



Center for Mathematical Analysis, Geometry, and Dynamical Systems

Report 2004

April 2005

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1. Research Report for 2004

1.1 *Distinguished Visitors*

The following researchers visited the Center in 2004:

- D. Andrica, University of Clus, Romenia, 13-20.03.04.
F. Balibrea, Universidad de Murcia, Spain, 25-30.01.04.
C. Barbarosie, Universidade de Lisboa, Portugal, 27.04.04.
M. Bardi, Università di Padova, Italy, 1-7.11.04.
P. Baum, Pennsylvania State University, USA, 10-15.01.04.
J. Bioucas Dias, Instituto Superior Técnico, Lisboa, Portugal, 3.12.04.
R. Carles, Université Bourdeaux I, France and Centro de Matemática e Aplicações Fundamentais, Lisboa, Portugal, 23.01.04 and 2-10.11.04.
F. Chalub, Universidade de Lisboa, Portugal, 16.01.04.
L. Consiglieri, Universidade de Lisboa, Portugal, 26.03.04.
J. Correia, Universidade de Évora, Portugal, 30.04.04.
A. Domingos, Universidade de Lisboa, Portugal, 12.03.04.
B. Dubrovin, SISSA, Italy, 7-11.09.04.
D. Dugger, University of Oregon, USA, 15-25.07.04.
S. Elaydi, Trinity University, San Antonio, USA, 21-28.11.04.
J. Faria Martins, Instituto Superior Técnico, Lisboa, Portugal, 16.11.04.
S. Fernandes, Universidade de Évora, Portugal, 29.01.04.
M. Figueiredo, Instituto Superior Técnico, Lisboa, Portugal, 6.02.04.
C. Florentino, Instituto Superior Técnico, Lisboa, Portugal, 29.04.04.
I. Fonseca, Carnegie Mellon University, Pittsburgh, USA, 12-31.07.04.
D. Forge, LRI, Université Paris XI, Orsay, France, 5-14.09.04.
A. Garcia, Institut National de Recherche en Informatique et en Automatique, France, 5.03.04.
P. Gimenez, Universidad de Valladolid, Spain, 11-15.12.04.
P. Gonçalves, Instituto Superior Técnico, Lisboa, Portugal, 9.01.04.
M. Grandis, Università degli Studi di Genova, Italy, 8-16.02.04.
J. Guirao, Universidad de Castilla, La Mancha, Spain, 25-30.01.04.
T. Harmark, Niels Bohr Institute, Denmark, 18-25.01.04.
M. Holland, University of Surrey, UK, 13.01-22.01.04.
W. Jarczyk, University of Zielona Góra, Poland, 17-24.09.04.
R. Jerrard, University of Toronto, Canada, 19-23.06.04. equations, 23.06.04.
N. Kitchloo, Johns Hopkins University, USA, 27.06-19.07.04.
J. Lamb, Imperial College, UK, 14-19.10.04.
D. Lannes, Université Bordeaux I, France, 24-29.10.04.
G. Leoni, Carnegie Mellon University, Pittsburgh, USA, 19-31.07.04.
P. Lima-Filho, Texas A & M, USA, 28.02-9.04.04.

J. Lopes Dias, Instituto Superior de Economia e Gestão, Lisboa, Portugal, 19.11.04 and 10.12.04.

R. Lozi, Institute Universitaire de Formation des Maîtres, Nice, France and Université de Nice, Sophia-Antipolis, France, 25.05-2.06.04.

M. Marino, CERN, Switzerland, 25-28.2.04.

D. Martelli, Imperial College, UK, 20-27.06.04.

A. Martins, Instituto Superior Técnico, Lisboa, Portugal, 5.11.04.

A. Martins, Universidade de Lisboa, Portugal, 30.11.04.

J. Marklof, University of Bristol, UK, 31.05-4.06.04.

P. Mateus, Instituto Superior Técnico, Lisboa, Portugal, 2.04.04.

P. Matias, Instituto Superior Técnico, Lisboa, Portugal, 14.10.04.

D. Milutinovic, Instituto Superior Técnico, Lisboa, Portugal, 19.03.04.

J. Mourão, Instituto Superior Técnico, Lisboa, Portugal, 22.04.04 e 27.04.04.

J. Nelson, Università delgi Studi di Torino, Italy, 17-20.11.04.

J. Neves, Universidade de Coimbra, Portugal, 25.05.04.

F. Ngakeu, Université de Donala, Cameroon, 11-20.01.04.

S. Oliva, Universidade de São Paulo, Brazil, 8.07.04.

A. Ornelas, Universidade de Évora, Portugal, 13.02.04.

P. Padilla, Universidade Nacional Autónoma de México, Mexico, 26.09-3.10.04.

A. Pascoal, Instituto de Sistemas e Robótica, Lisboa, Portugal, 2.04.04.

A. Plahkov, Universidade de Aveiro, Portugal, 20.02.04 and 21.05.04.

F. Planchon, Université Paris 13, France, 4-10.05.04.

R. Plymen, Manchester University, UK, 13-17.01.04.

M. Pinsonnault, University of Toronto, Canada, 11-15.07.04.

M. Ramos, Universidade de Lisboa, Portugal, 16.3.04 and 28.05.04.

M. Rieger, Scuola Normale Superiore di Pisa, Italy, 26.01-4.02.04.

J. Rodrigues, Universidade de Lisboa, Portugal, 23.03.04.

I. Salavessa, Instituto Superior Técnico, Lisboa, Portugal, 12.10.04.

A. Sharkovsky, Institute of Mathematics, Kiev and National Academy of Sciences of Ukraine, Ukraine, 9.05-8.06.04.

J. Sobrinho, Instituto Superior Técnico, Lisboa, Portugal, 14.05.04.

B. Steirteghem, Columbia University, USA, 5-10.07.04.

H. Stimming, Wolfgang Pauli Institute, Germany, 28.11-5.12.04.

K. Stroyan, University of Iowa, USA, 3-12.07.04.

A. Toader, Universidade de Lisboa, Portugal, 16.04.04.

J. Urbano, Universidade de Coimbra, Portugal, 14.05.04.

E. Valdinocci, Università di Roma II, Italy, 12-18.04.04.

J. Videman, Instituto Superior Técnico, Lisboa, Portugal, 20.01.04.

O. Villamayor, Universidad Autonoma de Madrid, Spain, 26-30.09.04.

S. Vinagre, Universidade de Évora, Portugal, 23.09.04.

1.2 *Seminars*

➤ *Mathematical Analysis, Geometry, and Dynamical Systems Seminar*

This is the main seminar of the Center. It included the following talks in 2004:

