



Research Report 1998

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RESEARCH REPORT

1998

Preface

The Department of Mathematics regards the annual publication of this research report as an important instrument of scientific policy. On the eighth 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 66 members holding PhD degrees and relies on the contribution of a large 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 a formal graduate program, the department is today one of the largest mathematics departments in the country and a major mathematics research center.

For administrative purposes, the department is divided into four sections: *Algebra and Mathematical Analysis, Statistics and Applications, Applied Mathematics and Numerical Analysis, and Computer Science*. The first section accounts for approximately two thirds of the department. Its name, motivated by historical reasons related to the courses taught at the Institute, is not an accurate description. In fact, in this section most of the research activity is on mathematical analysis and geometry, and it is within this section that areas like topology and algebra are developing.

In the second half of 1996 most of the research activities of the department were subjected to an external international review, within the overall Research Units Assessment carried out by the Ministry of Science and Technology. The research units related to our department received very high ratings from this board 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 PhD 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, already announced, 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 Gabriel Pires, who coordinated the preparation of the report. I am also grateful to Ema Silva for her work in word processing this issue.

Lisbon, 3 May 1999

The Department Chairman

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Research Areas

The main areas of research pursued in the Department of Mathematics of IST are:

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 is organized along five lines of work: qualitative theory of dynamical systems, geometric mechanics and hamiltonian systems, methods of non-linear analysis in mechanics of continuous media and methods of non-linear systems analysis in control theory, ergodic theory and discrete 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 queueing theory and quality control, multivariate analysis, stochastic optimization, categorical data analysis and statistical inference. In queueing theory and quality control interest is concentrated on order relations, transient behaviour, 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 behaviour 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, categorial 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. Typical problems addressed include the categorial characterization of logic structures and translation mechanisms as well as the completeness of specialized calculi.

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 ACL, LogComp, MAGO, SARA and SitCalc.

Other Areas

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

Research seminars

During 1998 the Department of Mathematics at IST ran regular sessions of the following seminars:

- Seminar on Analysis, Geometry, and Dynamical Systems, every week.
Organizer: Luis Barreira.
- Seminar on Applied Mathematics and Numerical Analysis, every other week.
Organizer: Adélia Sequeira.
- Seminar on Functional Analysis and Applications, every week.
Organizer: Frank-Olme Speck.
- Seminar on Geometric and Topological Methods in Low Dimension and Infinite Dimensions, every other week.
Organizer: José Sousa Ramos
- Seminar on Mathematical Physics, every other week.
Organizer: Rui Loja Fernandes.
- Seminar on Theory of Computing, every week.
Organizer: Amílcar Sernadas.
- TQFT Club, on Geometry, Topology and Quantum Theory, monthly.
Organizer: Roger Picken

1 Publications

1.1 Publications which appeared in 1998

1.1.1 Books (authored or edited)

Algebra and Mathematical Analysis

Magalhães, M., Rocha, C. and Sanchez, L., International Conference on Differential Equations, Equadiff 95, *World Scientific*, Singapore, 1998.

1.1.2 Chapters/Articles in Books with international refereeing

Applied Mathematics and Numerical Analysis

Sequeira, A. and Videman, J. H., Existence, uniqueness and asymptotic behaviour of viscoelastic fluids in \mathbf{R}^3 and in \mathbf{R}^3_+ , (Amann et al., Eds.), *Navier-Stokes Equations and Related Nonlinear Problems*, VSP/TEV, (1998), 301-313.

Computer Science

Conrad, S., Ramos, J., Saake, G. and Sernadas, C., Evolving logical specification in information systems, *Logic for Databases and Information Systems*, (Chomicki, J. and Saake, G., Eds.), Kluwer Academic Publishers, (1998), 199-228.

Ehrich, H.-D., Caleiro, C., Sernadas, A. and Denker, G., Logics for specifying concurrent information systems, *Logic for Databases and Information Systems*, (Chomicki, J. and Saake, G., Eds.), Kluwer Academic Publishers, (1998), 166-198.

1.1.3 Articles in International Journals and Serials

Algebra and Mathematical Analysis

Abreu, M., Kähler geometry of toric varieties and extremal metrics, *International Journal of Mathematics*, **9**, 6, (1998), 641-651.

Abreu, M., Topology of symplectomorphism groups of $S^2 \times S^2$, *Inventiones Mathematicae*, **131**, (1998), 1-23.

Bastos, M. A., Karlovich, Yu. I. and dos Santos, A. F., The Corona theorem and the canonical factorization of triangular AP matrix functions - effective criteria and explicit formulas, *Journal of Mathematical Analysis and Applications*, **223**, (1998), 523-550.

Bastos, M. A., Karlovich, Yu. I. and dos Santos, A. F., The Corona theorem and the existence of canonical factorization of triangular AP - matrix functions, *Journal of Mathematical Analysis and Applications*, **223**, (1998), 494-522.

Câmara, M. C. and dos Santos, A. F., A non-linear approach to generalized factorization of matrix functions, *Operator Theory: Advances and Applications*, **102**, (1998), 21-37.

Castro, L. and Speck, F.-O., Regularity properties and generalized inverses of delta-related operators, *Zeitschr. Anal. Anw.* **17**, (1998), 577-598.

Cordovil, R., The fundamental group of the complement of the complexification of a real arrangement of hyperplanes, *Advances in Applied Mathematics*, **21** (3), (1998), 481-498.

Corso, A., Polini, C. and Vaz Pinto, M., Sally modules and associated graded rings, *Communications in Algebra*, **26** (8), (1998), 2689-2708.

Costa, F. P., A finite dimensional dynamical mode for gelation in coagulation processes, *J. Nonlinear Sci.*, **8**, (1998), 619-653.

Costa, F. P., Asymptotic behaviour of low density solutions to the generalized Becker-Döring equations, *Nonlinear Diff. Eq. Appl.*, **5**, (1998), 23-37.

Coutinho, R. and Fernandez, B., Fronts and interfaces in bistable extended mappings, *Nonlinearity*, **11**, (1998), 1407-1433.

Duarte, P., Fernandes, R. L. and Oliva, W., Dynamics of the attractor in Lotka-Volterra equations, *J. Diff. Equations*, **149**, (1998), 143-189.

Ferreira, J. M., and Pedro, A. M., Oscillations of delay difference systems, *J. Math. Anal. Appl.*, **221**, (1998), 364-383.

Freitas, P. and Sweers, G., Positivity results for a nonlocal elliptic equation, *Proc. Roy. Soc. Edinburgh*, **128A**, (1998), 697-715.

Freitas, P., The linear damped wave equation, Hamiltonian symmetry, and the importance of being odd, *Disc. Cont. Dyn. Syst.*, **4**, (1998), 635-640.

Giga Y., Gurtin, M. E. and Matias, J., On the dynamics of crystalline motions, *Japan Journal of Industrial and Applied Mathematics*, **15**, (1), (1998), 7-50.

Gomes, D., Integrability, non-integrability in vortices dynamics, *Univ. Iagel. Acta Math.*, **37**, (1998).

Isidro, J. M., Mukherjee, A., Nunes, J. P. and Schnitzer, H, A note on the Picard-Fuchs equations for $N=2$ Seiberg-Witten theories, *International Journal of Modern Physics*, **A13**, (1998), 233-250.

Jevicki, A., Mihailescu, M. and Nunes, J. P., Large n WZW field theory of $n=2$ strings, *Physics Letters*, **B 416**, (1998), 334-340.

Liverani, C., Saussol, B. and Vaienti, S., Conformal measure and decay of correlations for covering weighted systems, *Ergodic Theory and Dynamical Systems*, **18** (6), (1998), 1399-1420.

Loura, L. and Viegas, F., Hermitean Ultradistributions, *Portugaliae Mathematica*, **55**, (1998), 39-57.

Meister, E., Penzel, F., Speck, F.-O. and Teixeira, F. S., Some interior and exterior boundary value problems for the Helmholtz equation in a quadrant, *Operator theory: Advances and Applications*, **102**, (1998), 169-178.

de Mello Koch, R., Jevicki, A., Mihailescu, M. and Nunes, J. P., Evaluation of glueball masses from supergravity, *Physical Review*, **D 58**, (1998), 1050-1059.

Moura Santos, A., Speck, F.-O. and Teixeira, F.S., Minimal normalization of Wiener-Hopf operators in spaces of Bessel potentials. *J. Math. Anal. Appl.*, **225**, (1998), 501-531.

Vilela Mendes, R. and Coutinho, R., On the computation of quantum characteristic exponents, *Physics Letters*, **A239**, (1998), 239-245.

Statistics and Applications

Antunes, N., Rocha, R. , Pinto, P. and Pacheco, A., Impact of next-generation wireless networks requirements on teletraffic modeling, *Interoperable Communication Network*, **1** (2-4), (1998), 706-715.

Morais, M. C. and Natário, I., Improving an upper one-sided c -chart, *Communications in Statistics - Theory and Methods*, **27**, (1998), 353-364.

Morais, M. C. and Pacheco, A., Two stochastic properties of one-sided Exponentially Weighted Moving Average control charts, *Communications in Statistics - Simulation and Computation*, **27**, (1998), 937-952.

Ramalhoto, M. F. and Gomez-Corral, A., Some decomposition formulae for $M/M/r/r+d$ queues with constant retrial rate, *Communications in Statistics-Stochastic Models*, (special issue in Honor of Marcel F. Neuts), **14**, (1,2), (1998), 123-145.

Ramalhoto, M. F. and Morais, M. C., EWMA control charts for the scale parameter of a Weibull control variable with fixed and variable sampling intervals, *Economic Quality Control-Journal for Quality and Reliability*, **13**, (1), (1998), 23-46.

Applied Mathematics and Numerical Analysis

Brinca, A. L. and Romeiras, F. J., On the stability of stationary nongyrotropic distribution functions: coupling and purely growing waves, *Journal of Geophysical Research*, **103** (A5), (1998), 9275-9284.

Padula, M. and Sequeira, A., A note on a vector transport equation with applications to Non-Newtonian fluids, (Heywood, J.G., Masuda, K., Rautmann, R. and Solonnikov, V.A., Eds.), *Theory of the Navier-Stokes Equations*, Series on Adv. in Math. for Appl. Sci., World Scientific, **47**, (1998), 121-127.

Computer Science

Dionísio, F.-M. and Lipeck, U., Specifying with defaults: Compositional semantics, *Recent Trends in Data Type Specification*, (Presicce, F., Ed.), LNCS 1376, Springer-Verlag (1998), 206-222.

Menezes, P., Sernadas, A. and Costa, J.-F., Nonsequential automata semantics for a concurrent object-based language, *Electronic Notes in Theoretical Computer Science*, **14**, (1998).

Sernadas, A., Sernadas, C. and Caleiro, C., Denotational semantics of object specification, *Acta Informatica*, **35**, (1998), 729-773.

1.1.4 Proceedings of International Conferences

Algebra and Mathematical Analysis

Barreira, L., Dimension of Cantor sets with complicated geometry, *Proc. Equadiff'95*, (Magalhães, L., Rocha, C. and Sanchez, L., Eds.), World Scientific, (1998), 258-264.

Barreira, L., The dimension theory of hyperbolic dynamics, *Proc. Equadiff'95*, (Magalhães, L., Rocha, C. and Sanchez, L., Eds.), World Scientific, (1998), 253-257.

Buescu, J., Transverse instability of attractors in invariant submanifolds, *Proc. Equadiff'95*, (Magalhães, L., Rocha, C. and Sanchez, L., Eds.), World Scientific, (1998), 288-294.

Castro, L. and Speck, F.-O., A Fredholm study for Sommerfeld diffraction problems, *Analysis, Numerics and Applications of Differential and Integral Equations* (Constanda, C., Bach, M., Sändig, A. M., Werner, P. and Hsiao, G. C., Eds.), Longman, London, (1998), 47-51.

Fernandes, R. L. and Oliva, W., Hamiltonian dynamics of the Lotka-Volterra equations, *Proc. Equadiff'95* (Magalhães, L., Rocha, C. and Sanchez, L., Eds.) World Scientific, (1998), 327-334.

Freitas, P., (In)stability results for the wave equation with indefinite damping, Proc. Equadiff'95 (Magalhães, L., Rocha, C. and Sanchez, L., Eds.) World Scientific, (1998), 350-355.

Fusco, G. and Oliva, W., Asymptotic behavior of a system of repelling particles: Asymptotic velocities, phases, scattering operator and integrability, Proc. Equadiff'95 (Magalhães, L., Rocha, C. and Sanchez, L., Eds.) World Scientific, (1998), 69-81.

Gomes, D., Chaotic motions in vortices dynamics, Proc. Equadiff'95 (Magalhães, L., Rocha, C. and Sanchez, L., Eds.) World Scientific, (1998), 373-379.

Martins, P. and Sousa Ramos, J., Algebraic results on Markov shifts of torus automorphisms, Proc. Equadiff'95 (Magalhães, L., Rocha, C. and Sanchez, L., Eds.) World Scientific, (1998), 436-441.

Moura Santos, A., Speck, F.-O. and Teixeira, F.S., Minimal normalization of Wiener-Hopf operators in applications, Analysis, Numerics and Applications of Differential and Integral Equations (Constanda, C., Bach, M., Sändig, A. M., Werner, P. and Hsiao, G. C., Eds.), Longman, London (1998), 189-193.

Rodrigues, P. M. and Sousa Ramos, J., Algebraic results on Markov shifts of torus automorphisms, Proc. Equadiff'95 (Magalhães, L., Rocha, C. and Sanchez, L., Eds.) World Scientific, (1998), 436-441.

