, Ericeira, 28.9.05.

- *Robust tests for the common principal components model*, Poster, International Conference on Robust Statistics (ICORS 2005), Jyväskylä, Finland, 14.6.05.

P. A. Santos,

- *Abstracting approximation methods*. OTFUSA2005 – Conference on Operator Theory, Function Spaces and Applications. Aveiro, Portugal, 7–9 July 2005.
- *Systems and signals online questions and grading*. 10th IEEE International Conference on Emerging Technologies and Factory Automation, Special session on Elearning and Remote Laboratories, Catania, Italy, 19–22 September 2005.
- *An approximation theory for operators generated by shifts*. Presented in two universities: Fakultät für Mathematik, Arbeit Seminar, 19.04.2005, TU-Chemnitz, Alemanha, e FB 4 Mathematik, Offenes Seminar AG 6, 26.04.2005, TU-Darmstadt, Alemanha.

A. Sequeira,

- *Numerical Simulations of non-Newtonian blood flow models in straight and curved vessels*, Invited Lecture, Department of Mathematics, University of Hamburg-Harburg, Germany, January 27, 2005.
- *Simulations numériques de la circulation du sang dans des vaisseaux courbes*, Invited Lecture, LAMSIN-ENIT, Tunis, Tunisie, February 18, 2005. á
- *Modelos matemáticos de hemodinâmica e hemorreologia*, Plenary Lecture, 3º Encontro Nacional de Engenharia Biomédica, FMUL-IST, February 23, 2005. á
- *Circulation in small vessels and capillaries: Development and analysis of non-Newtonian models*, Plenary Lecture, Mid Term Review Meeting of the European Union HaeModel Project, IST-Lisbon, Portugal, March 30, 2005. á
- *Mathematical modelling in haemorheology*, Keynote Lecture, 2nd International Symposium on Modelling of Physiological Flows - MPF 2005, Sesimbra, Portugal, March 31-April 2, 2005. á
- *Numerical simulations of generalized Newtonian and viscoelastic flows in curved pipes*, Plenary Lecture, International Workshop on Current Topics in Mathematical Fluid Mechanics - MFM 2005 (in honor of Prof. John Heywood), IST-Lisbon, Portugal, June 17-18, 2005. á
- *Non-Newtonian effects of shear-thinning Oldroyd-B flows in curved pipes*, Invited Lecture, WSEAS International Symposium on Mathematical Fluid Dynamics and Related Topics (in memory of Prof. J. Necas), Corfu, Greece, August 21-22, 2005. á
- *Constitutive models and numerical simulations of blood flow in small vessels*, Invited Lecture, The First Pittsburgh Workshop on Hemorheology, Mechanical Engineering Department, University of Pittsburgh, USA, October 27, 2005.

G.L. Silva,

- *New Researchers in Spatial Statistics*, Discussion of Invited Papers, 2005 WNAR/IMS Annual Meeting, Fairbanks, Alaska, USA, 22 July 2005.
- *Hierarchical Bayesian Spatio-temporal Mapping of Revascularization Odds by using Smoothing Splines*, Invited Papers, 2005 Annual Scientific Conference VII GEOIDE – Geomatics for Informed Decisions, Quebec, Canada, 30 May 2005.

A. L. Silvestre, *On the motion of a rigid body in a Navier-Stokes liquid*, Invited Speaker, ANCIF'05 - International Workshop on Numerical Analysis and Control of Fluid-Structure Interactions, Chillan, Chile, 5–10.12.05.

F. Speck, *Mixed boundary value problems for the Helmholtz equation in a quadrant*, 5th Congress of The International Society for Analysis, its Applications and Computation, Catania, Italy, 28.7.05.

F. Sepúlveda Teixeira, *On the first sixty years of Frank-Olme Speck*, Conference on Operator Theory, Function Spaces and Applications, OTFUSA2005, Dedicated to the 60th birthday of Professor F.-O. Speck, 7.2005.

• **Other Research Units**

R. Coutinho, *Planar fronts in bistable coupled map lattices*, Conference on Difference Equations, Special Functions and Applications, Munich, Germany, July 25–30, 2005, contributed talk.

J. Félix Costa,

- *Physics and computation Complexity Studies* Institute at Lisbon, December 9, 2005.
- *Caminhos da Complexidade: Ciência e Arte*, Invited Lecturer in the Workshop, Encontros Arrábida, Fundação Oriente, July 4–6, 2005.
- *Poly analog computation and the $P \neq NP$ conjecture*, The First CiE conference, CiE 2005 — Computability in Europe 2005: New Computational Paradigms, University of Amsterdam, June 8–12.

A. B. Cruzeiro,

- *Geometrical numerical schemes for s.d.e.'s*, Fifth Seminar on Stochastic Analysis, Random Fields and Applications, Ascona, Switzerland, May 2005
- *Fluxos em variedades de dimensão infinita e aplicações*, Algarve Workshop on Modern Mathematical Physics, October 2005.
- *Differential equations on invariant manifolds: a Malliavin calculus approach*, Journées de Probabilité, Inst. Élie Cartan, Nancy, September 2005.
- *Diffusions on the group of homeomorphisms in the torus and the Navier-Stokes equation*, International Conference on Mathematical Analysis of Random Phenomena, Hammamet, Tunisia, September 2005.

M.F. Ramalhoto, *An Innovative Strategy to Put Integrated Maintenance, Reliability and Quality Improvement Concepts Into Action*, Invited Lecture, on June 29, at the ESREL'05, Gdansk/Tri-City, Poland, 27–30 June, 2005.

4 Guest program

• Center for Logic and Computation (CLC)

Jirí Adámek, TU Braunschweig, Germany, 30–31.3.05. *Lecture:* A logic of coequations, 31/03/05.

Andris Ambainis, U Waterloo, Canada, 20–28.4.05. *Lecture:* Adiabatic theorem and adiabatic quantum algorithms, 22/04/05.

Markus Arndt, U Vienna, Austria, 16–20.11.05. *Lecture:* Experimental exploration of the quantum/classical transition, 18/11/05.

David Basin, ETH, Switzerland, 11–17.7.05. *Lecture:* Model driven security, 14/07/05.

Jean-Yves Béziau, SNSF, U Neuchâtel, Switzerland, 1.7.05. *Lecture:* Combining conjunction with disjunction.

Jonathan Borwein, Dalhousi University, Canada, 22–29.11.05. *Lecture:* What is high performance mathematics, 28/11/05.

Sougato Bose, University College London, UK, 12–17.12.05. *Lecture:* Quantum communication through spin chains and related systems, 13/12/05.

Gilles Brassard, U Montréal, Canada, 28.6–1.7.05. *Lecture:* The spooky power of quantum entanglement, 1/07/05.

Caslav Brukner, U Vienna, Austria, 16–20/04/05. *Lecture:* How to compute a function without knowing its input? Using quantum entanglement!, 19/04/05.

Walter Carnielli, CLE, UniCamp, Brazil, 2–7.10.05. *Lecture:* Infinite voting, fuzziness and modulated quantifiers, 4/10/05.

Francesco Ciccarello, U Palermo, Italy, 11–16.9.05. *Lecture:* Hot electron noise in n-type GaAs in crossed electric and magnetic fields, 13/09/05.

José Carlos Cifuentes, UF Paraná, Brasil, 22.7.05. *Lecture:* Lógica fuzzy e consistência polivalente.

Claude Crépeau, McGill University, Canada, 26–29.5.05. *Lecture:* Quantum zero-knowledge: state of the art, 27/05/05.

Kai Eckert, U Hannover, Germany, 2–7.7.05. *Lecture:* Quantum information with neutral atoms trapped in optical potentials, 5/07/05.

Jörg Flum, U Freiburg, Germany, 18.3.05. *Lecture:* Parameterized complexity.

Kokichi Futatsugi, JAIST, Japan, 13.9.05. *Lecture:* Formal methods with CafeOBJ.

Simon Gay, U Glasgow, UK, 7.6.05. *Lecture:* Probabilistic model-checking of quantum protocols.

Dan Ghica, U Birmingham, UK, 16–22.9.05. *Lecture:* Data-abstraction refinement: a game semantic approach, 20/09/05.

Lov Grover, Bell Labs, USA, 2–6.2.05. *Lecture:* Quantum algorithms, 4/02/05.

Beatrix Hiesmayr, U Vienna, Austria, 17–20.2.05. *Lecture:* Thermodynamical versus optical complementarity, 18/02/05.

Dick de Jongh, ILLC, U Amsterdam, Netherlands, 13–19.6.05. *Lecture:* The logic of the Rieger-Nishimura ladder, 17/06/05.

Elham Kashefi, IQC, U Waterloo, Canada, 1–5.9.05. *Lecture:* Measurement calculus, 2/09/05.

Sara Madeira, INESC and U Beira Interior, Portugal, 11.11.05. *Lecture:* CCC-biclustering: a linear time biclustering algorithm for time-series gene expression data.

João Marcos, Instituto Superior Técnico, Portugal, 3–10.4.05. *Lecture:* Paraconsistency, many-valuedness, modality, 8/04/05.

Alessandra di Pierro, U Pisa, Italy, 29.8–5.9.05. *Lecture:* Time-based interference and probabilistic padding, 2/09/05.

Karina Roggia, UF Rio Grande do Sul, Brazil, 9–13.2.05. *Lecture:* Category of partial graphs with total homomorphisms: Theory and applications, 11/02/05.

Luís Russo, INESC, Portugal, 9.12.05. *Lecture:* Improved indexing of text using the Ziv-Lempel trie.

Lutz Schröder, U Bremen, Germany, 25–30.7.05. *Lecture:* Expressivity of coalgebraic modal logic, 29/07/05.

João Sobrinho, Instituto de Telecomunicações, Portugal, 6.5.05. *Lecture:* O m(in)istério da educação: ou o problema da colocação dos docentes 2004/2005.

Ana Paula Tomás, LIACC, U Porto, Portugal, 15.4.05. *Lecture:* Casamentos estáveis e colocação de professores em Portugal.

Umesh Vazirani, U California, Berkeley, USA, 12–16.7.05. *Lecture:* Quantum algorithms: The non-abelian hidden subgroup problem, 14/07/05.

Luca Viganò, ETH, Switzerland, 28.8–12.9.05. *Lecture:* The AVISPA Tool for the automated validation of internet security protocols and applications, 9/09/05.

Anton Zeilinger, U Vienna, Austria, 2.12.05. *Lecture:* ¿From Einstein to Quantum Information.

• **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

D. Abriani, Scuola Internazionale Superiore di Studi Avanzati, Italy, 9.10–12.11.05.

M. Audin, Institut de Recherche Mathématique Avancée de Strasbourg, France, 11–15.07.05. *Lecture:* Around the Sofia Kowalevskaya top, 12/7/05.