- Philippe Gimenez (Universidad de Valladolid)
Sparse changes of coordinates for computing the Castelnuovo-Mumford regularity, 14/12/04.
- Godofredo Iommi (Centro de Análise Matemática, Geometria e Sistemas Dinâmicos)
Multifractal analysis for countable Markov shifts, 30/11/04.
- Saber Elaydi (Trinity University, San Antonio)
Global stability in autonomous and nonautonomous discrete dynamical systems II, 25/11/04.
- Saber Elaydi (Trinity University, San Antonio)
Global stability in autonomous and nonautonomous discrete dynamical systems I, 23/11/04.
- Pedro Silva Santos (Instituto Superior Técnico)
A-quasi-convexity, 16/11/04.
- Rémi Carles (Université Bordeaux I e Centro de Matemática e Aplicações Fundamentais)
Schrödinger equations with potential and hyperbolic Hamiltonian, 9/11/04.
- David Lannes (Université Bordeaux I)
Well-Posedness of the water-waves equations, 26/10/04.
- Jeroen Lamb (Imperial College, London)
The geometry of Penrose tilings: projection and substitution, 19/10/04.
- Katrin Gelfert (Centro de Análise Matemática, Geometria e Sistemas Dinâmicos)
Multifractal analysis for Lyapunov exponents, 12/10/04.
- Carlos Rocha (Instituto Superior Técnico)
Attractors for semilinear parabolic equations on the circle, 28/9/04.
- Irene Fonseca (Carnegie Mellon University, Pittsburgh)
Second order variational problems, 27/7/04.
- Giovanni Leoni (Carnegie Mellon University, Pittsburgh)
Optimal regularity for free boundary problems and a conjecture of De Giorgi, 20/7/04.
- Sérgio Oliva (Universidade de São Paulo)
Discretization of unidimensional functional partial equations, 8/7/04.
- Bart Van Steirteghem (Columbia University)
A classification of affine smooth spherical varieties, 6/7/04.
- Pierre Martinetti (Centro de Análise Matemática, Geometria e Sistemas Dinâmicos)
Renormalization and Hopf algebras, 29/6/04.
- Philippe Monnier (Centro de Análise Matemática, Geometria e Sistemas Dinâmicos)
A cohomology associated to a function, 22/6/04.
- Luis Barreira (Instituto Superior Técnico)
Stability of nonautonomous differential equations, 15/6/04.
- Jens Marklof (University of Bristol)
Ergodic theory and the distribution of n^2x modulo one, 1/6/04.
- João Lopes Dias (Centro de Análise Matemática, Geometria e Sistemas Dinâmicos)
Floquet solutions for linear ODEs with quasiperiodic coefficients, 18/5/04.

- David Krejcirik (Centro de Análise Matemática, Geometria e Sistemas Dinâmicos)
A lower bound to the spectral threshold in curved tubes, 11/5/04.
- Fabrice Planchon (Université Paris 13)
Dispersion for Schrödinger equations with variable coefficients and applications, 4/5/04.
- José Mourão (Instituto Superior Técnico)
Generalized theta functions, 27/4/04.
- Jorge Buescu (Instituto Superior Técnico)
Integral equations, positive matrices, and reproducing kernel inequalities, 20/4/04.
- Margarida Mendes Lopes (Instituto Superior Técnico)
Godeaux surfaces with an involution, 5/4/04.
- Luis Barreira (Instituto Superior Técnico)
Ergodic theory and cohomology, 30/3/04.
- José Francisco Rodrigues (Universidade de Lisboa)
The N-membranes problem for nonlinear degenerate systems, 23/3/04.
- Miguel Ramos (Universidade de Lisboa)
Asymptotic properties of the ground-state solutions of singularly perturbed elliptic Hamiltonian systems, 16/3/04.
- Pedro Resende (Instituto Superior Técnico)
Noncommutative topology and quantales, 9/3/04.
- João Alves (Instituto Superior Técnico)
Topological entropy and homological growth on graphs, 2/3/04.
- Henrique Oliveira (Instituto Superior Técnico)
Iterates of nonpolynomial maps, 3/2/04.
- Marc Oliver Rieger (Scuola Normale Superiore, Pisa)
Young measures - basic ideas and recent applications, 27/1/04.
- Mark Holland (University of Surrey)
Nonuniformly hyperbolic dynamics and Lorenz attractors, 20/1/04.

➤ *Geometria em Lisboa Seminar*

It included the following talks in 2004:

- Bart Van Steirteghem (Centro de Análise Matemática, Geometria e Sistemas Dinâmicos)
A classification of smooth affine spherical varieties. Why? and how, 14/12/04.
- Ana Rita Dias Martins (Universidade de Lisboa)
Representations of real semisimple Lie groups and D-modules, 30/11/04.
- João Faria Martins (Instituto Superior Técnico)
Observables of the Turaev-Viro invariant and invariants of embedded graphs, 16/11/04.
- Rui Loja Fernandes (Instituto Superior Técnico)
Rigidity and flexibility in Poisson geometry, 2/11/04.
- Isabel Salavessa (Instituto Superior Técnico)
Angles of minimal submanifolds, 12/10/04.
- Orlando Villamayor (Universidad Autonoma de Madrid)
On constructive resolution of singularities, 28/9/04.

- Martin Pinsonnault (University of Toronto)
Hamiltonian S1 and T2 actions on 4-manifolds and J-holomorphic curves, 13/7/04.
- Bruno de Oliveira (University of Miami)
Hyperbolicity of nodal hypersurfaces and Kobayashi's conjecture, 8/7/04.
- Nitu Kitchloo (Johns Hopkins University)
Atiyah dual of a loop space and the Witten Genus, 29/6/04.
- Miguel Abreu (Instituto Superior Técnico)
Topology of symplectomorphism groups and spaces of complex structures, 8/6/04.
- Jorge Neves (Universidade de Coimbra)
Surfaces of general type and weighted Grassmannians, 25/5/04.
- João Pimentel Nunes (Instituto Superior Técnico)
Geometric applications of the coherent state transform., 11/5/04.
- Matthew Perlmutter (Centro de Análise Matemática, Geometria e Sistemas Dinâmicos)
Singular reduction of cotangent bundles, 20/4/04.
- Paulo Lima-Filho (Texas A & M)
Ternary trees, operads and polynomial maps, 6/4/04.
- Hui Li (Centro de Análise Matemática, Geometria e Sistemas Dinâmicos)
The fundamental group of symplectic manifolds with rank 1 Hamiltonian Lie group actions, 16/3/04.
- Marcos Marino (CERN and Instituto Superior Técnico)
Topological strings and integrable hierarchies, 26/2/04.

