



Research Report 2000

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Preface

The Department of Mathematics regards the annual publication of this research report as an important instrument of scientific policy. On the 10th year of its publication we reassert the original goals. 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 year of 1980, when the Department of Mathematics was created, is long gone. At present, the department has 74 members holding Ph.D. degrees and relies on the contribution of a number of teaching assistants. Most of these are also graduate students in mathematics. With its own undergraduate degree in Applied Mathematics and Computer Science and its graduate program, the department is today one of the largest mathematics departments in Portugal and a major mathematics research center.

In 1996 and in 1999 the Ministry of Science and Technology subjected most of the research activities of the department to an external international evaluation, within the overall Research Units Assessment. The research units related to our department received very high ratings, acknowledging the international value of the research conducted.

The department experienced a fast development since it embraced the goal of becoming a research department. The number of members holding a Ph.D. degree and the predominant youth of its faculty is appropriate for the creation and conduction of innovative projects. The number and quality of international activities is an indication that the department has accepted the challenge of achieving a significant position among the international mathematics research centers.

I would like to thank everyone who was involved in the organization of this issue, especially Professor Luis Barreira, who coordinated the production of the report. I am also grateful to Adelaide Airoso and Ema Silva for their work in the preparatory word processing of this issue.

Lisbon, April 2001

The Department Chairman,

Prof. Francisco Sepúlveda Teixeira

Research Areas

The main areas of research in the Department of Mathematics of Instituto Superior Técnico are the following:

Dynamical Systems and Differential Equations

The dominant research in this area falls within the general field of mathematical analysis with an emphasis on non-linear 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 non-linear 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 non-linear analysis in mechanics of continuous media; methods of non-linear systems analysis in control theory; ergodic theory and dynamical systems.

Geometry and Topology

The work in this area is mostly concerned with problems spanning geometry, topology, algebra and analysis, namely questions related to the connection of some classical topics — differential geometry, mathematical physics, dynamical systems, symplectic geometry — with modern developments, including infinite-dimensional and discrete problems, for which Lie groups, K-theory, von Neumann algebras, noncommutative geometry, and combinatorics are essential tools.

Operator Theory and Integral Equations

The work in this area is focused on singular integral operators and other related classes of linear operators like Toeplitz, Carleman-shift and pseudo-differential operators. The motivation for the work comes mainly from problems of diffraction theory and other applications leading to elliptic boundary-value problems. These problems are formulated in appropriate Sobolev spaces and treated by operator theory methods. The emphasis is on linear operator theory and Banach algebras and their connections with complex analysis, in particular Hardy spaces. Current problems under investigation include factorization of (semi)-almost periodic matrix-valued symbols, diffraction problems with approximate boundary conditions of arbitrary order, operator relations, normalization problems, and finite section methods for singular equations.

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 Mathematical Analysis in Fluid Dynamics

The research on numerical methods for differential and integral equations is mainly directed towards: i) convergence acceleration techniques for ordinary differential equations with singularities and also for integral equations with singular kernels; ii) integral equation methods applied to problems in material science (elasticity and effective properties of composite materials); iii) spline collocation methods for Volterra integral equations with singular kernels; iv) boundary integral equations methods in acoustic and elastic scattering and related inverse scattering problems. The research on fluid dynamics is concerned with the questions of existence, uniqueness and asymptotic behavior of solutions to the equations modeling the flow of incompressible non-Newtonian fluids of differential type. Situations such as flows in bounded and exterior domains and flows in domains with unbounded boundaries (channels, pipes, aperture domains) have been studied. The numerical study of the Stokes and Navier-Stokes equations by boundary and finite element methods as well as by domain decomposition methods has also been addressed.

Computer Science

The research work in the area of Computer Science has been focused on the algebraic, categorical and logical foundations of software engineering, with emphasis on system specification and verification. The main lines of research are: (1) combination of logics for heterogeneous approaches to specification; (2) alternatives to the temporal logic approach to the specification and verification of reactive, concurrent systems, such as the situation calculus and observational logic; (3) action and deontic logic for the representation of juridical and organizational knowledge; (4) new logics for specifying and verifying probabilistic and hybrid systems; (5) computability and complexity in digital, analog and hybrid computational systems; (6) non-standard models of computation; (7) applications of noncommutative topology and quantales to the semantics of concurrent and quantum computation. Typical problems addressed include the categorical characterization of logic structures and translation mechanisms as well as the completeness of specialized calculi, complexity of analog computational classes, topology of analog recurrent neural nets and subsymbolic algorithms and the study of computational systems viewed as points of noncommutative spaces. Most of the work has been carried out within the scope of either international cooperation projects, namely the ESPRIT Basic Research Actions ASPIRE and FIREworks, or national projects, namely the PRAXIS projects, LogComp, ProbLog, QUEST and Quantales.

Other Areas

There are also some individual members of the department working in other areas, including combinatorics, logic, mathematical physics, operations research, theory of distributions.

Research Seminars

During 2000 the Department of Mathematics at Instituto Superior Técnico ran regular sessions of the following seminars:

- Seminar on Analysis, Geometry, and Dynamical Systems (43 sessions).
Organizer: Luis Barreira.
- Seminar on Applied Mathematics and Numerical Analysis (16 sessions).
Organizer: Adélia Sequeira.
- Seminar on Functional Analysis and Applications (17 sessions).
Organizer: Frank-Olme Speck.
- Seminar on Mathematical Physics (11 sessions).
Organizers: Rui Loja Fernandes.
- Seminar on Theory of Computing (37 sessions).
Organizer: Amílcar Sernadas.
- TQFT Club on Geometry, Topology, and Quantum Theory (18 sessions).
Organizers: José Mourão and Roger Picken.

During 2000 regular sessions also ran of the following seminars, in collaboration with other institutions:

- Seminar Geometria em Lisboa, in collaboration with Universidade de Lisboa.
Organizers: Ana Cannas da Silva and Orlando Neto (Universidade de Lisboa).
- Seminar on Mathematical Logic, in collaboration with Universidade de Lisboa.
Organizers: Fernando Ferreira (Universidade de Lisboa) and Narciso Garcia.

Colloquium: the department also runs a Colloquium, jointly sponsored by the Applied Mathematics Centre and the Center for Mathematical Analysis, Geometry, and Dynamical Systems, with 10 sessions in 2000 (see §4 below for detailed information). The organizers are Luis Barreira and Frank-Olme Speck.

1 Publications

1.1 Publications appeared in 2000

1.1.1 Books (authored or edited)

Algebra and Mathematical Analysis

Yu. Kubyshin, M. Mackaay, N. Manojlovic, R. Picken and P. Sá Eds, *Proceedings of the Workshop New Developments in Algebraic Topology* (July 13-14, 1998), Faro, Portugal, Universidade do Algarve, 2000.

Statistics and Applications

M. A. Turkman and G. L. Silva, *Modelos Lineares Generalizados da Teoria à Prática*, Edições SPE, 2000.

Computer Science

J. F. Costa, *Génese da Revolução Astronómica*, Escolar Editora, 2000.

1.1.2 Chapters/Articles in Books with international refereeing

Statistics and Applications

M. F. Ramalhoto, *Stochastic modeling for quality improvement in processes*, chapter 26 in *Statistical Process Monitoring and Optimization*, H. Sung, G. Park and G. Vining Eds, Marcel Dekker, 2000, pp. 435-456.

Applied Mathematics and Numerical Analysis

A. Sequeira and J. H. Videman, *Mathematical results and numerical methods for steady incompressible viscoelastic fluid flows*, in *Advances in Differential Equations and Nonlinear Mechanics* (dedicated to V. Lakshmikantham's 75th birthday), K. Vajravelu et al Eds, Series Mathematics and its Applications, Kluwer Academic Publishers, 2000, pp. 325-366.

Computer Science

P. Gouveia and C. Sernadas, *Abductive reasoning over temporal specifications of objects*, in Advances in Modal Logic – Vol. 2, K. Segerberg, M. Zakharyashev, M. de Rijke and H. Wansing Eds, CSLI Publications, 2000, pp. 293-318.

A. Sernadas, C. Sernadas, C. Caleiro and T. Mossakowski, *Categorical fibring of logics with terms and binding operators*, Frontiers of Combining Systems 2, D. Gabbay and M. de Rijke Eds, Research Studies Press, 2000, pp. 295-316.

1.1.3 Articles in International Journals and Serials

Algebra and Mathematical Analysis

M. Abreu and D. McDuff, *Topology of symplectomorphism groups of rational ruled surfaces*, J. Amer. Math. Soc. **13** (2000), 971-1009.

V. Afraimovich, J.-R. Chazottes and B. Saussol, *Local dimension for Poincaré recurrence*, Electron. Res. Announc. Amer. Math. Soc. **6** (2000), 64-74.

L. Barreira and B. Saussol, *Multifractal analysis of hyperbolic flows*, Comm. Math. Phys. **214** (2000), 339-371.

L. Barreira and J. Schmeling, *Sets of “non-typical” points have full topological entropy and full Hausdorff dimension*, Israel J. Math. **116** (2000), 29-70.

M. C. Câmara and A. F. dos Santos, *Wiener-Hopf factorization for a class of oscillatory symbols*, Integral Equations Operator Theory **36** (2000), no. 4, 409-432.

M. C. Câmara and M. T. Malheiro, *Wiener-Hopf factorization for a group of exponentials of nilpotent matrices*, Linear Algebra Appl. **320** (2000), 79-96.

A. Cannas da Silva, V. Guillemin and C. Woodward, *On the unfolding of folded symplectic structures*, Math. Res. Lett. **7** (2000), 35-53.

A. Cannas da Silva, Y. Karshon and S. Tolman, *Quantization of presymplectic manifolds and circle actions*, Trans. Amer. Math. Soc. **352** (2000), 525-552.

R. P. Carpentier, *From planar graphs to embedded graphs - a new approach to Kauffman and Vogel's polynomial*, J. Knot Theory Ramifications **9** (2000), no. 8, 975-986.

L. Castro and F.-O. Speck, *Relations between convolution type operators on intervals and on the half-line*, Integral Equations Operator Theory **37** (2000), 169-207.

R. Cordovil and P. Duchet, *Cyclic polytopes and oriented matroids*, European J. Combin. **21** (2000), no. 1, 49-64.

R. Cordovil, K. Fukuda and A. Guedes de Oliveira, *On the cocircuit graph of an oriented matroid*, Discrete Comput. Geom. **24** (2000), 257-265.

R. Duduchava and F.-O. Speck, *Singular integral equations in special weighted spaces*, Georgian Math. J. **7** (2000), 633-642.

R. Loja Fernandes, *Deformation quantization and Poisson geometry*, Resenhas **4** (2000), 327-361.

R. Loja Fernandes, *Connections in Poisson geometry I: holonomy and invariants*, J. Differential Geometry **54** (2000), 303-366.

- J. M. Ferreira and A. M. Pedro, *Spectral bounds and oscillations of a differential-difference system of neutral type*, J. Differential Equations **168** (2000), 168-179.
- B. Fiedler and C. Rocha, *Orbit equivalence of global attractors of semilinear parabolic differential equations*, Trans. Amer. Math. Soc. **352** (2000), 257-284.
- P. Freitas, *Delay-induced instabilities in gyroscopic systems*, SIAM J. Control Optimization **39** (2000), 196-207.
- P. Freitas and M. Vishnevskii, *Stability of stationary solutions of nonlocal reaction-diffusion equations in m -dimensional space*, Differential Integral Equations **13** (2000), 265-288.
- G. Fusco and W. M. Oliva, *Formation of symmetric structures in the dynamics of repelling particles*, Arch. Rational Mech. Anal. **151** (2000), no. 2, 95-123.
- P. A. Lopes and A. F. dos Santos, *New results on the invertibility of the finite interval convolution operator*, Integral Equations Operator Theory **38** (2000), no. 3, 317-333.
- J. E. Nelson and R. F. Picken, *Quantum holonomies in (2+1)-dimensional gravity*, Phys. Lett. B **471** (2000), 367-372.
- J. E. Nelson and R. F. Picken, *Quantum matrix pairs*, Lett. Math. Phys. **52** (2000), 277-290.
- W. M. Oliva, J. S. dos Santos and P. Z. Táboas, *A set of global bounded solutions for a Volterra system of retarded equations on R_+^3* , NoDEA Nonlinear Differential Equations Appl. **7** (2000), no. 3, 259-283.
- L. Rodriguez and M. Vaz Pinto, *On the monotonicity of the Hilbert function of the Sally module*, Comm. Algebra **28** (2000), no. 4, 1861-1866.
- P. A. Santos and B. Silbermann, *Galerkin method for Wiener-Hopf operators with piecewise continuous symbol*, Integral Equations Operator Theory **38** (2000), no. 1, 66-80.
- B. Saussol, *Absolutely continuous invariant measures for multidimensional expanding maps*, Israel J. Math. **116** (2000), 223-248.

Statistics and Applications

- J. A. Amaral, B. M. Rosário and T. M. Paixão, *Data and projections of HIV and AIDS in Portugal*, J. Appl. Statist. **27** (2000), no. 3, 269-279.
- M. Cabral Morais and A. Pacheco, *On the performance of combined EWMA schemes for μ and σ , A Markovian approach*, Comm. Statist.—Simulation Comp. **29** (2000), no. 1, 153-174.

