



**Center for Mathematical Analysis,
Geometry, and Dynamical Systems**

Report 2008

April 2009

Conteúdo

1	Visitors	3
2	Seminars	5
3	Conferences and short courses	11
4	Invited lectures	15
5	Postdoctoral program	18
6	Doctoral supervision	21
7	Publications in 2008	21
8	Partnership and outreach	31
9	Personal notes	32

1 Visitors

The following researchers visited the Center in 2008:

- L. Alvarez-Consul, CSIC, Spain, 26–28.5.08.
- T. Arnarson, KTH, Sweden, 22–24.05.08.
- J. Baez, Univ. California at Riverside, USA, 13–16.07.08.
- L. Bakker, Brigham Young Univ., Salt Lake City, USA, 23–29.06.08.
- J. Baptista, Univ. Amsterdam, The Netherlands, 22.07.08.
- J. Boehm, Univ. Saarland at Saarbrücken, Germany, 26.08–2.09.08.
- H. Bursztyn, IMPA, Brazil, 14.07–14.08.08.
- S. Calogero, Univ. Minho, Portugal, 28–29.02.08.
- B. Chorny, Australian National Univ., Australia, 25.02–1.03.08.
- L. Crane, Kansas State Univ., USA, 21–25.09.08.
- R. Czaja, Univ. Silesia, Katowice, Poland, 24.1–4.02.08.
- S. Elaydi, Trinity Univ., USA, 1–15.07.08.
- R. El Harti, Univ. Hassan I, Morocco, 23.05–6.06.08.
- M. Fernandez, Fac. Ciência y Tecnologia, Spain, 17–26.01.08.
- C. Fernández, Academia Militar, Portugal, 12.2.08.
- S. Ferreira, Instituto Politécnico de Leiria, Portugal, 8–13.09.08.
- O. García-Prada, CSIC, Madrid, Spain, 6–9.10.08.
- D. Gepner, Univ. Sheffield, UK, 15–22.07.08.
- T. Gharibyan, Armenian National Academy of Sciences, Armenia, 3.11–3.12.08.
- P. Gothen, Univ. Porto, Portugal, 6–9.10.08.
- S. Gutenberg, Athens, Greece, 13–21.09.08.
- J.-C. Hausmann, Univ. Genève, Switzerland, 16–18.7.08.
- R. Hepworth, Univ. Sheffield, UK, 12–18.07.08.
- R. Hric, Matej Bel Univ. and Slovak Academy of Sciences, Banská Bystrica, Slovakia, 3–20.06.08.
- D. Iglesias, CSIC, Madrid, Spain, 9–14.11.08.
- F. Incensi, Univ. Bologna, Italy, 3.4.08.
- A. Kapustin, California Institute Tech., USA, 7–14.09.08.
- L. Kauffman, Univ. Illinois at Chicago, USA, 12–16.07.08.
- M. Lawson, Heriot-Watt Univ., UK, 31.03–6.04.08.