Sarreira, M. and Sousa Ramos, J., Markov shifts in complex dynamical systems, Proc. Equadiff'95 (Magalhães, L., Rocha, C. and Sanchez, L., Eds.) World Scientific, (1998), 498-505.

Severino, R. and Sousa Ramos, J., Dimension groups and one-dimensional maps of the interval, Proc. Equadiff'95 (Magalhães, L., Rocha, C. and Sanchez, L., Eds.) World Scientific, (1998), 511-517.

Statistics and Applications

Amaral, J. A., Rosário, M. B. and Paixão, M. T., A challenge for the health services: Data and projections of HIV and AIDS in Portugal, Proceedings of 2nd International Conference on Technology Policy and Innovation (Puzzen Session), Lisbon, Portugal, (1998).

Morais, M. C. , PCV: Um velho problema revisitado estatisticamente. Proc. of the V Conference CEMAPRE - Mathematics Applied to Economics and Management, (Proença, I., and Mendes, Z., Eds.), (1998), 439-458.

Morais, M. C. and Pacheco, A., Comparing first passage times of Markovian processes, Proc. of the 2nd International Symposium on Semi-Markov Models: Theory and Applications, Session 4: Statistical Estimation II, (Janssen, J., and Limnios, N., Eds.), (1998).

Nunes, C. and Pacheco, A., Parametric estimation in MMPP(2) using time discretization, Proceedings of the 2nd International Symposium on Semi-Markov Models: Theory and Applications, (Janssen, J. and Limnio, N., Eds), (1998).

Nunes, C., Flowshop scheduling: Some contributions, Proceedings of the 5th CEMAPRE, (Proença, I. and Mendes, Z., Eds), (1998), 481-490.

Nunes, C. S. S., Caldas Pinto, J. R. and Pacheco, A., Two-dimensional forgetting factor. (Dourado, A., Silva Leite, F., Pedroso Lima, T., Cardoso, F., Dias, J., Oliveira, N., Ribeiro, B. and Afonso, J., Eds), Proceedings of the 3rd Portuguese Conference on Automatic Control - CONTROLO'98, Coimbra, Portugal, 9.9.98 - 11.9.98, (1998), 513-517.

Ramalhoto, M. F. and Morais, M. C., Some simple control charts for the location parameter of a Weibull control variable with fixed and variable sampling intervals, Proc. of the VIth International Workshop on Intelligent Statistical Quality Control, Wuerzburg University, Germany, (1998), 141-148.

Applied Mathematics and Numerical Analysis

Alves, C. J. S., Inverse scattering with spherical incident waves, Mathematical and Numerical Aspects of Wave Propagation, (DeSanto, J., Ed.), *SIAM*, (1998), 502-504.

Pileckas, K., Sequeira, A. and Videman, J. H., A note on steady flows of non-Newtonian fluids in channels and pipes, Proc. Equadiff'95 (Magalhães, L., Rocha, C. and Sanchez, L., Eds.), World Scientific, (1998), 458-467.

Computer Science

Dionísio, F.-M., Brass, S., Ryan, M. and Lipeck, U., Hypothetical reasoning with defaults, Proceedings of the Workshop on Computational Aspects of Nonmonotonic Reasoning, (Niemälä, I. and Schaub, T., Eds.), Helsinki University of Technology, (1998), 9-15.

Pacheco, O. and Carmo, J., Collective agents: from law to AI, Proceedings of the 2nd French-American Conference on Law and Artificial Intelligence, (1998).

Ravara, A., Resende, P. and Vasconcelos, V., Towards an algebra of dynamic object types, ICALP'98 Workshop Semantics of Objects as Processes, (Huttel, H. and Nestmann, U., Eds.), BRICS Note Series NS-98-5, University of Aarhus, (1998). 25-30.

1.1.5 Other Publications

Statistics and Applications

Amado, C. and Pires, A. M., Uso de técnicas de reamostragem para selecção de variáveis em análise discriminante, *Estatística: A Diversidade na Unidade* (Miranda, M. S. and Pereira, I. Eds.), Col. Novas Tecnologias/Estatística, Edições Salamandra, Lisboa, (1998), 247-253.

Branco, J. A., O fascínio de coleccionar e analisar dados estatísticos, *Estatística: A Diversidade na Unidade* (Miranda, M. S. and Pereira, I. Eds.), Col. Novas Tecnologias/Estatística, Edições Salamandra, Lisboa, (1998), 9-27.

Branco, J. A., Aspecto da realidade estatística em Portugal, *Boletim da Associação Brasileira de Estatística*, XVI, 40, 2º quadro, (1998).

Branco, J. A., William Playfair e o seu pobre diagrama de barras, *Boletim Informativo da Sociedade Portuguesa de Estatística*, 3, 4, 6.

Brandão, A., Pires, A. M. and Portugal, J., Agrupamentos de Concelhos de Portugal Continental e sua caracterização, *Revista de Estatística* 1, (1998), 73-93.

Morais, M. C. , Esquemas CEWMA para o controlo simultâneo de μ e de σ^2 — Uma abordagem Markoviana, *Estatística: A Diversidade na Unidade* (Miranda, M. S. and Pereira, I. Eds.), Col. Novas Tecnologias/Estatística, Edições Salamandra, Lisboa, (1998), 207-219.

Morais, M. C. , Grafos, caixeiros viajantes e estatística, (Azenha, A., Jerónimo, M. A. and Rodrigues, J., Eds.), *Actas das Jornadas de Aplicação da Matemática*, Centro de Matemática, Instituto Superior de Engenharia de Lisboa, Portugal, (1998), 17-26.

Morais, M. C. and Pacheco, A., Ordenação estocástica: Um pouco de história e aplicações, *Estatística: A Diversidade na Unidade* (Miranda, M. S. and Pereira, I. Eds.), Col. Novas Tecnologias/Estatística, Edições Salamandra, Lisboa, (1998), 221-235.

Nunes, C. and Pacheco, A., Martingalas: Uma ferramenta em inferência estatística, *Estatística: A Diversidade na Unidade* (Miranda, M. S. and Pereira, I. Eds.), Col. Novas Tecnologias/Estatística, Edições Salamandra, Lisboa, (1998), 393-404.

Nunes, C., Telecomunicações: Um desafio às probabilidades, (Azenha, A., Jerónimo, M. A. and Rodrigues, J. Eds.), *Actas das Jornadas de Aplicação da Matemática*, Centro de Matemática, Instituto Superior de Engenharia de Lisboa, Portugal, (1998), 187-196.

Oliveira, M. R. and Maia, J. A., Análise multivariada: uma ferramenta a ter sempre ao "pé", (Azenha, A., Jerónimo, M. A. and Rodrigues, J. Eds.), Actas das Jornadas de Aplicação da Matemática, Centro de Matemática, Instituto Superior de Engenharia de Lisboa, Portugal, (1998), 133-142.

Rodrigues, I. M. A. and Paulino, C. D. M., Avaliação comparada da susceptibilidade à cárie dentária: Uma análise de dados categorizados incompletos, Estatística: A Diversidade na Unidade (Miranda, M. S. and Pereira, I. Eds.), Col. Novas Tecnologias/Estatística, Edições Salamandra, Lisboa, (1998), 109-115.

Segão, S., Nóbrega, S. D., Ramalhoto, F., Matos, J. and Miranda, A., Impacto dos erros de registo na análise de sobrevivência, Estatística: A Diversidade na Unidade (Miranda, M. S. and Pereira, I. Eds.), Col. Novas Tecnologias/Estatística, Edições Salamandra, Lisboa, (1998), 175-182.

Silva, G. L. and Amaral-Turkman, M. A., Additive survival models: A Bayesian approach, Faculdade de Ciências, Universidade de Lisboa, *Notas e Comunicações* **10**, (1998).

Silva, G. L. and Amaral-Turkman, M. A., Alguns resultados de modelos de fragilidade bayesianos, Estatística: A Diversidade na Unidade (Miranda, M. S. and Pereira, I., Eds), Col. Novas Tecnologias/Estatística, Ed. Salamandra, (1998), 377-382.

Soares, P. and Paulino, C. D. M., Análise bayesiana de dados categorizados informativamente omissos: uma abordagem por simulação, (Miranda, M. and Pereira, I., Eds.), Actas do V Congresso Anual da SPE, Ed. Salamandra, (1998), 405-410.

1.2 Publications submitted in 1998

Algebra and Mathematical Analysis

Alves, J. F. and Sousa Ramos, J., Kneading theory: A function approach, Preprint 15/98, to appear in *Communications in Mathematical Physics*.

Alves, J. F. and Sousa Ramos, J., Zeta function of a tree map, Preprint 25/98.

Barreira, L. and Schmeling, J., Sets of "non-typical" points have full topological entropy and full Hausdorff dimension, to appear in *Israel Journal of Mathematics*.

Câmara, M. C. and dos Santos, A. F., Wiener-Hopf factorization for a class of oscillatory symbols, Preprint 30/98.

Câmara, M. C. and dos Santos, A. F., Wiener-Hopf factorization of a generalized Daniele-Kharkov class of 2×2 matrix functions, Preprint 12/98, to appear in *Math. Meth. Appl. Sciences*.

Canas da Silva, A. and Guillemin, V., Quantization of symplectic orbifolds and group actions, to appear in Proceedings of the Northern California Symplectic Geometry Seminar, Selecta of the A.M.S.

Canas da Silva, A. and Weinstein, A., Geometric models for noncommutative algebras, to appear in Berkeley Lecture Notes Series of the A.M.S.

Canas da Silva, A., Guillemin, V. and Woodward, C., On the unfolding of folded symplectic structures, to appear in *Mathematical Research Letters*.

Castro, H. M. A. and Oliva, W., Anosov-flows induced by partially hyperbolic Σ - geodesic flows, 1998.

Castro, L. and Speck, F.-O., An operator approach to a boundary value problem for the Helmholtz equation, Preprint 26/98.

Castro, L. and Speck, F.-O., Relations between convolution type operators on intervals and on the half-line, Preprint 3/98.

Concus, P., Finn, R. and Gomes, D., A symmetry breaking experiment aboard mir and the stability of rotating liquid films, 1998.

Cordovil, R., Cyclic polytopes and oriented matroids, to appear in *European Journal of Combinatorics*, (Special Issue on Polytopes), (Fukuda, K. and Ziegler, G., Eds).

Cordovil, R., Fukuda, K. and Guedes de Oliveira, A., On the cocircuit-graph of an oriented matroid, 1998.

Costa, F. P., Convergence to equilibria of solutions to the coagulation-fragmentation equations, Preprint 32/98, to appear in Proceedings of the Luso-Chinese Symposium on Nonlinear Evolution Equations and their Applications.

de Sousa Dias, M. E., Relative equilibria in linear elasticity, to appear in STP 98 - Symmetry and Perturbation Theory II, World Scientific, (Degasperis, A. and Gaeta, G., Eds.).

Duarte, P., Abundance of elliptic isles at conservative bifurcations, Preprint 7/98.

Duarte, P., Persistent homoclinic tangencies for conservative maps near the identity, Preprint 6/98, to appear in *Ergod. Th. & Dyn. Sys.*

Fiedler, B. and Rocha, C., Realization of meander permutations by boundary value problems, Preprint 2/98, to appear in *Journal of Differential Equations*.

Florentino, C., Schottky uniformization and vector bundles over Riemann surfaces, Preprint 20/98.

Freitas, P., Nonlocal reaction-diffusion equations, to appear in *Differential Equations with Applications to Biology*, Fields Institute Communications.

Gomes, D., Stability of rotating liquid films, 1998.

Hirata, M., Saussol, B. and Vienti, S. Statistics of return times: a general framework and new applications, to appear in *Communication in Mathematical Physics*.

Lampreia, J. P., Severino, R. and Sousa Ramos, J., Renormalizations for trimodal maps, to appear in *Differential Equations with Applications to Biology*, Fields Institute Communications.

Lillywhite, S., The topology of the moduli space of arc-length parametrised closed curves in Euclidean space, to appear in *Topology*.

Nunes, J. P., R., Jevicki, A. and Mihailescu, Large N field theory of N=2 strings and self-dual gravity, to appear in a special issue of *Journal of Chaos, Solitons and Fractals*.

Oliva, W., Santos, J. S. and Táboas, P. Z., Global bounded solutions in a 3-dimensional Volterra system of retarded equations, to appear in *NoDEA (Non-Linear Differential Equations and Applications)*.

Penne, V., Saussol, B. and Vienti, S., Dimensions for recurrence times: topological and dynamical properties, Preprint CPT 1998.

Penzel, F. and Teixeira, F. S., The Helmholtz equation in a quadrant with Robin's conditions, Preprint 17/98, to appear in *Math. Meth. Appl. Sci.*.

Caetano, A. P. and Picken, R. F., On a family of topological invariants similar to homotopy groups, to appear in *Rendiconti Univ. di Trieste*.

Santos, J. and Carvalho A., The delay effect on reaction-diffusion equations, 1998.

Santos, P. A., Spline approximation methods with uniform meshes in algebras of multiplication and convolution operators, Preprint 21/98.

Statistics and Applications

Amado, C. and Pires, A. M., A utilização da função de influência para melhorar o desempenho do método de reamostragem bootstrap, to appear in *Actas do VI Congresso Anual da SPE*, Tomar, Portugal, 1998.

Gomez-Corral, A. and Ramalhoto, M. F., On the waiting time distribution and the busy period of a retrial queue with constant retrial rate.

Morais, M. C. and Pacheco, A., On the performance of combined EWMA schemes for μ and σ : A Markovian approach.