Applied Mathematics and Numerical Analysis

- P. M. Lima and M. P. Carpentier, *Numerical solution of a singular boundary-value problem in non-Newtonian fluid mechanics*, Comput. Phys. Comm. **126** (2000), 114-120.
- S. McKee, T. Tang and T. Diogo, *An Euler-type method for two-dimensional Volterra integral equations of the first kind*, IMA J. Numer. Anal. **20** (2000), no. 3, 423-440.
- K. Pileckas, A. Sequeira and J. H. Videman, *Steady flows of viscoelastic fluids in domains with outlets to infinity*, J. Math. Fluid Mech. **2** (2000), no. 3, 185-218.

Computer Science

M. Campagnolo, C. Moore and J. F. Costa, *Iteration, inequalities, and differentiability in analog computers*, J. Complexity **16** (2000), no. 4, 642-660.

H.-D. Ehrich and C. Caleiro, *Specifying communication in distributed information systems*, Acta Inform. **36** (2000), 591-616.

C. Hermida, *Representable multicategories*, Adv. Math. **151** (2000), 164-225.

H. Lourenço and A. Sernadas, *An institution of hybrid systems*, in Recent Trends in Algebraic Development Techniques - Selected Papers, D. Bert and C. Choppy Eds, Lect. Notes in Comput. Sci. 1827, Springer Verlag, 2000, pp. 219-236.

P. Mateus, A. Sernadas and C. Sernadas, *Realization of probabilistic automata: categorical approach*, in Recent Trends in Algebraic Development Techniques - Selected Papers, D. Bert and C. Choppy Eds, Lect. Notes in Comput. Sci. 1827, Springer Verlag, 2000, pp. 237-251.

J. Pinto, A. Sernadas, C. Sernadas and P. Mateus, *Non-determinism and uncertainty in the situation calculus*, Internat. J. Uncertain. Fuzziness Knowledge-Based Systems **8** (2000), no. 2, 127-149.

A. Ravara and V. Vasconcelos, *Typing non-uniform concurrent objects*, in CONCUR'00, C. Palamidessi Ed, Lect. Notes in Comput. Sci. 1877, Springer Verlag, 2000, 474-488.

P. Resende, *Quantales and observational semantics*, in Current Research in Operational Quantum Logic: Algebras, Categories and Languages, B. Coecke, D. Moore and A. Wilce Eds, Fundamental Theories of Physics 111, Kluwer Academic Publishers, 2000, pp. 263-288.

A. Sernadas, *Book review: Fibring Logics, by D. M. Gabbay*, J. Logic Lang. Inform. **9** (2000), no. 4, 511-513.

1.1.4 Articles/Communications in Proceedings of International Conferences

Algebra and Mathematical Analysis

C. J. S. Alves and G. E. Pires, *Sound soft screen detection in the near field*, in Inverse Problems in Engineering Mechanics II, M. Tanaka and G. Dulikravich Eds, Proceedings of International Symposium in Inverse Problems 2000 (March 2000), Nagano, Japan, Elsevier, 2000, pp. 563-571.

L. Castro and F.-O. Speck, *An operator approach to a boundary value problem for the Helmholtz equation*, in Proceedings of the 17th Conference on Operator Theory (June 1998), Timisoara, Romania, Theta Foundation, Bucharest, 2000, pp. 67-86.

M. E. S. Dias, *Relative equilibria in linear elasticity*, in International Workshop on Symmetry and Perturbation Theory, SPT 98, A. Degasperis and G. Gaeta Eds, 2000, pp. 258-267.

J. P. Lampreia, R. Severino and J. Sousa Ramos, *Star product for bimodal maps*, in Equadiff 99, Proceedings of the International Conference on Differential Equations, B. Fiedler, K. Gröger and J. Sprekels Eds, Berlin, Germany, World Scientific, 2000, pp. 1473-1475.

R. F. Picken and P. A. Semião, *TQFT - a new direction in algebraic topology*, in Proceedings of the Workshop New Developments in Algebraic Topology (July 13-14, 1998), Yu. Kubyshin, M. Mackaay, N. Manojlovic, R. Picken and P. Sá Eds, Faro, Portugal, Universidade do Algarve, 2000, pp. 85-101.

Statistics and Applications

C. A. Amado and A. M. Pires, *Robust bootstrapping using influence functions*, in Proceedings in Computational Statistics 2000 (August 21-25, 2000), Short Communications and Posters, W. Jansen and J. Bethlehem Eds, Voorburg, Netherlands, 2000, pp. 83-84.

J. A. Branco and M. M. Souto de Miranda, *The tuning constant problem in regression type models*, in New Trends on Probability and Statistics, The 6th Tartu conference on Multivariate Statistics, T. Kollo, E. M. Tiit and M. Srivastava, Vol. 5, TEV, Vilnius, 2000, pp. 45-50.

C. Nunes and A. Pacheco, *Using MCMC in the estimation of MMPP parameters*, in Proceedings in Computational Statistics 2000 (August 21-25, 2000), Short Communications and Posters, W. Jansen and J. Bethlehem Eds, Voorburg, Netherlands, 2000, pp. 77-78.

M. R. Oliveira and J. A. Branco, *Projection pursuit approach to robust canonical correlation analysis*, in Proceedings in Computacional Statistics 2000, J. G. Bethlehem and P. G. M. van der Heijden Eds, 2000, pp. 415-420.

A. M. Pires and J. A. Branco, *Confidence intervals for a threshold parameter*, in Proceedings in Computational Statistics 2000 (August 21-25, 2000), Short Communications and Posters, W. Jansen and J. Bethlehem Eds, Voorburg, Netherlands, 2000, pp. 7-8.

M. F. Ramalhoto, *Recent development issues in stochastic reliability MMR'2*, in Deuxième Conférence Internationale sur les Méthodes Mathématiques en Fiabilité: Methodologie, Pratique et Inference (June 2000), Livre des Actes, Vol. 2, M. Nikulin and N. Limnios Eds, Université Victor Segalen, Bordeaux, France, 2000, pp. 895-898.

M. F. Ramalhoto, *Stochastics for the quality movement - a transdisciplinary research area for discussion*, in Proceedings of the Industrial Statistics IN ACTION 2000 International Conference, University of Newcastle, Tyne, UK, 2000, pp. 64-75.

Applied Mathematics and Numerical Analysis

C. J. S. Alves, *Density results for the Helmholtz equation and the method of fundamental solutions*, in Advances in Computational Engineering & Sciences I, Proceedings of of International Symposium in Inverse Problems 2000 (March 2000), S. N. Atluri and F. W. Brust Eds, Nagano, Japan, Tech. Sc. Press, 2000, pp. 45-50.

C. J. S. Alves and T. Ha Duong and F. Penzel, *On the identification of conductive cracks*, in Inverse Problems in Engineering Mechanics II, Proceedings of of International Symposium in Inverse Problems 2000 (March 2000), M. Tanaka and G. Dulikravich Eds, Nagano, Japan, Elsevier, 2000, pp. 213-218.

C. J. S. Alves and G. E. Pires, *Sound soft screen detection in the near field*, in Inverse Problems in Engineering Mechanics II, Proceedings of of International Symposium in Inverse Problems 2000 (March 2000), M. Tanaka and G. Dulikravich Eds, Nagano, Japan, Elsevier, 2000, pp. 563-571.

T. Diogo and P. M. Lima, *Numerical solution of a non-uniquely solvable Volterra integral Equation*, in Proceedings of the 3rd International Conference FDS2000 (September 1-4, 2000), Finite Difference Schemes: Theory and Applications, R. Ciegis, A. Samarskii and M. Sapagovas Eds, Palanga, Lithuania, IMI, Vilnius, 2000, pp. 39-49.

T. Diogo, P. M. Lima and N. Franco, *Analysis of product integration methods for a class of singular Volterra integral equations*, in *Tendências da Matemática Aplicada e Computacional*, Vol. 1, no. 2, Proceedings of XXII CNMAC99 (September 13-17, 1999), Santos, Sociedade Brasileira de Matemática Aplicada e Computacional, 2000, pp. 373-387.

P. M. Lima and A. M. Oliveira, *Aproximação de problemas de valores de fronteira singulares usando subsoluções e supersoluções*, in *Tendências da Matemática Aplicada e Computacional*, Vol. 1, no. 2, Proceedings of XXII CNMAC99 (September 13-17, 1999), Santos, Sociedade Brasileira de Matemática Aplicada e Computacional, 2000, pp. 401-414.

P. M. Lima and A. Oliveira, *Numerical solution of nonlinear singular boundary-value problems using variable substitutions*, in Proceedings of the 3rd International Conference FDS2000 (September 1-4, 2000), Finite Difference Schemes: Theory and Applications, R. Ciegis, A. Samarskii and M. Sapagovas Eds, Palanga, Lithuania, IMI, Vilnius, 2000, pp. 153-162.

Computer Science

M. Campagnolo, C. Moore and J. F. Costa, *An analog characterization of the subrecursive functions*, in Proceedings of the 4th Conference on Real Numbers and Computers, P. Kornerup Ed, Odense University Press, 2000, pp. 91-109.

J. Carmo and O. Pacheco, *Deontic and action logics for collective agency and roles*, in Proceedings of the Fifth International Workshop on Deontic Logic in Computer Science DEON'00, R. Demolombe and R. Hilpinen Eds, ONERA-DGA, 2000, pp. 93-124.

M. E. Coniglio, A. T. Martins, A. Sernadas and C. Sernadas, *Fibring (para)consistent logics (extended abstract)*, in Proceedings of the II World Congress on Paraconsistency WCP'00, São Sebastião, São Paulo, Brazil.

R. Demolombe, A. Jones and J. Carmo, *An application of deontic logic to the analysis of information systems constraints*, in Proceedings of the Fifth International Workshop on Deontic Logic in Computer Science DEON'00, R. Demolombe and R. Hilpinen Eds, ONERA-DGA, 2000, pp. 147-166.

J. P. Neto, J. F. Costa and A. Ferreira, *Merging symbolic and subsymbolic computation*, in Proceedings of the Second International ICSC Symposium on Neural Computation NC'00, H. Bothe and R. Rojas Eds, ICSC Academic Press, 2000, pp. 329-335.

P. Resende, *Quantales as spaces of dynamical systems*, in Abstracts of the International Summer Conference in Category Theory CT2000, A. Carboni, G. Rosolini and R. Walters Eds, 2000, pp. 165-171.

1.1.5 Other Publications

Statistics and Applications

J. A. Branco, *Estatística no secundário: o ensino e os seus problemas*, in *Ensino e Aprendizagem da Estatística*, C. Loureiro, F. Oliveira and L. Brunheira Eds, Encontro sobre o Ensino e Aprendizagem da Estatística, Sociedade Portuguesa de Estatística and others, Lisbon, 2000, pp. 11-30.

M. A. Turkman and C. D. Paulino, *Bayesians in Portugal*, The International Society for Bayesian Analysis Bulletin **6** (2000), no. 4.

C. D. Paulino, *Analysis of missing categorical data*, Revista de Estatística **1** (2000), 25-46.

M. F. Ramalhoto, *Book review: Spatial Pattern Analysis in Plant Ecology*, International Statistical Institute - Short Book Reviews, A. M. Herzberg Ed **20** (2000), no. 1, 5.

Applied Mathematics and Numerical Analysis

P. M. Lima and A. M. Oliveira, *Aproximação numérica de problemas de valores de fronteira com aplicações em mecânica*, in Actas do VI Congresso de Mecânica Aplicada e Computacional, P. Vila Real and J. Grácio Eds, Aveiro, Universidade de Aveiro, 2000, pp. 1615-1626.

A. Sequeira, *Introduction to the section overviews and tutorials*, in Meccanica **35** (2000), 161.

1.2 Publications accepted or submitted in 2000

Algebra and Mathematical Analysis

M. Abreu, *Kähler geometry of toric manifolds in symplectic coordinates*, Preprint 8/00, to appear in Toric Varieties in Algebraic Geometry and Mathematical Physics, V. Batyrev Ed, Amer. Math. Soc..

V. Afraimovich, J.-R. Chazottes and B. Saussol, *Pointwise dimensions for Poincaré recurrence associated with maps and special flows*, preprint.

J. F. Alves and J. Sousa Ramos, *Kneading theory for tree maps*, Preprint 33/00.

L. Barreira, *Variational properties of multifractal spectra*, Preprint 18/00, to appear in Nonlinearity.

L. Barreira and Ya. Pesin, *Lectures on Lyapunov exponents and smooth ergodic theory*, Preprint 2/00, to appear in Smooth Ergodic Theory and its Applications, A. Katok, R. de la Llave, Ya. Pesin and H. Weiss Eds, Proceedings of Symposia in Pure Mathematics, Amer. Math. Soc..

L. Barreira and B. Saussol, *Hausdorff dimension of measures via Poincaré recurrence*, Preprint 4/00, to appear in Comm. Math. Phys..

L. Barreira and B. Saussol, *Product structure of Poincaré recurrence*, Preprint 19/00, to appear in Ergodic Theory Dynam. Systems.

L. Barreira and B. Saussol, *Variational principles and mixed multifractal spectra*, Preprint 27/99, to appear in Trans. Amer. Math. Soc..