K. Lesh, Union College, USA, 1–2.07.08.
C. Liedtke, Univ. Düsseldorf, Germany, 31.08–7.09.08.
P. Lima-Filho, Texas A&M Univ., USA, 6–18.07.08.
R. Loll, Utrecht Univ., The Netherlands, 9–12.07.08.
A. Lopes, Univ. Federal Rio Grande do Sul, Brazil, 29.12.08–19.01.09.
O. Lopes, IMECC, Univ. Campinas, Brazil, 10–22.02.08.
L. Macarini, Univ. Federal Rio de Janeiro, Brazil, 15.7.08.
D. Marciniak, Mathematical Institute of the Polish Academy of Sciences, Poland, 7–27.07.08.
D. Martinez Torres, Utrecht Univ., The Netherlands, 23–26.03.08.
J. Mohr, Univ. Federal do Rio Grande do Sul, Brazil, 3.01–1.02.08.
C. Mulvey, Univ. Sussex, UK, 3–15.11.08.
J. Nelson, Univ. Torino, Italy, 16–20.06.08, 19–25.09.08, 10–14.11.08.
A. Oliveira, Univ. Porto, Portugal, 8–13.09.08.
S. Pasquetti, CERN, Switzerland, 10–15.09.08.
R. Pardini, Univ. Pisa, Italy, 21–24.01.08.
I. Parissis, KTH, Stockholm, Sweden, 20.11–7.12.08.
G. Pezzini, Univ. Basel, Switzerland, 28–31.01.08.
R. Pignatelli, Univ. Trento, Italy, 7–17.06.08.
T. Porter, Univ. Wales, Bangor, UK, 23.11–6.12.08.
F. Presas, CSIC, Madrid, Spain, 24–29.11.08.
S. Ramanan, Chennai Math. Inst. India, 11–13.06.08.
R. Reis, Univ. of Aberdeen, UK, 29.7.08.
J. Rocha, CENTRA, Lisboa, Portugal, 17.11.09.
C. Rito, UTAD, Vila Real, Portugal, 2.12.08.
H. van Roessel, Univ. Alberta, Edmonton, Canada, 21–27.09.08.
N. Romão, Aarhus Univ., Denmark, 30.09–1.10.08.
S. Sabatini, MIT, USA, 10–13.11.08.
D. Salamon, ETH Zürich, Switzerland, 17–26.1.08.
B. Simões, Univ. Lisbon, Lisboa, Portugal, 9.12.08.
H. Shahgolian, KTH, Stockholm, Sweden, 22–26.11.08.
H. Soares, ISCTE, Lisboa, Portugal, 21.10.08.
R. Souza, Univ. Federal do Rio Grande do Sul, Brazil, 3.01–1.02.08.

J. Sparks, Univ. Oxford, UK, 7–13.09.08.
 I. Stubbe, Univ. Antwerp, Belgium, 4–6.11.08.
 I. Struchiner, Unicamp, Brazil, 29.06–23.07.08.
 M. Szamotulski, Mathematical Institute of the Polish Academy of Sciences, Poland, 7–27.07.08.
 T. Thiemann, Max-Planck Inst. für Gravitationsphysik, Golm, Germany, 9–13.07.08.
 C. Tomei, PUC, Rio de Janeiro, Brazil, 10–16.02.08.
 H. Uehara, Tokyo Metropolitan Univ. Japan, 21–26.07.08.
 H. van Rosset, Univ. of Alberta, Edmonton, Canada, 21–27.09.08.
 P. Vieira, Max-Planck Inst. für Gravitationsphysik, Germany, 23–25.11.08.
 J. Wattis, Univ. Nottingham, UK, 20–25.04.08.
 J. Wood, Univ. Leeds, UK, 8.05.08.
 M. Zambon, Centre de Recerca Matemàtica, Spain, 27–30.7.08.
 G. Zoupanos, National Tech. Univ., Greece, 4–13.03.08.

2 Seminars

Analysis, Geometry, and Dynamical Systems Seminar. This is the main seminar of the Center. It included the following talks in 2008:

- Ioannis Parissis (KTH, Stockholm) Logarithmic dimension bounds for the maximal function along a polynomial curve, 2/12/08.
- Henry van Roessel (Univ. Alberta, Edmonton), Some exact solutions to the coagulation equation, 23/9/08.
- Roman Hric (Matej Bel Univ. and Slovak Academy of Sciences, Banská Bystrica), Dense orbits and some misunderstandings around them, 17/7/08.
- Lennard Bakker (Brigham Young Univ., Salt Lake City), The conjugacy problem for torus automorphisms, 24/6/08.
- Rachid El Harti (Univ. Hassan I, Morocco), On Pro-C*-algebras, 5/6/08.
- Jonathan Wattis (Univ. Nottingham), The effects of grinding chiral crystals and similarity solutions of Becker–Döring equations, 22/4/08.
- Orlando Lopes (IMECC, Univ. Campinas), Simetria radial de minimizadores de problemas variacionais com termos não locais, 15/2/08.

- Carlos Tomei (PUC, Rio de Janeiro), The subtle convergence of Wilkinson’s method, 12/2/08.
- Rafael Souza (Univ. Federal do Rio Grande do Sul), Stationary Markov chains on $[0, 1]$ that maximize a potential: unicity and an L.D.P., 29/1/08.
- Joana Mohr (Univ. Federal do Rio Grande do Sul), Large deviation principle for the Mather measure, 24/1/08.