➤ *Partial Differential Equations Seminar*

It included the following talks in 2004:

- João Paulo Teixeira (Instituto Superior Técnico).
A hyperfinite approach to a system of diffusion-advection equations, 17/12/04.
- João Lopes-Dias (Instituto Superior de Economia e Gestão).
Renormalization of quasi-periodic motion - II, 10/12/04.
- Hans Peter Stimming (Wolfgang Pauli Institute).
Introduction to Wigner measures and applications in the mathematical theory of quantum mechanics - II, 2/12/04.
- Hans Peter Stimming (Wolfgang Pauli Institute).
Introduction to Wigner measures and applications in the mathematical theory of quantum mechanics - I, 30/11/04.
- João Lopes-Dias (Instituto Superior de Economia e Gestão).
Renormalization of quasi-periodic motion - I, 19/11/04.
- Diogo Gomes (Instituto Superior Técnico).
A short course on Aubry-Mather theory and partial differential equations - V, 12/11/04.
- Diogo Gomes (Instituto Superior Técnico).
A short course on Aubry-Mather theory and partial differential equations -IV, 29/10/04.
- Diogo Gomes (Instituto Superior Técnico).
A short course on Aubry-Mather theory and partial differential equations - III, 22/10/04.

- Diogo Gomes (Instituto Superior Técnico).
A short course on Aubry-Mather theory and partial differential equations - II, 15/10/04.
- Diogo Gomes (Instituto Superior Técnico).
A short course on Aubry-Mather theory and partial differential equations - I, 8/10/04.
- Pablo Padilla (Universidad Nacional Autónoma de México).
Topological properties of bubble clusters, 1/10/04.
- Robert Jerrard (University of Toronto).
Jacobian estimates for Ginzburg-Landau equations, 23/6/04.
- Miguel Ramos (Universidade de Lisboa).
An open problem on the existence of nonzero solutions for a class of superlinear elliptic equations, 28/5/04.
- Alexander Plakhov (Universidade de Aveiro).
The problem of minimal resistance of a rotating body and problems of mass transport, 21/5/04.
- José Miguel Urbano (Universidade de Coimbra).
Regularity results for doubly nonlinear PDEs, 14/5/04.
- Joaquim Correia (Universidade de Évora).
Aproximações às leis de conservação hiperbólicas, 30/4/04.
- Cristian Barbarosie (Universidade de Lisboa).
Shape optimization and inverse homogenization, 27/4/04.
- Enrico Valdinocci (Università di Roma II).
Quasi-periodic solutions for the n body problem, 16/4/04.
- Anca-Maria Toader (Universidade de Lisboa).
A level-set method for shape optimization, 13/4/04.
- Luísa Consiglieri (Universidade de Lisboa).
Weak and strong solutions for thermoconvective flows, 26/3/04.
- Dejan Milutinovic (Instituto Superior Técnico).
Stochastic micro agents, 19/3/04.
- Ana Rute Domingos (Universidade de Lisboa).
Resultados do tipo Liouville para um sistema de quarta ordem em R^N , 12/3/04.
- Alexandre Plakhov (Universidade de Aveiro).
Newton's problem of minimal resistance: the case of multiple collisions, 20/2/04.
- António Ornelas (Universidade de Évora).
Existence and regularity for minimizers of nonconvex coercive scalar 1-dimensional integrals with nonlower semicontinuous autonomous Lagrangian, 13/2/04.
- Juha Videman (Instituto Superior Técnico).
Modified Reynolds equation for thin viscous flows, 30/1/04.
- Rémi Carles (Centre National de la Recherche Scientifique, Universités Bordeaux).
Changing blow-up time in nonlinear Schroedinger equations, 23/1/04.
- Fabio Chalub (Universidade de Lisboa).
Kinetic models for chemotaxis, 16/1/04.

➤ *Spectral Theory Seminar*

It included the following talks in 2004:

- Carlos Florentino (Instituto Superior Técnico)
Geometry and spectral theory of modular curves, 3/6/04.
- Ana Bela Cruzeiro (Instituto Superior Técnico)
Derivation formulae for heat kernels associated with some elliptic operators., 27/5/04.
- Ana Bela Cruzeiro (Instituto Superior Técnico)
Probabilistic approach to the existence of fundamental solutions associated to hypoelliptic operators., 20/5/04.
- Jorge Silva (Instituto Superior Técnico)
A theorem on the spectral asymptotics of $P1/m$, on a compact manifold, where P is an elliptic, self-adjoint linear partial differential operator of order m , 13/5/04.
- Jorge Silva (Instituto Superior Técnico)
Fourier Integral Operators: the construction of parametrices for strictly hyperbolic Cauchy problems, 29/4/04.
- Jorge Silva (Instituto Superior Técnico)
A review of methods for obtaining approximate fundamental solutions to linear PDEs: Pseudodifferential operators and Fourier integral operators, 22/4/04.

➤ *Mathematical Physics Seminar*

It included the following talks in 2004:

- Pedro Matias (IST).
Geometric quantization, complex structures and the coherent state transform, 14/10/04.
- Carlos Florentino (IST).
Soliton equations and the infinite Grassmannian, 29/4/04.
- José Mourão (IST).
Krichever-Phong universal configuration spaces and symplectic forms, 22/4/04.
- Troels Harmark (Niels Bohr Institute).
Phases of Kaluza-Klein black holes, 22/1/04.

➤ *Discrete Dynamical Systems Seminar*

It included the following talks in 2004:

- Alexander Sharkovsky (Institute of Mathematics, Kiev and National Academy of Sciences of Ukraine)
Descriptive estimates of sets in dynamical systems theory, 26/5/04.
- René Lozi (Université de Nice, Sophia-Antipolis)
Giga-periodic orbits for very weakly coupled tent and logistic discretized maps, 26/5/04.
- João F. Alves (Instituto Superior Técnico)
Dynamical zeta functions on infinite trees, 26/5/04.