L. Barreira, B. Saussol and J. Schmeling, *Higher-dimensional multifractal analysis*, Preprint 41/00.

A. C. Barroso and J. Matias, *On a volume constrained variational problem in $SBV^2(\Omega)$: Part 1*, Preprint 13/00, to appear in European Series on Applied and Industrial Mathematics; Control, Optimization and Calculus of Variations.

M. A. Bastos, A. Bravo, Yu. I. Karlovich, *Fredholm theory in $\text{alg}(S_R, [SO, SAP]_{n,n})$* , Preprint 3/00.

M. A. Bastos, Yu. Karlovich and A. F. dos Santos, *The invertibility of convolution type operators on a union of intervals and the corona theorem*, to appear in Integral Equations Operator Theory.

H. Bruin, B. Saussol, S. Troubetzkoy and S. Vaienti, *Statistics of return time via inducing*, preprint.

- J. Buescu, F. Garcia and I. Lourtie, $L^2(\mathbb{R})$ nonstationary processes and the sampling theorem, Preprint 37/00, to appear in *IEEE Signal Processing Letters*.
- J. Buescu and I. Lourtie, *Positive-definiteness, integral equations and Fourier transforms*, Preprint 36/00.
- M. C. Câmara, A. F. dos Santos and M. P. Carpentier, *Explicit Wiener-Hopf factorization and non-linear Riemann-Hilbert problems*, to appear in Proc. Roy. Soc. Edinburgh Sect. A.
- M. C. Câmara, A. F. dos Santos and N. Manojlovic, *Generalized factorization for $n \times n$ Daniele-Khrapkov matrix functions*, to appear in Math. Methods Appl. Sci..
- A. Cannas da Silva, *Lectures on symplectic geometry*, to appear in Lect. Notes in Math..
- H. Castro, M. Kobayashi and W. M. Oliva, *Partially hyperbolic Σ -geodesic flows*, to appear in *J. Differential Equations*.
- L. Castro and F.-O. Speck, *Well-posedness of diffraction problems involving n coplanar strips*, Preprint 14/00.
- J. Chabrowski and P. M. Girão, *Symmetric solutions of the Neumann problem involving a critical Sobolev exponent*, preprint
- J. Chabrowski and P. M. Girão, *The nonlinear Neumann problem and sharp weighted Sobolev inequalities*, preprint
- R. Cordovil, *A commutative algebra for oriented matroids*, preprint
- R. Cordovil and G. Etienne, *A note on the Orlik-Solomon algebra*, to appear in European J. Combin..
- R. Loja Fernandes and P. Vanhaecke, *Hyperelliptic Prym varieties and integrable systems*, to appear in Comm. Math. Phys..
- R. Loja Fernandes, *Lie algebroids, holonomy and characteristic classes*, preprint.
- J. M. Ferreira, *Oscillations and nonoscillations in retarded equations*, to appear in Portugal. Math..
- J. M. Ferreira and A. M. Pedro, *Oscillations of differential-difference systems of neutral type*, to appear in J. Math. Anal. Appl..
- L. Fichmann and W. M. Oliva, *Collision of global orbits in C^∞ retarded functional differential equations*, to appear in Topics in Functional Differential and Difference Equations, T. Faria and P. Freitas Eds, Fields Inst. Commun., Amer. Math. Soc..
- L. Fichmann and W. M. Oliva, *One-to-oneness and hyperbolicity*, to appear in Topics in Functional Differential and Difference Equations, T. Faria and P. Freitas Eds, Fields Inst. Commun., Amer. Math. Soc..
- C. Florentino, *Schottky uniformization and vector bundles over Riemann surfaces*, to appear in Manuscripta Math..
- P. Freitas, *On minimal eigenvalues of Schrödinger operators on manifolds*, Preprint 20/00, to appear in Comm. Math. Phys..
- P. Freitas, *Closed nodal lines and interior hotspots of the second eigenfunction of the Laplacian on surfaces*, Preprint 21/00.
- Yu. I. Karlovich and A. B. Lebre, *Algebra of singular integral operators with a Carleman backward slowly oscillating shift*, to appear in Integral Equations Operator Theory.

V. G. Kravchenko, A. B. Lebre and G. S. Litvinchuk, *Spectrum problems for singular integral operators with Carleman shift*, appear in Math. Nach..

I. Kupka and W. M. Oliva, *The non-holonomic mechanics*, to appear in J. Differential Equations.

M. Mackaay and R. F. Picken, *Holonomy and parallel transport for Abelian gerbes*, preprint.

M. Mikovic and R. F. Picken, *Super Chern-Simons theory and flat super connections on a torus*, Preprint 16/00.

W. M. Oliva, *Mechanics on Riemannian manifolds*, to appear in Nonlinear Analysis and its Applications to Differential Equations (Lisbon, 1998), Progr. Nonlinear Differential Equations Appl. 43, Birkhäuser.

W. M. Oliva, *Geometric Mechanics*, 247pp.

W. M. Oliva, *Morse-Smale semiflows. Openness and A-stability*, preprint.

W. M. Oliva, *Elipsóides de Riemann - uma abordagem informal*, to appear in Coleção de Documentos, IEA- USP.

P. A. Santos, *Spline approximation methods with uniform meshes in algebras of multiplication and convolution operators*, to appear in Math. Nach..

P. F. Santos, *A note on the equivariant Dold-Thom theorem*, preprint.

P. F. Santos, *Algebraic cycles on real varieties and $\mathbb{Z}/2$ -equivariant homotopy theory*, preprint.

B. Saussol, *On fluctuations and the exponential statistics of return times*, to appear in Nonlinearity.

L. Silva and J. Sousa Ramos, *Topological invariants and renormalization of Lorenz maps*, preprint.

H. Spielberg, *Counting generic genus-0 curves on Hirzebruch surfaces*, preprint.

H. Spielberg, *The Gromov-Witten invariants of symplectic toric manifolds*, preprint.

Statistics and Applications

C. Amado and A. M. Pires, *Robust bootstrap with non-random weights based on the influence function*, Preprint 30/00.

N. Antunes, A. Pacheco and R. Rocha, *A Markov renewal based model for wireless networks*, to appear in Actas do VII Congresso Anual da Sociedade Portuguesa de Estatística (October 14-16, 1999), Ofir, Portugal.

N. Antunes, A. Pacheco and R. Rocha, *Traffic modeling for broadband wireless networks: the highway scenario*, to appear in Advances in Performance Analysis.

M. Cabral Morais and A. Pacheco, *Comparação estocástica de tempos de primeira passagem: uma aplicação a controlo de qualidade, fiabilidade e filas de espera*, to appear in Actas do VIII Congresso Anual da Sociedade Portuguesa de Estatística (October 4-7, 2000), Peniche, Portugal.

M. Cabral Morais and A. Pacheco, *Misleading signals em esquemas combinados EWMA para μ e σ* , to appear in Actas do VII Congresso Anual da Sociedade Portuguesa de Estatística (October 14-16, 1999), Ofir, Portugal.

M. Cabral Morais and A. Pacheco, *Misleading signals in joint schemes for μ and σ* , Preprint 17/00.

M. Cabral Morais and A. Pacheco, *Some stochastic properties of upper one-sided \bar{X} and EWMA charts for μ in the presence of shifts in σ* , Preprint 38/00, to appear in Sequential Anal..

P. Mateus, M. Cabral Morais, C. Nunes, A. Pacheco, A. Sernadas and C. Sernadas, *Randomly timed automata*, preprint.

P. Mateus, A. Pacheco, J. Pinto, A. Sernadas and C. Sernadas, *Probabilistic situation calculus*, preprint.

C. Nunes and A. Pacheco, *Estimação dos estados da cadeia de Markov de um MMPP*, to appear in Actas do VII Congresso Anual da Sociedade Portuguesa de Estatística (October 14-16, 1999), Ofir, Portugal.

M. R. Oliveira and A. B. Branco, *Mínimos quadrados parciais em análise de correlações canónicas*, to appear in Actas do VIII Congresso Anual da Sociedade Portuguesa de Estatística (October 4-7, 2000), Peniche, Portugal.

C. D. Paulino, *Modelação e análise de dados Poisson sob censura não informativa Parte I - Modelação e ajustamento de modelos de censura*, to appear in Actas do VII Congresso Anual da Sociedade Portuguesa de Estatística (October 14-16, 1999), Ofir, Portugal.

C. D. Paulino and P. Soares, *Analysis of incomplete Poisson data*, Preprint 31/00.

C. D. Paulino and P. Soares, *Modelação e análise de dados Poisson sob censura não informativa Parte II - Ajustamento de modelos estruturais para as taxas e aplicações*, preprint.

A. M. Pires and J. A. Branco, *Partial influence functions*, Preprint 23/00.

A. M. Pires, J. A. Branco, A. M. Picado and E. Mendonça, *Models for the estimation of a "no effect concentration"*, Preprint 22/00, to appear in Environmetrics.

A. M. Pires, *Intervalos de confiança para uma proporção*, preprint.

M. F. Ramalhoto and A. Gomez-Corral, *On the waiting time distribution and the busy period of a retrial queue with constant retrial rate*, to appear in Stochastic Modelling and Applications.

N. Sepúlveda and C. D. Paulino, *Comparação por métodos exactos de técnicas serológicas de diagnóstico da esquistossomiase*, preprint.

G. L. Silva and M. A. Turkman, *Bayesian analysis of an additive survival model with frailty*, preprint.

P. Soares and C. D. Paulino, *Incomplete categorical data analysis: a Bayesian perspective*, Preprint 20/99, to appear in J. Statist. Comp. and Simulation.

Applied Mathematics and Numerical Analysis

C. J. S. Alves and H. Ammari, *Boundary integral formulae for the reconstruction of imperfections of small diameter in an elastic medium*, Preprint 39/00, to appear in SIAM J. Appl. Math..

C. J. S. Alves, J. Ben Abdallah and M. Jaoua, *Recovery of cracks by the use of cracklets*, preprint.

M. C. Câmara, A. F. dos Santos and M. P. Carpentier, *Explicit Wiener-Hopf factorization and non-linear Riemann-Hilbert problems*, to appear in Proc. Roy. Soc. Edinburgh Sect. A.

P. M. Carpentier and P. M. Lima, *Approximation of a class of differential equations using a generalization of the Frobenius method*, Preprint 27/00.

A. L. Dyshko, P. M. Carpentier, N. B. Konyukhova and P. M. Lima, *On singular problems for non-linear ordinary second-order differential equations of Emden-Fowler type (in Russian)*, to appear in Zh. Vychisl. Mat. i Mat. Fiz..

P. M. Lima and T. Diogo, *Numerical solution of a non-uniquely solvable Volterra integral equation using extrapolation methods*, Preprint 25/00.

P. M. Lima and A. Oliveira, *Numerical solution of nonlinear singular boundary-value problems using variable substitutions*, Preprint 29/00.

S. Nazarov, A. Sequeira and J. H. Videman, *Asymptotic behaviour at infinity of threedimensional steady viscoelastic flows*, Preprint 11/00, to appear in Pacific J. Math..

J. M. Urbano and J. H. Videman, *Unidirectional steady flow of a viscoelastic fluid with a free surface*, to appear in Interfaces and Free Boundaries.

Computer Science

C. Caleiro, W. A. Carnielli, M. E. Coniglio, A. Sernadas and C. Sernadas, *Fibring non-truth-functional logics: completeness preservation*, preprint

M. Campagnolo and C. Moore, *Upper and lower bounds on continuous-time computation*, to appear in 2nd International Conference on Unconventional Models of Computation UMC'2K, I. Antoniou and C. Calude Eds, Springer Verlag.

M. Campagnolo, C. Moore and J. F. Costa, *An analog characterization of the Grzegorzcyk hierarchy*, preprint.

J. F. Costa, *Hypercomputation in the limits of classical physical reality. Review of Neural Networks and Analog Computation - Beyond the Turing Limit*, by H. Siegelmann, Birkhäuser, to appear in ACM Comput. Reviews.

C. Hermida, *From coherent structures to universal properties*, to appear in J. Pure Appl. Algebra.

C. Hermida, M. Makkai and P. Power, *On the definition of weak higher-dimensional categories I*, to appear in J. Pure Appl. Algebra.

C. Hermida and P. Mateus, *Internal paracategories*, preprint.

P. Mateus, M. Cabral Morais, C. Nunes, A. Pacheco, A. Sernadas and C. Sernadas, *Randomly timed automata*, preprint.

P. Mateus, A. Pacheco, J. Pinto, A. Sernadas and C. Sernadas, *Probabilistic situation calculus*, preprint.

J. P. Neto, H. T. Siegelmann and J. F. Costa, *Symbolic processing in neural networks*, to appear in Journal of the Brazilian Computer Society.

J. Rasga, A. Sernadas, C. Sernadas and L. Viganò, *Fibring labelled deduction systems*, to appear in J. Logic Comput..

P. Resende and S. Vickers, *Localic sup-lattices and tropological systems*, Preprint 28/00.

A. Zanardo, A. Sernadas and C. Sernadas, *Fibring: completeness preservation*, to appear in J. Symbolic Logic.

2 Academic Degrees awarded in 2000

2.1 Agregações

F. J. Romeiras, Agregação em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 31.5.00.

2.2 Doutoramentos/Ph.D.'s

J. Alves, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 24.3.00. *Thesis*: Uma Abordagem Functorial à Teoria do Kneading. *Supervisor*: J. S. Ramos.