Morais, M. C. and Pacheco, A., Comparação estocástica de tempos de primeira passagem: uma aplicação a controlo de qualidade, fiabilidade e filas de espera, to appear in Actas do VI Congresso Anual da SPE, Tomar, Portugal, 1998.

Nunes, C. and Pacheco, A., Stability for input-output processes, to appear in ASMDA 99.

Nunes, C. and Pacheco, A., Estimação paramétrica em MMPP's, to appear in Actas do VI Congresso Anual da SPE, Tomar, Portugal, 1998.

Oliveira, M. R., Maia, J. A. and Branco, J. A., Análise dos efeitos do treino em jovens futebolistas, to appear in Actas do VI Congresso Anual da SPE, Tomar, Portugal, 1998.

Paulino, C. D. M. and Silva, G. L., On the maximum likelihood analysis of the general linear model in categorical data, to appear in *Computational Statistics and Data Analysis*.

Ramalhoto, M. F., The research global network in stochastic for the "Quality Movement".

Ramalhoto, M. F., A way of addressing some of the new challenges of quality management.

Ramalhoto, M. F., Some recent developments in control charts for the non-Gaussian quality characteristics.

Ramalhoto, M. F., A framework for quality improvement of queueing systems of the service industry.

Ramalhoto, M. F., The infinite server queue and heuristic approximations to the multi-server queue with and without retrials.

Segão, S., Aplicação do modelo de regressão de hazards proporcionais a covariáveis observadas com erro, to appear in Actas do VI Congresso Anual da SPE, Tomar, Portugal, 1998.

Santos, C. and Pires, A. M., Algumas questões em aberto na análise discriminante para três grupos, to appear in Actas do VI Congresso Anual da SPE, Tomar, Portugal, 1998.

Applied Mathematics and Numerical Analysis

Alves, C. J. S., Ha Duong, T., Inverse scattering for elastic plane cracks, to appear in *Inverse Problems*.

Alves, C. J. S., Numerical simulations on resonance poles - the trapping case of two plane cracks, Preprint 31/98, to appear in, *J. Comp. Appl. Math.*.

Brinca, A. L., Motschmann, U. and Romeiras, F. J., On the dispersion of two coexisting nongyrotropic ion species, to appear in *Annales Geophysicae*.

Graça, M. M., Formal and quasi-formal sequence transformations for monotone sets, Preprint 24/98.

Graça, M. M., A retardement approach to convergence acceleration, Preprint 23/98.

Lima, P. M. and Carpentier, M., Iterative methods for a singular boundary-value problem, to appear in *Journal of Computational and Applied Mathematics*.

Lima, P. M. and Carpentier, M., Numerical solution of a singular boundary-value problem in non-Newtonian fluid mechanics, to appear in *Computer Physics Communications*.

Matusu-Necasova, S., Sequeira, A. and Videman, J. H., Existence of classical solutions for compressible viscoelastic fluids of Oldroyd type past an obstacle, Preprint 19/98, to appear in *Math. Meth. Appl. Sci.*

Novotny, A., Sequeira, A. and Videman, J. H., Steady motions of viscoelastic fluids in 3-D exterior domains - existence, uniqueness and asymptotic behaviour, Preprint 4/98, to appear in *Arch. Rational Mech. Anal.*

Romeiras, F. J. and Brinca, A. L., On the stability of perpendicular electrostatic modes in stationary nongyrotropic plasmas, to appear in *Journal of Geophysical Research*.

Computer Science

Caleiro, C., Sernadas, C. and Sernadas, A., Parameterisation of logics, to appear in *Recent Developments in Algebraic Development Techniques, Selected Papers*, (Fiadeiro, J. L., Ed.), Springer LNCS series, (1998).

Carmo, J. and Jones, A., Deontic logic and contrary-to-duties, to appear in *Handbook of Philosophical Logic - 2nd ed., Vol. 3: Extensions to Classical Systems 2*, (Gabbay, D. and Guenther, F., Eds.), Kluwer Publishing Company, (1998).

Ehrich, H.-D. and Caleiro, C., Specifying communication in distributed information systems.

Gouveia, P., Sernadas, C., Abductive reasoning over temporal specifications of objects, (presented at AIML'98).

Pinto, J., Sernadas, A., Sernadas, C. and Mateus, P., Non-determinism and uncertainty in the situation calculus, in *Proceedings of the FLAIRS'99 -the 12th International Florida AI Research Symposium*, AAAI Press, (1999).

Ramos, J. and Sernadas, A., The situation and state calculus versus branching temporal logic, to appear in *Recent Developments in Algebraic Development Techniques, Selected Papers*, (Fiadeiro, J.L., Ed.), Springer LNCS series, (1998).

Resende, P., Modular specification of concurrent systems with observational logic, Preprint 29/98, to appear in *Recent Developments in Algebraic Development Techniques*, Selected Papers, (Fiadeiro, J.L., Ed.), Springer LNCS Series, (1998).

Schobbens, P.-Y., Saake, G., Sernadas, A. and Sernadas, C., A two-level temporal logic for evolving specifications.

Sernadas, A., Sernadas, C. and Caleiro, C., Fibring of logics as a categorial construction, to appear in *Journal of Logic and Computation*.

Sernadas, A., Sernadas, C., Caleiro, C., and Mossakowski, T., Categorial fibring of logics with terms and binding operators, in *Frontiers of Combining Systems - FroCoS'98*. Kluwer Academic Publishers, 1998, to appear in *Applied Logic Series*.

2 Academic degrees awarded in 1998

2.1 Doutoramentos/PhD's

Almeida, J., Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 29.7.97. Thesis: *Ultradistribuições Temperadas e Ultradistribuições de Tipo Exponencial*. Supervisor: Francisco Viegas.

Castro, L., Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 8.7.98. Thesis: *Relations between Singular Operators and Applications*. Supervisor: Frank-Olme Speck.

Gouveia, P., Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 29.6.98. Thesis: *Raciocínio Abduativo sobre Especificações Temporais de Objectos*. Supervisor: Cristina Sernadas.

Resende, P., Doutoramento em Matemática, Instituto Superior Técnico, Universidade Técnica de Lisboa, 5.1.98. Thesis: *Tropological Systems and Observational Logic in Concurrency and Specification*. Supervisor: Amílcar Sernadas.

Santos, F., Doutoramento em Informática, Faculdade de Ciências, Universidade de Lisboa, 21.10.98. Thesis: *Lógicas Modais de Acção para a Modelação de Intervenção entre Agentes e de Organizações*. Supervisor: José Carmo.

Santos, P. A., Doktor Rerum Naturalium, Technischen Universität Chemnitz, Germany, 22.5.98. Thesis: *Approximation Methods for Convolution Operators on the Real Time*. Supervisor: Bernd Silbermann.

2.2 Mestrados/MSc's

Baía, M., Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 19.5.98. Thesis: *Métodos Numéricos para Modelos de Fluidos Viscoelásticos de tipo Oldroyd no caso Estacionário*. Supervisor: Adélia Sequeira.

Cotrim, L., Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 25.7.98. Thesis: *Factorização de Símbolos e Difracção por Estruturas Periódicas Abertas*. Supervisor: Amélia Bastos.

Nunes, A.-L., Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 18.4.98. Thesis: *Combinação de Lógicas: Temporalização*. Supervisor: Cristina Sernadas.

Rocha, J., Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 14.12.98. Thesis: *Dimensão de Hausdorff de Conjuntos Fractais Gerados por Sistemas de Funções Iteradas*. Supervisor: José Sousa Ramos.

Salazar, J., Mestrado em Matemática Aplicada, Instituto Superior Técnico, Universidade Técnica de Lisboa, 27.7.98. Thesis: *Símbolos de Invertibilidade em Álgebras de Banach*. Supervisor: Cristina Câmara.

3. Research Lectures

3.1 Lectures at Conferences, Workshops, Meetings etc.

Algebra and Mathematical Analysis

Abreu, M., Geometria e topologia simplética, Encontro Nacional da SPM, Braga, Portugal, 9.2.98 - 12.2.98.

Alves, J.F. and Sousa Ramos, J., Entropy and zeta function for tree maps, Conference on Dynamical Systems and Evolutionary Equations in Honor of Jack Hale, IST, Lisbon, Portugal, 23.11.98 - 28.11.98.

Barreira, L., Birkhoff ergodic theorem revisited: the importance of zero measure sets, Conference on Dynamical Systems and Evolutionary Equations in Honor of Jack Hale, IST, Lisbon, Portugal, 23.11.98 - 28.11.98.

Bastos, M. A., Problemas de Riemann-Hilbert e o teorema da coroa. Aplicação a um operador de convolução, Workshop on Operator Factorization and Applications, Universidade do Algarve, Faro, Portugal, 2.10.98 - 3.10.98.

Câmara, M. C., Wiener-Hopf factorization for a class of oscillatory symbols, Workshop on Operator Factorization and Applications, Universidade do Algarve, Faro, Portugal, 2.10.98 - 3.10.98.

Canas da Silva, A., Folding symplectic manifolds, Warwick Symposium on Symplectic Geometry, Warwick, United Kingdom, July 1998.

Costa, F. P., Convergence to equilibria of solutions to the coagulation-fragmentation equations, Luso-Chinese Symposium on Nonlinear Evolution Equations and Their Applications, Macau, 7.10.98 - 9.10.98.

Costa, F. P., Transições de fase nas equações de coagulação de Smoluchowski, Encontro da SPM, Braga, Portugal, 9.2.98 - 12.2.98.

de Sousa Dias, M. E., Relative equilibria for elastic bodies, Symmetry and Perturbation Theory Conference, Univ. Roma - La Sapienza, Italy, 16.12.98 - 22.12.98.

dos Santos, A. F., Wiener-Hopf factorization and Banach-Lie groups, Workshop on Operator Factorization and Applications, Universidade do Algarve, Faro, Portugal, 2.10.98 - 3-10.98.

Duarte, P., Conservative Lotka-Volterra systems, Workshop on Dynamical Systems, ICTP Trieste, Italy, 31.8.98 - 12.9.98.

Duarte, P., Persistent homoclinic tangencies and elliptic islands in conservative systems, Workshop on Stable Periodic Orbits and Homoclinic Tangencies in Symplectic Systems, Weierstrass Inst. App. Stat., Berlin, Germany, 21.12.98 - 22.12.98.

Fernandes, R. L., Attractors for Lotka-Volterra systems, Conference on Dynamical Systems and Evolutionary Equations in Honor of Jack Hale, IST, Lisbon, Portugal, 23.11.98 - 28.11.98.

Fernandes, R. L., Deformation quantization and Poisson geometry, Short Course, Dep. of Mathematics, Universidade do Algarve, Faro, Portugal, 1.9.98 - 8.9.98.

Fernandes, R. L., Famílias de órbitas periódicas em sistemas Hamiltonianos e integrabilidade, Encontro Nacional da SPM, Braga, Portugal, 9.2.98 - 12.2.98.

Fernandes, R. L., Poisson brackets on symmetric spaces and linearization of Poisson structures, VIIth Oporto Meeting on Geometry, Topology and Physics, Porto, Portugal, 5.6.98 - 8.6.98.

Fernandes, R. L., Redução comuta com quantização por deformação, TQFT Club Seminar, IST, Lisbon, Portugal, 19.3.98 - 14.5.98.

Ferreira, J. M., Spectral measures and oscillations of a differential-difference system of neutral type, Conference on Dynamical Systems and Evolutionary Equations in Honor of Jack Hale, IST, Lisbon, Portugal, 23.11.98 - 28.11.98.

Freitas, P., Optimal decay of energy for a system of linear oscillators, 8th Stockholm Optimization Days, Stockholm, June 1998.

Freitas, P., Optimização do decaimento de soluções de sistemas de segunda ordem. Seminário conjunto I.S.R./C.A.M, 1998.

Florentino, C., Fibrados vectoriais e funções teta, Encontro Nacional da SPM, Braga, Portugal, 9.2.98 - 12.2.98.

Grácio, C. and Sousa Ramos, J., Dependence of the hyperbolic geodesic flow with the Teichmuller Space, European Conference on Iteration Theory - ECIT98, Muszyna, Poland, 30.8.98 - 5.9.98.

Lampreia, J. P., Severino, R. and Sousa Ramos, J., Renormalizations for cubic maps, European Conference on Iteration Theory - ECIT98, Muszyna, Poland, 30.8.98 - 5.9.98.

Martins, P. and Sousa Ramos, J., Topological conjugacy for hyperbolic automorphisms, Conference on Dynamical Systems and Evolutionary Equations in Honor of Jack Hale, IST, Lisbon, Portugal, 23.11.98 - 28.11.98.

Moura Santos, A., Wiener-Hopf factorization related to some diffraction problems, Workshop on Operator Factorization and Applications, Universidade do Algarve, Faro, Portugal, 2.10.98-3.10.98.

Nunes J. P., $N=2$ string field theory as a large N Wess-Zumino-Witten model, Lisbon School on Superstrings, IST, Lisbon, Portugal, December 1998.

Oliva, W., On the dynamics of non holonomic systems, Third Americas Conference on Differential Equations and Nonlinear Analysis, Georgia Tech, USA, 23.9.98 - 29.9.98.

Oliva, W., From Morse-Smale to Anosov flows in mechanics, International Conference on Dynamical Systems and Evolutionary Equations in honor of Jack Hale, IST, Lisbon, Portugal, 23.11.98 - 29.11.98.

Picken, R. F., Kontsevich integrals, knot invariants and TQFT, Joint Mathematics Meetings, Baltimore, USA, 7-10.1.98

Picken, R. F., Vassiliev-like link invariants from a Kohno-Kontsevich integral for braids, Low Dimension Topology, Funchal, Portugal, 11.1.98 - 16.1.98.