➤ *Algebra Seminar*

It included the following talks in 2004:

- Daniel Dugger (University of Oregon)
The Hurwitz sum-of-squares problem meets motivic cohomology, 21/7/04.

➤ *Mathematics, Systems and Robotics Seminar*

In collaboration with ISR-IST. It included the following talks in 2004:

- 9/01/04:
 - Paulo Gonçalves (Instituto Superior Técnico), Diverging moments and parameter estimation
 - Jorge Silva (Instituto Superior Técnico), Wavelets and applications
- 6/02/04:
 - Gabriel Pires (Instituto Superior Técnico), Partial differential equations and image processing
 - Mário Figueiredo (Instituto Superior Técnico), iterative algorithms for wavelet-based image restoration
- 5/03/04:
 - Andrés García (Institut National de Recherche en Informatique et en Automatique), The concept of controlled eigenvectors for affine nonlinear systems applied to vehicle formations control
 - Diogo Gomes (Instituto Superior Técnico), Optimal control and viscosity solutions
- 2/04/04:
 - Paulo Mateus (Instituto Superior Técnico), An overview of quantum computation
 - António M. Pascoal (Instituto Superior Técnico), Dynamical systems and marine robotics: from theory to practice
- 14/05/04:
 - João Luís Sobrinho (Instituto Superior Técnico), An algebraic theory of network routing
 - Rui Loja Fernandes (Instituto Superior Técnico), Symmetry beyond groups
- 5/11/04:
 - André T. Martins (Instituto Superior Técnico), Estimating camera orientation from video in a Manhattan world
 - Martino Bardi (Università di Padova, Italy), The dynamic programming approach to differential games
- 3/12/04:
 - João Pimentel Nunes (Instituto Superior Técnico), From Maxwell to the matrix

- José Bioucas Dias (Instituto Superior Técnico), Absolute phase estimation

➤ *Colloquium*

This is the Colloquium of the Department of Mathematics of Instituto Superior Técnico, jointly supported with CEMAT-IST AND CLC-IST. It included the following talks in 2004:

- Martin Davis (Professor Emeritus, Courant Institute, New York University).
Gödel's legacy, 30/9/04.
Jointly organized with LabMag, Fundação da Faculdade de Ciências.

1.3 Conferences and Short Courses

The following Conferences and Short Courses were organized or co-organized by members of the Center in 2004:

- YERM2004 – Young European Network under the Human Potential Program, IST, January 13-17, 2004.

Lecturers:

- R. Tudoran, Ecole Polytechnique Federale de Lausanne
- J. Fejoz, Institut de mathematiques, Universite P. & M. Curie
- L. Sbano, University of Warwick
- D. Torres, University of Aveiro
- T. Golinski, University in Bialystok
- N. Chtcherbakova, Scuola Internazionale Superiore di Studi Avanzati, Italy
- A. Giacobbe, Utrecht University
- M. Vuk, University of Ljubljana
- T. Sauvaget, University of Nottingham
- T. Schmäh, University of Warwick
- A. Ramos, Università degli studi di Padova
- M. Rodriguez-Olmos, Instituto Superior Técnico
- K. Efstathiou, Université du Littoral
- R. Prieto, Consejo Superior de Investigaciones Científicas
- C. Stoica, University of Surrey
- U. Serres, Scuola Internazionale Superiore di Studi Avanzati, Italy
- V. Planas-Bielsa, Institut non Lineaire de Nice
- P. Matias, Instituto Superior Técnico

<http://www.inln.cnrs.fr/~planas/WebYerm/>

- Directed combinatorial homology and noncommutative geometry, IST, February 9-12, 2004.
Lecturer:
M. Grandi (Università degli Studi di Genova, Italy)

http://www.math.ist.utl.pt/~pmr/corso_grandis/
- IST Courses on Algebraic Geometry I - Techniques of Algebraic Geometry, IST, May 3-5, 2004.
Lecturers:
B. Fantechi (SISSA),
R. Pardini (Università di Pisa).

<http://www.math.ist.utl.pt/~mmlopes/CourseAG.html>
- V Lisbon Summer Lectures in Geometry, IST, June 15-18, 2004.
Lecturers:
N. Mishachev (Lipetsk Technical University, Russia),
R. Nest (University of Copenhagen).

<http://www.math.ist.utl.pt/galg/SummerLect04/>
- Modern Trends in String Theory II, FCUP, June 21-26, 2004.
Lecturers:
J. de Boer (Universiteit van Amsterdam, Amsterdam),
G. Gibbons (University of Cambridge, Cambridge),
S. Minwalla (Harvard University, Cambridge),
L. Rastelli (Princeton University, Princeton),
A. Sagnotti (Università di Roma Tor Vergata, Rome),
C. Teitelboim (CECS, Valdivia).

<http://www.math.ist.utl.pt/~strings/MTST2>
- Conference on Nonstandard Mathematics, UA, July 5-10, 2004.
Main lecturers:
I. van den Berg, (University of Évora, Portugal),
N. Cutland, (University of Hull, England),
F. Diener, (University of Nice, France),
R. Jin, (College of Charleston, USA),
H. Jerome Keisler, (University of Wisconsin, Madison, USA),
P. Loeb, (University of Illinois, Urbana-Champaign, USA),

E. Nelson, (Princeton University, USA),
D. Ross, (University of Hawaii, USA),
T. Sari, (University of Haute-Alsace, France),
K. Stroyan (University of Iowa, USA),
M. Wolff, (University of Tübingen, Germany).

<http://www.mat.ua.pt/eventos/nsmath2004/>

- Workshop on Algebraic Geometry and Physics (WAGP04), IST, 7-12 September 2004.

Minicourses by:

S. Katz (University of Illinois),
M. Mariño (CERN, Geneve and Instituto Superior Técnico, Lisbon),
R. Pandharipande (Princeton University),
P. van Moerbeke (Louvain University & Clay Mathematical Institute).

Seminars by:

E. Aldrovandi (Florida State University),
B. Andreas (Humboldt Universitaet, Berlin),
C. Bartocci (Università degli Studi di Genova),
A. Braverman (Harvard University),
R. Donagi (University of Pennsylvania),
B. Dubrovin (SISSA, Trieste),
F. Fucito (INFN, Università di Roma II),
L. Goettsche (ICTP),
D. Grunberg (Max Planck Institute, Bonn),
B. Kreussler (Mary Immaculate College, Limerick),
A. Morozov (ITEP, Moscow),
M. Mulase (University of California, Davis),
N. Nekrasov (IHES, France),
T. Pantev (University of Pennsylvania),
C. Pedrini (Università degli Studi di Genova),
R. Reinbacher (Rutgers University),
E. Scheidegger (Institute for Theoretical Physics, Vienna),
S. Shadrin (Independent Univ. of Moscow and Stockholm University).