C. Caleiro, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 5.12.00. *Thesis*: Combining Logics. *Supervisor*: A. Sernadas.

P. Lopes, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 5.7.00. *Thesis*: An Invertibility Study of the Finite Interval Convolution Operator. *Supervisor*: A. F. dos Santos.

J. Natário, Ph. D. in Mathematics, Oxford University, 21.10.00. *Thesis*: Causal Relations on the Manifold of Light Rays. *Supervisor*: K. P. Tod.

J. Ramos, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 19.5.00. *Thesis*: The Situation and State Calculus: Specification and Verification. *Supervisor*: A. Sernadas.

A. Ravara, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 18.12.00. *Thesis*: Typing Non-uniform Concurrent Objects. *Supervisors*: A. Sernadas and V. Vasconcelos.

R. M. Saramago, Ph. D. in Mathematics, Johns Hopkins University, Baltimore, Maryland, USA, 10.00. *Thesis*: Dieudonné Theory for Ungraded and Periodically Graded Hopf Rings, *Supervisors*: S. W. Wilson and M. J. Boardman.

R. Severino, Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 23.11.00. *Thesis*: Invariantes Topológicos e Algébricos em Sistemas Dinâmicos Discretos. *Supervisor*: J. S. Ramos.

2.3 Mestrados/M.A.'s/M.Sc.'s

C. Fernandes, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 22.12.00. *Thesis*: Método de Localização em Óbitras - Operadores com Deslocamento. *Supervisor*: M. A. Bastos.

F. Louro, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 7.6.00. *Thesis*: Complexidade Homológica e Topológica em Sistemas Dinâmicos. *Supervisor*: L. Barreira.

T. Pires Monteiro, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 26.5.00. *Thesis*: Factorização em Álgebras de Funções Contínuas e Sistemas Integráveis. *Supervisors*: M. A. Bastos and A. F. dos Santos.

P. Tabora Duarte, Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 20.9.00. *Thesis*: Um Símbolo para uma Álgebra de Operadores num Espaço com Peso Muckenhoupt. *Supervisor*: M. A. Bastos.

3 Research Lectures by Department Members

3.1 Invited Lectures

Algebra and Mathematical Analysis

M. Abreu,

- *Kähler geometry of toric manifolds in symplectic coordinates*, Symplectic/Algebraic Geometry Seminar, University of Toronto, Canada, 9.00 and Topology and Differential Geometry Seminar, University of Quebec, Montreal, Canada, 10.00.
- *Kähler metrics on toric varieties: a symplectic approach*, Geometry Seminar, University of Michigan, Ann Arbor, USA, 11.00 and Geometry Seminar, University of Illinois at Urbana-Champaign, USA, 12.00.
- *Topology of symplectomorphism groups and spaces of symplectic forms*, Topology and Differential Geometry Seminar, University of Quebec, Montreal, Canada, 10.00 and Differential Geometry Seminar, University of California, Santa Barbara, USA, 12.00.

S. Anisov,

- *The joy of quantum computing*, Universidade do Porto, Portugal, 31.5.00.
- *On the van Kampen-Flores theorem*, Universidade do Porto, Portugal, 6.00.

L. Barreira,

- *Multifractal analysis and the variational principle*, Conference Recent Trends in Dynamics, Universidade do Porto, Portugal, 17.1.00-21.1.00.
- *Recorrência quantitativa e estrutura produto em dinâmica*, Universidade do Porto, Portugal, 11.00.

A. Bravo, *Singular integral operators with Carleman shift and piecewise almost periodic coefficients*, CINVESTAV del IPN, Mexico, Seminario Interinstitucional Analisis: Norte-Sur 2000, 6.12.00-8.12.00.

A. Cannas da Silva, *Symplectic folds, twists and cuts*, Basic Notions Seminar, Harvard University, Cambridge, USA, 14.2.00.

R. Cordovil, *A commutative algebra for oriented matroids*, Arrangements of Hyperplanes Special Session, M. Falk and A. Suciú Eds, AMS Fall Eastern Section Meeting, Columbia University, New York, USA, 3.11.00-5.11.00.

M. E. S. Dias,

- *Symmetries of Riemann ellipsoids*, Dipartimento di Matematica, Università degli Studi di Trento, Italy, 10.3.00.

- *Symmetries of the affine rigid body*, Mechanics and Symmetry Euro Summer School, Peyresq, France, 7.9.00.

R. Loja Fernandes,

- *Connections in Poisson geometry*, Symplectic Geometry Seminar, University of California, Berkeley, USA, 17.3.00.
- *Connections and characteristic classes in Poisson geometry*, Colloque Poisson 2000, CIRM Luminy, Marseille, France, 6.00.

C. Florentino,

- *Coherent state transform and theta functions*, IXth Oporto Meeting on Geometry, Topology and Physics, Porto, Portugal, 29.9.00-2.10.00.
- *Coherent state transform on Abelian varieties*, Seminario de Geometria Algebraica, Universidad de Salamanca, Spain, 22.11.00.

P. Freitas,

- *Valores próprios minimais de operadores de Schrödinger em variedades compactas*, Centro de Matemática e Aplicações Fundamentais, Lisbon, Portugal, 12.00.
- *Spectral sequences and isospectral sets for quadratic pencils*, Workshop on Partially Known Matrices and Operators, Coimbra, Portugal, 7.9.00-8.9.00.
- *A internacionalização da matemática e dos matemáticos portugueses*, Segundo Debate sobre a Investigação Matemática em Portugal, Coimbra, Portugal, 4.00.
- *A estrutura das equações de FitzHugh-Nagumo*, Seminário do Centro de Matemática Aplicada, Faculdade de Ciências, Universidade do Porto, Portugal, 7.4.00.
- *On the invariant spectrum of S^1 -invariant metrics on S^2* , Ecole Polytechnique, Paris, France, 12.00.

P. Girão, *A Neumann problem and best constants for some weighted Sobolev inequalities*, Centro de Matemática e Aplicações Fundamentais, Lisbon, Portugal, 11.00.

L. Godinho,

- *Eclatement d'orbifolds symplectiques I and II*, Seminaire Geometrie Symplectique, Institut de Recherche Mathématique Avancée, Strasbourg, France, 28.1.00 and 4.2.00.
- *Variétés de contact I and II*, Seminaire Geometrie Symplectique et Applications, Institut de Recherche Mathématique Avancée, Strasbourg, France, 27.10.00 and 9.11.00.
- *Homologie de contact*, Seminaire Geometrie Symplectique et Applications, Institut de Recherche Mathématique Avancée, Strasbourg, France, 16.11.00.

G. Granja, *Self maps of HP^n* , Seminari de Topologia, Universitat Autònoma de Barcelona, Spain, 22.9.00.

J. Matias, *Sobre um problema variacional com restrições de volume*, Universidade de Évora, Portugal, 12.00.

J. P. Nunes, *Coherent state transformations and theta functions*, Brandeis University, USA, 11.00 and Brown University, USA, 11.00.

W. M. Oliva,

- *Figuras de equilíbrio de massas fluidas auto-gravitantes*, Instituto de Matemática e Estatística da USP, São Paulo, Brazil, 25.8.00.
- *Elipsóides de Riemann - uma abordagem informal*, Instituto de Estudos Avançados da USP, São Paulo, Brazil, 18.4.00.
- *Riemann Ellipsoids*, Dipartimento di Matematica, Università Degli Studi di Trento, Italy, 9.3.00.

C. Rocha, *Meander permutations, reaction-diffusion equations and Jacobi systems*, Comenius University, Bratislava, Slovakia, 26.10.00.

A. M. Santos, *Operadores de Wiener-Hopf em problemas de difracção de Sommerfeld*, Departamento de Matemática, Grupo de Análise Funcional, Universidade de Aveiro, Portugal, 19.5.00.

P. F. Santos,

- *Algebraic cycles on real algebraic varieties and $\mathbb{Z}/2$ -homotopy theory*, Mathematisches Kolloquium, Osnabrück, Germany, 13.9.00
- *Quaternionic algebraic cycles and reality*, Mathematisches Kolloquium, Osnabrück, Germany, 13.9.00.

Statistics and Applications

J. A. Branco,

- *Ordenação em Análise Multivariada*, Seminário do Centro de Matemática da Universidade do Minho, Braga, Portugal, 12.1.00.
- *Estatística no secundário: o ensino e os seus problemas*, Encontro sobre o Ensino e Aprendizagem da Estatística, Faculdade de Ciências, Universidade de Lisboa, Portugal, 3.2.00-4.2.00.

C. D. Paulino, *Confrontando as abordagens bayesiana e frequentista à estatística*, Conferência, Departamento de Matemática, Universidade de Aveiro, Portugal, 31.5.00.

Applied Mathematics and Numerical Analysis

C. J. S. Alves,

- *Detecção de obstáculos - um problema inverso em difracção acústica*, Universidade do Porto, Portugal, 2.00.
- *Density results for the Helmholtz equation and the method of fundamental solutions*, International Conference in Computational Engineering and Sciences 2000, Los Angeles, USA, 8.00.
- *Le choix des points sources dans la méthode des solutions fondamentales*, Ecole Nationale d'Ingénieurs de Tunis, Tunisia, 12.00.

P. M. Lima,

- *Aproximação de problemas de valores de fronteira singulares para equações de Emden-Fowler*, Seminário do Departamento de Matemática, Universidade da Beira Interior, Covilhã, Portugal, 16.2.00 and Seminário do Departamento de Matemática, Universidade de Coimbra, Portugal, 21.6.00.
- *Numerical solution of nonlinear singular boundary-value problems using variable substitutions*, Computing Center of The Russian Academy of Sciences, Moscow, Russia, 7.9.00.

A. Sequeira,

- *On the steady fall of a rigid body in an Oldroyd-B fluid*, Colloquium Seminar, Department of Mechanical Engineering, University of Pittsburgh, USA, 12.4.00.
- *Short Course (3 hours): Méthodes mathématiques et numériques pour les écoulements de fluides non-newtoniens*, Laboratoire de Mathématiques Appliqués, Université de Pau et des Pays de l'Adour, France, 15.3.00-16.3.00.

J. H. Videman,

- *Mathematical analysis of viscoelastic fluids*, Seminar at the Department of Mathematical Sciences, University of Turku, Finland, 1.12.00.
- *Comportamento assintótico de escoamentos de fluidos viscoelásticos*, Seminário no Departamento de Matemática Aplicada, Universidade do Porto, Portugal, 11.2.00.
- *Asymptotic behaviour of viscoelastic flows in a 3-D exterior domain*, Seminar at the Institute of Applied Mathematics, Bonn Universität, Germany, 3.2.00.

Computer Science

F. M. Dionísio,

- *Crash course in category theory*, Software Engineering Seminar, Institut für Informatik, University of Freiburg, Germany, 13.3.00-17.3.00.
- *Institutional defaults*, Software Engineering Seminar, Institut für Informatik, University of Freiburg, Germany, 4.9.00-6.9.00.

P. Resende,

- *Independência, causalidade e estruturas concorrentes em quantales*, Encontros de Quarta Feira, Faculdade de Ciências, Universidade de Lisboa, Portugal, 14.12.00.
- *Quantales and localic dynamical systems*, Workshop on Current Research on Operational Quantum Logic III, Université Libre de Bruxelles, Belgium, 10.4.00-14.4.00.
- *Quantales, noncommutative topology and observable properties of systems*, Seminário de Álgebra, Centro de Matemática, Universidade de Coimbra, Portugal, 15.3.00.
- *Quantales, noncommutative topology and computer science*, Seminar on Logical and Algebraic Methods behind Systems, Department of Pure Mathematics, Open University, Milton Keynes, UK, 16.2.00 and Theory Seminar, Department of Computing, Imperial College, London, UK, 23.2.00.

C. Sernadas, *Unidades de investigação e departamentos universitários*, Segundo Debate sobre a Investigação Matemática em Portugal, Coimbra, Portugal, 1.4.00-2.4.00.

3.2 Lectures at Conferences, Workshops, Meetings, etc.

Algebra and Mathematical Analysis

J. F. Alves and J. Sousa Ramos,

- *One-dimensional semiconjugacy revisited*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.
- *Variations and semiconjugacy*, Conference on Differential Equations and Dynamical Systems (in honor of Waldyr Oliva), Instituto Superior Técnico, Lisbon, Portugal, 2000.

M. A. Bastos, *The invertibility of convolution type operators on a union of intervals*, IWOTA Portugal 2000, International Workshop on Operator Theory and Applications, Faro, Portugal, 12.9.00-15.9.00.

J. Buescu, *Stable Ω limit sets interval maps*, International Conference on Dynamical Systems, Porto, Portugal, 8.5.00-13.5.00.

M. C. Câmara, *$N \times N$ Daniele-Khrapkov class, explicit Wiener-Hopf factorization, structure of the factors and applications to integrable systems*, IWOTA Portugal 2000, International Workshop on Operator Theory and Applications, Faro, Portugal, 12.9.00-15.9.00.