Picken, R. F., Introdução à teoria quântica do campo topológica, Encontro Nacional da SPM, Braga, Portugal, 9.2.98 - 12.2.98.

Picken, R. F., Quantum gravity in 2+1 dimensions via quantum matrices, 3º Encontro Projecto Praxis Física-Matemática, Porto, Portugal, 20.6.98 -23.6.98.

Picken, R. F., TQFT - A new direction in algebraic topology, New Developments in Algebraic Topology, Faro, Portugal, 13.7.98.

Picken, R. F., Some multiplicative properties of quantum matrices, Workshop on Operator Factorization and Applications, Faro, 2.10.98 - 3.10.98.

Saussol, B., Statistics of the recurrence time in a non-uniformly expanding map, Seminar in ESF-Workshop, University of Warwick, Coventry, Great-Britain, 24.4.98 - 1.5.98.

Severino, R. and Sousa Ramos, J., Dimension groups and isentropic real cubic maps, Conference on Dynamical Systems and Evolutionary Equations in Honor of Jack Hale, IST, Lisbon, Portugal, 23.11.98 - 28.11.98.

Silva, L. and Sousa Ramos, J., Two-parameter families of discontinuous unidimensional maps, European Conference on Iteration Theory - ECIT98, Muszyna, Poland, 30.8.98 - 5.9.98.

Speck, F.-O., Normalization of some ill-posed problems in diffraction theory, Conference in Honor of Vladimir Mazya on Functional Analysis, Partial Differential Equations and Applications, University of Rostock, Germany, 31.8.98 - 4.9.98.

Speck, F.-O., Relations between convolution type operators on intervals and on the half-line, International Congress of Mathematicians, Berlin, Germany, 18.8.98 - 27.8.98.

Statistics and Applications

Amado, C. and Pires, A. M., A utilização da função de influência para melhorar o desempenho do método de reamostragem bootstrap, VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 12.6.98.

Antunes, N., Rocha, R., Pinto, P. and Pacheco, A., Impact of next-generation wireless networks requirements on teletraffic modeling, 4th IEEE International Symposium on Internetworking - Ottawa, Canada, 6.7.98 - 9.7.98.

Morais, M. C., Comparing first passage times of Markovian processes, 2nd International Symposium on Semi-Markov Models: Theory and Applications, Compiègne, France, 9.12.98 - 11.12.98.

Morais, M. C., Grafos, caixeiros viajantes e estatística, Jornadas de Aplicações da Matemática, Lisbon, Portugal, 14.10.98 - 16.10.98.

Morais, M. C. and Pacheco, A., Comparação estocástica de tempos de primeira passagem: uma aplicação a controlo de qualidade, fiabilidade e filas de espera, VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 12.6.98.

Nunes, C. and Pacheco, A., Estimação paramétrica em MMPP's, Seminário da SPE, Lisbon, Portugal, 28.10.98.

Nunes, C., Parametric Estimation of MMPP(2), 2nd International Symposium on Semi-Markov Models: Theory and Applications, Compiègne, France, 9.12.98 - 11.12.98.

Nunes, C., Telecomunicações: Um desafio às probabilidades, Jornadas das Aplicações da Matemática, ISEL, Lisbon, Portugal, 14.10.98 - 16.10.98.

Oliveira, M. R., Maia, J. A. and Branco, J. A., Análise dos efeitos do treino em jovens futebolistas, VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 12.6.98.

Oliveira, M. R. and Maia, J. A., Análise multivariada: uma ferramenta a ter sempre ao "pé", Jornadas de Aplicação da Matemática, Lisbon, Portugal, 14.10.98 - 16.10.98.

Paulino, C. D. M., How to apply Bayesian methods to missing categorical data, 6th Valencia International Meeting on Bayesian Statistics, Alcossebre, Spain, 30.5.98 - 4.6.98.

Paulino, C. D. M., Modelação e análise de dados Poisson aleatoriamente omissos (joint work with P. Soares e R. Paulo), VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 1.6.98.

Ramalhoto, M. F., Some simple control charts for the location parameter of a Weibull control variable with fixed and variable sampling intervals, VIth International Workshop on Intelligent Statistical Quality Control, Wuerzburg University, Germany, 14.9.98 - 16.9.98.

Ramalhoto, M. F., The finite server queue and heuristic approximations to the multi-server queue with and without retrials, First International Workshop on Retrial Queues, Department of Statistics and Operations Research, Mathematics Faculty, Universidad Complutense de Madrid, Spain, 22.9.98 - 24.9.98.

Ramalhoto, M. F., Some queueing systems issues in the quality improvement of maintenance management, Department of Mathematics, University of Maryland, College Park, USA, 12.5.98.

Pires, A. M. and Santos, C., Algumas questões em aberto na análise discriminante para três grupos, VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 12.6.98.

Pires, A. M. and Soares, R., Métodos robustos e não paramétricos em análise discriminante, VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 12.6.98.

Segão, S., Aplicação do modelo de regressão de hazards proporcionais a covariáveis observadas com erro, VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 12.6.98.

Applied Mathematics and Numerical Analysis

Alves, C. J. S., Problemas inversos em difracção de ondas, Encontro da SPM, Braga, Portugal, 2.2.98 - 14.2.98.

Alves, C. J. S., Numerical simulations on resonance poles - the trapping case of two plane cracks, Second Meeting in Numerical Methods for Differential Equations, Coimbra, Portugal, 25.2.98 - 27.2.98.

Alves, C. J. S., Inverse scattering with spherical incident waves, Fourth International Conference on Mathematical and Numerical Aspects of Wave Propagation, Golden, Colorado, USA, 1.6.98 - 5.6.98.

Graça, M. M., Kummer's type sequence transformations for monotone sets, 7th International Colloquium Numerical Analysis and Computer Science with Applications, Plovdiv, Bulgaria, 13.8.98 - 17.8.98.

Graça, M. M., A retardement approach to convergence acceleration, International Congress of Computational and Applied Mathematics, Leuven, Belgium, 27.7.98 - 1.8.98.

Lima, P. M., Numerical and asymptotic approximation of a singular boundary-value problem, II International Conference on Numerical Methods for Differential Equations, Coimbra, Portugal, 25.2.98 - 27.2.98.

Lima, P. M., Numerical solution of a singular boundary-value problem in non-Newtonian fluid mechanics, First International Conference on Modern Trends in Computational Physics, Dubna Russia, 15.6.98 - 8.6.98.

Lima, P. M., Numerical and asymptotic solution of a singular boundary-value problem, Second International Conference on Differential Equations and Their Applications, St. Petersburg, 18.6.98 - 20.6.98.

Sequeira, A., Numerical methods for viscoelastic fluid models, 2nd Meeting on Numerical Methods for Differential Equations, Coimbra, Portugal, 25.2.98 - 27.2.98.

Sequeira, A., Numerical methods for unsteady grade-type fluids, RIP International Workshop on Recent Progress in Navier-Stokes Equations and Related Topics - 65th birthday of Prof. V. A. Solonnikov, Math. Forschungsinstitut, Oberwolfach, Germany, 21.6.98 - 26.6.98.

Sequeira, A., Mathematical results and numerical methods for some non-Newtonian fluid models, International Colloquium on Mathematical and Numerical Results in Fluid Mechanics - in honor of Prof. J. Necas, Prague, Czech Republic, 25.10.98 - 27.10.98.

Sequeira, A., Applied mathematics for industrial flow problems (AMIF), ESF International Conference, San Feliu de Guixols, Spain, 1.10.98 - 3.10.98.

Computer Science

Caleiro, C., Adjunções entre sistemas lógicos, Encontro ESCOLA-ACL, Coimbra, Portugal. 26.1.98 - 27.1.98.

Caleiro, C., Combining logics for distribution, Dagstuhl Seminar 9807, Wadern, Germany. 16.2.98 - 20.2.98.

Caleiro, C., Parameterisation of logics, 13th WADT (Satellite Event of ETAPS'98), Lisbon, Portugal. 2.4.98 - 4.4.98.

Caleiro, C., Parameterisation of logics, Segundo Encontro ACL, Figueira da Foz, Portugal. 22.6.98 - 23.6.98.

Carmo, J., Modal logics of action: brief overview, Lógica 98, Évora, Portugal. 13.7.98 - 18.7.98.

Carmo, J., Completeness of a conditional obligation operator, Lógica 98, Évora, Portugal. 13.7.98 - 18.7.98.

Coutinho, M.-J., Morfismos entre sistemas lógicos, Encontro ESCOLA-ACL, Coimbra, Portugal. 26.1.98 - 27.1.98.

Coutinho, M.-J., Logic systems - (co)limits and (co)cartesian liftings, Segundo Encontro ACL, Figueira da Foz, Portugal. 22.6.98 - 23.6.98.

Gouveia, P., Raciocínio abdutivo sobre especificações temporais de objectos, Encontro ESCOLA-ACL, Coimbra, Portugal. 26.1.98 - 27.1.98.

Gouveia, P., Abductive reasoning over temporal specifications of objects, Joint Subgroup Meeting of the ESPRIT IV Working Group 22704 ASPIRE, Namur, Belgium. 18.9.98 - 19.9.98.

Gouveia, P., Abductive reasoning over temporal specifications of objects, AiML 98 (Advances in Modal Logic 98), Uppsala, Sweden. 16.10.98 - 18.10.98.

Guerra, S., Defaults in specifications - distance functions between temporal models, Third ESSLII Student Session, Saarbrücken, Germany. 17.8.98 - 28.8.98.

Guerra, S., Defaults in specifications - distance functions between temporal models, Joint Subgroup Meeting of the ESPRIT IV Working Group 22704 ASPIRE, Namur, Belgium. 18.9.98 - 19.9.98.

Lourenço, H., Verificação de propriedades em sistemas híbridos lineares, Encontro ESCOLA-ACL, Coimbra, Portugal. 26.1.98 - 27.1.98.

Lourenço, H., Aggregation and interconnection of hybrid automata - categorical characterization, FIREworks Meeting, Magdeburg, Germany. 15.5.98 - 16.5.98.

Lourenço, H., Aggregation and interconnection of hybrid automata, Segundo Encontro ACL, Figueira da Foz, Portugal. 22.6.98 - 23.6.98.

Mateus, P., Agregação e interconexão de autómatos probabilísticos, Encontro ESCOLA-ACL, Coimbra, Portugal. 26.1.98 - 27.1.98.

Mateus, P., Aggregation and interconnection of probabilistic automata, 13th WADT (Satellite Event of ETAPS'98), Lisbon, Portugal. 2.4.98 - 4.4.98.

Mateus, P., Combining probabilistic automata

- FIREworks Meeting, Magdeburg, Germany. 15.5.98 - 16.5.98.
- Segundo Encontro ACL, Figueira da Foz, Portugal. 22.6.98 - 23.6.98.

Ramos, J., Lógica temporal ramificada versus cálculo de situações, Encontro ESCOLA-ACL, Coimbra, Portugal. 26.1.98 - 27.1.98.

Ramos, J., The situation and state calculus versus temporal logic, 13th WADT (Satellite Event of ETAPS'98), Lisbon, Portugal. 2.4.98 - 4.4.98.

Ravara, A., Álgebra de tipos para um cálculo de objectos concorrentes, Encontro ESCOLA-ACL, Coimbra, Portugal. 26.1.98 - 27.1.98.

Ravara, A., A type algebra for concurrent objects, Dagstuhl Seminar 9807, Wadern, Germany. 16.2.98 - 20.2.98.

Ravara, A., An algebra of dynamic object types, Segundo Encontro ACL, Figueira da Foz, Portugal. 22.6.98 - 23.6.98.

Ravara, A., Towards an algebra of object types, Workshop on the Semantics of Objects as Processes (Satellite Event of ICALP'98), Aalborg, Denmark. 18.6.98.

Resende, P., Lógica observacional e sistemas tropológicos, Encontro ESCOLA-ACL, Coimbra, Portugal. 26.1.98 - 27.1.98.

Resende, P., Observational logic for the specification of concurrent systems, Dagstuhl Seminar 9807, Wadern, Germany. 16.2.98 - 20.2.98.

Resende, P., Observational logic, 13th WADT (Satellite Event of ETAPS'98), Lisbon, Portugal. 2.4.98 - 4.4.98.

Resende, P., On observing independence and causality, MFPS-14 (14th International Workshop on the Mathematical Foundations of Programming Semantics), London, U.K.. 10.5.98 - 13.5.98.

Resende, P., (In)completeness in observational logic, Segundo Encontro ACL, Figueira da Foz, Portugal. 22.6.98 - 23.6.98.

Resende, P., Quantale modules and observational logic, 68th Peripathetic Seminar on Sheaves and Logic, Brno, Czech Republic. 29.8.98 - 30.8.98.

Resende, P., Quantales and observational logic in concurrency and specification (tutorial), Joint Subgroup Meeting of the ESPRIT IV Working Group 22704 ASPIRE, Namur, Belgium. 18.9.98 - 19.9.98.

Sernadas, C., Fibrilação de lógicas com termos, Encontro ESCOLA-ACL, Coimbra, Portugal. 26.1.98 - 27.1.98.

Sernadas, C., Impacto da Álgebra na Computação, Encontro Nacional de Matemática 98, Braga, Portugal. 9.2.98 - 12.2.98.

Sernadas, C., Categorical techniques for combining logics, ETAPS'98 Tutorials (Satellite Event of ETAPS'98), Lisbon, Portugal, 29.3.98.