<http://www.math.ist.utl.pt/galg/WAGP04/>

- IST Courses on Algebraic Geometry II - Degeneration Techniques in Algebraic Geometry, IST, September 13-17, 2004.

Lecturers:

C. Ciliberto (Università di Roma II, Tor Vergata),

R. Miranda (University of Colorado, Boulder).

<http://www.math.ist.utl.pt/~mmlopes/CourseAGII.html>

Details on the programs can be found at the webpages.

1.4 Postdoctoral Program

The Center started a postdoctoral program in the academic year 1998/99. Positions are for one year, with the possibility of extension for a second year upon mutual agreement. Applicants must have earned a Ph.D. in mathematics preferably within a 2-year period before the date of the opening of the position. To be selected an applicant must show very strong research promise in one of the areas in which the members of the Center are currently active. There are no teaching duties associated with these positions. They are announced internationally including in Notices and in the Data Base of the American Mathematical Society.

- Postdocs 04/05:
 - G. Iommi, PhD in Mathematics, University of Warwick, UK, 2004. Research areas: dynamical systems.
 - N. Jung, PhD in Mathematics, University of Illinois, Urbana-Champaign, USA, 2003. Research areas: nonlinear analysis.
 - H. Li, PhD in Mathematics, University of Illinois, Urbana-Champaign, USA, 2003. Research areas: symplectic geometry.
 - M. Panthee, PhD in Mathematics, Instituto de Matemática Pura e Aplicada, Rio de Janeiro, Brazil, 2004. Research areas: partial differential equations, harmonic analysis.
 - B. Van Steirteghem, PhD in Mathematics, Columbia University, USA, 2004. Research areas: Algebraic groups, symplectic geometry.
- Postdocs 03/04:
 - G. Del Magno, PhD in Mathematics, Georgia Institute of Technology, Atlanta, USA, 2002. Research areas: dynamical systems. (Supported by FCT.)
 - N. Jung, PhD in Mathematics, University of Illinois, Urbana-Champaign, USA, 2003. Research areas: nonlinear analysis.
 - H. Li, PhD in Mathematics, University of Illinois, Urbana-Champaign, USA, 2003. Research areas: symplectic geometry.
 - P. Monnier, PhD in Mathematics, University of Montpellier, France, 2001. Research areas: Poisson geometry, singularities. (Supported by FCT.)
- Postdocs 02/03:
 - G. Del Magno, PhD in Mathematics, Georgia Institute of Technology, Atlanta, USA, 2002. Research areas: dynamical systems.
 - R. Hric, PhD in Mathematics, Comenius University, Bratislava, Slovakia, 1999. Support: FCT grant. Research areas: dynamical systems. (Supported by FCT.)
 - P. Monnier, PhD in Mathematics, University of Montpellier, France, 2001. Research areas: Poisson geometry, singularities.
 - M. Perlmutter, PhD in Mathematics, University of California, Berkeley, USA, 1999. Support: FCT grant. Research areas: geometric mechanics, symplectic and Poisson geometry, geometric integrators. (Supported by FCT.)
- Postdocs 01/02:
 - R. Hric, PhD in Mathematics, Comenius University, Bratislava, Slovakia, 1999. Research areas: dynamical systems.

C. Wolf, PhD in Mathematics, Technical University of Munich, Germany, 1999. Research areas: dynamical systems, dimension theory, ergodic theory, complex analysis.

M. Perlmutter, PhD in Mathematics, University of California, Berkeley, USA, 1999. Research areas: geometric mechanics, symplectic and Poisson geometry, geometric integrators.

- Postdocs 00/01:

H. Spielberg, Docteur en Mathématiques, Université Louis Pasteur, Strasbourg, France, 1999. Research areas: algebraic geometry, symplectic geometry and topology.

- Postdocs 99/00:

S. Anisov, PhD in Mathematics, Independent University of Moscow, Russia, 1998. Research Areas: singularities, geometry and topology.

Y. Koo, PhD in Mathematics, University of Minnesota, USA, 1998. Research Areas: partial differential equations, geometric measure theory.

B. Saussol, Doctor in Mathematics, Université de Toulon et du Var, France, 1998. Research Areas: dynamical systems, ergodic theory.

- Postdocs 98/99:

S. Lillywhite, PhD in Mathematics, University of Maryland, USA, 1998. Research Areas: differential and symplectic geometry and topology.

B. Saussol, Doctor in Mathematics, Université de Toulon et du Var, France, 1998. Research Areas: dynamical systems, ergodic theory.

The Center research activities have also attracted other postdoctoral fellows supported either directly by FCT or by other research projects:

- G. Farkas, PhD in Mathematics, Technical University of Budapest, Hungary, 2001. Research areas: dynamical systems, numerical analysis. Supported by the FCT project POCTI/32931/MAT/2000 (Oct. 2001- Feb. 2002).
- D. Forge, Doct. en Mathématiques, Université de Pierre et Marie Curie (Paris VI), France, 1996. Research areas: combinatorics. Supported by DONET (Discrete Optimization: Theory and Applications) a consortium of European research institutes on Discrete Optimization funded by the European Union under contract ERB TMRX-CT90-0202 (Oct. 1999 - Jul. 2003).
- K. Gelfert, PhD in Mathematics, Technische Universität, Dresden, Germany, 2001. Research areas: dynamical systems, dimension theory, ergodic theory. (Supported by FCT) (Dec. 2003- Dec. 2004).
- D. Krejcirik, PhD in Mathematics, Université de Toulon et du Var, France, 2001 and PhD in Theoretical Physics, Charles University of Prague, Czech Republic, 2001. Research areas: mathematical physics, quantum mechanics, spectral geometry. (Supported by FCT) (Feb. 2003-Jan. 2005).
- J. Lopes Dias, PhD in Mathematics, University of Cambridge, UK, 2002. Research areas: dynamical systems, renormalization, hamiltonian dynamics. (Supported by FCT) (Jun. 2003-Aug. 2004).
- C. Valls, Doctor in Matemáticas, Universidad de Barcelona, Spain, 1999. Research areas: dynamical systems, partial differential equations. (Supported by FCT) (Oct. 2003-).
- J. Agapito, PhD in Mathematics, University of California, Santa Cruz, USA, 2004. Research areas: symplectic geometry, combinatorial geometric. (Supported by FCT) (Jan. 2005-).
- R. Popescu, Doctorat de Mathématiques, Université Claude Bernard, Lyon 1, France, 2000. Research areas: C^* -algebras, bivariant K-theory, groupoids, foliations, quantales. (Supported by FCT) (Apr. 2005-).
- N. Luzia, Doutorado em Matemática, IMPA, Brasil, 2004. Research areas: dynamical systems. (Supported by FCT) (May 2005-).