D. Auroux, Massachusetts Institute of Technology, USA, 6–10.07.05.

J. Baptista, Cambridge Univ. UK, 10–26.10.05. *Short Course:* Thematic Period — Algebraic Geometry and Topological Strings

J. Bioucas, Instituto Superior Técnico, Portugal, 12.05.

C. Bispo, Instituto Superior Técnico, Portugal, 04.11.05. *Lecture:* Optimality of idling policies: the entangled scheduling and routing problem, 4/11/05.

F. Bourgeois, Univ. Libre de Bruxelles, Belgium, 6–9.07.05. *Lecture:* Workshop on Symplectic Topology

R. Brunetti, Institute für Theoretische Physik, Univ. Hamburg, Germany, 20–25.07.05.

J. Bryan, Univ. British Columbia, Canada, 16–22.10.05. *Short Course:* Thematic Period — Algebraic Geometry and Topological Strings

D. Bucur, Univ. Metz, France, 9–15.10.05.

H. Bursztyn, Instituto Nacional de Matemática Pura e Aplicada, Brazil, 20–24.11.05. *Lecture:* Reduction of generalized complex structures, 22/11/05.

A. Calabri, Univ. Bologna, 14–21.01.05 and 15–22.03.05.

F. Chalub, Univ. Nova de Lisboa, Portugal, 1.04.05. *Lecture:* Kinetic models for chemotaxis, 1/4/05.

M. Cheng, Institute for Theoretical Physics, Univ. Amsterdam, Holland, 14–22.10.05.

R. Cohen, Stanford Univ. USA, 29.10–3.11.05. *Seminar talk:* Thematic Period — Algebraic Geometry and Topological Strings

A. Dey, The Institute of Mathematical Sciences, India, 9.10–12.11.05.

L. Díaz, Univ. Extremadura, Badajoz, Spain, 31.01.05.

Y. Dinar, Scuola Internazionale Superiore di Studi Avanzati, Italy, 10.10–12.11.05.

M. Domagala, Uniwersytet Warszawski, Poland, 20–25.07.05.

T. Domingos, Instituto Superior Técnico, Portugal, 18.01.05. *Lecture:* The formal unification of thermodynamics and microeconomics, 18/1/05.

T. Downarowicz, Wroclaw Univ. Technology, Poland, 24–30.10.05. *Lectures:*

- Minimal realizations of Jewett-Krieger type for nonuniquely ergodic systems I, 26/10/05.
- Minimal realizations of Jewett-Krieger type for nonuniquely ergodic systems II, 28/10/05.

M. Efendiev, Univ. Stuttgart, Germany, 15–22.05.05. *Lecture:* Symmetry and attractors, 17/5/05.

S. Elaydi, Trinity Univ. USA, 10–23.07.05. *Lectures:*

- Extension of the Sharkovsky theorem to non-autonomous dynamical systems I, 19/7/05.
- Extension of the Sharkovsky theorem to non-autonomous dynamical systems II, 21/7/05.

J. Erven, Univ. Mnchen, Germany, 06.05.05. *Lecture:* To keep a secret — no secret with mathematics!, 6/05/05.

G. Etesi, Budapest Univ. Technology and Economics, Hungary, 20–25.07.05.

P. Flandrin, Ecole Normale Supérieure de Lyon, France, 25.02.05. *Lecture:* Chirps everywhere, 25/2/05.

F. Garcia, Instituto Superior Técnico, Portugal, 08.04.05. *Lecture:* Local stationarity in passive detection of transient signals.

W. Goldman, Univ. Maryland, USA, 14–17.06.05.

P. Gonçalves, Instituto de Sistemas e Robótica, Portugal, 04.02.05. *Lecture:* Empirical mode decomposition from a filter bank viewpoint.

T. Graber, Univ. California, Berkeley, USA, 6–13.11.05. *Seminar talk:* Thematic Period — Algebraic Geometry and Topological Strings.

M. Grinfeld, Univ. Strathclyde, UK, 4–10.05.05. *Lecture:* Reaction-Dispersion Equations, 9/5/05.

- A. Grnrock, Univ. Wuppertal, Germany, 18–25.09.05.
- S. Gukov, Harvard Univ. USA, 25–30.10.05.
- S. Gutierrez, Catholic Univ. Chile, Chile, 23.04–01.05.05. *Lecture*: Compensated Compactness and the difference between quasiconvexity and rank-one convexity, 29/4/05.
- J. Hale, Georgia Institute of Technology, USA, 23–30.06.05. *Lecture*: Perturbation of periodic orbits of functional differential equations, 28/6/05.
- S. Hollander, Hebrew Univ. Jerusalem, Israel, 4–20.11.05.
- R. Jerrard, Univ. Toronto at St. George, Canada, 14.06–13.07.05. *Lecture*: On the weak continuity of Hessian measures, 1/7/05.
- N. Jung, Univ. Toronto at Mississauga, Canada, 14.06–13.07.05.
- A. Klemm, Univ. Wisconsin, Madison, USA, 6–13.11.05. *Short Course*: Thematic Period — Algebraic Geometry and Topological Strings.
- Y.-P. Lee, Univ. Utah, USA, 16–29.10.05. *Seminar talk*: Thematic Period — Algebraic Geometry and Topological Strings.
- P. Lescot, Univ. Picardie, France, 22.06.05. *Lecture*: Preliminaries to a possible construction of a unitarizing measure for the Virasoro algebra (after Kirillov and Malliavin), 22/6/05.
- P. Lima-Filho, Texas A\&M Univ. USA, 20.05–09.06.05. *Lecture*: On the holonomy Lie algebra of graphic arrangements, 1/6/05.
- J.de Loera, Univ. California, Davis, USA, 7–9.07.05. *Lecture*: The many aspects of counting lattice points on polytopes, 8/7/05.
- A. Lopes, Univ. Federal do Rio Grande do Sul, Brazil, 16–18.07.05. *Lecture*: Gibbs states limits and large deviations, 18/7/05.
- M. Málek, Silesian Univ. Czech Republic, 3–10.12.05. *Lecture*: Basic sets and distributional chaos in dimension one, 6/12/05.
- A. Mandel, Univ. São Paulo, Brazil, 1–5.11.05. *Lecture*: Faithful linear representations of the free group, 3/11/05.
- C. Manolescu, Princeton Univ. USA, 5–10.07.05. *Lecture*: Workshop on Symplectic Topology.
- R. Dawe Martins, Univ. Nottingham, UK, 10.10–12.11.05.
- R. Martins, Univ. Nova de Lisboa, Portugal, 18.10.05. *Lecture*: When is the attractor of a dissipative system in the cylinder homeomorphic to the circle?.
- D. Maulik, Princeton Univ. USA, 18.10–1.11.05. *Seminar talk*: Thematic Period — Algebraic Geometry and Topological Strings.
- R. McCann, Univ. Toronto at St. George, Canada, 14–15.01.05. *Lecture*: Optimal convergence rates for the fastest conservative nonlinear diffusions, 14/1/05.
- D. McComb, Univ. Edimburgh, UK, 20–25.07.05.
- C.J. Mulvey, Univ. Sussex & Univ. Cambridge, UK, 16.03.05. *Lecture*: Sheaves of C^* -algebras, 16/3/05.

- J. Nelson, Univ. Torino, Italy, 10–14.10.05.
- A. Neitzke, Harvard Univ. USA, 16–23.10.05. *Seminar talk:* Thematic Period — Algebraic Geometry and Topological Strings.
- A. Okounkov, Princeton Univ. USA, 9–14.10.05. *Seminar talk:* Thematic Period — Algebraic Geometry and Topological Strings.
- M.R. Olmos, école Polytechnique Fédérale de Lausanne, Switzerland, 2–9.09.05.
- R. Pandharipande, Princeton Univ. USA, 10.10–12.11.05. *Short Course:* Thematic Period — Algebraic Geometry and Topological Strings.
- R.Pardini, Univ. Pisa, 13–20.02.05 and 23.06–1.07.05.
- M. Pinsonnault, The Fields Institute, Canada, 2–10.07.05. *Lecture:* Homotopical complexity of symplectomorphism groups, 5/7/05.
- A. Plakhov, Univ. Aveiro, Portugal, 03.06.05. *Lecture:* Problema aerodinâmico de Newton e problema de transporte de massa.
- M. Portilheiro, Univ. Coimbra, Portugal, 17.06.05. *Lecture:* Histerese num problema parabólico mal-posto, 17/6/05.
- V. Przyjalkowski, Steklov Mathematical Institute, Russia, 9.10–12.11.05. *Seminar talk:* Thematic Period — Algebraic Geometry and Topological Strings.
- L. Rastelli, Princeton Univ. USA, 27.10–3.11.05, *Seminar talk:* Thematic Period — Algebraic Geometry and Topological Strings.
- M. Ribeiro, Instituto Superior Técnico, Portugal, 07.10.05. *Lecture:* Estimating camera orientation from video in a Manhattan world.
- N.Romão, Univ. Adelaide, Australia, 29.06.05. *Lecture:* Gauged vortices in a background, 29/06/05.
- V. Rychkov, Scuola Normale Superiore di Pisa, Italy, 24–27.10.05. *Seminar talk:* Thematic Period — Algebraic Geometry and Topological Strings.
- V. Ruuska, Univ. Jyväskylä, Finland, 17.10–11.11.05.
- S.F. Sawin, Fairfield Univ. USA, 8–13.02.05, *Lecture:* Witten-style nonabelian localization for a noncompact manifold.
- E. Scheidegger, Univ. Piemonte Orientale, Italy, 26.10–11.11.05. *Seminar talk:* Thematic Period — Algebraic Geometry and Topological Strings.
- B. Schrör, Centro Brasileiro de Pesquisas Físicas, Brazil, 19–24.07.05. *Lectures:*
- Extension of the Sharkovsky theorem to non-autonomous dynamical systems I, 19/7/05.
 - Extension of the Sharkovsky theorem to non-autonomous dynamical systems II, 21/7/05
- A. Sharkovsky, Institute of Mathematics, Ukraine, 31.03–22.04.05. *Lectures:* in Ideal Turbulence, 12–15/4/05.
- J.N. Silva, Univ. Lisboa, Portugal, 20.05.05. *Lecture:* O jogo dos filósofos, 20/5/06.
- J. Silva, Instituto Superior de Engenharia de Lisboa, Portugal, 20.05.05. *Lecture:* Manifold learning with tangent bundle approximation, 20/5/06.