Sernadas, C., Fibring of logics with terms and binding operators, 13th WADT (Satellite Event of ETAPS'98), Lisbon, Portugal. 2.4.98 - 4.4.98.

Sernadas, C., Fibring of logics with terms and binding operators, Segundo Encontro ACL, Figueira da Foz, Portugal. 22.6.98 - 23.6.98.

Sernadas, C., Fibring of logics, Lógica 98, Évora, Portugal. 13.7.98 - 18.7.98.

Sernadas, C., Categorical fibring of logics with terms and binding operators, FROCCOS 98 (Frontiers of Combining Systems 98), Amsterdam, Netherlands. 2.10.98 - 4.10.98.

3.2 Invited lectures

Algebra and Mathematical Analysis

Abreu, M., Kähler geometry of toric varieties and extremal metrics, Symplectic Geometry Seminar, ETH-Zürich, Switzerland, January 1998.

Barreira, L., Invariant sets with zero measure and full Hausdorff dimension, Dynamical Systems Seminar, The Pennsylvania State University, USA, 2.3.98.

Barreira, L., Teoria ergódica e dinâmica hiperbólica, Seminário de Geometria e Topologia, CMAF, Lisbon, Portugal, 17.3.98.

Barreira, L., Conjuntos com medida nula e dimensão de Hausdorff máxima, Universidade do Porto, Portugal, 15.5.98.

Bastos, M. A., Oscillatory Riemann-Hilbert problems and the corona theorem, Technische Universität Chemnitz, Germany, December 1998.

Canas da Silva, A., Folding symplectic manifolds, Pacific Northwest Geometry Seminar, Mathematical Sciences Research Institute, Berkeley, California, USA, February 1998.

Canas da Silva, A., Geometrization of Spin-c structures, Cascade Topology Seminar, Eugene, Oregon, USA, May 1998.

Canas da Silva, A., Reciprocity laws, lattice points and quantization, Northern California Symplectic Geometry Seminar, Stanford, California, USA, December 1998.

Cordovil, R., Variétés différentiables combinatoires, d'après MacPherson, Université Paris 6, France, 14.5.98.

Cordovil, R., Triangulations de matroides orientés, d'après Francisco Santos, Université Paris 6, France, May 1998.

Cordovil, R., Triangulações de matroides orientados, segundo Francisco Santos, Universidade do Porto, Portugal, 13.12.98 - 19.12.98.

de Sousa Dias, M. E., Bifurcações de equilíbrios relativos de sistemas Hamiltonianos simétricos, Seminário do grupo de Matemática Aplicada da Universidade do Porto, Portugal, March 1998.

de Sousa Dias, M. E., Riemann's theorem for rotating fluid masses, Workshop on Symmetric Hamiltonian Systems, Symposium on Symplectic Geometry, 13.07.98 - 24.07.98.

de Sousa Dias, M. E., Redução de sistemas Hamiltonianos simétricos, Dia da Matemática e Física, Universidade de Coimbra, Portugal, 15.09.98.

Freitas, P., Asymptotic behaviour for the wave equation with indefinite damping, Institut for Matematik, Danmarks Tekniske Universitet, June 1998.

Freitas, P., When is the perturbation of a Hamiltonian system Hamiltonian?, Kungl. Tekniska Högskolan, Stockholm, Sweden, May 1998.

Freitas, P., Decaimento óptimo de energia na equação de onda e em sistemas de osciladores lineares, Encontro da SPM, Braga, Portugal, February 1998.

Florentino, C., Integrable systems and vector bundles over Riemann surfaces, Universidade do Algarve, Faro, Portugal, 19.5.98.

Florentino, C., Períodos de formas diferenciais em superfícies de Riemann, CMAF, Lisbon, Portugal, 26.5.98.

Nunes, J. P., The geometry of supersymmetric Yang-Mills theories. and Picard Fuchs equations, CMAF, Lisbon, Portugal, April 1998.

Matias, J., Sobre um problema de evolução cristalina, CMAF, Lisbon, Portugal, December 1998.

Oliva, W., Mecânica geométrica, CMAF, Lisbon, Portugal, November 1998.

Saussol, B., Distribution de Poisson des temps de retour,

- Université de Bretagne Occidentale, Brest, France, November 1998.
- Institut Mathématique de Luminy, Marseille, France, October 1998.

Saussol, B., Décroissance des corrélations pour des applications multidimensionnelles avec singularités, Centre de Physique Theorique, Marseilles, France, June 1998.

Saussol, B., Mesures absolument continues pour des applications dilatantes avec singularités,

- Université Paul Sabatier, Toulouse, France, January 1998.
- Laboratoire de Topologie, Dijon, France, January 1998.

Speck, F.-O., Normalization of some ill-posed problems in diffraction theory, University of Göttingen, Germany, May 1998.

Speck, F.-O., Operator factorization methods in diffraction theory, University of Kassel, Germany, May 1998.

Speck, F.-O., Some operator theoretic aspects in diffraction problems, Ceremonial Colloquium on the Occasion of the Retirement of E. Meister, Technical University of Darmstadt, Germany, February 1998.

Statistics and Applications

Branco, J. A., Previsão estatística, Faculdade de Ciências do Desporto e de Educação Física, Universidade do Porto, Portugal, 13.3.98.

Nunes, C., Estimação paramétrica em MMPP's, Faculdade de Ciências de Lisboa, Universidade de Lisboa, Portugal, 28.10.98.

Nunes, C., and Pacheco, A., Estimação paramétrica em MMPP's, Seminário da SPE, Lisbon, Portugal, 28.10.98.

Oliveira, M. R., Análise discriminante: um problema de classificação, Seminário: A Aventura da Previsão, Faculdade de Ciências do Desporto e da Educação Física, Universidade do Porto, Portugal, 13.2.98.

Paulino, C. D. M., Missing categorical data: an overview of methods of analysis, III Congreso Iberoamericano de Estadística and VII Congreso Latinoamericano de Probabilidad y Estadística, Cordoba, Argentina, 21.9.98 - 25.09.98.

Paulino, C. D. M., Análise de dados categorizados informativamente incompletos, Universidade Portucalense, Porto, Portugal, February 1998.

Pires, A. M., Métodos robustos em análise discriminante, Faculdade de Economia, Universidade do Porto, Portugal, 19.2.98.

Applied Mathematics and Numerical Analysis

Sequeira, A., Modelos de fluidos não-Newtonianos. Resultados analíticos e aproximação numérica, Departamento de Matemática da Faculdade de Ciências da Universidade do Porto, Portugal, 18.1.98.

Sequeira, A., Mathematical results for some non-Newtonian fluid models, Colloquium Seminar, Department of Mathematics, Northern Illinois University, USA, 20.3.98.

Sequeira, A., Numerical methods for some viscoelastic non-Newtonian fluid models, Colloquium Seminar, Department of Mathematics, University of Pittsburgh, USA, 3.4.98.

Sequeira, A., Méthodes numériques en mécanique des fluides, Short Course, SOCRATES - ERASMUS, Département de Mathématiques, Université de Toulon et du Var, France, 10.5.98 - 14.5.98.

Sequeira, A., Résultats d'analyse mathématique pour quelques modèles de fluides non-Newtoniens, Département de Mathématiques, Université de Toulon et du Var, France, 14.5.98.

Sequeira, A., Numerical methods for non-Newtonian viscoelastic fluids, Faculty of Sciences and Technology, University of Macau, 30.6.98.

Videman, J. H., Existência, unicidade e estabilidade de escoamentos estacionários de fluidos viscoelásticos em canais e tubos, Departamento de Matemática/Informática, Universidade da Beira Interior, Covilhã, Portugal, 15.6.98.

Videman, J. H., Existência, unicidade e comportamento assintótico de soluções para equações de fluidos não-Newtonianos, Seminário de Equações Diferenciais e com Derivadas Parciais, Universidade de Aveiro, Portugal, 16.5.98.

Computer Science

Dionísio, F.-M., Composition of hierarchic default specifications, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal. 18.2.98.

Ravara, A., A type algebra for concurrent objects, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal. 25.3.98.

Ravara, A., An object calculus with implicit communication, Faculdade de Ciências da Universidade de Lisboa, Lisbon, Portugal. 29.4.98.

4. Guest Programme

Algebra and Mathematical Analysis

Aldrovandi, E., SISSA, Trieste, Italy, 30.5.98 - 18.6.98. *Lecture:* Simplicial methods, characteristic classes and applications in mathematical physics: 5 sessions.

Alikakos, N., University of Tennessee, USA, 23.11.98 - 29.11.98. *Lecture:* The stability of the spherical shape in geometric evolution.

Almeida, L., École Normale Supérieure, Cachan, 27.10.98. *Lecture:* Méthodos topológicos e conjuntos de nível para funcionais de Ginzburg-Landau.

Alvarez, J. C., Université Catholique de Louvain, Belgium, 18.12.97. *Lecture:* Admissible symplectic forms and Hilbert's fourth problem.

Ambrosetti, A., Scuola Normale di Pisa, Italy, 23.11.98 - 29.11.98. *Lecture:* On the bifurcation for variational problems.

Anjos, S., State University of New York at Stony Brook, USA, 30.7.98. *Lecture:* Almost complex structures on $S^2 \times S^2$.

Arrieta, J., Universidad Complutense de Madrid, Spain, 20.11.97. *Lecture:* Abstract parabolic problems with critical nonlinearities and applications to heat equations with nonlinear boundary conditions.

Avritzer, D., Universidade Federal de Minas Gerais, Belo Horizonte, Brazil, 5.1.98 - 7.1.98. *Lecture:* Geometria enumerativa e teoria de cordas em física.

Barrett, J., University of Nottingham, UK, 21.12.98. *Lecture:* Relativistic spin networks for $SO(3,1)$.

Bedjaoui, N., École Polytechnique, France, 27.10.98 - 3.11.98. *Lecture:* A non-hyperbolic system modeling a statistical multi-phase flow.

Beirão da Veiga, H., Università di Pisa, Italy, 23.11.98 - 29.11.98. *Lecture:* Developable surfaces and the Euler equations. A mathematical curiosity.

Beliaivsky, P., Université Libre de Bruxelles, Belgium, 3.5.98 - 9.5.98. *Lecture:* Symmetric spaces and quantization.

Boettcher, A., Technische Universität Chemnitz, Germany, 9.6.98. *Lecture:* On the corona theorem for almost periodic functions.

Castro, L., Universidade de Aveiro, Portugal, 3.4.98. *Lecture:* Relations between convolution type operators on intervals and on the half-Line.

Chipôt, M., Universität Zürich, 27.2.98. *Lecture*: On a class of non-local problems.

Chow, S.-N., Georgia Institute of Technology, USA, 23.11.98 - 29.11.98.

Collet, P., École Polytechnique, Paris, France, 9.3.98 - 13.3.98. *Lecture*: Rigorous approach to amplitude equations by renormalization group techniques.

Crane, L., Kansas State University, USA, 1.10.98 - 31.3.99. *Lectures*:

- Unitary representations of non-compact groups, (minicourse), Nov. and Dec. 1998.
- Topological and geometric quantum field theories, 29.9.98.
- Lorentzian signature quantum gravity, 21.12.98.

Ehrhardt, T., Technische Universität Chemnitz, Germany, 18.2.98 - 1.4.98. *Lecture*: Toeplitz operators over the half plane.

Dafermos, C., Brown University, USA. *Lecture*: Hyperbolic systems of conservation laws in several space dimensions.

Davids, S., University of Nottingham, UK, 20.12.98 - 24.12.98. *Lecture*: The geometry of $SU(1,1)$ representation theory, 21.12.98.

Ettinger, M., Los Alamos National Laboratory, 27.1.98 - 28.1.98. *Lecture*: Quantum computation.

Ferreira Alves, J., Universidade do Porto, Portugal, 26.5.98. *Lecture*: Medidas de Sinai-Ruelle-Bowen para sistemas não hiperbólicos com expansão multidimensional.

Fiedler, B., Freie Universität Berlin, Germany, 23.11.98 - 29.11.98. *Lecture*: Some spiral wave patterns in two and three space dimensions.

Fonseca, P., Rutgers University, USA, 25.6.98. *Lecture*: Aspects of Conformal Field Theory.

Fusco, G., Università di L'Aquila, Italy, 23.11.98 - 29.11.98. *Lecture*: Multi-spikes for a reaction-diffusion system.

Galves, A., IME, Universidade de São Paulo, Brazil, 20.4.98. *Lecture*: Instantes de repetição de longas sequências de símbolos.

Giannakopoulos, F., Universität zu Köln, Germany, 13.10.98. *Lecture*: Bifurcation properties of a planar system of piecewise linear differential equations with a line of discontinuity.

Grebogi, C., University of Maryland, USA, 12.6.98 - 15.6.98. *Lecture*: Obstruction to modelling and shadowing.

Greenberg, J., Carnegie Mellon University, USA, 30.6.97 - 12.7.97. *Lectures*:

- Antiplane shear flows in visco-plastic solids exhibiting isotropic and kinematic hardening.

- Elastic phase transitions.

Gürlebeck, K., Technische Universität Chemnitz, Germany, 16.3.98. *Lecture:* On a class of hypercomplex pi-operators.

Hale, J., Georgia Institute of Technology, USA, 23.11.98 - 29.11.98. *Lecture:* Compact global attractors.

Karapetyants, N.K., Rostov State University, Rostov-on-Don, Russia, 17.4.98 - 13.11.98. *Lectures:*

- Multidimensional integral operators with homogeneous kernels.
- On a functional equation with some types of shifts and shift factorization.

Homburg, A. J., Freie Universität, Berlin, Germany, 17.4.98. *Lecture:* Homoclinic doubling cascades.