1.5 Special Events

Escola de Verão do Programa Gulbenkian Novos Talentos em Matemática, Fundação Calouste Gulbenkian, September 6-10, 2004
<http://www.math.ist.utl.pt/talentos/>

Encontro Nacional do Programa Gulbenkian Novos Talentos em Matemática, Grande Hotel da Curia, September 10-12, 2004
<http://www.math.ist.utl.pt/talentos/>

1.6 Partnership Protocols

In October 2004 the Center submitted to the Minister of Science, Innovation and Higher Education a request for the Statute of Associated Laboratory, with a strategic project entitled “Internationalization of the Research and Promotion of Mathematics in Portugal”. Besides pursuing the strategy of further development and internationalization of the research activities, in particular through the Postdoctoral Program and a Program for career development and employment of new researchers, the Center signed partnership protocols with the Institute for Systems and Robotics - Lisbon (ISR-Lisbon) and with the Institute of Telecommunications (IT) regarding interdisciplinary research cooperation, and also signed partnership protocols with 44 secondary and basic schools, which together enroll more than 38000 students, aiming at the promotion of Mathematics at these education levels through a set of activities oriented to students and teachers. The Center will also pursue the past collaboration with the Ciência Viva Program.

1.7 Publications in 2004

1.7.1 Publications which appeared in 2004

Books

Iteration Theory ECIT'02 (Évora, September 1-7, 2002), edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkowsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004.

R. Loja Fernandes and M. Ricou, Introdução à Álgebra, IST Press, Lisboa, 2004.

Articles in International Journals with Referees

M. Aganagic, A. Klemm, M. Mariño and C. Vafa, Matrix model as a mirror of Chern-Simons theory, J. High Energy Phys. 2004, no. 2, 010, 45 p.

M. Aganagic, M. Mariño and C. Vafa, All loop topological string amplitudes from Chern-Simons theory, Comm. Math. Phys. 247 (2004), 467-512.

J. Almeida and J. Teixeira, The space of state vectors: a hyperfinite approach, J. Math. Phys. 45 (2004), 1-20.

J. F. Alves and J. Sousa Ramos, Kneading theory for tree maps, Ergodic Theory Dynam. Systems 24 (2004), 957-985.

S. Anjos and G. Granja, Homotopy decomposition of a group of symplectomorphisms of $S^2 \times S^2$, Topology 43 (2004), 599-618.

L. Barreira and P. Doutor, Birkhoff averages for hyperbolic flows: variational principles and applications, J. Statist. Phys. 115 (2004), 1567-1603.

L. Barreira, L. Radu and C. Wolf, Dimension of measures for suspension flows, Dyn. Syst. 19 (2004), 89-107.

- V. Bouchard, B. Florea and M. Mariño, Counting higher genus curves with crosscaps in Calabi-Yau orientifolds, *J. High Energy Phys.* 2004, no. 12, 035, 34 p.
- H. Bray and A. Neves, Classification of prime 3-manifolds with Yamabe invariant greater than \mathbf{RP}^3 , *Ann. of Math. (2)* 159 (2004), 407-424, 887.
- J. Buescu, Positive integral operators in unbounded domains, *J. Math. Anal. Appl.* 296 (2004), 244-255.
- J. Buescu, A. Paixão and F. Garcia, Positive-definiteness, integral equations and Fourier transforms, *J. Integral Equations* 16 (2004), 33-51.
- A. Calabri, C. Ciliberto and M. Mendes Lopes, Even sets of four nodes on rational surfaces, *Math. Res. Lett.* 11 (2004), 799-808.
- J. Cánovas and R. Hric, Distributional chaos of tree maps, *Topology Appl.* 137 (2004), 75-82.
- V. Cardoso, J. Natário and R. Schiappa, Asymptotic quasinormal frequencies for black holes in nonasymptotically flat spacetimes, *J. Math. Phys.* 45 (2004), 4698-4713.
- G. Carron, P. Exner and D. Krejcirik, Topologically nontrivial quantum layers, *J. Math. Phys.* 45 (2004), 774-784.
- J. Chabrowski and P. Girão, On the exterior Neumann problem involving the critical Sobolev exponent, *Topol. Methods Nonlinear Anal.* 23 (2004), 33-43.
- R. Cordovil, D. Forge and S. Klein, How is a chordal graph like a supersolvable binary matroid?, *Discrete Math.* 288 (2004), 167-172.
- M. Crainic and R. Loja Fernandes, Integrability of Poisson brackets, *J. Differential Geom.* 66 (2004), 71-137.
- P. F. dos Santos and P. Lima-Filho, Quaternionic algebraic cycles and reality, *Trans. Amer. Math. Soc.* 356 (2004), 4701-4736.
- P. Exner, P. Freitas and D. Krejcirik, A lower bound to the spectral threshold in curved tubes, *R. Soc. Lond. Proc. Ser. A Math. Phys. Eng. Sci.* 460 (2004), 3457-3467.
- R. Loja Fernandes and P. Monnier, Linearization of Poisson brackets, *Lett. Math. Phys.* 69 (2004), 135-159.
- B. Fiedler, C. Rocha and M. Wolfrum, Heteroclinic orbits between rotating waves of semilinear parabolic equations on the circle, *J. Differential Equations* 201 (2004), 99-138.
- C. Florentino, J. Mourão and J. P. Nunes, Coherent state transforms and theta functions, *Proc. Steklov Inst. Math.* 246 (2004), 283-302.
- P. Freitas and A. Henrot, On the first twisted Dirichlet eigenvalue, *Commun. Anal. Geom.* 12 (2004), 1083-1103.
- D. Gomes and A. Oberman, Computing the effective Hamiltonian using a variational approach, *SIAM J. Control Optim.* 43 (2004), 792-812.
- D. Gomes and E. Valdinoci, Lack of integrability via viscosity solution methods, *Indiana Univ. Math. J.* 23 (2004), 1055-1071.
- D. Gomes and C. Valls, Approximation of ill-posed Boussinesq equations, *Dyn. Syst.* 19 (2004), 345-357.
- R. Jerrard and N. Jung, Strict convergence and minimal liftings in BV, *Proc. Roy. Soc. Edinburgh Sect. A* 134 (2004), 1163-1176.
- H. Kantz, W. Just, N. Baba, K. Gelfert and A. Riegert, Fast chaos versus white noise: entropy analysis and a Fokker Planck model for the slow dynamics, *Phys. D* 187 (2004), 200-213.
- M. Kobayashi and W. Oliva, A note on the conservation of energy and volume in the setting of nonholonomic mechanical systems, *Qual. Theory Dyn. Syst.* 4 (2004), 383-411.
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45 (2004), 287-296.