Algebra Seminar. This included the following talks in 2008:

- David Gepner (Univ. Sheffield), On the motivic spectra representing algebraic K-theory and algebraic cobordism, 21/7/08.
- Sean Lawton (CAMGSD), Algebraic independence in $SL(3, \mathbb{C})$ -character varieties of free groups, 15/7/08.
- Paulo Lima-Filho (Texas A&M Univ.), Deligne cohomology and the Picard–Witt group of real varieties, 10/7/08.
- Kathryn Lesh (Union College), An interesting filtration of bu and an analogue of the Whitehead Conjecture, 2/7/08.
- Pedro Ferreira dos Santos (IST), A model for equivariant Eilenberg–Mac Lane spectra, 19/6/08.
- Stavros Papadakis (CAMGSD), An introduction to the McKay correspondence, 6/3/08.
- Boris Chorny (Australian National Univ.), Smallness in a model category and smallness in the homotopy category, 28/2/08.

“Geometria em Lisboa” Seminar. This included the following talks in 2008:

- Rosa Sena Dias (IST), Spectral measures and algebraic metrics on toric manifolds, 18/12/08.
- Bruno A. Simões (Univ. Lisbon), Explicit constructions of harmonic maps into the unitary group, 9/12/08.
- Carlos Rito (Univ. Trás-os-Montes e Alto Douro, Vila Real), Involutions on surfaces with $p_g = q = 1$, 2/12/08.
- Francisco Presas (CSIC, Madrid), Non-fillability versus non-squeezing in contact geometry, 25/11/08.

- David Iglesias (CSIC, Madrid), Courant morphisms and moment maps, 13/11/08.
- Silvia Sabatini (MIT), Equivariant cohomology of Hamiltonian T -spaces and equivariant fiber bundles, 11/11/08.
- Thomas Baier (IST), (Tropical) amoebas in moment polytopes, 4/11/08.
- Helena Soares (ISCTE, Lisboa), On the stability of some exceptional bundles, 21/10/08.
- Peter B. Gothen (Univ. Porto), Deformations of maximal representations of surface groups, 8/10/08.
- Oscar García-Prada (CSIC, Madrid), Higgs bundles and representations of surface groups, 7/10/08.
- Christian Liedtke (Düsseldorf Univ., Germany), Non-classical Godeaux surfaces, 4/9/08.
- Henrique Bursztyn (IMPA), Generalized reduction and super geometry, 17/7/08.
- Jean-Claude Hausmann (Univ. Genève), Simple Hamiltonian manifolds, 17/7/08.
- Leonardo Macarini (Univ. Federal Rio de Janeiro), Symplectically convex and non-convex hypersurfaces in cotangent bundles, 15/7/08.
- Richard Hepworth (Univ. Sheffield), Orbifold Morse theory, 8/7/08.
- Bruno de Oliveira (Univ., Miami), Symmetric differentials, webs and the geometry of surfaces, 17/6/08.
- Sundararaman Ramanan (Chennai Math. Inst.), Algebraic geometric understanding of the fundamental group through Higgs pairs, 12/6/08.
- Luís Álvarez-Cónsul (CSIC, Madrid), Moduli of sheaves from moduli of Kronecker modules, 27/5/08.
- John C. Wood (Univ. Leeds and Gulbenkian visiting Professor, Univ. Lisbon), Harmonic morphisms between Riemannian manifolds, 8/5/08.
- Francesca Incensi (Univ. Bologna), GIT quotients of products of projective planes, 3/4/08.
- David Martínez Torres (Utrecht Univ.), Boothby–Wang contact structures and hyperplane sections, 25/3/08.

- Margarida Mendes Lopes (IST), The algebraic fundamental group of surfaces with small c_1^2 , 19/2/08.
- César Rodrigo Fernández (Academia Militar), First and second variation for variational problems with PDE constraints, Hamiltonian approach, 12/2/08.
- Guido Pezzini (Univ. Basel), Automorphisms of wonderful varieties, 29/1/08.
- Dietmar Salamon (ETH, Zürich), Nonlinear Hardy spaces and stable maps, 21/1/08.
- Rogier Bos (CAMGSD), A momentum map for symplectic fibrations, 15/1/08.