Kaashoek, M.A., Vrije Universiteit, Amsterdam, Netherlands, 1.11.98 - 8.11.98. *Lecture:* Problems in analysis and the state-space method from system theory.

Karlovich, A., South Ukrainian Pedagogical University, Odessa, Ukraine, 9.10.98. *Lecture:* One-sided invertibility of functional operators with a shift on rearrangement-invariant spaces.

Kawohl, B., Universität zu Köln, Germany, 29.5.98. *Lecture:* Anisotropic diffusion and image reconstruction.

Kirchgässner, K., Universität Stuttgart, Germany, 23.11.98 - 29.11.98. *Lecture:* Resonant dynamics in one-dimensional lattices.

Krámli, A., József Attila University, Szeged, 18.10.98 - 26.10.98. *Lecture:* Central limit theorems in dynamical systems.

Lacey, A., Heriot-Watt University, 14.9.98 - 18.9.98. *Lecture:* A Nonlocal hyperbolic problem modelling food sterilization.

Laptev, A., KTH, Stockholm, Sweden, 1.3.98 - 9.3.98. *Lecture:* Sharp Szegő type limit theorems, 3.3.98.

Lebeau, G., Université de Paris XI, Paris-Sud, France, 7.9.98 - 11.9.98. *Lecture:* Waves with oscillating density.

Lecomte, F., Université Louis Pasteur, Strasbourg, France, 22.4.98 - 28.4.98. *Lecture:* Adams operations in algebraic K-theory.

Lillywhite, S., IST, Lisbon, Portugal, Oct. 98. *Lectures:*

- Cohomology of symplectic quotients and loop spaces: 1-3.
- Equivariant Cohomology, 4-6.
- Iterated Integrals.
- The topology of symplectic quotients of loop spaces.

Llibre, J., Universitat Autònoma de Barcelona, Spain, 23.11.98 - 29.11.98. *Lecture:* Algebraic solutions for planar polynomial differential systems.

Lopes, M. M., Universidade de Lisboa, Portugal, 15.10.98. *Lecture:* Canonical models of surfaces of general type.

Lüneburg, E., Deutsche Forschungsanstalt für Luft und Raumfahrt, Oberpfaffenhofen, Germany, 12.7.98 - 26.7.98. *Lectures:*

- Diffraction of an obliquely incident plane wave by a two-face impedance half-plane.
- Mathematical problems in radar polarimetry.

Lunel, S., Vrije Universiteit Amsterdam, Netherlands, 23.11.98 - 29.11.98. *Lecture:* Unique identification of parameters in functional differential equations.

Mallet-Paret, J., Brown University, USA, 23.11.98 - 29.11.98. *Lecture:* Superexponential solutions in cyclic feedback systems with delay.

Matveev, V., Université de Bourgogne, Dijon, France, 4.12.98. *Lecture :* Integrable systems and related spectral problems.

Mischaikow, K., Georgia Institute of Technology, USA, 23.11.98 - 29.11.98. *Lecture:* Construction of symbolic dynamics from experimental time series.

Nelson, J., University of Turin, Italy, 9.5.98 - 13.5.98.

Neto, O., Universidade de Lisboa, Portugal, 14.5.98. *Lecture:* Dessingularização de variedades Lagrangeanas e sistemas de equações às derivadas parciais.

Neto, O., Faculdade de Ciências, Universidade de Lisboa, Portugal, 19.11.98. *Lecture:* Rigid local systems after Deligne and Simpson.

Neunhäuserer, J., Freie Universität, Berlin, Germany, 17.5.98 - 30.5.98. *Lecture:* The variational principle for Hausdorff dimension.

Neves, E. J., IME, Universidade de São Paulo, Brazil, 8.1.98 - 18.1.98. *Lecture:* A Note on Percolation in a Voronoi competition-growth model.

Ney de Souza, P., University of California, Berkeley, USA, 30.6.98. *Lecture:* À procura de um nó com invariante de Jones trivial: Um exemplo do uso de computadores em teoria dos nós.

Nussbaum, R., Rutgers University, USA, 23.11.98 - 29.11.98. *Lecture:* Periodic points of nonexpansive maps.

Olech, C., Polish Academy of Sciences, Poland, 23.11.98 - 29.11.98. *Lecture:* The Markus-Yamabe problem and some other stories.

Paris, L., Université de Bourgogne, Dijon, France, 20.4.98 - 24.4.98. *Lecture:* Braid group and its generalizations.

Penzel, F., Technische Universität Darmstadt, Germany, 1.1.98 - 30.6.98. *Lecture:* Existence, uniqueness and regularity of the solution of a canonical diffraction problem.

Portilheiro, M., University of California, Berkeley, USA, 17.12.98. *Lecture:* Soluções fracas de equações não-lineares.

Rabinovich, V.S., Rostov State University, Rostov-on-Don, Russia, 22.5.98. *Lecture:* Acoustic field generated by moving sources in stratified waveguides.

Samko, S.G., Universidade do Algarve, Faro, Portugal, 6.3.98. *Lecture:* The method of approximate inverses for potential type operators.

Samko, N.G., Rostov State University, Rostov-on-Don, Russia, 23.10.98. *Lecture:* Singular operators with discontinuous coefficients in weighted spaces of smooth functions with a prescribed behavior of continuity moduli.

Santos, J. P., Stanford University, USA, 25.6.98. *Lecture:* Seiberg-Witten equations.

Santos, P., State University of New York at Stony Brook, USA, 30.7.98. *Lecture:* Algebraic cycles and homotopy theory.

Saussol, B., IST, Lisbon, Portugal, 10.1.98. *Lecture:* Distribution of return time and exponential law.

Schiappa, R., Massachusetts Institute of Technology, USA, 30.7.98. *Lecture:* Large N limits.

Schmeling, J., Freie Universität, Berlin, Germany, 2.4.98 - 18.4.98. *Lectures:* Ergodic theory and dimension theory of smooth dynamical systems:

- Invariant manifolds and regularity of foliations.
- The notion of fractal dimension.
- Lyapunov exponents, entropy and dimension.

Sell, G., University of Minnesota, USA, 23.11.98 - 29.11.98. *Lecture:* The challenge of global climate modelling and longtime dynamics.

Sequeira, J., IST, Lisbon, Portugal, 21.5.98. *Lecture:* Comportamentos na cooperação entre robots.

Silverio dos Santos, J., FFCLRP, Universidade de São Paulo, Ribeirão Preto, Brazil, 21.7.98. *Lecture:* Um conjunto de soluções globais e limitadas para um sistema de Volterra com equações retardadas.

Simó, C., Universidad de Barcelona, Spain, 23.11.98 - 29.11.98. *Lecture:* Linear differential equations with quasiperiodic coefficients: resonance tongues, instability pockets and global phenomena.

Táboas, P. Z., Universidade de São Paulo, São Carlos, Brazil, 23.1.98 - 14.2.98. *Lecture:* Periodicidade em sistemas com retardamento e impulsivos.

Takhtajan, L., SUNY, Stony Brook, USA, 1.6.98 - 13.6.98. *Lecture:* Quantum field theory on algebraic curves.

Tartar, L., Carnegie Mellon University, USA, 23.11.98 - 29.11.98. *Lecture:* PDEs as limits of ODEs, ODEs as limits of PDEs, and more.

Tsygan, B., Pennsylvania State University, USA, 1.6.98 - 4.6.98. *Lecture:* Deformation quantization and Rozanski-Witten forms.

Vasilevski, N., CINVESTAV del I.P.N., Mexico City, 26.6.98. *Lectures:*

- Bergman-Toeplitz operators with commutative symbol algebras.
- Hilbert spaces of analytic functions.

Velhinho, J., Universidade do Algarve, Portugal, 25.06.98. *Lecture:* Aspects of the relation between non-commutative geometry and deformation quantization.

Walther, H.-O., Justus-Liebig Universität, Germany, 23.11.98 - 29.11.98. *Lecture:* The attractor of a positive feedback delay differential equation.

Woronowicz, S. L., University of Warsaw, 16.2.98 - 2.3.98. *Lecture:* Quantum groups on the Hilbert space level.

Yost, D., Universidad de Extremadura, Badajoz, Spain, 20.11.98. *Lecture:* Complemented and uncomplemented subspaces of Banach spaces.

Statistics and Applications

Cox, T., Department of Statistics, University of Newcastle Upon Tyne, England, 27.10.98 - 10.11.98. *Lecture:* Looking at multidimensional scaling.

Narula, S. C., School of Business, Virginia Commonwealth University, USA, 27.11.98. *Lecture:* The state of art of the minimum sum of absolute errors regression.

Applied Mathematics and Numerical Analysis

Abboud, T., CMAP, École Polytechnique, Palaiseau, France, 12.12.98 - 19.12.98. *Lecture*: Retarded potential methods for acoustic and electromagnetic problems.

Ammari, H., CMAP, École Polytechnique, Palaiseau, France, 4.10.98 - 11.10.98. *Lecture*: Chirality in the Maxwell equations by the dipole approximation method.

Ferreira, P., CMAP, École Polytechnique, Palaiseau, France, 12.12.98 - 26.12.98. *Lecture*: Simulação numérica de modelos matemáticos determinísticos e estocásticos com aplicação industrial.

Grebogi, C., University of Maryland at College Park, USA, 12.6.98 - 15.6.98. *Lecture*: Obstruction to modelling and shadowing.

Ishenko, S., Moscow State University, Russia, 17.10.98 - 30.10.98. *Lecture*: Numerical solution of the Schrödinger equation for many-electron atoms.

Morimoto, H., Meiji University, Japan, 7.3.98 - 14.3.98, *Lecture*: Steady Navier-Stokes flow in a two dimensional tube under general outflow condition.

Nazarov, S., State Maritime Academy, St. Petersburg, Russia, 1.4.98 - 30.4.98. *Lecture*: Weighted spaces with detached asymptotics and the three-dimensional exterior Navier-Stokes problem.

Novotny, A. Université de Toulon et du Var, France, 14.1.98 - 12.2.98. *Short Course*: About the Steady transport equation (3 Lectures).

Passerini, A., Università di Ferrara, Italy, 7.1.98 - 18.1.98. *Lecture*: Asymptotic stability in time of steady flows of incompressible viscoelastic fluids in pipes.

Penel, P., Université de Toulon et du Var, France, 8.6.98 - 21.6.98. *Short Course*: Contrôle optimal de systèmes décrits par des équations aux dérivées partielles (3 Lectures).

Penzel, F., Centro de Matemática Aplicada, I.S.T., Lisbon, Portugal, 1.4.98 - 30.6.98. *Lecture*: Analytical and numerical results for scattering by a circular disk.

Potthast, R., Göttingen University, Germany, 20.10.98 - 24.10.98. *Lecture*: On mixed reciprocity relations in inverse scattering.

Sean McKee, S., University of Strathclyde, Glasgow, U.K., 23.5.98 - 30.5.98. *Lecture*: A cautionary tale on Cauchy integral equations.

Shibata, Y., Waseda University, Japan, 7.3.98 - 14.3.98, *Lecture*: Some stability results on the Navier-Stokes equations in the three-dimensional exterior domain.

Solonnikov, V. A., Steklov Mathematical Institute, St. Petersburg, Russia, 18.5.98 - 20.5.98. *Lecture: Quasistationary approximation in the problem of motion of an isolated liquid mass (2 Lectures).*

Ha-Duong, T., Université de Technologie de Compiègne, France, 15.2.98 - 30.3.98. *Short Course: On acoustic scattering problems (4 Lectures).*

Ha-Duong, T., Université de Technologie de Compiègne, France, 27.3.98. *Lecture: Some invariance theorems for acoustic and elastic scattering.*

Urbano, J.M., CMUC, University of Coimbra, Portugal, 20.2.98. *Lecture: Existence results in the Stefan-Darcy problem.*

Computer Science

Bertossi, L., Catholic University of Chile, Chile, 16.2.98 - 19.2.98. *Lecture: Hypothetical temporal reasoning with history encoding, 16.2.98.*

Clementino, M.-M., Universidade de Coimbra, Portugal. *Lecture: O teorema de Tychonoff em categorias, 16.10.98.*

Hermida, C., McGill University, Canada, 27.5.98 - 28.5.98.

Longo, G., École Normale Supérieure, Paris, France, 12.2.98. *Lecture: Proofs and programs: an introductory survey.*

Lopes, A., Faculdade de Ciências da Universidade de Lisboa, Portugal, 30.10.98. *Lecture: Using explicit state to describe software architectures.*

Martini, A., Technical University of Berlin, Germany, 29.6.98 - 3.7.98. *Lecture: A unifying presentation of arrows between institutions, 3.7.98.*

Mossakowski, T., University of Bremen, Germany, 23.3.98 - 27.3.98. *Lecture: Combining and representing logical systems, 27.3.98.*

Nestmann, U., BRICS, Aalborg University, Denmark, 23.3.98 - 27.3.98. *Lecture: What is a good encoding of choice?, 26.3.98.*

Oitavem, I., Universidade Nova de Lisboa, Portugal, 13.11.98. *Lecture: Caracterizações predicativas de classes de complexidade computacional.*

Paz, A., Technion, Israel, 13.4.98 - 17.4.98. *Lecture: Chaotic evolution via generalized probabilistic automata (probabilistic arrays), 17.4.98.*

Pinto, J., Catholic University of Chile, Chile, 2.1.98 - 31.3.98. *Lecture: Causation in the situation calculus, 16.1.98.*

Pinto, J., Catholic University of Chile, Chile, 20.3.98. *Lecture: Handling uncertainty in the situation calculus.*

Rijke, M., ILLC, University of Amsterdam, Netherlands, 6.5.98 - 8.5.98. *Lecture: Classifying small description languages, 8.5.98.*

Schobbens, P.-Y., University of Namur, Belgium, 1.9.97 - 21.1.98 and 26.10.98 - 31.10.98.