- I. Smith, Univ. Cambridge, UK, 6–9.07.05. *Lecture:* Workshop on Symplectic Topology (SYMAT05)
- L. Snoha, Matej Bel Univ. Slovakia, 24–31.10.05. *Lecture:* Small scrambled sets, 25/10/05.
- J. Sobrinho, Instituto Superior Técnico, Portugal, 06.05.05. *Lecture:* O M(in)istério da Educação: ou o problema da colocação dos docentes 2004/2005.
- M. Stessin, State Univ. New York, Albany, USA, 25.09–1.10.05. *Lecture:* Subalgebras dense in Hardy spaces, 27/9/05.
- B. Szendroi, Utrecht Univ. Holland, 10–15.05.05. *Lecture:* Quivers and sheaves on surfaces and threefolds, 10/5/05.
- L. Szulc, Warsaw Univ. Poland, 20–25.07.05.
- G. Tabuada, Univ. Paris VII – Denis Diderot, France, 14.09.05. *Lecture:* Invariantes aditivos de dg-categorias, 14/9/05.
- S. Vacaru, Instituto de Matemáticas y Física Fundamental, Spain, 4–5.07.05.
- E. Valdinoci, Univ. Roma II, Italy, 24.07–2.08.05.
- J. Weitsman, Univ. California, Santa Cruz, USA, 14–20.06.05. *Lecture:* in VI Lisbon Summer Lectures in Geometry.
- C. Werner, Allegheny College, USA, 31.05.05. *Lecture:* Examples of surfaces with zero geometric genus, 31/5/05.
- T. Weth, Univ. Giessen, Germany, 20–28.02.05. *Lecture:* Partial symmetry of solutions to some variational problems, 22/2/05.
- M. Zambon, Univ. Zürich, Switzerland, 22–29.01.2005. *Lecture:* Averaging of isotropic submanifolds, 25/1/05.

• **Center for Mathematics and its Applications (CEMAT)**

- Alexandre Almeida, Universidade de Aveiro, 1.4.05., *Lecture:* Characterization of function spaces of Riesz and Bessel potentials in case of variable exponent, 1/04/05.
- Abdel Artoli, CEMAT – IST, *Lecture:* Lattice Boltzmann models for blood flow simulations, 09.11.05.
- A.V. Balakrishnan, The Flight Systems Research Center, University of California, Los Angeles, USA, 13–15.07.05., *Lectures:* Mathematical theory of aeroelasticity, 15/07/05.
- Tomás Bodnár, Czech Technical University of Prague, Czech Republic and CEMAT – IST, *Lectures:*
- Selected applications of incompressible viscous flows models, 09/03/05.
 - On the viscoelastic shear-thinning models with application to blood flows, 22/07/05.
- Graciela Boente, CONICET e Universidad de Buenos Aires, 8–19.01.05, *Lecture:* Robust bandwidth selectors in semiparametric partly linear regression models, 12/01/05.
- Márcia Branco, Universidade de São Paulo, 1.06–31.07.05.
- Hedia Chaker, LAMSIN-ENIT, Tunis, Tunisia, 31.01.–07.02.05, *Lecture:* Modélisation d’injection de bulles dans un lac eutrophe, 02/02/05.

Frank Critchley, The Open University, 29.01–12.02.05, *Lecture*: Skewness a la mode?, 2/02/05.

Lars Diening, Universität Freiburg, Germany, 8.04.05., *Lectures*: Lebesgue and Sobolev spaces with variable exponent, 8/04/05.

Roland Duduchava, A. Razmadze Mathematical Institute, Academy of Sciences, Tbilisi, Georgia, 19.02.–29.03.05 and 6–11.07.05. *Lectures*:

- Interface cracks in anisotropic composite materials, 25/02/05,
- Uniqueness and stability of a classical solution to a non cut off Boltzmann equation, 18/03/05.

Rudolf Dutter, Vienna University of Technology, 10–14.10.05. *Lecture*: Development of a data analysis system in R, with graphical interface, 11/10/05.

Antonis Economou, University of Athens, 27.09–5.10.05. *Lecture*: Exact computations and approximations for the stationary distributions of Markov chains in random environments and applications in queueing and population growth models, 4/10/05.

Torsten Ehrhardt, University of California at Santa Cruz, USA, 11.7.–15.7.05.

Driss Esselaoui, University of Kénitra, Morocco, 16.07.05 – 30.07.05, *Lecture*: Numerical analysis of viscoelastic flows using characteristics and finite volume methods, 22.07.05

Rafael Estepa, Universidade de Sevilha, 1.03–20.06.05. *Lecture*: Traffic modeling of voice over IP, 30/05/05.

Neville J. Ford, University College Chester, UK, 29.01.05 – 05.02.05, *Lecture*: An algorithm for detecting small solutions for delay differential equations, 02.02.05.

Giovanni Paolo Galdi, University of Pittsburgh, PA, USA, 01.06.06 –31.07.05, *Lecture*: The relation between flow rate and axial pressure gradient for time-periodic Poiseuille flow in a pipe, 29.07.05. *Lecture*: A mathematical analysis of lift and sedimentation of particles in the flow of a viscoelastic liquid in a channel, 22/07/05.

Manuel Guerra, Departamento de Matemática, ISEG/UTL, *Lecture*: Generalized synthesis and computation of nonclosed accessible sets in control theory, 20/05/05.

David Kapanadze, A. Razmadze Mathematical Institute, Academy of Sciences, Tbilisi, Georgia, 18.11.05. , *Lecture*: Wave diffraction by a strip with first and second kind boundary conditions: the real wave number case, 18/11/05.

Alexei Karlovich, Universidade do Minho, 31.01.–1.02.05, 15–16.09.05 and 23.9.05. , *Lecture*: Algebras of singular integral operators on Nakano spaces with Khvedelidze weights over Carleson curves with logarithmic whirl points, 16/09/05.

Yuri Karlovich, Universidad Autónoma del Estado de Morelos, Mexico, 2.1.–14.1.05, 7.7.–18.7.05 and 13.12.–23.12.05. , *Lectures*:

- Pseudodifferential operators with non-regular symbols, 14/01/05,
- A weighted analogue of the Carleson-Hunt theorem and new classes of pseudodifferential operators, 16/12/05.

Andreas Kirsch, University of Karlsruhe, Germany, 24 – 28.02.05, *Lecture*: The Factorization Method in Inverse Problems, 25/02/05.

Matias Kirst, University of Florida, 12–16.09.05. *Short Course:* Introduction to Association Mapping in Plants.

Georgii Litvinchuk, Universidade de Madeira, Funchal, 27.–30.06.05.

Vladimir Maz'ya, Ohio State University, USA, 10.7.–14.7.05. , *Lecture:* Boundary value problems for the Stokes and Navier-Stokes systems in polyhedral domains, 12/07/05.

Luisa Morgado, Departamento de Matemática, Universidade de Trás-os-Montes e Alto Douro, *Lecture:* Análise e Tratamento Numérico de Problemas de Valores de Fronteira Singulares, 30/11/05.

Lionel Nadau, CEMAT – IST, *Lecture:* Numerical simulations of shear dependent viscoelastic flows with a combined finite element – finite volume method, 16/11/05.

Yarema Okhrin, Department of Statistics/University of Frankfurt Oder, 6–14.09.05, *Lecture:* Distributional properties and estimation of optimal portfolio, 13/09/05.

Helcio R. B. Orlande e Paulo Couto, Universidade Federal do Rio de Janeiro, Brazil, 01–15.03.05, *Lecture:* Identificação de parâmetros e funções em transferência de calor e massa, 03/03/05.

Carlos Alberto B. Pereira, Instituto de Matemática e Estatística, Universidade de São Paulo, 11–15.01.05.

Isabel Pereira, Departamento de Matemática, Universidade de Aveiro, 2.02.05. *Lecture:* Propriedades, estimação e predição em modelos bilineares com erros exponenciais, 2/02/05.

Vladimir Rabinovich, Instituto Politecnico Nacional, Mexico, 27.09–9.10.05., *Lecture:* Essential spectrum of the main operators of quantum mechanics. Applications of the limit operators method, 7/10/05.

K. R. Rajagopal, Texas A&M University, College Station, USA, 24.02.– 01.03.05, *Lecture:* The Undiscovered Stokes: the Navier-Stokes equations and beyond, 25/02/05.

Nilson C. Roberty, Univ. Federal do Rio de Janeiro, Brazil, 01–15.12.05, *Lecture:* Coefficient determination for the stationary anisotropic Boltzmann transport equation, 07/12/05.

Anne M. Robertson, University of Pittsburgh, USA, 01.05.05 – 31.07.05, *Lecture:* On steady flows of viscoelastic fluids in curved pipes, 08.07.05; *Lecture:* 1D and directed continuum models for flow of non-Newtonian fluids in slender bodies, 22/07/05.

Steffen Roch, Technische Universität Darmstadt, Germany, 4.9.–15.9.05., *Lecture:* Finite sections of band-dominated operators, 13/9/05.

Sergei V. Rogosin, Belarussian State University, Minsk, Belarus, 26–29.6.05 and 3–5.07.05., *Lectures:* A nonlinear Riemann-Hilbert boundary value problem and its relation to a matrix factorization problem, 28/06/05.

Natasha Samko, Universidade do Algarve, Faro, 22.4.05., *Lecture:* Generalized Hölder spaces with non-equilibrated characteristics and Fredholmness of singular integral operators, 22/04/05.

Wolfgang Schmid, Europe University, Frankfurt Oder, 15–22.09.05. *Lecture:* Eighty years of control charts: Some new developments, 22/09/05.

Euripides Sellountos, University of Patras, Greece, 12–16.11.05, *Lecture:* Two meshless methods for solving fluid problems in two dimensions, 15/11/05.

Pedro Serranho, University of Goettingen, Germany and CEMAT – IST, *Lecture:* Um método híbrido para a reconstrução de obstáculos 2D, 18/05/05.

Eugene Shargorodsky, King's College London, UK, 15–24.09.05., *Lectures*: Complex methods for Bernoulli free-boundary problems, 23/09/05.

Bernd Silbermann, Technische Universität Chemnitz, Germany, 6.7.–10.7.05 and 7.9.–24.9.05., *Lecture*: Asymptotic behavior of variable Toeplitz matrices, 23/09/05.

Keith Smith, CEMAT–IST, *Lecture*: A kinetic theory viscoelastic blood flow model, 22/07/05.

Claude Tadonki, University of Geneva, Switzerland, 05–09.11.05, *Lecture*: Integer programming heuristic for the dual power selection problem in wireless network. 07/11/05.

Murilo Tomé, ICMC –USP de S. Carlos, Brazil, *Lecture*: Numerical simulation of free-surface flows. Developments of the marker-and-cell method, 22/07/05.

Harald Upmeyer, Universität Marburg, Germany, 3–10.07.05.

Rui Valadas, Instituto de Telecomunicações/Universidade de Aveiro, *Lecture*: 14.01.05. *Lecture*: Caracterização estatística de tráfego internet, 14/01/2005.

Hugo Beirão da Veiga, Università di Pisa, Italy, 01–15.02.05. *Lecture*: Soluções periódicas das equações de Navier-Stokes em tubos infinitos. Parte I, 09/02/05.

• **Other Research Units**

Pra Murphy, University of Queensland, Brisbane, Australia, 23.11.2005. *Lectures*: Workshop Lectures on 'Stochastics for The Quality Movement (SQM) and Product Warranty'.

5 Postdoctoral fellows

• Center for Logic and Computation (CLC)

Luís Cruz-Filipe, PhD in Mathematics, University of Nijmegen, The Netherlands, since October 2004. Support: FCT SFRH/BPD/16372/2004, Center for Logic and Computation (with Amílcar Sernadas). *Research areas*: Logic and Computation.