A. Cannas da Silva, *Index of contact diffeomorphisms and folded symplectic structures*, Meeting of the Canadian Mathematical Society, Toronto, Canada, 10.6.00-13.6.00.

R. Loja Fernandes, *Connections and characteristic classes in Poisson geometry*, Colloque Poisson, 2000, CIRM Luminy, Marseille, France, 6.00.

J. M. Ferreira, *On the stability and oscillatory behavior of a retarded functional equation*, Conference on Differential Equations and Dynamical Systems (in honor of Waldyr Oliva), Instituto Superior Técnico, Lisbon, Portugal.

C. Grácio and J. Sousa Ramos, *Boundary maps and Fenchel-Nielsen coordinates*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.

V. G. Kravchenko, F. S. Teixeira and A. C. Conceição, *Factorization of matrix functions and the resolvent of certain operators*, IWOTA Portugal 2000, International Workshop on Operator Theory and Applications, Faro, Portugal, 12.9.00-15.9.00.

M. Mackaay and R. Picken, *Poster presentation: 4D TQFT's and gerbes*, International Conference on Mathematical Physics, London, UK, 17.7.00-22.7.00.

N. Martins and J. Sousa Ramos,

- *Bowen-Franks groups for subshifts arising from linear mod one maps*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.
- *K_0 groups for C^* -algebras arising from linear mod one transformations*, 28th Canadian Annual Symposium on Operator Algebras, 2000.

P. Martins and J. Sousa Ramos, *Symbolic representations and T^n automorphisms*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.

J. P. Nunes, *Coherent state transformations and theta functions*, Meeting Strings@pt, Instituto Superior Técnico, Lisbon, Portugal, 2000.

W. M. Oliva, *Figures of relative equilibrium for self-gravitating fluid mass*, 26.6.00, Conference on Differential Equations and Dynamical Systems, Instituto Superior Técnico, Lisbon, Portugal, 26.6.00-30.6.00.

H. Oliveira and J. Sousa Ramos, *On iterated positive Schwarzian derivative maps*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.

G. E. Pires, *Screen detection with near field measurements*, Inverse Problems in Engineering Mechanics II, International Symposium in Inverse Problems 2000, Nagano, Japan, March 2000 and Seminaire Mathematiques Appliquées, Ecole Nationale d'Ingénieurs de Tunis, Tunisia, 6.12.00.

C. C. Ramos and J. Sousa Ramos, *Kleinian groups and holomorphic dynamics*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.

L. Rocha and J. Sousa Ramos, *Tilings described by iterated maps*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.

P. Rodrigues and J. Sousa Ramos, *Symbolic representations of torus automorphisms*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.

A. M. Santos, *Image domain normalization of Wiener-Hopf operators*, IWOTA Portugal 2000, International Workshop on Operator Theory and Applications, Universidade do Algarve, Faro, Portugal, 12.9.00-15.9.00.

P. A. S. Santos, *An axiomatic approach to stability of approximating sequences*, IWOTA Portugal 2000, International Workshop on Operator Theory and Applications, Universidade do Algarve, Faro, Portugal, September 12.9.00-15.9.00.

B. Saussol,

- *Hausdorff dimension of measures via Poincaré recurrence*, Workshop TREC, Luminy, Marseille, France, 3.00.
- *Recurrence de Poincaré*, University of Picardie, Amiens, 10.00.
- *Product structure of Poincaré recurrence*, University of Rennes, France, 10.00.

R. Severino and J. Sousa Ramos, *Symbolic dynamics in nonlinear boundary value problems*, Conference on Differential Equations and Dynamical Systems (in honor of Waldyr Oliva), Instituto Superior Técnico, 2000.

R. Severino, N. Martins and J. Sousa Ramos, *Isentropic real cubic maps*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.

L. Silva and J. Sousa Ramos,

- *A Genealogy for kneading sequences of two-piecewise monotonous maps of the interval*, Conference on Differential Equations and Dynamical Systems (in honor of Waldyr Oliva), Instituto Superior Técnico, Lisbon, Portugal.
- *A unified renormalization scheme for two-piecewise monotonous maps of the interval*, ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.

Statistics and Applications

C. Amado,

- *Método de reamostragem robusto para selecção de variáveis em análise discriminante*, VIII Congresso Anual da Sociedade Portuguesa de Estatística, Peniche, Portugal, 4.10.00-7.10.00.
- *Robust bootstrapping using influence functions*, COMPSTAT'00: XIV Compstat Conference of the International Association for Statistical Computing, Utrecht, Netherlands, 21.8.00-25.8.00.

N. Antunes, A. Pacheco and R. Rocha,

- *Um modelo markoviano de renovamento para redes sem fios*, VIII Congresso Anual da Sociedade Portuguesa de Estatística, Peniche, Portugal, 4.10.00-7.10.00.
- *A Markov renewal based model for wireless networks*, Conference on Stochastic Networks, University of Wisconsin-Madison, USA, 19.6.00-24.6.00.

M. Cabral Morais and A. Pacheco, *Ordenação estocástica na análise de desempenho de esquemas de controlo de qualidade*, VIII Congresso Anual da Sociedade Portuguesa de Estatística, Peniche, Portugal, 4.10.00-7.10.00.

C. Nunes and A. Pacheco,

- *Efeito da distribuição inicial do ambiente no comportamento do índice de dispersão de um MMPP(2)*, VIII Congresso Anual da Sociedade Portuguesa de Estatística, Peniche, Portugal, 4.10.00-7.10.00.
- *Using MCMC in the estimation of MMPP parameters*, COMPSTAT, Utrecht, Netherlands, 21.8.00-25.8.00.

R. M. Oliveira,

- *Compstat 2000*, Utrecht, Netherlands, 21.8.00-25.8.00.
- *VIII Congresso Anual da Sociedade Portuguesa de Estatística*, Peniche, Portugal, 4.10.00-7.10.00.

A. M. Pires,

- *Confidence intervals for a threshold parameters*, COMPSTAT 2000: XIV Compstat Conference of the International Association for Statistical Computing, Utrecht, Netherlands, 21.8.00-25.8.00.
- *Intervalos de confiança para uma proporção*, VIII Congresso Anual da Sociedade Portuguesa de Estatística, Peniche, Portugal, 4.10.00-7.10.00.

M. F. Ramalhoto,

- *Recent development issues in stochastic reliability MMR'2*, Deuxième Conférence Internationale sur les Methodes Mathematiques en Fiabilité: Methodologie, Pratique et Inference, Université Victor Segalen, Bordeaux, France, 4.7.00-7.7.00.
- *Heuristic methods to obtain approximations and bounds for multi-server loss and delay queues with and without retrials*, Third Workshop on Advance Retrial Queues, Amsterdam, Netherlands, 13.3.00-15.3.00.

- *Stochastics for the quality movement a transdisciplinary research area for discussion*, The Industrial Statistics IN ACTION 2000 International Conference, University of Newcastle, Tyne, UK, (45 minutes lecture replacing Henry P. Wynn, who could not be present), 8.9.00-10.9.00.

M. Silva, A. M. Pires and F. Mira da Silva, *Comparação entre regressão logística e redes neuronais num problema de exploração de dados*, VIII Congresso Anual da Sociedade Portuguesa de Estatística, Peniche, Portugal, 4.10.00-7.10.00.

Applied Mathematics and Numerical Analysis

C. J. S. Alves, *On the identification of conductive cracks*, International Symposium in Inverse Problems 2000, Nagano, Japan, 3.00.

T. Diogo and P. M. Lima, *Numerical solution of a non-uniquely solvable Volterra integral equation*, Ninth International Congress on Computational and Applied Mathematics (ICCAM 2000), Leuven, Belgium, 17.7.00-21.7.00 and International Conference on Finite Difference Schemes, Palanga, Lithuania, 1.9.00-4.9.00.

P. M. Lima and A. Oliveira, *Numerical solution of nonlinear singular boundary-value problems using variable substitutions*, International Conference on Finite-Difference Schemes, Palanga, Lituânia, 1.9.00-4.9.00.

A. Sequeira,

- *Steady motion of viscoelastic non-Newtonian fluids in an exterior domain with application to particle sedimentation*, Seminar at International Conference on Topics in Mathematical Fluid Mechanics-dedicated to the 60th Birthday of John Heywood, Capo Miseno, Italy, 27.5.00-30.5.00.
- *Mathematical theory and numerical methods for viscoelastic fluid models in unbounded domains*, Seminar at The Third World Conference on Nonlinear Analysis-Session on Differential Equations and Nonlinear Mechanics, Catania, Italy, 19.7.00-26.7.00.
- *On steady flows of viscoelastic fluids in pipes*, Seminar at 16th IMACS World Congress 2000-Session on Applied Mathematics for Industrial Flows, EPFL, Lausanne, Switzerland, 21.8.00-25.8.00.
- *Short Course (2 hours): Viscoelastic fluids: constitutive models, mathematical theory and applications*, International Workshop on Non-Newtonian and Viscoelastic Fluid Flows: Mathematical Theory, Modelling and Applications, Scuola Normale Superiore di Pisa, Italy, 16.10.00-17.10.00.

J. H. Videman, *Asymptotic behaviour at infinity of threedimensional steady viscoelastic flows*, Third World Congress of Nonlinear Analysts, Catania, Italy, 19.7.00-26.7.00.

Computer Science

C. Caleiro,

- *Decidability and trace-consistency of DTL*, ASPIRE Workshop, Berlin, Germany, 23.3.00-25.3.00.
- *Sincronização versus fibrilação*, Encontro LogComp, Lisbon, Portugal, 29.9.00.

C. Hermida, Advanced course on fibred category theory, Instituto Superior Técnico, Lisbon, Portugal, 7.2.00-11.2.00.

P. Mateus, *Composicionalidade de espaços de probabilidades*, Encontro LogComp, Lisbon, Portugal, 29.9.00.

J. Ramos,

- *Specification and verification of agent communities in the SSC*, ASPIRE Workshop, Berlin, Germany, 23.3.00-25.3.00.
- *Agentes no cálculo de estados e situações*, Encontro LogComp, Lisbon, Portugal, 29.9.00.

J. Rasga, *Fibrilação de sistemas dedutivos etiquetados*, Encontro LogComp, Lisbon, Portugal, 29.9.00.

A. Ravara,

- *What is TyCO, after all?*, Pi-Meetings, INRIA, Sophia-Antipolis, France, 20.6.00 and Encontro LogComp, Lisbon, Portugal, 29.9.00.
- *Typing non-uniform concurrent objects*, International Conference on Concurrency Theory (CONCUR 2000), State College, USA, 22.8.00-25.8.00.

P. Resende,

- *Noncommutative topology in computer science*, Dagstuhl Seminar on Topology in Computer Science: Constructivity; Asymmetry and Partiality; Digitization, Dagstuhl, Germany, 4.6.00-9.6.00.
- *Quantaes as spaces of dynamical systems*, 72nd Peripatetic Seminar on Sheaves and Logic, Brussels, Belgium, 8.4.00-9.4.00.

A. Sernadas, *Fibring-completeness preservation*, Seminário de Lógica Matemática, Instituto Superior Técnico e Universidade de Lisboa, Lisbon, Portugal, 4.5.00.

4 Guest Program

Algebra and Mathematical Analysis

S. Anisov, Center for Mathematical Analysis, Geometry, and Dynamical Systems. *Lectures:*

- Towards lower bounds of Matveev complexity, 6.7.00.
- Handle decompositions and Kirby diagrams for 4-manifolds, 6.4.00.

E. R. Arantes e Oliveira, Instituto Superior Técnico. *Lecture:* Desafios lançados pelo desenvolvimento dos processos tecnológicos à aplicação da matemática na engenharia - *Colloquium of the Department of Mathematics*, 13.4.00.

V. Araújo, Universidade do Porto, Portugal. *Lectures:*

- Stochastic stability for an infinite number of coexisting attractors, 28.4.00.
- Decomposição espectral para aplicações sob perturbações aleatórias, 19.12.00.

F. Balibrea, Universidad de Murcia, Spain, 31.1.00-3.2.00. *Lecture:* New results on bidimensional dynamics, 1.2.00.

M. Bertelson, Max-Planck Institut fur Mathematik, Bonn, Germany, 4.12.00-10.12.00. *Lecture:* Regular Poisson manifolds and their foliations, 5.12.00.

F. Bogomolov, Courant Institute, 18.7.00-22.7.00. *Lectures:*

- Fundamental groups of algebraic/complex surfaces, 20.7.00.
- Tensors on algebraic surfaces, 21.7.00.

P. Brunovsky, Comenius University, Bratislava, Slovakia, 22.5.00-3.6.00. *Lecture:* Genericity of the Morse-Smale property for reaction-diffusion and damped hyperbolic equations, 30.5.00.

C. Casacuberta, Universitat Autònoma de Barcelona, Spain, 5.2.00-9.2.00. *Lecture:* Elliptic genera of manifolds, 2.8.00.

L. Crane, Kansas State University, USA, 1.9.00-31.12.00. *Lectures:* Introduction to categorical physics I and II, 12.10.00 and 26.10.00.

M. Crainic, Universiteit Utrecht, 5.11.00-12.11.00. *Lecture:* Algebroids, cohomology, and characteristic classes, 7.11.00.