Schroder, L., University of Bremen, Germany, 21.9.98 - 25.9.98. *Lecture: Adjoint functors between composition graphs, 25.9.98.*

Silva, J.-P., INESC, Portugal, 6.3.98. *Lecture: Backtrack search algorithms for propositional satisfiability.*

Zanardo, A., University of Padova, Italy, 2.3.98 - 31.5.98 and 9.11.98 - 13.11.98. *Lecture: Advanced course in branching time logics, 6.3.98, 13.3.98, 20.3.98, 10.4.98 and 17.4.98.*

Zanardo, A., University of Padova, Italy. *Lecture: Crash course on Henkin's style proofs of completeness in temporal logics, 20.5.98.*

5. Post-Doc's

Algebra and Mathematical Analysis

Stephen Lillywhite, University of Maryland, USA, Center for Mathematical Analysis, Geometry and Dynamical Systems.

Benoît Saussol, Université de Toulon et du Var, France, Center for Mathematical Analysis, Geometry and Dynamical Systems.

Jair Santos, University of São Paulo, Ribeirão Preto, Brazil, Center for Mathematical Analysis, Geometry and Dynamical Systems, Research work with Waldyr Oliva.

Statistics and Applications

Gomez-Corral, A., Universidad Complutense de Madrid, Spain, 1.1.97 - 30.9.97, Research work with M. F. Ramalhoto.

6. Research Programmes and Sponsorship

6.1 Research Units

The members of the Department participate in research units that receive grants under the “Programa de Financiamento Plurianual de Unidades de I&D”, JNICT:

- Applied Mathematics Center, n° 82/96, coordinated by A. Ferreira dos Santos, with the following research groups:

1. Operator Theory, Integral Equations and Applications, Coordinated by A. Ferreira dos Santos.
2. Numerical Analysis and Applications in Fluid Mechanics, Coordinated by Adélia Sequeira.
3. Statistics, Stochastic Processes and Applications, Coordinated by João A. Branco.
4. Mathematical Physics, Coordinated by Roger Picken.
5. Logic and Computation, Coordinated by Amílcar Sernadas.

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

- Center for Mathematical Analysis, Dynamical Systems and Applications, n° 89/96, coordinated by C. Rocha.

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

- Institute for Systems and Robotics at Lisbon, n° 101/96, coordinated by J. Sentieiro (Department of Electrical Engineering and Computers)

URL: <http://fire.ist.utl.pt/isr/>

- Center for Plasma Physics, n° 90 B/96, coordinated by José Tito Mendonça (Complexo Interdisciplinar)
- Research Unit for Naval Engineering and Technology, n° 134/96, coordinated by Carlos Guedes Soares (Section of Naval Engineering)

6.2 Research Projects Coordinated by Department Members

Branco, J. A., Coordinated the research project:

- Análise e Implementação Computacional em Estatística Aplicada, PRAXIS XXI Project PCEX/C/MAT/41/96.

Canas da Silva, A., Coordinated the research project:

- Geometry and Topology of Moduli Spaces, PRAXIS XXI Project PCEX/C/MAT/44/96, January 1998.

Cordovil, R., Coordinated the research project:

- Variedades Diferenciais Combinatoriais e Discretas, PRAXIS XXI Project PCEX/C/MAT/39/96.

Costa, F. P., Coordinated the research project:

- Transições de Fase e Equações Diferenciais Parciais, PRAXIS XXI Project PBIC/C/MAT/2139/95, (1996-98).

dos Santos, A. F., Coordinated the research project:

- Factorização de Operadores e Aplicações à Física-Matemática, PRAXIS XXI Project 2/2.1/MAT/441/94 (1997-99).

Fernandes, R. L., Coordinated the research project:

- Geometric and Topological Methods in Hamiltonian Dynamical Systems and Ergodic Theory, PRAXIS XXI Project PBIC/C/MAT/2140/95, (1996-1998).

Freitas, P., Coordinated the research project:

- Teoria Qualitativa de Equações Funcionais e Sistemas de Equações Funcionais e Sistemas de Equações às Derivadas Parciais, PRAXIS XXI Project PCEX/P/MAT/36/96.

Ramalhoto, M. F., Coordinated the research project:

- Advances in Retrial Queueing Theory, INTAS 96-0828, (1997-2000).

Resende, P., Portuguese Coordinator of the following project:

- Dynamic Observational Logic, Acção Integrada Luso-Britânica N° B-29/99, in cooperation with Imperial College, 1998-2000.

Rocha, C., Coordinated the research project:

- Análise Não-Linear e Sistemas Dinâmicos, PRAXIS XXI Project 2/2.1/MAT/199/94 .

Sequeira, A., Coordinated the projects:

- Mathematical and Numerical Analysis of Nonlinear Problems in Mechanics and Physics, JNICT/CNRS (IST in collaboration with CMAP - École Polytechnique, France).
- Mathematical Analysis and Numerical Solution of Non-Newtonian Fluids with Applications in Liquid-Crystalline Polymers, PRAXIS XXI Project 2/2.1/MAT/380/94.

Sernadas, A., Coordinated the projects:

- SitCalc: Situation Calculus - Modularization, Reification and Distribution, PRAXIS XXI Project 2/2.1/MAT/262/94: 1996-98.
- ACL: Algebraic Combination of Logics, PRAXIS XXI Project PCEX/P/MAT/46/96: 97-99.

Speck, F.-O., Coordinated the following projects:

- Singular Operators - New Features and Applications, in collaboration with the Technische Hochschule Darmstadt, JNICT and BMFT (the Federal Minister for Research and Technology in Germany), (1995-98).

- Spline-Galerkin Methods for Integral Equations of Wiener-Hopf Type, in collaboration with the Technische Universität Zwickau, Chemnitz, JNICT and BMFT (the Federal Minister for Research and Technology in Germany), (1995-98).

Sousa Ramos, J., Coordinated the research project:

- Métodos Geométricos e Topológicos em Baixa Dimensão e em Dimensão Infinita. PRAXIS XXI - 2/2.1/MAT/132/94.

6.3 Participation in Other Research Projects

Some members of the Department also received research funding through projects coordinated outside the Department:

- Astrophysics and Gravitational Interaction Physics, ESO, coordinated by A. B. Henriques (Department of Physics, IST), project PESO/PRO/1009/93.
- Mathematical Physics, JNICT - Programa Base/PRAXIS XXI, coordinated by A. Cruzeiro (Department of Mathematics, Faculdade de Ciências, Universidade de Lisboa), project PBIC/CEN/1631/93.

Bastos, M. A., Câmara, M. C. and Teixeira, F. S.

- Operator Factorization and Applications to Mathematical Physics, PRAXIS XXI 1996/99.

Carmo, J., participates in:

- SARA: Society of Animated and Responsible Agents, PRAXIS XXI Project 2/2.1/TIT/1662/95.
- MAGO: Modeling of Agents and Organizations, JNICT Project PCSH/C/OGE/1038/95.

Graça, M. M., Member of the IDMEC (Instituto de Mecânica), since January 1998, Centro de Projecto Mecânico, coordinated by Carlos Mota Soares.

Picken, R. F., participated in:

- Functional Analysis and Quantum Field Theory, PRAXIS/2/2.1/FIS/286/94, coordinated by José Mourão (Dept of Physics, IST)
- Mathematical Physics, PBIC/CEN/1631/93, coordinated by Ana Bela Cruzeiro (Faculdade de Ciências, Univ. of Lisbon)

Romeiras, F. J.

- Plasmas Espaciais Não Girotrópicos, PRAXIS XXI Project 2/2.1/FIS/435/94, coordinated by Brinca, A. L. (Departamento de Engenharia Electrotécnica e de Computadores, IST).

Saussol, B. participate in:

- Probabilistic methods in non hyperbolic dynamics, Program of the European Science Foundation, 1998-2003.

Sequeira, A., Portuguese member of the Steering Committee of Project of European Science Foundation (ESF), Applied Mathematics for Industrial Flow Problems - AMIF, 1998 - 2000 (coordinated by Lions, P.L. and Quarteroni, A.).

Sernadas, A., Sernadas, C., Carmo, J., Caleiro and C., Coutinho, M.-J., participate in:

- PRAXIS XXI Project PCEX/P/MAT/46/96 ACL: Algebraic Combination of Logics.

Sernadas, A., Sernadas, C., Resende, P., Gouveia, P., Caleiro and C., Guerra, S. participate in:

- ESPRIT IV Working Group 22704 ASPIRE: "Advanced modeling and SPecification of distributed InfoRmation systEms".

Sernadas, A., Sernadas, C., participate in:

- ESPRIT IV Working Group 23531 FIREworks: "Feature Integration in Requirements Engineering".

Sernadas, A., Sernadas, C., Resende, P., Gouveia, P. and Ravara, A., participate in:

- PRAXIS XXI Project 2/2.1/TIT/1658/95 LogComp: "LOGic and COMPutation".

Sernadas, A., Sernadas, C., Caleiro, C. and Ramos, J., participate in:

- PRAXIS XXI Project 2/2.1/MAT/262/94 SitCalc: Situation Calculus - Modularization, reification and distribution .

7. Organization of Conferences, Meetings, etc.

Branco, J. A., Chairman of the VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 12.6.98.

Canas da Silva, A., Symplectic Geometry and Microlocal Analysis, a conference celebrating Victor Guillemin's 60th birthday, held at the Massachusetts Institute of Technology, Cambridge, Massachusetts, USA, September 1998.

Canas da Silva, A., Co-organizer of the Symplectic Geometry Seminar, University of California, Berkeley, USA, August-December 1998.

Costa, F. P., Co-organizer of the Conference on Dynamical Systems and Evolutionary Equations, in Honor of Jack K. Hale, IST, Lisbon, Portugal, 23.11.98 - 28.11.98.

Pacheco, A., Member of Organizing Committee, VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 12.6.98.

Paulino, C. D. M., Chairman of the Organizing Committee of the VI Congresso Anual da SPE, Tomar, Portugal, 09.6.98 - 12.6.98.

Picken, R. F., Member of the Organizing Committee:

- VII Oporto Meeting on Geometry, Topology and Physics, Oporto, Portugal, 5.6.98- 8.6.98.
- New Developments in Algebraic Topology, Faro, Portugal, 13.7.98 - 14.7.98.
- Lisbon School on Superstrings, Lisbon, Portugal, 16.12.98 - 18.12.98.

Pires, A. M., Member of Organizing Committee, VI Congresso Anual da SPE, Tomar, Portugal, 9.6.98 - 12.6.98.

Ramalhoto, M. F.:

- Member of the Technical Programme Committee of the ESREL'98 - International Conference on Safety and Reliability, Trondheim, Norway, 17.6.98 - 19.6.98.
- Organizer of the Session: Continuous Statistical Development for Employees in Technical Industries of the Area 3, Statistical Education for People in the Workplace of the International Conference on Teaching Statistics-ICOTS'5, Singapore, 21.7.98 - 26.7.98.
- Member of the Programme Committee, and Chairperson of Session V, of the First International Workshop on Retrieval Queues, Department of Statistics and Operation Research, Mathematics Faculty, Complutense University of Madrid, 22.9.98 - 24.9.98.

Rocha, C., Co-organizer of the Conference on Dynamical Systems and Evolutionary Equations, in Honor of Jack K. Hale, IST, Lisbon, Portugal, 23.11.98 - 28.11.98.

Sequeira, A., Chairman of the Session: Métodos Numéricos, National Meeting of SPM, Universidade do Minho, Braga, Portugal, 9.2.98 - 12.2.98.

Sernadas, A., Member of the Program Committee:

- CAISE98: 10th Conference Advanced Information Systems Engineering, Pisa, Italy. 8.6.98 - 12.6.98.
- FOSSACS: Foundations of Software Science and Computation Structures, Lisbon, Portugal. 30.3.98 - 3.4.98.
- FROCOS98: Frontiers of Combining Systems, Amsterdam, Netherlands. 2.10.98 - 4.10.98.
- 9th Conference on Data Base and Expert Systems Applications, Viena, Austria. 24.8.98 - 28.8.98.

8. Personal Notes

A Honours and Prizes

Câmara, M. C., Received the "Prémio José Anastácio da Cunha" awarded by the Sociedade Portuguesa de Matemática, 1998.

Lourenço, H., Received the "Prémio Nacional de Engenharia" awarded by the Ordem dos Engenheiros, November 1998.

Morais, M. C. and Pacheco, A., Received the "Best Poster SPE-98 Award" - 2nd Prize (ex-aequo) with the poster entitled "Comparação estocástica de tempos de primeira passagem: uma aplicação a controlo de qualidade, filas de espera e fiabilidade", VI Congresso Anual da SPE, Tomar, Portugal.

Nunes, C., Received the Prize of SPE'98, entitled "Estimação Paramétrica em MMPP's".

Oliva, W., Nominated Member of the "Academia Brasileira de Ciências", (Elected in November 1998).

Oliveira, M. R., Maia, J. A. and Branco, J. A., Received the "Best Poster SPE-98 Award" - 2nd Prize (ex-aequo) with the poster entitled "Análise dos efeitos do treino em jovens futebolistas", VI Congresso Anual da SPE, Tomar, Portugal.

B New Professors and Promotions

Dionísio, F., Professor Auxiliar.

Florentino, C., Professor Auxiliar.

Gouveia, M. P., Professora Auxiliar.