Mathematical Physics Seminar. This included the following talks in 2008:

- Pedro Girão (IST), Spherically symmetric self-gravitating scalar field, 29/2/08.
- Simone Calogero (Univ. Minho), Dynamics of Bianchi I elastic space-times, 29/2/08.

Mathematics, Systems and Robotics Seminar. In collaboration with Instituto de Sistemas e Robótica. It included the following talks in 2008:

- Ricardo Ferreira (IST), Reconstruction of a 2d flat manifold from isometrically embedded 3d features, 9/5/08.
- Margarida Mendes Lopes (IST), What is an algebraic surface?, 9/5/08.
- José Rodrigues (Instituto de Sistemas e Robótica), An analytic signature for permutation-invariant two-dimensional shape representation, 4/4/08.
- Gabriel Pires (IST), A geometric view of hybrid systems, 4/4/08.

String Theory Seminar. This included the following talks in 2008:

- *Video Talk:* Marcos Mariño, Phase transition in topological string theory, 15/12/08.
- Pedro Vieira (Max-Planck-Institut für Gravitationsphysik, Potsdam), Squeezed Integrability, 24/11/08.

- Jorge Rocha (CENTRA), Evaporation of large black holes in anti-de Sitter, 17/11/08.
- Marcel Vonk (CAMGSD), Field theory structures in string theory amplitudes, 10/11/08.
- *Video talk:* Robbert Dijkgraaf, Mathematics and the quantum universe, 3/11/08.
- Paulo Pires Pacheco (CAMGSD), (Exceptional) Generalised geometry, 27/10/08.
- *Video Talks:* Leonardo Rastelli / Wati Taylor, Progress in open string field theory / Computing tree and loop amplitudes in string field theory, 20/10/08.
- Daniel Gomez Vergel (Instituto de Estructura de la Materia, Madrid), Axiomatic structure of quantum mechanics, 13/10/08.
- *Video talks:* Hiroshi Ooguri / Sir Michael Atiyah, Worldsheet derivation of a large N duality / Twisted K-theory and physics, 6/10/08.
- Nuno Romão (Univ. Aarhus), Spectral data of singular monopoles, 1/10/08.
- Sebastian Guttenberg (Demokritos National Research Center, Greece), Pure spinor string in general background, 15/9/08.
- Sara Pasquetti (CERN), Modularity of the remodeled open topological string, 10/9/08.
- Rui Reis (Univ. Aberdeen), K-homology and D -branes, 29/7/08.
- João Baptista (Univ. Amsterdam), The quantum equivariant cohomology of toric manifolds, 22/7/08.

Topological Quantum Field Theory Club. This included the following talks in 2008:

- Tim Porter (Univ. Wales, Bangor), The “crossed” technology and its applications IV, 4/12/08.
- Tim Porter (Univ. Wales, Bangor), The “crossed” technology and its applications III, 4/12/08.
- Tim Porter (Univ. Wales, Bangor), The “crossed” technology and its applications II, 3/12/08.

- Tim Porter (Univ. Wales, Bangor), The “crossed” technology and its applications I, 3/12/08.
- John Baez (Univ. California at Riverside), Topological 2-groups and their classifying spaces, 14/7/08.
- Louis Kauffman (Univ. Illinois at Chicago), Virtual knot theory, 14/7/08.
- George Zoupanos (National Tech. Univ., Athens), Dimensional reduction of gauge theories over continuous and fuzzy coset spaces, 12/3/08.
- Atle Hahn (Math. Phys. Group, Univ. Lisbon),
From the Chern–Simons path integral to the Reshetikhin–Turaev invariant, 5/3/08.

Working Seminar on Contact/Symplectic Topology/Geometry. This included the following talks in 2008:

- Pedro Frejlich (CAMGSD), The h -principle, four sessions on 28/02/08, 6/03/08, 13/03/08 and 27/03/08.
- Miguel Abreu (IST), Toric Kähler and Sasakian geometries in action-angle coordinates, four sessions on 1/04/08, 8/04/08, 15/04/08 and 17/06/08.
- Flávio Cordeiro (Univ. Coimbra), The Maslov Index - linear and non-linear, three sessions on 22/04/08, 29/04/08 and 06/05/08.
- Bart Van Steirteghem (CAMGSD), Invariant Kähler structures on multiplicity free Hamiltonian manifolds and spherical varieties (after Woodward and Losev), 13/05/08.
- Oana Dragulete (CAMGSD), Quotients of Kähler and Sasakian manifolds, two sessions on 27/05/08 and 12/06/08.