C. T. J. Dodson, UMIST, Manchester. *Lecture:* Information geometry: security and stochastic clustering, 16.11.00.

I. Dolgachev, University of Michigan, USA, 17.7.00-20.7.00. *Lectures:*

- Negative rational curves on algebraic surfaces, 17.7.00.
- Kummer surfaces, 19.7.00.
- Double planes of general type, 20.7.00

R. Duduchava, Georgian Academy of Science, Tbilisi, Georgia, 12.6.00-10.7.00. *Lecture*: Boundary value problems on domains with peaks, 16.6.00.

D. Dugger, Purdue University, USA, 19.6.00-27.6.00. *Lecture*: An introduction to motivic topology, 21.6.00.

L. Fernandez, Universidade do Minho, Portugal. *Lecture*: Os invariantes numéricos de Lusternik e Schnirrelman, 16.6.00.

J. Ferreira Alves, Universidade do Porto, Portugal. *Lecture*: Perturbações aleatórias de transformações não uniformemente expansoras. 28.4.00.

B. Fiedler, Freie Universität Berlin, 18.3.00-2.4.00. *Lecture*: Hopf bifurcation without parameters, and conservation laws without conservation, 28.3.00.

K. Gawedzki, Institute des Hautes Études Scientifiques. Introduction to conformal field theory, in 2nd IST Lecture Series in Algebraic Geometry & Physics 21-25/2/00.

S. Gonchenko, Institute for Applied Mathematics and Cybernetics, Nizhny Novgorod, Russia, 13.5.00-5.6.00. *Lecture*: Homoclinical bifurcations of two-dimensional maps, 16.5.00.

C. Gorodski, Universidade de São Paulo and Universität zu Köln, Germany, 3.5.00-8.5.00. *Lecture*: Representações de grupos de Lie compactos e os espaços osculadores de suas órbitas, 5.5.00.

M. Grinfeld, The University of Strathclyde in Glasgow, 15.9.00-8.12.00. *Lectures*:

- Young measures and invariance, 7.11.00.
- An applied introduction to the Conley index, 22.11.00.

J. Grodal, Institute for Advanced Study, Princeton, USA, 11.3.00-17.3.00. *Lecture*: Maps between classifying spaces, 14.3.00.

M. Jiang, Wake Forest University, USA, 1.7.00-5.7.00. *Lecture*: Sinai-Ruelle-Bowen measures for lattice dynamical systems, 4.7.00.

I. Kanatchikov, Institute of Fundamental Technological Research, Warsaw, Poland. *Lecture*: Precanonical hamiltonian formalism: polysymplectic structure, graded Poisson brackets and quantization, 3.10.00.

A. Karlovich, South Ukrainian Pedagogical University, Odessa, Ukraine, 1.3.00-31.12.00. *Lectures*:

- On the essential norm of the Cauchy singular integral operator in rearrangement-invariant spaces, 7.4.00.
- On the interpolation constant for Orlicz spaces, 20.10.00.

Yu. Karlovich, CINVESTAV del IPN, Mexico, 10.1.00-23.1.00 and 5.6.00-11.6.00. *Lectures*:

- Fredholm theory for a shift-invariant algebra generated by singular integral operators with oscillating coefficients, 21.1.00.
- Singular integral operators with oscillating data, 9.6.00.

M. Kashiwara, Research Institute for Mathematical Sciences, Kyoto, 13.4.00-15.4.00. *Lecture*: Finite dimensional representations of quantum affine algebras, 14.4.00.

L. Kauffman, University of Illinois, Chicago, USA, 2.10.00-6.10.00. *Lecture*: Virtual knot theory - *Colloquium of the Department of Mathematics*, 3.10.00.

P. Kulish, Universidade do Algarve, Faro, Portugal, 10.11.00. *Lecture:* Representations of quantum algebras, 10.11.00.

A. Laptev, Kungl Tekniska Högskolan, Stockholm, Sweden, 26.2.00-4.3.00. *Lecture:* Lieb-Thirring inequalities, 29.2.00.

G. Lebeau, Ecole Polytechnique, Palaiseau, France, 7.10.00-13.10.00. *Lecture:* Uniqueness for the Stokes equation, 13.10.00.

P. Lima-Filho, Texas A&M University, USA, 10.7.00-22.7.00. *Lecture:* Using grass to build character, 13.7.00.

N. Manojlovic, Universidade do Algarve, Faro, 30.6.00-17.11.00. *Lectures:*

- Integrable systems and factorization, 30.6.00.
- Quantum inverse scattering method: examples, 17.11.00.

R. Martins da Rosa, Pontifícia Universidade Católica, Rio de Janeiro, Brazil, 1.2.00-28.2.00. *Lecture:* Curvas de Gorenstein trigonais, 11.2.00.

S. Matveev, Chelyabinsk State University, Russia, 10.1.00-26.1.00. *Lectures:* Algorithms in topology of 3-manifolds (short course), 17.1.00-21.1.00.

V. Maz'ya, Linköping University, Sweden, 17.9.00-23.9.00. *Lecture:* Some open problems in partial differential equations - *Colloquium of the Department of Mathematics*, 21.9.00.

C. Mese, Connecticut College, USA, 23.6.00-26.6.00. *Lecture:* The Gerstenhaber-Rauch principle, 23.6.00.

G. Mikhalkin, Harvard University, USA, 17.6.00-21.6.00. *Lecture:* Dequantization and pairs of pants decomposition, 20.6.00.

A. Mikovic, Universidade do Algarve, Faro, Portugal. *Lecture:* Algebro-geometric approach to matrix factorization for spinning tops, 11.2.00.

A. Mikovic, Institute of Physics, Belgrade, Serbia, 1.4.00-31.12.00. *Lectures:*

- Super Chern-Simons theory and flat super connections on a torus, 23.6.00.
- Path-integral quantization of BF theories and state-sum models of quantum gravity, 9.11.00.

R. Moeckel, University of Minnesota, 20.10.00-26.10.00. *Lecture:* Arnold diffusion, horseshoes and the problem of the gaps, 24.10.00.

T. Monteiro Fernandes, Universidade de Lisboa. *Lecture:* Estimações do microsuporte em teoria de D-módulos, 25.2.00.

J. Nelson, Univ. Torino, Italy, 16.10.00-20.10.00. *Lecture:* Quantum matrices and 2+1 dimensional quantum gravity, 19.10.00.

B. Oliveira, University of Pennsylvania, USA, 17.7.00-28.7.00. *Lectures:*

- Uniformization of complex surfaces, 19.7.00.
- Shafarevich Conjecture I and II, 20.7.00 and 21.7.00.

F. Pioli, Università di Genova, Italy, 13.2.00-20.2.00. *Lecture:* Isotropic embeddings of moduli spaces of vector bundles, 15.2.00.

F. Plaza-Martin, Universidad de Salamanca, Spain, 20.2.00-28.2.00. *Lecture:* Algebraic solutions of the multicomponent KP hierarchy, 23.2.00.

T. Ratiu, Ecole Polytechnique Fédérale de Lausanne, Switzerland, 12.4.00-16.4.00. *Lecture:* Reduction methods in the tangent bundle, 13.4.00.

J. Rocha, Universidade do Porto, Portugal. *Lecture:* Desdobramento de ciclos heterodimensionais, 15.6.00.

J. Rodríguez, Universidade do Algarve, Faro, Portugal, 22.12.00. *Lecture:* Factorização de operadores integrais singulares com deslocamento de Carleman e conjugação, 22.12.00.

C. Sabbah, Ecole Polytechnique, France. *Lecture:* On semi-simple perverse sheaves and D-modules, 21.7.00.

S. Samko, Universidade do Algarve, Faro, Portugal, 10.3.00-11.3.00. *Lecture:* What is the correct way to choose a bounded shift operator on an infinite line, 10.3.00.

T. Shaposhnikova, Linköping University, Sweden, 17.9.00-23.9.00. *Lecture:* Applications of Sobolev multipliers to nonsmooth elliptic problems and boundary integral equations, 22.9.00.

J. Schmeling, Freie Universität Berlin, Germany, 20.4.00-30.4.00. *Lecture:* Invariant foliations in dynamical systems, 21.3.00.

B. Silbermann, Technische Universität Chemnitz, Germany, 5.3.00-11.9.00. *Lectures:*

- Recent advances in asymptotic spectral theory - *Colloquium of the Department of Mathematics*, 30.3.00.
- Continuity of generalized inverses in Banach algebras, 28.4.00.

C. Sorger, Université de Nantes, France, 21-25.2.00. *Lectures:* Conformal field theory (Wess-Zumino-Witten models) and generalized theta-functions (short course), 21-25.2.00.

A. Sossinsky, Independent University of Moscow, Russia, 17.6.00-25.6.00. *Lectures:* Finite-type invariants (short course),

- General method: discriminant spaces and associated finite-type invariants, 19.6.00.
- Vassiliev knot invariants (elementary theory), 20.6.00.
- The Kontsevich integral and its computation, 21.6.00.
- The Vassiliev spectral sequence, 21.6.00
- Arnold's invariants of plane curves, 23.6.00

H. Spielberg, Center for Mathematical Analysis, Geometry, and Dynamical Systems. *Lectures:*

- A gentle introduction to stacks, 11.10.00.
- Gromov-Witten invariants via localization with respect to torus actions, 14.11.00.

I. Stoleriu, The University of Strathclyde in Glasgow. *Lecture:* Integrodifferential models for solid-solid phase transitions, 23.11.00.

G. Terra, IME, Universidade de São Paulo, Brazil, 29.8.00-31.12.00. *Lecture:* D'Alembertian versus Vakonomic mechanics (a brief comparison between the two mechanics), 28.11.00.

D. Turaev, WIAS, Berlin, 13.5.00-12.6.00. *Lecture:* On a blue-sky catastrophe, 6.6.00.

A. Tyurin, Steklov Institute of Mathematics, Moscow, Russia, 6.00-12.00. *Lectures:*

- Algebraic and Lagrangian geometry - *Colloquium of the Department of Mathematics*, 16.11.00.
- Four dimensional geometry via algebraic geometry, 12.12.00.

P. Vanhaecke, Université de Poitiers, France, 21.5.00-28.5.00. *Lecture:* Deformation quantization for polynomial Poisson algebras, 23.5.00.

M. Viana, Instituto de Matemática Pura e Aplicada, Rio de Janeiro, 3.2.00-28.2.00. *Lecture:* Chaotic dynamical systems: a probabilistic viewpoint - *Colloquium of the Department of Mathematics*, 17.2.00.

W. Wendland, Universität Stuttgart, Germany, 4.12.00-9.12.00. *Lecture:* Foundation and application of boundary element methods - *Colloquium of the Department of Mathematics*, 7.12.00.

S. Yamada, Cornell University, USA, 23.6.00-26.6.00. *Lecture:* Weil–Petersson geometry of Teichmüller spaces, 23.6.00.

Statistics and Applications

Y. Akyildiz, Georgia Institute of Technology, USA, 5.6.00-9.6.00. *Lecture:* Mobility management in next generation wireless systems, 9.6.00.

J. Berger, Duke University, USA. *Lecture:* Unifying classical and Bayesian testing, 3.4.00.

G. Boente, Universidad de Buenos Aires, Argentina, 25.2.00-29.2.00. *Lecture:* Robust estimators of common principal components and related models, 28.2.00.

C. Croux, Université Libre de Bruxelles, Belgium, 25.11.00-30.11.00. *Lectures:*

- The most robust S -estimators for linear discriminant analysis, 28.11.00.
- Robust principal components, 29.11.00.

R. German, TU Berlin, Germany, 8.5.00-12.5.00. *Lecture:* Iterative analysis of Markov regenerative models, 12.5.00.

J. Hinde, University of Exeter, UK, 21.2.00-25.2.00, *Lectures:* SPLUS (course).

C. Lindemann, University of Dortmund, Germany, 22.5.00-26.5.00. *Lecture:* Numerical analysis of generalized semi Markov processes, 26.5.00.

W. Schmid, Europa-Universität Viadrina, Germany, 10.11.00-17.11.00. *Lectures:*

- On the behaviour of EWMA charts for correlated data, 13.11.00.
- Control charts for time series, 15.11.00.
- Sequential methods for detecting changes in the variance of economic time series, 16.11.00.

P. K. Sen, University of North Carolina at Chapel Hill, USA, 23.6.00-2.7.00. *Lectures:*

- Multivariate statistical analysis: beyond parametrics, 26.6.00.
- Mathematical perspectives in statistical science, and current trends - *Colloquium of the Department of Mathematics*, 29.6.00.

R. Serfozo, Georgia Institute of Technology, USA, 26.6.00-30.6.00. *Lecture:* Advanced course on stochastic networks - equilibrium behavior and travel times, 26.6.00-29.6.00.

Applied Mathematics and Numerical Analysis

A. Ben Abda, LAMSIN, Ecole Nationale d'Ingénieurs de Tunis, Tunisia, 20.11.00-27.11.00, *Lecture:* A non-iterative process for cracks identification, 22.11.00.

H. Chaker, LAMSIN, Ecole Nationale d'Ingénieurs de Tunis, Tunisia, 20.11.00-27.11.00, *Lecture:* The high field asymptotics for degenerate semiconductors, 23.11.00.

L. Diening, Universitat Freiburg, Germany, 8.7.00-12.7.00. *Lecture:* Strong solutions for non-Newtonian fluids for small times, 11.7.00.