Nunes, J. P., Professor Auxiliar.

Resende, P., Professor Auxiliar.

Santos, P. A., Professor Auxiliar.

Vaz Pinto, M., Professora Auxiliar.

C Other Degrees Supervised by Members of the Department

Pires, A. M., Supervisor of the Master thesis, "Métodos não paramétricos em Análise Discriminante", (Soares, R.), Instituto Superior de Economia e Gestão, Universidade Técnica de Lisboa, Portugal, 28.1.98.

D Other Notes

Abreu, M.:

- Visiting Research, SUNY at Stony Brook University, USA, June 1998, for scientific collaboration with Dusa McDuff.

Abreu, M., Canas da Silva, A. Fernandes, R. L. and Nunes, J. P., Organizers of the Conference on Symplectic Geometry, to be held in Lisbon, Portugal, June 1999.

Barreira, L.:

- Sistemas Dinâmicos, Convénio ICCTI/CNPq-98 with M. Viana in Brazil
- Ergodic theory and dimension theory of dynamical systems with non-zero Lyapunov exponents and semi-dispersive billiards, Acção Integrada Luso-Húngara ICCTI/OMFB, with D. Szász in Hungary.
- Dimension theory, multifractal analysis and rigidity, and applications to dynamical systems and ergodic theory, Acção Integrada Luso-Alemã A-10/98, CRUP, with B. Fiedler in Germany.
- Topics in dynamical systems, dimension theory and multifractal rigidity, CRG 970161, Collaborative Research Grant Programme, NATO, with Ya. Pesin in the USA.
- Executive Editor of *Portugaliae Mathematica*.
- Editor of the Section "Permanent Forum for Mathematical Research", *Boletim da Sociedade Portuguesa de Matemática*.

Barreira, L., Duarte, P. and Fernandes, R. L., Organizers of the Conference "Workshop on Smooth Ergodic Theory", to be held in IST, Lisbon, Portugal, 29.3.99 - 31.3.99.

Canas da Silva, A., Featured in Selections from MSRI's Video Archive, Vol. 1, Spring 1998.

Carmo, J., Member of the Program Committee of the Fifth International Workshop on Deontic Logic in Computer Science, Toulouse, France. 20.1.00-22.1.00.

Cordovil, R.:

- Co-organizer of the seminar on Geométries Combinatoires: Matroides Orientés, Matroides et applications, CIRM, Luminy-Marseille, France, 14.11.99 - 19.11.99.
- Invited Professor of the Paris 6 University, France, May 1998.
- Member of the Project PRAXIS/2/2.1/MAT/125/94

de Sousa Dias, E., Short term grant award by Fundação Calouste Gulbenkian, for Scientific Collaboration with M. Roberts, University of Warwick, July 1998.

Florentino, C. and Nunes, J. P., Organizers of the School in Singularities in Algebraic Geometry and String Theory, Centro Interdisciplinar, Lisboa, July 1999.

Freitas, P., Co-organizer of the International Conference on Functional Differential and Difference Equations, to be held in Lisbon, July 1999.

Matias, J. and Matos, J. P., Co-organizers of the International Conference "New Trends in the Calculus of Variations", to be held in Lisbon, October 1999.

Nunes, J. P.:

- Post-Doctoral Research Associate, Physics Dep., Brown University, Providence, RI, USA, June-August 1998.
- Co-Organizer of the First IST Lecture Series in Algebraic Geometry and Physics, to be held in IST, Lisbon, Portugal, February 1999.

Pacheco, A., Book review: Estatística Aplicada. *Boletim Informativo da SPE*, **1/98**, (1998), 7-14.

Paulino, C. D. M., President of the Editorial Committee of the Proceedings of the VI Congresso Anual da SPE.

Picken, R. F., Member of the Organizing Committee, VIII Oporto Meeting on Geometry, Topology and Physics, to be held in Porto, Portugal, 2.7.99 - 5.7.99.

Ramalhoto, M. F.,

- Member of the "Júri de Doutoramento em Engenharia Mecânica", Iordan Ivanov Garbatov, Thesis: Reliability Assessment of Maintained Ship Hull Subjected to Corrosion and Fatigue.
- Visiting Fellow at Princeton University, 1.3.98 - 8.9.98.
- Awarded SEFI-Fellow-98.
- Member of an Evaluation Committee for Promotion to the Rank of Full Professor at Pohang University of Science and Technology, Korea, 1998.
- Guest Editor of the special issue of the "European Journal of Engineering Education" on Research and Education in Quality Control, Maintenance, Reliability, Risk Analysis and Safety.

Rocha, C.:

- Coordinator of the Research Project "PII-093, Laboratório de Matemática - Um espaço de experimentação e investigação", Programa Ciência Viva, 1998.
- Coordinator of the Program "Ciência Viva nas Férias", Centro de Análise Matemática, Sistemas Dinâmicos e Aplicações à Engenharia, 1998.
- Review in the collection "Featured Reviews in Mathematical Reviews 1995-1996", AMS, 1998.

- Co-organizer with Amann, H. and Rodrigues, J. F. of the Workshop on Nonlinear Parabolic Problems, Nonlinear Partial Differential Equations, Centro de Matemática e Aplicações Fundamentais da UL and Centro de Análise Matemática, Geometria e Sistemas Dinâmicos do IST, to be held in Lisbon, Portugal, May 1999.

Sequeira, A.:

- Member of the Scientific Committee of the International Conference on Differential Equations, Numerical Analysis and Nonlinear Mechanics, to be held in the University of Central Florida, Orlando, EUA, 17.3.99 - 19.3.99.
- Chairman of the Thematic Term on Theoretical and Computational Fluid Dynamics, CIM, to be held in Coimbra, Portugal, May, June and July 1999.
- Member of the Organizing Committee of the Workshop Theoretical Fluid Dynamics and Related Topics, to be held in Lisbon, Portugal, 16.6.99 - 19.6.99, organized by CMAF/UL in collaboration with CMA/IST and AMIF/ESF, (part of the Thematic Semester on Nonlinear Partial Differential Equations and Applications).
- Member of the Scientific Committee of the Seventh International Conference on Navier-Stokes Equations and Related Nonlinear Problems, to be held in Ferrara, Italy, 19.9.99 - 24.9.99.
- Member of the Organizing Committee of the International Conference on Partial Differential Equations and Applications, in honour of Prof. J. Necas, 70th. birthday, to be held in Olomouc, Czech Republic, 12.12.99 - 15.12.99.
- Co-editor of the book Applied Nonlinear Analysis - in honor of Professor Jindrick Necas'70th. birthday, Plenum Press Pub., 1999.
- Member of the jury of the PhD thesis: Patrick Dutto, Solutions Physiquement Raisonnables des Équations de Navier-Stokes Compressibles Stationnaires dans un Domaine Extérieur du Plan, Thèse de Doctorat, Université de Toulon et du Var, France, January 1998.
- Member of the jury of the PhD thesis: Frédéric Alliot, Étude des Équations Stationnaires de Stokes et Navier-Stokes dans des Domaines Extérieurs, Thèse de Doctorat, ENPC-CERMICS, Marne-la-Vallée, France, July 1998.
- Member of the jury of the PhD thesis: Pedro Ferreira, Diffraction d'Ondes Électromagnétiques par des Structures Périodiques Courbes, Thèse de Doctorat, CMAP, École Polytechnique, Palaiseau, France, November 1998.

Sernadas, A.:

- Member of the Program Committee of CAISE99: 11th Conference on Advanced Information Systems Engineering, Heidelberg, Germany. 14.6.99 - 18.6.99.
- Member of the Program Committee of LICS99, Trento, Italy. 2.7.99 - 10.7.99.
- Member of the Program Committee of the 10th Conference on Data Base and Expert Systems Applications, Florence, Italy. 30.8.99 - 3.9.99.

- Member of the Program Committee of CAISE2000: 12th Conference on Advanced Information Systems Engineering, Stockholm, Sweden. 5.6.2000 - 9.6.2000.

Sernadas, C., Member of the jury of the PhD thesis, Sophie Coudert, Mathematics and Computer Science, University of Évry, France, December 1998.

Vaz Pinto, M., Organizer of the Lectures:

- Álgebra Comutativa, Linkage e Homologia de Koszul, by Polini, C., State University, USA, Centro de Álgebra da Universidade de Lisboa, Portugal, 22.6.98 - 25.6.98.
- Complete Intersection Rings in Number Theory, by Zarzuela, S., Visiting Professor, Universidad de Barcelona, Centro de Álgebra da Universidade de Lisboa, Portugal, 3.9.98 - 8.9.98.

Videman, J. H., Member of the Organizing Committee of the Thematic Term on Theoretical and Computational Fluid Dynamics, CIM, to be held in Coimbra, Portugal, May, June and July 1999.

PREPRINT SERIES**1998**

- 1/98 PENZEL, Frank: On the Solution of Integral Equations on the Circular Disk by Use of Orthogonal Polynomials. 23pp.
- 2/98 FIEDLER, Bernold; ROCHA, Carlos: Realization of Meander Permutations by Boundary Value Problems. 40pp.
- 3/98 CASTRO, L.P.; SPECK, F. - O.: Relations Between Convolution Type Operators on Intervals and on the Half-Line. 26pp.
- 4/98 NOVOTNY, A.; SEQUEIRA, A.; VIDEMAN, J., H.: Steady Motions of Viscoelastic Fluids in 3-D Exterior Domains - Existence, Uniqueness and Asymptotic Behaviour. 19pp.
- 5/98 MATEUS, P.; SERNADAS, A.; SERNADAS, C.: Aggregation and Interconnection of Probabilistic Automata: Categorical Characterization. 15pp.
- 6/98 DUARTE, P.: Persistent Homoclinic Tangencies for Conservative Maps near the Identity. 47pp.
- 7/98 DUARTE, P.: Abundance of Elliptic Isles at Conservative Bifurcations. 16pp.
- 8/98 CASTELO, A., TOMÉ, M. F., CÉSAR, C. N. L., MCKEE, S., CUMINATO, J.A.: Freeflow: An Integrated Simulation System for Three-Dimensional Free Surface Flows. 22pp.
- 9/98 TOMÉ, M. F., MCKEE, S., BARRATT, L., JARVIS, D. A., PATRICK, A. J.: An Experimental and Numerical Investigation of Container Filling. 22pp.
- 10/98 GUERRA, S., RYAN, M., SCHOBENS, P.-Y.: Modular Specifications with Exceptions: On the Properties of a Default Institution. 19pp.
- 11/98 SAMKO, S. G.: A new Approach to the Inversion of the Riesz Potential Operator. 19pp.
- 12/98 CÂMARA, M. C., Dos SANTOS, A. F.: Wiener-Hopf Factorization of a Generalized Daniele-Khrapkov Class of 2×2 Matrix Symbols. 25pp.
- 13/98 DIOGO, T., FRANCO, N. B.: High Order Product Integration Methods for a Volterra Integral Equation with Weakly Singular Kernel. 20pp.
- 14/98 PENZEL, Frank: A Boundary Integral Method Applied to a Convection-Diffusion Problem. 8pp.
- 15/98 ALVES, J. F., SOUSA RAMOS, J.: Kneading Theory: A Functorial Approach. 22pp.

- 16/98 LAMPREIA, J. P., SEVERINO, R.; SOUSA RAMOS, J.: Renormalizations for Trimodal Maps. 10pp.
- 17/98 PENZEL, F., TEIXEIRA, F. S.: The Helmholtz Equation in a Quadrant with Robin's Conditions. 15pp.
- 18/98 CORDOVIL, Raul: The Fundamental Group of the Complement of the Complexification of a Real Arrangement of Hyperplanes. 21pp.
- 19/98 MATUSU-NECASOVÁ, S., SEQUEIRA, A., VIDEMAN, J. H.: Existence of Classical Solutions for Compressible Viscoelastic Fluids of Oldroyd Type past an Obstacle. 14pp.
- 20/98 FLORENTINO, C. A. A.: Schottky Uniformization and Vector Bundles over Riemann Surfaces. 19pp.
- 21/98 SANTOS, P. A.: Spline Approximation Methods with Uniform Meshes in Algebras of Multiplication and Convolution Operators. 34pp.
- 22/98 ALVES, C., HA-DOUNG, T., PENZEL, F.: On the Identification of Cracks or Cavities by Finitely Many Boundary Measurements. 14pp.
- 23/98 GRAÇA, M. M.: A retardement approach to convergence acceleration. 22pp
- 24/98 GRAÇA, M. M.: Formal and quasi-formal sequence transformations for monotone sets. 25pp.
- 25/98 ALVES, J. F., SOUSA RAMOS, J.: Zeta function of a tree map. 20pp.
- 26/98 CASTRO, L. P., SPECK, F.-O.: An Operator approach to boundary value problem for the Helmholtz equation. 21pp.
- 27/98 KARAPETIANTS, N. K., SAMKO, S. G.: Multi-Dimensional integral operators with homogeneous kernels. 28pp.
- 28/98 KARLOVICH, Y. I., SPITKOVSKY, I. M., WAOLKER, R. A.: Almost periodic factorization of block triangular matrix functions revisited. 35pp.
- 29/98 RESENDE, P.: Modular specification of concurrent systems with observational logic. 15pp.
- 30/98 CÂMARA, M. C., Dos SANTOS, A. F.: Wiener-Hopf factorization for a class of oscillatory symbols. 27pp.
- 31/98 ALVES, C. J.S.: Numerical simulations on resonance poles the trapping case of two plane cracks. 13pp.
- 32/98 COSTA, F. P.: Convergence to equilibria of solutions to the coagulation-fragmentation equations. 12pp.

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