Rohit Chadha (PhD in Mathematics, U Penn, USA), since September 2005. Support: CLC September – December 2005 / FCT SFRH/BPD/26137/2005 after January 2006. Supervisors: Amílcar Sernadas and Paulo Mateus. *Research areas*: Probabilistic and quantum computation and information.

Claudio Hermida, PhD in Computer Science, University of Edinburgh, UK, December 1999 – February 2005 (with several interruptions). Support: FCT PRAXIS XXI/BPD/18976/1998, Center for Logic and Computation (with Amílcar Sernadas). *Research areas*: Category Theory, Logic and Semantics of Computation.

Kerry Ojakian (PhD in Mathematics, CMU, USA), since May 2005. Support: FCT SFRH/BPD/16936/2004. Supervisor: Amílcar Sernadas. *Research areas*: Digital and analog computation; computational complexity.

• Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)

J. Agapito, PhD in Mathematics, Univ. California, Santa Cruz, USA, 2004. *Research areas*: symplectic geometry, discrete mathematics. (Jan. 2005–).

R. Czaaja, PhD in Mathematics, Univ. Silesia, Poland, 2004. *Research areas*: semilinear abstract parabolic equations. (Sep. 1, 2005–Aug. 31, 2006).

E. Dryden, PhD in Mathematics, Dartmouth College, USA, 2004. *Research areas*: spectral theory, geometry of orbifolds and Riemann surfaces. (Oct. 1, 2005–Jul. 31, 2006).

J. Faria Martins, PhD in Mathematics, Nottingham Univ., UK, 2004. *Research areas*: quantum topology, quantum groups, knot theory, applications of categorical groups to low dimensional topology. (Jan. 2005–).

R. Hric, PhD in Mathematics, Comenius Univ. in Bratislava, Slovakia, 1999. *Research areas*: dynamical systems. (Jan. 2003–Dec. 2005).

G. Iommi, PhD in Mathematics, Univ. Warwick, UK, 2004. *Research areas*: dynamical systems. (Nov. 1, 2004–Dec. 31, 2005).

S.S. Kim, PhD in Mathematics, Stanford Univ., USA, 2001. *Research areas*: symplectic and contact geometry. (Jul. 2005–).

D. Krejčířík, PhD in Mathematics, Univ. Toulon et du Var, France, 2001, and PhD in Theoretical Physics, Charles Univ. Prague, Czech Republic, 2001. *Research areas*: mathematical physics, quantum mechanics, spectral geometry. (Feb. 2003–Jan. 2005).

H. Li, PhD in Mathematics, Univ. Illinois, Urbana-Champaign, USA, 2003. *Research areas*: symplectic geometry. (Sep. 1, 2003–Aug. 31, 2005).

N. Luzia, Doutorado em Matemática, Instituto Nacional de Matemática Pura e Aplicada, Brazil, 2004. *Research areas*: dynamical systems. (May 2005–).

P. McNamara, PhD in Mathematics, Massachusetts Institute of Technology, USA, 2003. *Research areas:* algebraic combinatorics, matrix theory. (Aug. 1, 2005–Jul. 31, 2006).

M. Panthee, PhD in Mathematics, Instituto Nacional de Matemática Pura e Aplicada, Brazil, 2004. *Research areas:* partial differential equations, harmonic analysis. (Dec. 15, 2004–Jan. 14, 2006).

R. Popescu, Doctorat de Mathématiques, Univ. Claude Bernard, Lyon 1, France, 2000. *Research areas:* C^* -algebras, bivariant K-theory, groupoids, foliations, quantales. (Apr. 2005–).

B. Van Steirteghem, PhD in Mathematics, Columbia Univ. USA, 2004. *Research areas:* algebraic groups, symplectic geometry. (Nov. 1, 2004–Jan. 31, 2006).

C. Valls, Doctor in Mathematics, Univ. Barcelona, Spain, 1999. *Research areas:* dynamical systems. (Oct. 2003–).

• **Center for Mathematics and its Applications (CEMAT)**

N. Arada, Docteur en Mathématiques de l'Université de Toulouse, France, 1997. Support: FCT SFRH/BDP/3506/2000. CEMAT (with A. Sequeira), 1.04.01 – 19.01.06. *Research areas:* Partial Differential Equations, Optimal Control Theory, Mathematical Fluid Dynamics.

Abdel Monim Artoli, PhD in Mesoscopic Computational Haemodynamics, Department of Computer Science, University of Amsterdam, The Netherlands, October 2003. Contract FCT, SFRH/BPD/20823/2004, CEMAT (with A. Sequeira) since October 2005. *Research areas:* Non-Newtonian blood flow simulations in real arteries, CFD for industrial applications and modelling of cancer growth.

Tomas Bodnar, PhD in Mathematical Modelling, University of Toulon, France, 2003. PhD in Mathematical Engineering, Czech Technical University of Prague, Czech Republic, 2003. Contract: HPRN-CT-2002-00270, EU-RTN European Research Training Network – HaeMOdel, CEMAT (with A. Sequeira) March - August 2005, April – September 2006. *Research areas:* Computational Fluid Dynamics, Numerical Simulations in Atmospheric Pollution-Dispersion, Modelling in Hemodynamics and Hemorheology.

L. Nadau, Docteur en Mathématiques Appliquées, Université de Pau et des Pays de l'Adour (UPPA), Pau, France, 2003. Support: Project FCT POCTI/MAT/41898/2001. CEMAT (with A. Sequeira), 1.11.03 – 30.11.05. *Research areas:* Flows in Porous Media, Computational Blood Rheology.

Euripides Sellountos, PhD in Mechanical Engineering, University of Patras, Greece, April, 2004. Contract: HPRN-CT-2002-00270, EU-RTN European Research Training Network – HaeMOdel, CEMAT (with A. Sequeira) December 2005 – September 2006. *Research areas:* Boundary Domain Integral Equation Methods and Meshless Methods in elasticity and in fluid dynamics. Applications in Haemodynamics.

Keith Smith, PhD in Applied Mathematics, University of Wales Aberystwyth, UK, 2004. Contract: HPRN-CT-2002-00270, EU-RTN European Research Training Network – HaeMOdel. CEMAT (with A. Sequeira) January – July 2005. *Research areas:* Spectral Methods, Viscoelastic Fluids, Kinetic Theory Models, Computational Blood Rheology.

• **Other Research Units**

Marcello Savarese, University of Naples, 1.2–14.4.05 (with F. Ramalhoto). Support: University of Naples. Research Areas: Fuzzy Logic, Queuing Theory and Stochastic Reliability.

5.1 Publications by postdoctoral fellows ¹

• Center for Logic and Computation (CLC)

F. van Breugel, C. Hermida, M. Makkai, and J. Worrel, *An accessible approach to behavioural pseudo-metrics*, in L. Caires, G. F. Italiano, L. Monteiro, C. Palamidessi, and M. Yung, editors, Automata, Languages and Programming ICALP'05, volume 3580 of Lecture Notes in Computer Science, pages 1018–1030. Springer-Verlag, 2005.

L. Cruz-Filipe and C. Sernadas, *Sequent calculi based on derivations*, preprint, CLC, Department of Mathematics, Instituto Superior Técnico, 1049–001 Lisboa, Portugal, 2005. Submitted for publication. Get a preprint: 05-CS-quantfib01.pdf.

L. Cruz-Filipe, A. Sernadas and C. Sernadas, *Heterogeneous fibring of deductive systems via abstract proof systems*, preprint, CLC, Department of Mathematics, Instituto Superior Técnico, 1049–001 Lisboa, Portugal, 2005. Submitted for publication. Get a preprint: 05-CSS-fiblog26.pdf.

K. Ojakian, *Upper and lower ramsey bounds in bounded arithmetic*, Annals of Pure and Applied Logic, 135–150, 2005. Get a preprint: 05-O-ramsey.pdf.

• Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)

J. Agapito and J. Weitsman, *The weighted Euler–Maclaurin formula for a simple integral polytope*, Asian J. Math., 9 (2005), 199–211.

J. Agapito, *A weighted version of quantization commutes with reduction for a toric manifold*, In Integer points in polyhedra—geometry, number theory, algebra, optimization, Contemp. Math., vol. 374, Proceedings of the AMSIMS- SIAM Joint Summer Research Conference held in Snowbird, Utah, July 13–17, 2003, edited by A. Barvinok, M. Beck, C. Haase, B. Reznick and V. Welker, Amer. Math. Soc., 2005, 1–14.

J. Agapito, *Weighted Brianchon–Gram decomposition*, to appear in Canad. Math. Bull.

J. Alves, R. Hric and J. Sousa Ramos, *Topological entropy, homological growth and zeta functions on graphs*, Nonlinearity, 18 (2005), 591–607.

L. Barreira and C. Valls, *Center manifolds for nonuniformly partially hyperbolic diffeomorphisms*, J. Math. Pures Appl. (9), 84 (2005), 1693–1715.

L. Barreira and C. Valls, *Higher regularity of invariant manifolds for nonautonomous equations*, Nonlinearity, 18 (2005), 2373–2390.

L. Barreira and C. Valls, *Smoothness of invariant manifolds for nonautonomous equations*, Comm. Math. Phys., 259 (2005), 639–677.

L. Barreira and C. Valls, *Stability of nonautonomous differential equations in Hilbert spaces*, J. Differential Equations, 217 (2005), 204–248.

L. Barreira and C. Valls, *Existence of stable manifolds for nonuniformly hyperbolic C^1 dynamics*, to appear in Discrete Contin. Dyn. Syst.

L. Barreira and C. Valls, *Multifractal structure of two-dimensional horseshoes*, to appear in Comm. Math. Phys.

¹Including publications in 2005 resulting from work carried out by post-docs in previous years.