A. El Badia, Université de Technologie de Compiègne, France, 12.4.00-17.4.00. *Lecture:* On some inverse source problems, 14.4.00.

G. Giroire, Université de Technologie de Compiègne, France, 7.2.00-14.2.00. *Lecture:* Methods of elimination of hypersingular kernels in some boundary integral equations. Application to plate problems, 8.2.00.

M. Kassmann, Universitat Bonn, Germany, 8.7.00-12.7.00. *Lecture:* Analysis of jump-diffusion operators, 11.7.00.

S. Nazarov, University of St. Petersburg, Russia, 28.4.00-28.5.00. *Lectures:* Artificial boundary conditions for exterior domains (short course), 10.5.00-12.5.00.

J. Necas, Charles University, Prague, Czech Republic and Northern Illinois University, DeKalb, USA, 23.9.00-3.10.00. *Lecture:* A remark on the removable singularities for the solution of the solution of the Navier-Stokes equations, 28.9.00.

A. Oliveira, Departamento de Matemática, Universidade Nova de Lisboa, Portugal. *Lecture:* Resolução numérica de problemas de valores de fronteira singulares para equações de Emden-Fowler, 10.11.00.

K. Pileckas, University of Vilnius, Lithuania, 3.2.00-28.2.00. *Lecture:* Asymptotic conditions at infinity for the Stokes problem in a system of pipes, 21.2.00.

K. Rajagopal, Texas A&M University, College Station, USA, 20.5.00-26.5.00. *Lecture:* The role of Mathematics in general areas of Mechanical Engineering - *Colloquium of the Department of Mathematics*, 22.5.00.

Computer Science

I. Akyildiz, Georgia Institute of Technology, USA, 5.6.00-9.6.00. *Lecture:* Mobility management in next generation wireless systems.

P. Buchholz, Technical University of Dresden, Germany, 18.9.00-22.9.00. *Lecture:* A compositional approach for the analysis of stochastic automata networks.

W. Carnielli, University of Campinas, Brazil, 10.7.00-14.7.00. *Lecture:* Multimodalidades.

B. Coecke, Université Libre de Bruxelles, Belgium, 14.6.00-24.6.00. *Lecture:* Operational quantum logic: history and recent developments.

F. Coelho, Universidade de Évora, Portugal. *Lectures:*

- Autómatos quânticos, 28.1.00.
- Gramáticas quânticas, 19.5.00.

M. Coniglio, University of Campinas, Brazil, 24.1.00-28.1.00. *Lecture:* Splicing and splitting logics: a categorial approach.

M. Coniglio, University of Campinas, Brazil, 17.7.00-21.7.00. *Lecture:* Um enfoque modelo-teórico das traduções entre lógicas.

F. Ferreira, Universidade de Lisboa, Portugal, 30.6.00. *Lecture:* A teoria dos corpos reais fechados é interpretável na teoria de Robinson Q.

S. Franklin, University of Memphis, USA, 3.7.00-5.7.00. *Lecture:* A “consciousness” based architecture for autonomous software agents.

R. German, Technical University of Berlin, Germany, 8.5.00-12.5.00. *Lecture:* Iterative analysis of Markov regenerative models.

J. Goguen, University of California at San Diego, USA, 10.7.00-15.7.00. *Lecture:* The role of algebra in computer science - *Colloquium of the Department of Mathematics*, 13.7.00.

D. Kruml, Masaryk University, Czech Republic, 1.7.00-10.7.00. *Lecture:* Points of quantales.

C. Lindemann, University of Dortmund, Germany, 22.6.00-26.5.00. *Lecture:* Numerical analysis of generalized semi Markov processes.

A. T. Martins, University of Ceará, Brazil, 17.1.00-21.1.00. *Lecture:* Semantics for paraconsistent default logic.

F. Martins, Universidade dos Açores, Portugal, 14.1.00. *Lecture:* Computação em redes idiotípicas.

E. Pereira, Universidade do Minho, Portugal, 13.10.00. *Lecture:* Teoria estocástica do transporte radiativo - Desvios ao problema clássico e Levy flights.

J. Pinto, Catholic University of Chile, Chile, 21.1.00-3.3.00. *Lecture:* Specifying active rules for database maintenance.

R. Serfozo, Georgia Institute of Technology, USA, 26.6.00-30.6.00. *Lectures:* Advanced course on stochastic networks - equilibrium behavior and travel times, 26.6.00-29.6.00.

L. Viganò, University of Freiburg, Germany, 3.7.00-7.4.00. *Lecture:* Belief logics for security.

A. Zanardo, University of Padova, Italy, 4.9.00-20.12.00. *Lecture:* Fibred semantics of modal first-order based logics.

5 Postdoctoral Fellows

Algebra and Mathematical Analysis

S. Anisov, Ph. D. in Mathematics, Independent University of Moscow, 1998. Center for Mathematical Analysis, Geometry, and Dynamical Systems, 8.99-7.00. *Research areas:* singularities, geometry and topology.

D. Forge, Université Paris VI, France. DONET (European Union Contract ERBFMRX-CT98-0202) at Lisbon (with R. Cordovil). *Research areas:* combinatorics.

A. Karlovich, Ph. D. in Mathematics, Rostov State University, Rostov-on-Don, Russia, 1998. Applied Mathematics Centre, 1.3.00-31.12.00. *Research areas:* operator theory.

Y. Koo, Ph. D. in Mathematics, University of Minnesota, USA, 1998. Center for Mathematical Analysis, Geometry, and Dynamical Systems, 8.99-7.00. *Research areas:* partial differential equations, geometric measure theory.

B. Saussol, Docteur en Mathématique, Université Toulon et du Var, France, 1998. Center for Mathematical Analysis, Geometry, and Dynamical Systems, 12.98-8.00. *Research areas:* dynamical systems, ergodic theory.

H. Spielberg, Docteur en Mathématique, Université Louis Pasteur, Strasbourg, France, 1999. Center for Mathematical Analysis, Geometry, and Dynamical Systems, since 9.00. *Research areas:* algebraic geometry, symplectic geometry and topology.

Computer Science

C. Hermida, Ph. D. in Mathematics, University of Edinburgh, Scotland, UK, 1993. Applied Mathematics Centre, since 2.12.99. *Research areas:* higher order category theory.

6 Research Programs and Sponsorship

6.1 Research Units

The members of the Department participate in research units that receive grants under the “Financiamento Plurianual e Programático”, FCT-MCT:

Applied Mathematics Centre, coordinated by C. Sernadas, with the following research groups:

- Operator Theory, Integral Equations and Applications, Coordinated by A. F. dos Santos.
- Numerical Analysis and Applications in Fluid Mechanics, Coordinated by A. Sequeira.
- Statistics, Stochastic Processes and Applications, Coordinated by J. A. Branco.
- Mathematical Physics, Coordinated by R. Picken.
- Logic and Computation, Coordinated by A. Sernadas

URL: <http://www.cs.math.ist.utl.pt/cma.www/>

Center for Mathematical Analysis, Geometry, and Dynamical Systems, coordinated by C. Rocha.

URL: <http://www.math.ist.utl.pt/cam/>

Center for Plasma Physics, coordinated by J. T. Mendonça (Complexo Interdisciplinar).

Institute for Mechanical Engineering - IDMEC, Centro de Projecto Mecânico, coordinated by C. Mota Soares.

Research Unit for Naval Engineering and Technology, coordinated by C. G. Soares (Section of Naval Engineering, Instituto Superior Técnico), with the following research group:

- Research Line 3 - Queueing Systems and Quality Management, coordinated by F. Ramalhoto

6.2 Research Projects Coordinated by Department Members

M. Abreu, Invariantes in Symplectic and Related Geometries, FCT 33081/99, starting 1.01.

C. J. S. Alves, Inverse Problems and Numerical Analysis in Wave Scattering, FCT 34735/99, 1.9.00.

L. Barreira, Dynamical Systems, Convénio ICCTI/CNPq-2000, coordinator for Portugal, 2000. (Coordinator for Brazil: M. Viana.)

M. A. Bastos, Algebras of Operators of Non Local Type and Factorization of Oscillatory Symbols, FCT 34222/99, 2000-2002.

A. Cannas da Silva, Geometry and Topology of Moduli Spaces, FCT PRAXIS XXI Project PCEX/C/MAT/44/96, 1.98-6.00.

J. Carmo, Modeling Organizations and Normative Interaction, Acção Integrada Luso-Britânica N° 8-33/99 in cooperation with Imperial College, coordinator for Portugal, 1999-2000.

R. Cordovil, Combinatorial and Discrete Differential Manifolds, FCT Praxis/PCEX/C/MAT/39/96, 1.97-7.00.

P. Freitas, Qualitative Theory of Differential Equations, FCT POCTI/1999/MAT/32931, 1.9.00.

J. P. Nunes, Moduli Spaces, Integrability and String Theory, FCT POCTI/1999/MAT/33943, 1.01.

M. Paluch, Connections between Homotopy Theory and Algebraic Geometry, FCT 34015/99, 1.10.00-1.10.02.

R. Picken, Categorical Ideas in Gauge Theory and Applications in Low-Dimensional Topology, FCT POCTI/35175/MAT/2000, 1.7.00-30.6.03.

M. F. Ramalhoto, Advances in Retrial Queueing Theory, INTAS 96-0828, 1997-2000.

P. Resende,

- Dynamic Observational Logic, Acção Integrada Luso-Britânica N° B-29/99 in cooperation with Imperial College, coordinator for Portugal, 1998-2000.
- Quantales, FCT Project POCTI/1999/MAT/33018, 2000-2002.

A. F. dos Santos, Factorização de Operadores e Aplicações à Física-Matemática, PRAXIS XXI Project 2/2.1/MAT/441/94 (1996-2000).

A. Sequeira,

- Mathematical and Numerical Analysis of Non-Linear Problems in Mechanics and Physics, in collaboration with Centro de Matemática e Aplicações Fundamentais, Universidade de Lisboa and CMAP, Ecole Polytechnique, Palaiseau, France, ICCTI/CNRS, 1997-2000.
- Numerical Methods in Fluid Mechanics, in collaboration with Ecole Polytechnique, La Marsa, Tunisia, ICCTI/Tunisia, 1997-2000.
- Numerical Simulation of Direct and Inverse Problems in Wave Propagation and in Fluid Flows, in collaboration with Ecole Nationale d'Ingénieurs de Tunis/LAMSIN, Tunis, Tunisia, ICCTI/Tunisia, 1999-2001.
- Mathematical Analysis and Numerical Simulation of Non-Newtonian Fluids with Applications in Liquid-Crystalline Polymers, PRAXIS XXI Project 2/2.1/MAT/380/94, 1996-2000.

A. Sernadas, ProbLog: Probabilistic Methods in Logic of Reactive Systems, PRAXIS XXI Project PRAXIS/P/MAT/10002/1998: 1999-2001.

6.3 Participation in other Research Projects

R. Cordovil: Discrete Optimization: Theory and Applications DONET (European Union Contract ERBFMRX-CT98-0202), 1.99.

R. Loja Fernandes, GE-European Differential Geometry Endeavour, European Contract Human Potential Programme, Research Training Network HPRN-CT-2000-00101.

P. Gouveia, PRAXIS XXI Project PRAXIS/P/EEI/11249/1998-QUEST: Quintessential Algorithms for Satisfiability and Optimization, 1999-2001.

P. M. Lima, NATO Project Mathematical Models of Complex Media, NATO PST/CLG.976878.

R. F. Picken,

- Functional Analysis and Quantum Field Theory, FCT/PRAXIS, coordinated by J. Mourão.
- Mathematical Physics, FCT/PRAXIS, coordinated by A. Cruzeiro.

M. F. Ramalhoto,

- European Union Expert for two Research Programmes of the EU fifth Framework Programme.
- European Masters and Research Program on Total Quality Management, European Foundation for Quality Management.
- Executive Committee Member of ENBIS-European Network for Business and Industrial Statistics.

F. J. Romeiras, Influência da Não Girotopia em Plasmas Espaciais, Programa de Cooperação Científica e Técnica ICCTI/CONICYT, Project n° 423/CONICYT, coordinated by A. L. Brinca (Department of Electrical Engineering and Computers, Instituto Superior Técnico).

B. Saussol, Probabilistic Methods in Non-Hyperbolic Dynamics, European Science Foundation, 1998-2003.

A. Sequeira, Applied Mathematics for Industrial Flow Problems - European Science Foundation, AMIF/ESF, 1998-2001. (Chairman: P.-L. Lions; co-chairman: A. Quarteroni.)

A. Sernadas, C. Sernadas, F. M. Dionísio, C. Caleiro, ESPRIT IV Working Group 23531 FIREworks: "Feature Integration in Requirements Engineering", 1998-2000.

A. Sernadas, C. Sernadas, P. Resende, P. Gouveia, J. Ramos, C. Caleiro, A. Ravara, ESPRIT IV Working Group 22704 ASPIRE: "Advanced modeling and SPecification of distributed InfoRmation systEms", 1997-2000.

A. Sernadas, C. Sernadas, P. Resende, P. Gouveia, A. Ravara, PRAXIS XXI Project 2/2.1/TIT/1658/95 LogComp: "LOGic and COMPutation".