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M. Mendes Lopes and R. Pardini, Surfaces of general type with $p_g=0$, $K^2=6$ and non birational bicanonical map, *Math. Ann.* 329 (2004), 535-552.

M. Mendes Lopes and R. Pardini, A new family of surfaces with $p_g=0$ and $K^2=3$, *Ann. Sci. École Norm. Sup. (4)* 37 (2004), 507-531.

D. A. Mendes and J. Sousa Ramos, Kneading theory for triangular maps, *Int. J. Pure Appl. Math.* 10 (2004), 421-450.

J. Natário, Linking, Legendrian linking and causality, *Proc. London Math. Soc. (3)* 88 (2004), 257-272.

A. Pumariño and C. Valls, On the double pendulum: an approach to double resonant situations, *Discrete Contin. Dyn. Syst.* 11 (2004), 413-448.

M. M. Ramos, C. C. Ramos, R. Severino and J. Sousa Ramos, Topological invariants of a chaotic pendulum, *Int. J. Pure Appl. Math.* 10 (2004), 209-226.

P. Resende, Sup-lattice 2-forms and quantales, *J. Algebra* 276 (2004), 143-167.

J. L. Rocha and J. Sousa Ramos, Weighted kneading theory of one-dimensional maps with a hole, *Internat. J. Math. Math. Sci.* 38 (2004), 2019-2038.

P. M. Santos, A-quasi-convexity with variable coefficients, *Proc. Roy. Soc. Edinburgh Sect. A* 134 (2004), 1219-1237.

P. M. Santos and E. Zappale, Second order analysis for thin structures, *Nonlinear Anal.* 56 (2004), 643-791.

A. Serra, Multipliers of minimal norm on Dirichlet type spaces, *J. Operator Theory* 52 (2004), 293-302.

S. Vinagre, R. Severino and J. Sousa Ramos, Symbolic dynamics in chaotic wave vibration, *Int. J. Pure Appl. Math.* 16 (2004), 267-283.

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J. F. Alves, H. Oliveira and J. Sousa Ramos, Topological entropy of the tangent map, in *Dynamical Systems and Applications, ICDSA 2004*, edited by H. Akça, A. Boucherif and V. Covachev, GBS Publishers & Distributers, 2004, pp. 56-64.

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J. F. Alves and J. Sousa Ramos, Artin-Mazur zeta function on trees with infinite edges, in *Dynamical Systems and Applications, ICDSA 2004*, edited by H. Akça, A. Boucherif and V. Covachev, GBS Publishers & Distributers, 2004, pp. 19-28.

J. Duarte, L. Silva and J. Sousa Ramos, Bifurcation associated with the Fitzhugh-Nagumo systems, in *Nonlinear Dynamics of Electronic Systems, NDES 2004*, edited by J. A. C. Gallas, J. Corte-Real, M. Bezzeghoud and D. Barry, Universidade de Évora, 2004, pp. 142-145.

S. Fernandes and J. Sousa Ramos, Conductance: from electrical network, through graphs, to dynamical systems, in *Nonlinear Dynamics of Electronic Systems, NDES 2004*, edited by J. A. C. Gallas, J. Corte-Real, M. Bezzeghoud and D. Barry, Universidade de Évora, 2004, pp. 150-153.

S. Fernandes and J. Sousa Ramos, Spectral invariants of iterated maps of the interval, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkowsky, *Grazer*

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- C. Grácio and J. Sousa Ramos, The first eigenvalue of the Laplacian and the ground flow of a compact surface, in *Nonlinear Dynamics of Electronic Systems, NDES 2004*, edited by J. A. C. Gallas, J. Corte-Real, M. Bezzeghoud and D. Barry, Universidade de Évora, 2004, pp. 170-173.
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- J. P. Lampreia, R. Severino and J. Sousa Ramos, Symbolic product of bimodal kneading invariants, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkovsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004, pp. 245-254.
- R. Lozi, J. Sousa Ramos and A. Sharkovsky, One-dimensional dynamics generated by boundary value problems for the wave equation, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkovsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004, pp. 255-270.
- N. Martins, R. Severino and J. Sousa Ramos, Bowen-Franks groups associated with iterated maps on the interval, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkovsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004, pp. 271-282.
- D. A. Mendes and J. Sousa Ramos, Computing topological entropy of triangular maps of the real plane, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkovsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004, pp. 283-298.
- H. Oliveira and J. Sousa Ramos, Iterates of transcendent meromorphic maps, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkovsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004, pp. 313-322.
- H. Oliveira and J. Sousa Ramos, Dynamics of the tangent Map, in *New Progress in Difference Equations, Proceedings of the 6th ICDEA in Augsburg*, edited by B. Aulbach, S. Elaydi and G. Ladas, CRC Press, 2004, pp. 199-206.
- M. Rodríguez-Olmos and M. Sousa Dias, A note on the existence and symmetries of relative equilibria in simple mechanical systems, *Proceedings of the XI Fall Workshop on Geometry and Physics, Publicaciones de la Real Sociedad Matemática Española* 5, 2004, pp. 241-246.
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- C. C. Ramos, N. Martins and J. Sousa Ramos, Noncommutative dimension associated with limit sets of Fuchsian groups, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkovsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004, pp. 81-90.
- J. L. Rocha and J. Sousa Ramos, IFS with overlaps and Hausdorff dimension, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkovsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004, pp. 355-376.
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- P. Martins Rodrigues and J. Sousa Ramos, Some properties of the Jacobi-Perron algorithm, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkovsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004, pp. 377-392.
- R. Severino, A. Sharkovsky, J. Sousa Ramos and S. Vinagre, Symbolic dynamics in boundary value problems, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkovsky, Grazer Mathematische Berichte 346, Karl-Franzens-Universität Graz, 2004, pp. 393-402.
- R. Severino, A. Sharkovsky, J. Sousa Ramos and S. Vinagre, Topological invariants in a model of a

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L. Silva and J. Sousa Ramos, Renormalization and topological invariants of 2-pcm maps, in *Iteration Theory ECIT'02*, edited by J. Sousa Ramos, D. Gronau, C. Mira, L. Reich and A. Sharkowsky, *Grazer Mathematische Berichte* 346, Karl-Franzens-Universität Graz, 2004, pp. 413-436.