- L. Barreira and C. Valls, *Stable manifolds for nonautonomous equations without exponential dichotomy*, to appear in J. Differential Equations.
- L. Barreira and C. Valls, *A Grobman–Hartman theorem for nonuniformly hyperbolic dynamics*, to appear in J. Differential Equations.
- J. Faria Martins, *On the analytic properties of the z -coloured Jones polynomial*, J. Knot Theory Ramifications 14 (2005), no. 4, 435–466.
- J. Faria Martins, *Knot theory with the Lorentz group*, Fund. Math. 188 (2005), 59–93.
- J. Faria Martins, *Categorical Groups, Knots and Knotted Surfaces*, accepted in J. Knot Theory Ramifications.
- J. Faria Martins, *On 2-Dimensional Homotopy Invariants of Complements of Knotted Surfaces*, submitted to Algebraic Geometry and Topology.
- G. Iommi, *Multifractal analysis for countable Markov shifts*, Ergodic Theory Dynam. Systems, 25 (2005), 1881–1907.
- G. Iommi, *Ergodic optimization for renewal type shifts*, to appear in Monatsh. Math.
- G. Iommi and B. Skorulski, *Multifractal analysis for the exponential family*, to appear in Discrete Contin. Dyn. Systems.
- F. Knop and B. Van Steirteghem, *Classification of smooth affine spherical varieties*, to appear in Transformation Groups.
- H. Li, *On the construction of certain 6-dimensional symplectic manifolds with Hamiltonian circle actions*. Trans. Amer. Math. Soc., 357 (2005), 983–998.
- J. Llibre and C. Valls, *Formal and analytic integrability of the Lorenz system*, J. Phys. A, 38 (2005), 2681–2686.
- J. Llibre and C. Valls, *Integrability of the Bianchi IX system*, J. Math. Phys., 46 (2005), 072901, 13.
- J. Llibre and C. Valls, *Formal and analytic first integrals of Einstein–Yang–Mills equations*, J. Phys. A, 38 (2005), 8155–8168.
- J. Llibre and C. Valls, *Formal and analytical integrability of the Bianchi IX system*, to appear in J. Math. Phys.
- M. Panthee, *On the compact support of solutions to a nonlinear long internal waves model*, Nepali Math. Sci. Rep., 24 (2005), 49–58.
- M. Panthee, *Unique continuation property for the Kadomtsev–Petviashvili (KP-II) equation*, Electron J. Differential Equations, 2005, no. 59, 12.
- M. Panthee and J. Silva, *Well-posedness for the Cauchy problem associated to the Hirota–Satsuma equation: periodic case*, to appear in J. Math. Anal. Appl.
- A. Pumariño and C. Valls, *Instability in Hamiltonian systems*, Electr. J. Qual. Theory Diff. Equ., Monograph Series, 1 (2005), 204.
- C. Valls, *The Boussinesq system: dynamics on the center manifold*, Commun. Pure Appl. Anal., 4 (2005), 839–860.

C. Valls, *Rikitake system: analytic and Darbouxian integrals*, Proc. Roy. Soc. Edinburgh Sect. A, 135 (2005), 1309–1326.

C. Valls, *Analytical first integrals of the Halphen system*, to appear in J. Geom. Phys.

C. Valls, *Stability of some waves in the Boussinesq system*, to appear in Commun. Pure Appl. Anal.

C. Valls, *Quasiperiodic solutions for dissipative Boussinesq system*, to appear in Comm. Math. Phys.

C. Valls, *On the non-integrability of a generalized Darboux Halphen system*, to appear in J. Geom. Phys.

• **Center for Mathematics and its Applications (CEMAT)**

Abdel M. M. Artoli, A.G. Hoekstra and P.M.A. Sloot, *Optimizing lattice Boltzmann simulations for unsteady flows*, Computers & Fluids, vol. 35, nr 2 227–240. 2005.

Abdel M. M. Artoli, A.G. Hoekstra and P.M.A. Sloot, *Mesoscopic simulations of systolic flow in the human abdominal aorta*, Journal of Biomechanics, vol. 39, nr 5 873–884. 2005. (DOI: 10.1016/j.jbiomech.2005.01.033)

N. Arada and A. Sequeira, *Existence results for steady flows of quasi-Newtonian fluids using weak monotonicity*, J. Math. Fluid Mech., vol.7, sup.2, 2005, 273–288.

N. Arada and A. Sequeira, *Steady flows of Oldroyd-B fluids with shear-dependent viscosity around an obstacle*, J. Math. Fluid Mech., vol. 7, nr. 3, 2005, 1–33.

N. Arada, M. Pires and A. Sequeira, *Numerical simulations of shear-thinning Oldroyd-B fluids in curved pipes*, IASME Transactions, Issue 6, Vol. 2, 2005, 948–959.

N. Arada, M. Pires and A. Sequeira, *Secondary flows of shear-thinning generalized Newtonian fluids in curved pipes*, Proceedings of the 3rd IASME/WSEAS Int. Conf. on Fluid Mechanics and Aerodynamics, Corfu Island, Greece, August 20–22, 2005, 118–123.

N. Arada, M. Pires and A. Sequeira, *Viscosity Effects on Flows of Generalized Newtonian Fluids through Curved Pipes*, Computers and Mathematics with Applications, in press.

A. M. M. Artoli and A. Sequeira, *Mesoscopic simulations of unsteady shear-thinning flows*, Computational Science – ICCS 2006, series Springer Lecture Notes in Computer Science, vol 3992, in press.

T. Bodnár and M. Prosi, *Numerical Simulation of 3D Shear-Thinning Blood Flow in Axisymmetric Vessel Stenosis*, in Proceedings of Colloquium FLUID DYNAMICS 2005 (edited by P. Jona-s & V. Uruba), Institute of Thermomechanics, Academy of Sciences of Czech Republic, Praha, 2005, 17–20, ISBN 80–85918–94–3.

T. Bodnár, J. Poíhoda and K. Kozel, *Numerical Simulation of 3D Turbulent Free Surface Flow in a Curved Channel*, in Topical Problems of Fluid Mechanics 2005. Praha, 2005, 15–18. ISBN 80–85918–92–7.

Lionel Nadau and Adélia Sequeira, *Numerical simulations of shear dependent viscoelastic flows with a combined finite element, finite volume method*. Computers and Mathematics with Applications, 2005, in press.

K. D. Smith and Adélia Sequeira, *Micro-macro simulations of a shear-thinning viscoelastic kinetic model: applications to blood flow in a stenosed vessel*, submitted.

E. J. Sellountos and D. Polyzos, *A MLPG (LBIE) approach in combination with BEM*, Computer Methods in Applied Mechanics and Engineering, Vol. 194, No.6–8, 2005, 859–875.

E. J. Sellountos, V. Vavourakis and D. Polyzos, *A new Singular/Hypersingular MLPG (LBIE) method for 2D elastostatics*, CMES: Computer Modelling in Engineering and Sciences. Vol. 7, No. 1, 2005, 35–48.

I. Sládek, L. Bene, T. Bodnár and K. Kozel, *On the Numerical Study of the Atmospheric 3D-Flow over a Complex Topography with a Forest Blocks*, in Colloquium Fluid Dyna 2005. Praha, 2005, 139–142. ISBN 80–85918–94–3.

K.D. Smith, *Micro-macro simulations applied to blood rheology*, Research Report DM-IST, July 2005.

• **Other Research Units**

F. Ramalhoto and M. Savarese, *A Fuzzy Logic Approach to the Total Quality Queue Management Framework*, technical report.

6 Research programs and sponsorship

6.1 Research projects coordinated by department members

- **Center for Logic and Computation (CLC)**

A. Ravara, Behavioural and Spatial Type Systems, FCT POSC/EIA/55582/2004, 7.05–6.08.

A. Sernadas, QuantLog: Logic in Quantum Computation and Information. FCT Project FEDER POCI/MAT/55796/2004 (January 1, 2005 – December 31, 2007).

- **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

R. L. Fernandes, Symplect Topology and Related Geometries, Projecto POCTI/MAT/57888/2004, 2005–2008.

D. Gomes, Analysis and Applications of Partial Differential Equations FCT (Portugal) POCI/MAT/55745/2004.

M. Mendes Lopes, Classification of algebraic complex surfaces, POCTI/MAT/44068/2002, 10 de Setembro de 2003 a 9 de Setembro de 2006.

J. P. Nunes, Moduli Spaces and String Theory, POCI/MAT/58549/2004, July 2005–July 2008.

R. Picken, Quantum Topology, Fundação para a Ciência e a Tecnologia, POCI/MAT/60352/2004, 01/06/2005–31/05/2008.

J. S. Ramos, Low-dimensional and Infinite-dimensional Discrete Dynamical Systems, POCTI/MAT/60380/2004. (2005–2008).

P. Resende, Quantalic aspects of quasiperiodic tilings, CRUP/British Council (Treaty of Windsor) No. B–22/04, 1 April 2004 – 30 April 2006.

P. Resende

- Groupoids and quantales in geometry and analysis, FCT POCI/MAT/55958/2004, 14.07.05–13.07.08.
- Quantalic aspects of quasiperiodic tilings, CRUP / British Council (Treaty of Windsor) Nos. B–22/04, B–68/05 (renewal), 01.04.04–30.04.06.

C. Rocha,

- Geometric Properties of Invariant Sets, PDCT MAT/56476/2004, 12.05–12.07.
- Internacionalization of Post-Doctoral R&D in Mathematics, #20NMSL1032 (Gulbenkian), 01.05–12.06.
- Nonlinear Analysis and Dynamical Systems, POCTI MAT/199/94–20199 (Phase II), 1.02–12.05.

P. F. dos Santos, Homotopy Theoretic Methods in Geometry and Algebra, POCTI/MAT/58497/2004, 01/2005–01/2008.

- **Center for Mathematics and its Applications (CEMAT)**

C. Alves,

- Analysis of mathematical models for the motion of rigid bodies in incompressible fluids. Project FCT – POCTI/MAT/61792/2004, 2005–07.

- Three-Dimensional Wave Propagation in Layered Media containing Cracks or Thin Inclusions - Computational Modelling and Experimental Detection. Project FCT – POCTI/ECM/58940/2004, 2005–07.

M. Amélia Bastos, Non-local operator algebras, related operator corona problems and applications, FCT/FEDER/POCTI/MAT/59972/2004.IST–UTL [2005–2008].

P. Lima, Computational Methods for Singular Problems, FCT POCTI/MAT/45700/2002, September 2003– September 2006.

A. Pires Parente,

- Robust statistical methods in multivariate analysis, GRICES: Proc. 4.1.7/Argentina, 3.05–12.06.
- Models for passenger and cargo traffic at Lisbon Airport, Research and consultancy project for ANA, Aeroportos de Portugal, SA, 6.05–3.08 (with A. Pacheco, C. Nunes and M. R. Oliveira).

A. Sequeira,

- HaeMOdel: Mathematical and Numerical Modelling in Haemodynamics, Research Training Network, HPRN–CT–2002–00270, 1.10.02 – 30.9.06.
- Mathematical and Numerical Modelling of the Human Cardiovascular System, POCTI/MAT/41898/2001, 15.1.02 – 30.04.2006
- Mathematical Analysis and Numerical Simulation of Non-Newtonian Fluid Models with Applications to the Technology of Polymer Liquid Crystals, POCTI/MAT/380/2001, II phase, 1.09.00 – 31.08.05.
- Numerical Solution of Complex Non-Newtonian Fluid Flow Problems, Project GRICES/CNRST – Bilateral Project Portugal-Maroc, 1.03.04 – 31.12.06.
- Blood Flow Modelling in the Vascular System, Bilateral project Portugal/Tunisia, 1.03.04 – 31.12.06.

A. L. Silvestre, Analysis of mathematical models for the motion of rigid bodies in incompressible fluids, FCT - POCTI/MAT/61792/2004, 6.05–6.08

F.-O. Speck, Operator Theory, Banach Algebras and Applications, coordination of Research Group 1 of the Centre for Mathematics and its Applications, 1.05–12.05.