7 Organization of Conferences, Workshops, Meetings, etc.

C. J. S. Alves,

- Member of the Scientific Committee of the International Symposium in Inverse Problems 2000, Nagano, Japan, March 2000.
- Chairman in the session Inverse Heat Conduction, International Symposium on Inverse Problems, Nagano, Japan, March 2000.

J. Buescu, Coorganizer, with I. Labouriau, S. Castro and A. Dias, of the Conference on Bifurcations, Symmetry and Patterns (in honor of Martin Golubitsky and Ian Stewart) (June 29-July 4, 2000), Universidade do Porto, Porto, Portugal.

J. Carmo, Member of the program committee of the Fifth International Workshop on Deontic Logic in Computer Science (DEON-00), Toulouse, France, 20.1.00-22.1.00.

R. Loja Fernandes, Coorganizer of the Conference on Differential Equations and Dynamical Systems (in honor of Waldyr Oliva), Center for Mathematical Analysis, Geometry, and Dynamical Systems, Lisbon, Portugal, 26.6.00-30.6.00.

J. P. Nunes, Coorganizer of the IInd IST Lectures in Algebraic Geometry and Physics, Instituto Superior Técnico, Lisbon, Portugal, 21.2.00-25.2.00.

P. G. Henriques, Coorganizer of the Conference on Differential Equations and Dynamical Systems (in honor of Waldyr Oliva), Center for Mathematical Analysis, Geometry, and Dynamical Systems, Lisbon, Portugal, 26.6.00-30.6.00.

A. B. Lebre, Member of the Organizing Committee of the International Workshop on Operator Theory and Applications IWOTA Portugal 2000, Faro, Portugal, 12.9.00-15.9.00.

F. P. Costa, Coorganizer of the Conference on Differential Equations and Dynamical Systems (in honor of Waldyr Oliva), Center for Mathematical Analysis, Geometry, and Dynamical Systems, Lisbon, Portugal, 26.6.00-30.6.00.

J. P. Nunes,

- Coorganizer of the Summer Mini-Courses in Algebraic Geometry, Center for Mathematical Analysis, Geometry, and Dynamical Systems and Centro de Matemática e Aplicações Fundamentais, Lisbon, Portugal, 17.7.00-21.7.00.
- Coorganizer of the IInd IST Lectures in Algebraic Geometry and Physics, Instituto Superior Técnico, Lisbon, Portugal, 21.2.00-25.2.00.

R. Picken,

- Member of the Organizing Committee of the International Workshop on Operator Theory and Applications IWOTA Portugal 2000, Faro, Portugal, 12.9.00-15.9.00

- Member of the Organizing Committee of the IXth Oporto Meeting on Geometry, Topology and Physics, Porto, Portugal, 29.9.00-2.10.00.

M. F. Ramalhoto,

- Member of the Scientific Programme Committee of the Third Workshop on Advance Retrial Queues, Amsterdam, 13.3.00-15.3.00.
- Chairperson of the Session 5 of the Third Workshop on Advance Retrial Queues, Amsterdam, 13.3.00-15. 3.00.

J. S. Ramos, Member of the Scientific Committee of the ECIT2000-European Conference on Iteration Theory, La Manga, Spain, 4.9.00-9.9.00.

C. Rocha, Member of the Scientific Committee and Coorganizer of the International Conference on the Differential Equations and Dynamical Systems (in honor of Waldyr Oliva), Center for Mathematical Analysis, Geometry, and Dynamical Systems, Lisbon, Portugal, 26.6.00-30.6.00.

A. F. dos Santos,

- Coordinator of the Organizing Committee of the International Workshop on Operator Theory and Applications, IWOTA Portugal 2000, Faro, Portugal, 12.9.00-15.9.00.
- Coorganizer of the Summer School on Factorization and Integrable Systems, Universidade do Algarve, Faro, Portugal, 6.9.00-8.9.00.

A. Sequeira, Member of the Program Committee: Second International Conference on Applied Mathematics for Industrial Flow Problems-AMIF/ESF, Il Ciocco, Italy, 12.10.00-14.10.00.

A. Sernadas,

- Member of the program committee of DEMM2000 12th Workshop, Dagstuhl, Germany, 18.9.00-22.9.00.
- Member of the program committee of CAISE2000: 12th Conference on Advanced Information Systems Engineering, Stockholm, Sweden, 5.6.00-9.6.00.

F.-O. Speck, Member of the Organizing Committee of the International Workshop on Operator Theory and Applications, IWOTA Portugal 2000, Faro, Portugal, 12.9.00-15.9.00.

M. Vaz Pinto,

- Organizer of the short course Álgebra Comutativa, 28.1.00-1.2.00, Departamento de Matemática, Instituto Superior Técnico.
- Organizer of the course Local Cohomology, by S. Zarzuela, 7.2.00-11.2.00, Departamento de Matemática, Instituto Superior Técnico.

8 Personal Notes

A New Professors and Promotions

J. Alves, Professor Auxiliar.
C. Caleiro, Professor Auxiliar.
P. Lopes, Professor Auxiliar.
J. Natário, Professor Auxiliar.
L. Oliveira, Professor Auxiliar.
J. Ramos, Professor Auxiliar.
A. Ravara, Professor Auxiliar.
P. F. Santos, Professor Auxiliar.
J. P. Teixeira, Professor Auxiliar.

B Other notes

M. Abreu,

- Visited The Fields Institute for Research in Mathematical Sciences, Toronto, Canada, on a Jerrold E. Marsden Postdoctoral Fellowship, 8.00-7.01.
- Participant in the First AMS-Scandinavian International Mathematics Meeting, Odense, Denmark, 6.00.
- Participant in the Contact Geometry Conference, Stanford University, California, USA, 12.00.

L. Barreira,

- Member of the Executive Commission of the Center for Mathematical Analysis, Geometry, and Dynamical Systems, Lisbon, Portugal.
- Elected Associate Member of the Center for Dynamical Systems, The Pennsylvania State University, University Park, USA.
- Member of the Editorial Board of Dynamical Systems (formerly Dynamics and Stability of Systems).
- Executive Editor of Portugaliae Mathematica.

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

R. Cordovil,

- Executive Editor of *Portugaliae Mathematica*.
- Member of the Scientific Council of Centro Internacional de Matemática, Coimbra, Portugal, 2000-2004.

J. F. Costa,

- Supervisor of the Master thesis “Verificação de Propriedades em Redes Neurais”, by P. Rodrigues, Faculdade de Ciências, Universidade de Lisboa, Portugal, 23.5.00.
- Supervisor of the thesis “Computação em Redes Idiotípicas”, by F. Martins, Provas de Aptidão Pedagógica e de Capacidade Científica, Universidade dos Açores, Portugal, 18.9.00.

F. M. Dionísio, Member of the organizing committee of the Workshop Electronic Media in Mathematics, Coimbra, Portugal, 13.9.01-15.9.01.

R. Loja Fernandes, Member of the Executive Commission of the Center for Mathematical Analysis, Geometry, and Dynamical Systems, Lisbon, Portugal.

C. Florentino, Organizer of the Working Seminar on Algebraic Geometry, Department of Mathematics, Instituto Superior Técnico, Lisbon, Portugal.

J. P. Neto and J. F. Costa, WebPage NETDEF - A Neural Language, 2000. URL: <http://www.di.fc.ul.pt/~jpn/netdef/netdef.htm>.

J. P. Nunes,

- Coorganizer of the Summer Mini-Courses in Algebraic Geometry II, Center for Mathematical Analysis, Geometry, and Dynamical Systems and Centro de Matemática e Aplicações Fundamentais, Lisbon, Portugal, 18.6.01-30.6.01.
- Coorganizer of the Lisbon School on Superstrings II: Modern Trends in String Theory, Lisbon, Portugal, 13.7.01-17.7.01.

C. D. Paulino,

- Corresponding Editor of The International Society for Bayesian Analysis Bulletin, 2001.
- Member of the Program Committee of the VIII Latin-American Congress in Probability and Mathematical Statistics (sponsored by the Bernoulli Society and the International Center in Mathematics and Applied Mathematics), to be held in 12.11.001-16.11.001, at the University of Havana, Cuba.

R. Picken,

- Coorganizer of the weekly Quantum Gravity discussion seminar.
- Member of the organizing committee of the Xth Oporto Meeting on Geometry, Topology and Physics, Porto, Portugal, 20.9.01-24.9.01.
- Coorganizer of the public lecture by V. F. R. Jones (Fields Medallist) on 22.9.01, series The Future of the Future, part of the programme of Porto 2001 Cultural Capital.

- Collaborated on the knot theory section of the exhibition *Matemática Viva*, in the Knowledge Pavilion of the Park of Nations, Lisbon, Portugal, 24.11.00-6.01.

M. F. Ramalhoto,

- Nominated in July 2000 member of the International Advisory Board of Reliability Conferences.
- Member of the Advisory Board of the International Conference “Mathematical Methods in Reliability, MMR’ 2002”, Trondheim, Norway.
- Member of the Editorial Board Committee of the European periodical *EJEE*.

C. Rocha,

- Member of the Jury (“arguente”) for the Agregação of J. Rocha, Faculdade de Ciências, Universidade do Porto.
- Member of the Jury for the Agregação of S. Samko, Instituto Superior Técnico, Universidade Técnica de Lisboa.
- Member of the Jury for the Agregação of A. Meirmanov, Faculdade de Ciências, Universidade de Lisboa.

A. M. Santos, Participant in the Programme *Ciência Viva nas Férias 2000* - Department of Mathematics, Instituto Superior Técnico: *Cérebro, Computação, Consciência*, 10.7.00-21.7.00.

A. Sequeira,

- Supervisor of the Ph.D. thesis in Computational Mathematics “Analytic Continuation Techniques and Applications to Free Boundary Problems”, by C. Albuquerque, Faculdade de Ciências, Universidade de Lisboa, Portugal, 5.5.00.
- Invited Professor at the University of Pau, France (Laboratoire des Mathématiques Appliqués) 1.3.00-31.3.00.
- Sabbatical research grant from FCT to visit the University of Pittsburgh, USA.
- Member of the Scientific Committee and invited lecture: International Conference on Contemporary Challenges in Applied Fluid Mechanics, Capo Miseno, Italy, 31.5.01-5.6.01.
- Chairman of the Organizing Committee and Member of the Scientific Committee of the Second International Conference on Applied Mathematics for Industrial Flow Problems-AMIF/ESF, Lisbon, Portugal, 17.4.00-20.4.02.
- Member of the Organizing Committee: Series of International Summer Schools on Blood Flow, MSRI, Berkeley, USA, 2002, Instabilities and Waves, PIMS, Vancouver, Canada, 2004, Water and Air Pollution, IPAM, Los Angeles, USA, 2006.

A. Sernadas,

- Member of the program committee of CAISE2001: 13th Conference on Advanced Information Systems Engineering, Interlaken, Switzerland, 4.6.01-8.6.01.
- Member of the program committee IFIP WG8.1 Working Conference on Organisational Semiotics - the evolving science of information systems, Montreal, Canada, 23.5.01-25.5.01.

- Member of the scientific committee of the journal Information and Software Technology.
- Member of the scientific committee of the journal Formal Aspects of Computing.
- Member of Jury of the Agregação of S. Samko, Instituto Superior Técnico, Lisbon, Portugal, 4.5.00-5.5.00.
- Member of the Board of Directors of Centro Internacional de Matemática, Coimbra, Portugal, since 1996.

F-O. Speck,

- Member of the Advisory Board of Mathematische Nachrichten from November 2000.
- Nominated member of the Advisory Board of Mathematical Methods in the Applied Sciences.
- Member of the Jury (“arguente”) for the Agregação of S. G. Samko (Universidade do Algarve), Instituto Superior Técnico, Lisbon, Portugal, 4.5.00-5.5.00.
- Member of the Jury for the equivalence of the Ph. D. degree of S. B. Yakubovich, Universidade do Porto, July-October 2000.

F. S. Teixeira,

- Member of the Conselho Directivo of Instituto Superior Técnico in 1999-2000.
- President of the Department of Mathematics.

Preprint Series

- 1/00 SEQUEIRA, A.; VIDEMAN, J. H.: Mathematical results and numerical methods for steady incompressible viscoelastic fluid flows. 23pp.
- 2/00 BARREIRA, L.; PESIN, Ya.: Lectures on Lyapunov exponents and smooth ergodic theory. 83pp.
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- 19/00 BARREIRA, L.; SAUSSOL, B.: Product structure of Poincaré recurrence. 25pp.

- 20/00 FREITAS, P.: On minimal eigenvalues of Schrödinger operators on manifolds. 7pp.
- 21/00 FREITAS, P.: Closed nodal lines and interior hot spots of the second eigenfunction of the Laplacian on surfaces. 10pp.
- 22/00 PIRES, A. M.; J. A. BRANCO; PICADO, A.; MENDONÇA, E.: Models for the estimation of a “no effect concentration”. 25pp.
- 23/00 PIRES, A. M.; BRANCO, J. A.: Partial influence functions. 21pp.
- 24/00 DIOGO, T.; FRANCO, N. B.; LIMA, P.: High order product integration methods for a Volterra integral equation with logarithmic singular kernel. 23pp.
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