Working Seminar on Groupoids and Noncommutative Geometry. This included the following talks in 2008:

- Olivier Brahic (CAMGSD), Extensions of Lie algebroids, two sessions on 23/10/08 and 30/10/08.
- Pedro Frejlich (CAMGSD), Classification of foliations on open manifolds, 11/6/08.
- Olivier Brahic (CAMGSD), Integration of coupling Dirac structures, two sessions on 8/4/08 and 15/4/08.
- Mark Lawson (Heriot-Watt Univ.), The category action approach to inverse semigroups, 1/4/08.

Working Seminar on Topos/Quantum Theory. This included the following talks in 2008:

- Pedro Resende (IST), Toposes as spaces, four sessions on 9/10/08, 14/10/08, 21/10/08, and 6/11/08.
- José Mourão (IST), Path integrals, 20/11/08.

Other seminars. The Center has also contributed to activities of the Department of Mathematics of IST and of other research centers, in particular providing partial support to the Colloquium of the Department of Mathematics and to the Quantum Information and Computation Seminar of the Security and Quantum Information Group of Instituto de Telecomunicações.

3 Conferences and short courses

The following Conferences and Short Courses were organized or co-organized by members of the Center in 2008:

MIT Women in Mathematics: A Celebration

MIT, USA, April 12–13, 2008

Organizers: Bonnie Berger, Lenore Blum, Susan Colley, Ana Cannas Da Silva, Susan Landau, Gigliola Staffilani, Katrin Wehrheim.

Plenary speakers:

- Bonnie Berger (MIT)
- Lenore Blum (Carnegie Mellon Univ.)
- Ioana Dumitriu (Univ. Washington)
- Tara Holm (Cornell Univ.)
- Margaret Murray (Univ. of Iowa and ACT, Inc.)
- Linda Rothschild (Univ. California at San Diego)
- Brooke Shipley (Univ. Illinois at Chicago)
- Lauren Williams (Harvard Univ.)

<http://math.mit.edu/womeninmath/>

First AMS-SBM Joint Meeting: Special Session “Low Dimensional Topology”

IMPA, Rio de Janeiro, Brazil, June 4–7, 2008

Organizers: Louis Kauffman, Pedro Lopes.

Main speakers:

- Natália Bedoya (Univ. São Paulo)
- Rui Carpentier (IST)
- Scott Carter (Univ. South Alabama)
- Leonardo Carvalho (Univ. Federal Fluminense)
- Zsuzsanna Dancso (Univ. Toronto)
- Mohamed Elhamdadi (Univ. South Florida)
- Ji Gao (Community College of Philadelphia)
- Daciberg Lima Gonçalves (Univ. São Paulo)
- Hugh Hilden (Univ. Hawaii)
- Pedro Lopes (IST)
- Nathan Moreira dos Santos (Univ. Federal Fluminense)
- Fernando Souza (Univ. Federal Pernambuco)

<http://w3.impa.br/~amssbm/>

XVIIth Oporto Meeting on Geometry, Topology and Physics

Oporto, Portugal, July 10–13, 2008

Organizers: Miguel Costa, Carlos Herdeiro, Marco Mackaay, José Mourão, Roger Picken, João Nuno Tavares.

Main speakers:

- Ali Chamseddine (American Univ. Beirut & IHES)
- Steven Giddings (Univ. California, Santa Barbara)
- Renate Loll (Utrecht Univ.)
- Thomas Thiemann (Max-Planck Inst. für Gravitationsphysik, Golm)

<http://faraday.fc.up.pt/omgtp2008/textoom05.html>

GAP VI — Workshop on Geometry and Physics

CRM-Barcelona, 16–21 July, 2008

Coordinators: Carlos Currás-Bosch, Rui Loja Fernandes, David Iglesias,
Eva Miranda, San Vu Ngoc, Ping Xu.