• Other Research Units

F. Ramalhoto, PRO-ENBIS – Contract No. G6RT/CT/2001/05059. European Union 2001–2005.

6.2 Participation in other research projects

• Center for Logic and Computation (CLC)

L. Cruz-Filipe, QuantLog: Logic in Quantum Computation and Information, POCI/MAT/55796/2004, 1/2005–12/2007.

F. M. Dionísio, MAGO2 - Modelling AGents and Organizations, POSI/SRI/39351/2001, 01.03.2002 – 01.03.2005.

P. Gouveia, ConTComp: Continuous Time Computation and Complexity, FCT FEDER POCTI/MAT/45978/2002, 1.9.03 – 31.08.06.

P. Mateus, QuantLog: Logic in Quantum Computation and Information, FCT Project FEDER POCI/MAT/55796/2004 (January 1, 2005 – December 31, 2007).

J. Ramos, FibLog: Fibring of Logics, FCT FEDER POCTI/2001/MAT/37239, 1.02–31.04.

J. F. Rasga, QuantLog: Logic in Quantum Computation and Information, FCT Project FEDER POCI/MAT/55796/2004, 1/2005–12/2007.

A. Ravara, Software Engineering for Service-Oriented Overlay Computers, EU IST–2005–16004, 9.05–8.09.

C. Sernadas, QuantLog: Logic in Quantum Computation and Information, FCT Project FEDER POCI/MAT/55796/2004, 1/2005–12/2007.

A. Ravara,

- Models and Infra-structures for Mobile Computing, POSI/CHS/39789/2001, January 1, 2002 – December 31, 2004.
- Mikado: Mobile Calculi based on Domains, IST–2001–32222, January 1, 2002 – December 31, 2004.
- Profundis: Proofs of Functionality for Mobile Distributed Systems, IST–2001–33100, January 1, 2002 – December 31, 2004.

• **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

S. Anjos, Symplectic Topology and Related Geometries, POCTI/MAT/57888/2004, 6.05–5.08.

A. Cannas da Silva, Symplectic Topology and Related Geometries, POCTI/MAT/57888/2004, 2005–2007.

R. Cordovil, Algebraic techniques in graph theory, Cooperação Luso/Francesa – Programa PESSOA 2005, 01.01.05–31.12.05.

R.L. Fernandes,

- MISGAM-Methods of Integrable Systems in Geometry and Applied Mathematics, European Science Foundation (ESF): <http://misgam.sissa.it/> e <http://www.esf.org/misgam>, 7.04–7.09.
- ENIGMA-European Network in Geometry, Mathematical Physics and Applications, Marie Curie Research Training Network, FP6-2002-Mobility 1 Proposal 005652, 2004–2008.

C. Florentino, Moduli Spaces, Integrability and String Theory, Research Project in Exact Sciences, POCTI/33943/MAT/2000, FCT, 1.2001 – 1.2004.

P. Lopes, Non-local operator algebras, related operator corona problems and applications, FCT/FEDER/POCTI/MAT/59972/2004, 2005–2008.

P. Freitas, ESF Programme in Spectral Theory and Partial Differential Equations (SPECT), 2002–2006.

P. Lopes, Quantum Topology, POCI/MAT/60352/2004.

R. Picken, Nonperturbative Aspects of Fields and Strings, POCTI/FNU/49529/2002.

J. S. Ramos, Heterogeneous Agents, Learning and Complexity in Optimal Monetary Policy and Asset Pricing, POCTI/ECO/48628/2002.

P. Resende, GAMAP: Geometric and Algebraic Methods of Physics and Applications, SOCRATES IP 103466-IC-1-2003-1-BE-ERASMUS-IPUC-3 (coordinated by Univ. Antwerp), September 2005 – September 2008.

• **Center for Mathematics and its Applications (CEMAT)**

C. Alves

- Analysis of mathematical models for the motion of rigid bodies in incompressible fluids. Project FCT – POCTI/MAT/61792/2004, 2005–07.
- Three-Dimensional Wave Propagation in Layered Media containing Cracks or Thin Inclusions Computational Modelling and Experimental Detection. Project FCT – POCTI/ECM/58940/2004, 2005–07.

C. Carvalho,

- Quantization, noncommutative geometry and symmetry, NWO 616.062.384, 1.1.05 to 1-9-05 (coordinated by NP Landsman, Radboud University, Nijmegen, The Netherlands).
- Groupoids and quantales in geometry and analysis, FCT POCTI/MAT/55958/2004, 1.9.05 – 13.7.2008 (coordinated by P. Resende, IST).

T. Diogo, Computational Methods for Singular Problems, FCT POCTI/MAT/45700/2002, September 2003– September 2006.

H. Mascarenhas, Non-local operator algebras, related operator corona problems and applications, FCT/FEDER/POCTI/MAT/59972/2004, 1.2005 – 12.2008.

M. C. Morais, Internet Traffic Measurements, Modelling and Statistical Analysis, POSI/EIA/60061/2004.

A. Pacheco Pires,

- EURO-NGI, Design and Engineering of the Next Generation Internet, Towards Convergent Multi-Service Networks, 2003/12/01–2006/11/30.
- Internet Traffic Measurements, Modelling and Statistical Analysis, FCT POSI/EIA/60061/2004, 2005/01/01–2006/12/31.

L. V. Pessoa, Non-local operator algebras, related operator corona problems and applications, FCT/FEDER/POCTI/MAT /59972/2004.IST–UTL [2005–2008].

A. M. Pires, Statistical Analysis of Complex Data with Robust and Related Statistical Models (SACD), ESF Network: 117, 1.04–12.06.

A. M. Santos, Non-local operator algebras, related operator corona problems and applications, FCT/FEDER/POCTI/MAT/59972, 2006–2008.

P. A. Santos, Non-local operator algebras, related operator corona problems and applications, FCT/FEDER/POCTI/MAT/59972, 2006–2008.

A. Sequeira,

- Analysis of mathematical models for the motion of rigid bodies in incompressible fluids, POCTI/MAT/61792/2005–2007.
- 'O Livro da Natureza', POCTI/DIV/2005/00063, 01.07-31.12.2006 (joint project ofá CEMAT–IST and CFTP–IST with CFC–Univ. Coimbra, project leader).

A. L. Silvestre, Inverse problems and meshless methods in PDEs, FCT - POCTI/MAT/60863/2004, 1.05-12.07.

F.-O. Speck, Operator Theoretical Methods in Boundary Value Problems, FCT POCTI/34222/MAT/2000, 1.02-12.05.

J. Videman, Mathematical Methods Applied to the Environmental Problems, Programa Pessoa, GRICES-EGIDE, March 2004 – March 2005.

• **Other Research Units**

A. B. Cruzeiro,

- Integração Funcional e Aplicações (POCTI/MAT/55977/2004).
- Logic in Quantum Computation and Information (POCTI/MAT/55796/2004).

M. F. Ramalhoto, Research Line 3 – Queueing Systems and Quality Management – in the UETN (Marine Technology and Engineering Unit) – IST.

7 Organizations of scientific events

7.1 Events which took place in 2005

- **Center for Logic and Computation (CLC)**

C. Caleiro, Comissão científica, Logical Consequence and its Combinations – 2nd Indian Int. Conf. on Artificial Intelligence (IICAI-05), Pune, India, 12.05.05.

P. Mateus

- Member of the Scientific Committee of Logical Consequence and its Combinations, Pune, India, December 20–22, 2005.
- Member of the Scientific Committee of QAPL05: 3rd Workshop on Quantitative Aspects of Programming Languages, Edinburgh, Scotland, April 2–3, 2005.

A. Ravara, Member of the Organizing Committee of ICALP 2005, Lisbon, Portugal, 10–17.7.05.

- **Center for Mathematical Analysis, Geometry and Dynamical System (CAMGSD)**

M.T. Abreu, Co-organizer of SYMAT05 – Workshop on Symplectic Topology, IST, Lisbon, July 7–9, 2005.

S. Anjos, Co-organizador, SYMAT05 – Workshop in Symplectic Topology, IST, Portugal, 7–9.07.05

A. Cannas Silva, co-organizer of the Mathematics Undergraduate Summer School Escola Diagonal (Novos Talentos em Matemática), Instituto Superior Técnico, Portugal, 5–9.9.05.

R. Cordovil, Member of the Organizing Committee of Geometries Combinatoires et Applications: Matroides Orientes, Matroides, CIRM, Marseille-Luminy, France, 07–11.11.05.

R. L. Fernandes, Main Organizer of Tarde de Trabalho SPM/CIM, Os Novos Horizontes da Geometria, CIM–Coimbra, 3 September 2005.

C. Florentino, Co-organizer, Lisbon Summer Lectures in Geometry, DMIST Lisbon, Portugal, June 14 to 17, 2005.

L. Godinho, Co-organizer of the VI Lisbon Summer Lectures in Geometry, IST, June 14 to 17, 2005.

M. M. Lopes, J. Mourão, J. Nunes and R. Schiappa, Organizers of the First CAMGSD Thematic Period on Algebraic Geometry and Topological String Theory, IST, October–November 2005.

J. Mourão, Co-organizer, XIV Oporto Meeting on Geometry, Topology and Physics, Faculdade de Ciências, Universidade do Porto, Portugal, July 21–24, 2005.

R. Picken,

- Co-organiser, XIV Oporto Meeting on Geometry, Topology and Physics, Oporto, Portugal, 21–24.07.05.
- Member Scientific Committee, XIV Fall Workshop on Geometry and Physics, Bilbao, Spain, 14–16.09.05.

- **Center for Mathematics and its Applications (CEMAT)**

C. Alves,

- Co-chair of the Organizing Committee: ECOMMAS Thematic Conference on Meshless Methods. Lisbon, Portugal, July 11–14, 2005.
- Member of the organizing committee: Workshop on Optimization in Medicine. CIM (Coimbra, Portugal), July 20–22, 2005.
- Member of the Scientific Committee: 5th International Conference on Inverse Problems in Engineering: Theory and Practice (5th ICIPE). Cambridge, UK. July 11–15, 2005.
- Member of the Scientific Committee: ICCES Special Symposium on Meshless Methods. Stara Lesna, Slovakia. June 8–10, 2005.

A. Moura Santos, Member of the Organizing Committee of OTFUSA, Conference on Operator Theory, Function Spaces and Applications, Aveiro, Portugal, 7–9.07.05.

C.D. Paulino, Invited organizer of the session Bayesian Methods in Health Sciences in Joint Statistical Meetings, Minneapolis, USA, 07–10.08.05.

G. Silva, Spatio-Temporal Information System of myocardial Infarction, Primus Research Group – Geomatics for Informed Decisions, Université de Sherbrooke, Quebec, Canada, 2005.

F. Sepúlveda Teixeira, Member of the Scientific Committee of Conference on Operator Theory, Function Spaces and Applications, OTFUSA2005, Dedicated to the 60th birthday of Professor F.-O. Speck, Universidade de Aveiro, Portugal.