1.7.2 Publications submitted or accepted in 2004

M. Aganagic, R. Dijkgraaf, A. Klemm, M. Mariño and C. Vafa, Topological strings and integrable hierarchies. To appear in *Comm. Math. Phys.*

M. Aganagic, A. Klemm, M. Mariño and C. Vafa, The topological vertex. To appear in *Comm. Math. Phys.*

J. F. Alves, J. Fachada and J. Sousa Ramos, Detecting topological transitivity of piecewise monotone interval maps. To appear in *Topology Appl.*

J. F. Alves, J. Fachada and J. Sousa Ramos, On a condition for transitivity of Lorenz maps. To appear in *Proceedings ICDEA 2003*.

J. F. Alves, M. M. Graça, M. E. Sousa Dias and J. Sousa Ramos, A linear algebra approach to the conjecture of Collatz. To appear in *Linear Algebra Appl.*

J. F. Alves, R. Hric and J. Sousa Ramos, Topological entropy, homological growth and zeta functions on graphs. To appear in *Nonlinearity*.

S. Anjos and F. Lalonde, The homotopy type of the space of symplectic balls in $S^2 \times S^2$ above the critical value. Preprint.

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

L. Barreira and Ya. Pesin, Smooth ergodic theory and nonuniformly hyperbolic dynamics, in *Handbook of Dynamical Systems 1B*, edited by B. Hasselblatt and A. Katok, Elsevier, to appear.

L. Barreira and C. Valls, Stable manifolds for nonautonomous equations without exponential dichotomy. To appear in *Comm. Math. Phys.*

A. C. Barroso and J. Matias, Necessary and sufficient conditions for existence of solutions of a variational problem involving the curl. To appear in *Discrete Cont. Dyn. Syst.*

P. Bordalo, L. Cornalba and R. Schiappa, Towards quantum dielectric branes: curvature corrections in abelian beta function and nonabelian Born-Infeld action. To appear in *Nucl. Phys.*

V. Bouchard, B. Florea and M. Mariño, Topological open string amplitudes on orientifolds, *J. High Energy Phys.* 2005, no. 2, 002, 34 p.

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A. Cannas da Silva, Symplectic Geometry, in *Handbook of Differential Geometry 2*, edited by F. J. E. Dillen and L. C. A. Verstraelen, Elsevier, to appear.

L. Cornalba, M. Costa and R. Schiappa, D-brane dynamics in constant Ramond-Ramond potentials, S-duality and noncommutative geometry. Preprint.

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M. Crainic and R. Loja Fernandes, Exotic Characteristic Classes, in *Quantum Field Theory and Noncommutative Geometry, Lecture Notes in Physics 662*, edited by U. Carow-Watamura, Y. Maeda and S. Watamura, Springer, to appear.

M. Crainic and R. Loja Fernandes, Rigidity and flexibility in Poisson geometry. Preprint.

J. Duarte and J. Sousa Ramos, Topological invariants in forced piecewise-linear FitzHugh-Nagumo-like systems. To appear in *Chaos, Solitons and Fractals*.

D. Evans and P. Pinto, Modular invariants and the double of the Haagerup subfactor. To appear in

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R. Loja Fernandes, A note on proper Poisson actions. To appear in Proceed. 10th Internacional Conference in Modern Group Analysis.

S. Fernandes and J. Sousa Ramos, Conductance, Laplacian and mixing rate in discrete dynamical systems. Preprint.

S. Fernandes and J. Sousa Ramos, Second smaller zero of kneading determinant for iterated maps. To appear in Proceed. ICDEA 2003.

C. Florentino, P. Matias, J. Mourão and J. P. Nunes, On the BKS pairing for Kähler quantizations of the cotangent bundle of a Lie group. Preprint.

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P. Freitas and D. Krejcirik, Instability results for the damped wave equation in unbounded domains. To appear in J. Differential Equations.

K. Gelfert, Dimension estimates beyond conformal and hyperbolic dynamics. To appear in Dyn. Syst.

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L. Godinho, On certain symplectic circle actions. Preprint.

L. Godinho, Semifree symplectic circle actions on 4-orbifolds. To appear in Trans. Amer. Math. Soc.

D. Gomes, Viscosity solution methods and the discrete Aubry-Mather problem. To appear in Discrete Contin. Dyn. Syst.

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G. Granja, Self maps of HP^n via the unstable Adams spectral sequence. To appear in Proc. Amer. Math. Soc.

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J. Labastida and M. Mariño, Topological Quantum Field Theory and Four Manifolds, Mathematical Physics Studies 25, Springer, to appear.

J. Llibre and C. Valls, Integrability of the Lorenz system. To appear in J. Phys. A.

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L. Loura, A space of generalized distributions. To appear in Czech Math. J.

M. Mariño, Chern-Simons theory, matrix integrals, and perturbative three-manifold invariants. To appear in Comm. Math. Phys.

M. Mariño, Chern-Simons theory and topological strings. To appear in Rev. Modern Phys.

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N. Martins, R. Severino and J. Sousa Ramos, Bowen-Franks groups of reducible bimodal subshifts of finite type. Preprint.

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P. Monnier and N. T. Zung, Levi decomposition of smooth Poisson structures. To appear in J.

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C. J. Mulvey and P. Resende, A noncommutative theory of Penrose tilings. To appear in Int. J. Theoret. Phys.

J. Natário, Initial value formulation of Newtonian gravity. Preprint.

J. Natário and R. Schiappa, On the classification of asymptotic quasinormal frequencies for d-dimensional black holes and quantum gravity. Preprint.

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J. L. Rocha and J. Sousa Ramos, Computing Hausdorff dimensions and escape rates. Preprint.

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