A. Pacheco Pires

- Organizer of the invited thematic session in Stochastic Ordering with Applications, XIII Annual Meeting of the Portuguese Statistical Society, Ericeira, Portugal, 28/09/2005 – 01/10/2005.
- Member of the Technical Program Committee of Third International Conference on the Performance Modelling and Evaluation of Heterogeneous Networks (HET-NETs'05), Ilkley, United Kingdom, 18/07/2005 – 20/07/2005.
- Member of the Scientific Advisory Committee of Fifth International Conference on Matrix Analytic Methods in Stochastic Models, Pisa, Italy, 20/06/2005 – 24/06/2005.
- Member of the Technical Program Committee in First Conference on Next Generation Internet Networks – Traffic Engineering, Rome, Italy, 18/04/2005 – 20/04/2005.

A. Pires,

- Member of the Scientific Committee of the International Conference on Robust Statistics, ICORS2005, Jyvaskila, Finland, 12–17.6.05.
- Member of the Scientific Committee of the Workshop DREaM 2005, Developments in Statistical Methodology: Diagnostics, Robustness, Exploration and Modelling, Milton Keynes, United Kingdom, 30.3–2.4.05.

A. Sequeira,

- Chairman of the Organizing Committee, Mid Term Review Meeting of the European Union HaeModel Project, IST–Lisbon, Portugal, March 30, 2005.
- Chairman of the Organizing Committee and Member of the Scientific Committee, 2nd International Symposium on Modelling of Physiological Flows – MPF 2005, Sesimbra, Portugal, March 31–April 2, 2005.
- Co-organizer, International Workshop on Current Topics in Mathematical Fluid Mechanics – MFM 2005 (in honor of Prof. John Heywood), IST–Lisbon, Portugal, June 17-18, 2005. á

- Chairman of the Organizing Committee, International Workshop on Modelling, Analysis and Numerical Simulation of Viscoelastic Fluids – VF05, IST–Lisbon, July 22, 2005. á
- Member of the Scientific Committee, International Symposium on Mathematical Fluid Dynamics and related Topics, within the 3rd IASME/WSEAS International Conference on Fluid Mechanics and Aerodynamics (Fluid’s05), Corfu, Greece, 20-22.08.05.

A. L. Silvestre, Member of the Organizing Committee of International Workshop on Current Topics in Mathematical Fluid Mechanics - MFM 05, IST, Lisbon, Portugal, 17–18.6.05.

• **Other Research Units**

A. B. Cruzeiro, Co-organizer and Member of the Scientific Committee, International Conference on Mathematical Analysis of Random Phenomena, Hammamet, Tunisia, 12–17 September 2005.

M. F. Ramalhoto,

- Member of the International Technical Programme Committee of ESREL’05, Gdansk/Tri-City, Poland, 27–30 June, 2005. Organizer and Co-Chair of the Invited Session “Integrated Maintenance, Reliability and Quality Improvement Concepts”.
- Member of the International Advisory Committee of the International Conference on Operations Research Applications in Infrastructures Development, ICORAID–2005–ORSI, India Institute of Science, Bangalore, India, 27–29 December 2005.
- Member of the Scientific Program Committee of the International Symposium on Stochastic Models in Reliability Safety, Security and Logistics, SMRSSL’05, Negev Academic College of Engineering, Beer Sheva, Israel, 15–17 February 2005.
- Organizer of one-day Workshop on ‘Stochastics for the Quality Movement (SQM) and Product Warranty’, IST, Lisbon, 23.11.2005.

7.2 Events taking place after 2005

• **Center for Logic and Computation (CLC)**

C. Caleiro, Coorganizador, Days in Logic’08, Lisboa, Portugal, January 2008.

P. Mateus,

- Member of the Organizing Committee of LQCIL’07 Lisbon Quantum Computation, Information and Logic Meetings Series Workshop on Quantum Cryptography – July 18–20, 2007.
- Member of Scientific Committee of QAPL06: 4th Workshop on Quantitative Aspects of Programming Languages, Viena, Austria, April 1–2, 2006.

J. F. Rasga, Organization chair and member of the program committee of Days in Logic 2008 (DiL’08), IST, Lisboa, January 16–18, 2008.

A. Sernadas, Chair of scientific committee, LQCIL’07 – Lisbon Quantum Computation, Information and Logic Meetings Series – Workshop on Quantum Cryptography, IST, Lisboa, July 18–20, 2007.

• **Center for Mathematical Analysis, Geometry and Dynamical Systems (CAMGSD)**

R. Cordovil, Member of Organizing Committee of Aveiro Workshop on Graph Spectra, University of Aveiro, Aveiro, Portugal, 10–12.04.06.

R. Loja Fernandes, Main organizer of the Oberwolfach Workshop ID 0718a, Poisson Geometry and Applications, 29.04.–05.05.2007.

D. Gomes,

- Coordinator: CAMGSD thematic Semester on Partial Differential Equations (2006, IST)
- Local Organizer: New Trends in Viscosity Solutions and Nonlinear PDE (2006, IST).

P. Lopes, Organizer of the Symposium on Knot Theory and Related Areas, SCRA2006, Universidade Nova de Lisboa and Instituto Polit'ecnico de Tomar, Portugal, September 1-4, 2006.

J. Matias, Co-organizer of the Summer School on Calculus fo Variations, to be held in Ponta-Delgada, Azores (September 2006).

J. Mourão, Co-organizer, XV Oporto Meeting on Geometry, Topology and Physics, Faculdade de Ciências, Universidade do Porto, Portugal, July 20–23, 2006.

R. Picken,

- XV Oporto Meeting on Geometry, Topology and Physics, Oporto, Portugal, 20–23/7/2006.
- Member Scientific Committee, XV Fall Workshop on Geometry and Physics, Tenerife, Spain, 11–16/9/2006.

P. R. Pinto,

- Member of the International Scientific Committee of ICMP–Satellite Conference on Operator Algebras, Florianópolis, Brasil, July 24–28, 2006.
- Coorganizer of the Summer School and Workshop on Operator Algebras, Operator Theory and Applications (ICM 2006 Satellite meeting), Inst. Superior Técnico, Lisbon, Portugal, Sept 1–5.

• **Center for Mathematics and its Applications (CEMAT)**

C. Alves, Member of the Scientific Committee: III European Conference on Computational Mechanics. Lisbon, Portugal. June 5–9, 2006.

M. Baía,

- Member of the organizing committee of Summer School on Calculus of Variations and Applications, Ponta Delgada, Azores, 4–9 September 2006.
- Member of organizing committee of Workshop on Calculus of Variations and Applications, Lisbon, Portugal, 1–2 September 2006.

M. A. Bastos, Organizing Committee of WOAT, International Summer School and Workshop on Operator Algebras Operator Theory and Applications, IST, Lisbon, Portugal, 1–5 September 2006.

T. Diogo, Member of the Organizing Committee of the Second International Workshop on Analysis and Numerical Approximation of Singular Problems, Karlovassi, Greece, 6–8 September 2006.

P. Lima, Member of the Organizing Committee of the Second International Workshop on Analysis and Numerical Approximation of Singular Problems, September 6–8 2006, Karlovassi, Greece.

A. Moura Santos, Member of the Organizing Committee of WOAT, International Summer School and Workshop on Operator Algebras Operator Theory and Applications, Lisbon, Portugal, 1–5 September 2006.

A. Sequeira,

- Session Organizer, Non-Newtonian Fluids and Applications – Mini-Symposium on Mathematical Fluid Mechanics, IASME/WSEAS International Conference on Continuum Mechanics, Chalkida, Evia Island, Greece, May 11-13, 2006.
- Member of the Scientific Committee, 3rd International Conference on Mathematical Fluid Mechanics and Applications, Univ. Évora, Portugal, June 15–17, 2006.
- Member of the Scientific Committee, International Conference on Parabolic and Navier-Stokes Equations, Bedlewo, Poland, September 10–17, 2006.
- Member of the Scientific Committee, 3rd International Symposium on Modelling of Physiological Flows, Bergamo, Italy, September 25–27, 2006.

F. Speck, Member of the Organizing Committee of WOAT 2006 – the International Summer School and Workshop on Operator Algebras, Operator Theory and Applications, Lisboa, 1–5.9.06.

• **Other Research Units**

A. B. Cruzeiro,

- Organiser of session, 31st Conference on Stochastic Processes and their Applications. Paris, 17–21 July, 2006.
- Co-organizer and Scientific Committee, Stochastic Analysis in Mathematical Physics (Satellite conference of the International Congress of Mathematics ICM2006), Lisbon, Portugal, 4–8 September 2006.

M. F. Ramalhoto,

- Member of the Scientific Program Committee of the International Conference on Degradation, Damage, Fatigue and Accelerated Life Models in Reliability Testing, 22–24 May 2006, sponsored by IEEE, University of Angers, France.
- Member of the International Technical Program Committee of ESREL'06, Lisbon, Portugal, 27–30 September 2006.

8 Other information

8.1 Editorial boards

C. Alves, Associate Editor of *Computers, Materials and Continua*.

L. Barreira,

- Executive Editor of *Portugaliae Mathematica*.
- Member of the Editorial Board of *Dynamical Systems*.

R. Cordovil,

- Executive Editor of *Portugaliae Mathematica*.
- Associate Editor of *European Journal of Combinatorics*

A. B. Cruzeiro, Member of the Editorial Board of the *EMS Newsletter*.

R. L. Fernandes, Executive Editor of *Portugaliae Mathematica*.

A. Pacheco Pires, Associate Editor of *REVSTAT*.

M. F. Ramalhoto,

- Associate Editor of the International Journal *Quality Technology and Quantitative Management*.
- Member of the Editorial Board of *European Journal of Engineering Education*.

A. Sernadas,

- Member of editorial board of *Advanced Studies in Mathematics and Logic*.
- Member of editorial board of *Formal Aspects of Computing*

F. Speck,

- Member of the Advisory Board of *Mathematische Nachrichten*.
- Member of the Editorial Board of *Mathematical Methods in the Applied Sciences*.

8.2 Scientific management positions

A. Cannas Silva, Member of the Scientific Committee for the Gulbenkian undergraduate excellency prize *Novos Talentos em Matemática*.

A. B. Cruzeiro,

- Member of the Comitee for Meetings of the European Mathematical Society.
- Member of the Conselho Consultivo da Faculdade de Ciências e Tecnologia da Universidade do Algarve.
- Member of the Mathematical Physics Committee (C18) of the IUPAP (Intern. Union of Pure and Applied Physics).
- Member of the Mathematics and Computer Sciences pannel of the italian comittee for evaluation of research (CIVR), 2005.

D. A. Gomes, Vice-president of the Sociedade Portuguesa de Matemática.

A. Sequeira,

- Member of the ECCOMAS Computation Fluid Dynamics Committee.
- Member of the Scientific Board of SAEN, Instituto Superior Técnico.

A. Sernadas, Member of the Conselho Científico do Centro Internacional de Matemática, Coimbra, Portugal.

8.3 New Positions

Margarida Baía, Professor Auxiliar

José Roquette, Professor Auxiliar

8.4 Personal notes by department members

• Center for Logic and Computation (CLC)

C. Caleiro, *Equipollent logical systems* (joint work with R. Gonçalves) won the best paper award on *How to define identity between logics?*

F. M. Dionísio, Orientação de duas teses de mestrado em Matemática da Universidade da Madeira com (início em Setembro de 2005).

J. F. Rasga,

- Membro relator no júri de doutoramento de João Marcos de Almeida, Doutoramento em Filosofia, Universidade Estadual de Campinas, Brasil e Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, em co-tutela, 16 de Fevereiro de 2005.
- Membro relator no júri de mestrado de Luís Filipe Rodrigues Perdigão Silva, Mestrado em Inteligência artificial aplicada, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, 18 de Abril de 2005.

A. Ravara, The 32nd International Colloquium on Automata, Languages and Programming and Satellite Workshops, FCG and IST, Lisboa, July 11–15 and July 10, 16–17, 2005.

A. Sernadas,

- Member of scientific council, Centro Internacional de Matemática (CIM).
- Coordinator of the scholarships evaluation panel for Mathematics, Fundação para a Ciência e a Tecnologia.
- Member of the jury (opponent), Agregação in Mathematics, Fernando Ferreira, FCUL.
- Member of the jury, Full Professor in Mathematics, University of Coimbra.
- Member of the jury, Associate Professor in Mathematics, ISA, UTL.
- Member of the jury, Associate Professor in Artificial Intelligence, IST, UTL. External evaluator, Tenure in Informatics, Luís Caires, FCTUNL.

C. Sernadas, Chair of the tenure committee, Department of Mathematics, IST.

• Center for Mathematical Analysis, Geometry and Dynamical System (CAMGSD)

L. Barreira,

- Associate Member of the Center for Dynamics and Geometry, The Pennsylvania State University, University Park, USA.
- Member of the Executive Commission of the Center for Mathematical Analysis, Geometry, and Dynamical Systems, Lisbon, Portugal.
- Organizer of the Seminar on Analysis, Geometry, and Dynamical Systems.

R. L. Fernandes,

- Membro do Conselho Científico do Centro Internacional de Matemática.
- Provas de Agregação em Matemática de Joana Nunes da Costa, Universidade de Coimbra, arguente da Lição de Síntese, Junho 2005.

C. Florentino, Editor of the E-escola (www.e-escola.pt) since 10.05.

D. Gomes,

- Organizador: Seminário de Equações Diferenciais Parciais.
- Co-organizador: Seminário de Matemática, Sistemas e Robótica.

L. Godinho, Other talks: *Decomposições de polítopos*, Programa Gulbenkian Novos Talentos em Matemática – Encontro Nacional 9/09/2005.

M. M. Lopes, Other talks: *Quantos pontos racionais?*, Palestra de divulgação, Universidade do Algarve, Março de 2005.

P. Lopes,

- Visited IMPA, Rio de Janeiro, RJ, Brazil, February – August 2005;
- Visited University of Illinois at Chicago, Chicago, IL, USA, June 10–14 2005;
- Referee, J. Knot Theory Ramifications

J. Natário, External Examiner of the PhD dissertation of Francisco Lobo (Faculdade de Ciências da Universidade de Lisboa).

J.S. Ramos,

- Professor Coordenador jury in Instituto Politécnico de Lisboa, Instituto Superior de Engenharia de Lisboa, 2005.
- Nuno Ferreira PhD jury, in Instituto Superior de Ciências do Trabalho e da Empresa, 2005.
- Rui Jorge Gonçalves PhD jury, in Faculdade de Engenharia da Universidade do Porto, 2005.
- Caos e indeterminismo na matemática, Workshop sobre o Indeterminismo, Centro de Filosofia das Ciências da Univ. Lisboa, 9 Mar. 2005, no Museu da Ciência de Lisboa.
- Teoria do caos e complexidade – DNA e internet, Encontro Regional de Física, Matemática e Tecnologia, Porto Santo, 21–23 de Abril 2005.
- Da simetria ao caos, do cristal ao fractal, conferência na Escola Secundária Braamcamp Freire, 16 de Março de 2005.

P. Resende,

- Member of the PhD committee of Diana Rodelo (thesis: Direcções para a sequência longa de co-homologia), Univ. Coimbra, 18.11.05.

- Main examiner of PhD committee of Maria João Ferreira (thesis: Sobre a construção de estruturas quase-uniformes em topologia sem pontos), Univ. Coimbra, 28.02.05.

C. Rocha,

- Coordenador do Centro de Análise Matemática, Geometria e Sistemas Dinâmicos.
- Júri de Provas de Agregação de José Miguel Urbano, Departamento de Matemática, Faculdade de Ciências da Universidade de Coimbra.
- Júri de Provas de Agregação de Sofia de Castro Gothen, Grupo I – Matemática, Faculdade de Economia da Universidade do Porto.
- Júri de Concurso de Professor Associado de Matemática/Análise Matemática da Universidade Aberta.

• **Center for Mathematics and its Applications (CEMAT)**

C. Alves, Guest Editor of the Journal: Computer Modelling in Engineering and Sciences – selected contributions from the MeshFree2003 (with C.S. Chen and V. Leitão), Volume 7 – Issue 2 (2005).

M. Baía,

- Research visit: L.P.M.T.M., Universite Paris Nord, 93430, Villetaneuse, France, January 3–7, 2005.
- PhD at Carnegie Mellon University, Pittsburgh, USA, May 2005. Advisor: Irene Fonseca.
- Post-Doctoral position at Universita degli Studi di Tor Vergata, Rome, Italy, September 2005–August 2006. Mentor: Andrea Braides.

M.A. Bastos, Orientação do Mestrado de Isabel Oliveira, Problemas de Riemann Hilbert e polinómios ortogonais, Janeiro 2005.

C. Câmara,

- Orientação do Doutoramento de Maria Teresa Mesquita da Cunha Machado Malheiro, cuja tese de doutoramento, intitulada, *Factorização de uma classe de funções matriciais associadas a símbolos escalares numa superfície de Riemann*, foi defendida a 19 de Dezembro de 2005, na Universidade do Minho (Braga).
- Factorização generalizada de uma classe de matrizes quase-periódicas, Seminário da Officina Mathematica da Universidade do Minho, Guimarães, 30.09.05.

C. Carvalho, Committee member of the Master's Thesis: Algebraic K-theory, periodic cyclic homology and the Connes-Moscovici Index Theorem, Bram Mesland, Univeristy of Amsterdam, The Netherlands, 6.05.

T. Diogo and P. Lima visited Prof. Jingtang Ma and Prof. Tao Tang at the Institute of Computational Mathematics and Scientific Engineering, Chinese Academy of Sciences, Beijing, China, 5–11 December 2005.

C.D. Paulino

- Habilitation in Statistics and Operational Research by the Faculty of Sciences of the University of Lisbon.
- Reporting member of the PhD jury of Isabel Natário, Faculdade de Ciências da Universidade de Lisboa, April 2005.

- Member of the PhD jury of Susana Vinga, Instituto de Tecnologia Química e Biológica, Universidade Nova de Lisboa, February 2005.

A. Pacheco Pires

- President of Session W7 (Modelling and Performance Evaluation for Quality of Service in Next Generation Internet) at the SAINT2005: The 2005 International Symposium on Applications and the Internet, Trento, Italy, 31/01/2005 – 04/02/2005.
- Member of the Ph.D. thesis committee of:
 - Dulce Gomes, Doutoramento em Matemática, Universidade de Évora, October 2005 (Arguente).
 - João Pedro Cruz, Doutoramento em Matemática, Universidade de Aveiro, September 2005 (Arguente).
 - Maria de Lurdes Simões, Doutoramento em Ciências de Engenharia, Universidade do Porto, May 2005 (Arguente).
 - Paulo Salvador, Doutoramento em Engenharia Electrotécnica, Universidade de Aveiro, April 2005 (Vogal).
 - António Nogueira, Doutoramento em Engenharia Electrotécnica, Universidade de Aveiro, March 2005 (Vogal).

F.-O. Speck, Conference on Operator Theory, Function Spaces and Applications at Universidade de Aveiro, 5–9.7.05, dedicated to Frank-Olme Speck on the occasion of his 60th birthday, with proceedings to appear in the journal *Mathematische Nachrichten*.

A. Sequeira,

- Coordinator of CEMAT - Center for Mathematics and its Applications.
- Coordinator of the Doctoral Program in Mathematics.
- Member of the FCT panel for the evaluation of Postdoctoral, PhD and Master grants in Mathematics.
- Visiting Professor at the Department of Mathematics, University of Hamburg-Harburg, Germany, 23-30.01.05.
- Visiting Professor at LAMSIN-ENIT, Tunis, Tunisie, 13-20.02.05
- Visiting Professor at SIANO - Dept. de Math. Informatique, Univ. Ibn Tofail, Kénitra, Maroc, 1-8.12.04.
- Visiting Professor at University of Pittsburgh, Department of Mechanical Engineering, USA, 19-31.10.05.
- Reporting member of the jury of Mohamed Bensaada, for the Habilitation Universitaire en Mathématiques Appliquées de l'Université Ibn Tofail, Kénitra, Maroc, 07.10.05.
- Reporting member of the M.Sc jury of João Ricardo de Oliveira Branco, Departamento de Matemática, Universidade de Coimbra, á 18.04.05.
- Reporting member of the Ph.D jury of Sílvia Alexandra Alves Barbeiro, Departamento de Matemática, Universidade de Coimbra, 05.09.05.
- Reporting member of the jury for Professor Coordinator in Mathematics (Numerical Analysis) at Instituto Superior de Engenharia de Lisboa, 25.11.05 and 9-10.02.06.

- Co-supervisor of the PhD thesis of Lourenço A. Beirão da Veiga (Thesis: Theoretical and Numerical Analysis of Some Problems in Structural Mechanics, concluded in 2004) awarded with the distinction of the Best Portuguese PhD thesis in Applied and Computational Mechanics 2004, given by APMTAC.

- **Other Research Units**

J. Félix Costa,

- Editor of the Science Series 'Máquina do Mundo', Bizâncio, Lisbon, Portugal.
- Guest Editor (with F. Dória) of a Special Issue on Hypercomputation of the Journal of Applied Mathematics and Computation 178 (1) (2006), Elsevier.

M.F. Ramalhoto,

- "Expert-Evaluateur" for the European Commission Fifth Framework and the Sixth Framework.
- Founder member and former Vice-President of the European Network for Business and Industrial Statistics, ENBIS.
- Member of the International Advisory Board of Reliability Conferences of the International Statistical Institute.
- In 2005: Pra Murphy, professor from the University of Queensland, Brisbane, Australia, visited Ramalhoto from 22 to 30 November 2005 and conducted an one-day Workshop on "Stochastics for the Quality Movement (SQM) and Product Warranty" on November 23 at IST (SQM is a concept introduced by Ramalhoto in 1999).
- In 2006: A Pos-graduate student with a scholarship from the University of Palermo will come (for a semester, starting on March 15, 2006) to do research work under Ramalhoto's supervision.