Plenary speakers:

- Yves Colin de Verdière (Institut Fourier)
- Johannes Duistermaat (Univ. Utrecht)
- Hakan Eliasson (Institut de Mathématiques de Jussieu)
- San Vu Ngoc (Univ. Rennes)

<http://www.crm.cat/GAPVI/>

IX Lisbon Summer Lectures in Geometry

IST, Portugal, September 8–12, 2008

Organizing committee: José Mourão, João P. Nunes, Ricardo Schiappa.

Lecturers:

- Anton Kapustin (California Institute Tech.)
- James Sparks (Mathematical Institute, Univ. Oxford)

<http://www.math.ist.utl.pt/galg/SummerLect08/>

1st ICTI Workshop CMU-Portugal Program in Mathematics — New Developments in PDE and Calculus of Variations

Kos, Greece, 16–20 September 2008

Organizers: Ana Barroso, Irene Fonseca, Luísa Mascarenhas, José Matias.

Speakers:

- Irene Fonseca (Carnegie Mellon Univ.)
- David Kinderlehrer (Carnegie Mellon Univ.)
- Manuel Marques (Univ. Lisbon)
- Kavita Ramanan (Carnegie Mellon Univ.)
- Ana Bela Cruzeiro (IST)
- Luís Trabucho (Univ. Nova Lisboa)
- Adélia Sequeira (IST)

- Pedro Girão (IST)
- Filippo Cagnetti (Postdoc program CMU/Portugal)
- Milena Chermisi (Postdoc program CMU/Portugal)
- Rita Ferreira (PhD program CMU/Portugal)

<http://ferrari.dmat.fct.unl.pt/cva2008/>

Minisymposium on Computation and Analysis in Coagulation-Fragmentation Equations

Kos, Greece, 16–20 September 2008

Organizers: Fernando P. da Costa, Michael Grinfeld.

Speakers:

- Hans Babovsky (Tech. Univ. Ilmenau)
- Luís Bonilla (Univ. Carlos III, Madrid)
- Francis Filbert (Villeurbanne)
- Michael Grinfeld (Univ. Strathclyde, Glasgow)
- Flavius Guias (Tech. Univ. Dortmund)
- Paul Man (Cambridge Univ.)
- Jitendra Kumar (Univ. Magdeburg)
- Rafael Sasportes (Univ. Aberta, Lisboa)
- Henry van Roessel (Univ. Alberta)
- Wilson Lamb (Univ. Strathclyde, Glasgow)

<http://www.maths.strath.ac.uk/~caas05/icnaam/>

Second Workshop on Quantum Gravity and Noncommutative Geometry

Lisbon, Portugal, September 22–24, 2008

Organizing committee: Roger Picken, Aleksandar Mikovic, João Nuno Prata, Nuno Costa Dias, André Fonseca.

Main speakers:

- Orfeu Bertolami (IST)
- Louis Crane (Kansas State Univ.)
- Laurent Freidel (Perimeter Institute)
- Atle Hahn (Math. Phys. Group, Univ. Lisbon)

- Kirill Krasnov (Univ. Nottingham)
- Jerzy Lewandowski (Institute of Theoretical Physics, Warsaw)
- John Madore (Univ. Paris-Sud)
- Pierre Martinetti (Institute for Theoretical Physics, Göttingen)
- Rachel Martins (CAMGSD)
- Guillermo Mena Marugan (IEM, Madrid)
- Jeanette Nelson (Univ. and INFN Torino)
- Branislav Sazdovic (Institute of Physics, Belgrade)
- Harold Steinacker (Univ. Wien)
- Gheorghe Zet (Tech. Univ. Iasi)

<http://eventos.ulusofona.pt/quantum/index.html>

4 Invited lectures

The following invited lectures and short courses have been given by members of the Center:

- Miguel Abreu, Toric Kähler–Sasaki geometry in action-angle coordinates, Conference on Moment Maps, Centre de Recerca Matemàtica (CRM), Barcelona, June 25–28, 2008.
- Luís Barreira, Hyperbolicity and recurrence, Facultat de Matemàtiques i Estadística, Universitat Politècnica de Catalunya, Barcelona, April 22, 2008.
- Luís Barreira, Birkhoff’s ergodic theorem: old and new, Departament de Matemàtiques, Universitat Autònoma de Barcelona, September 8, 2008.
- Luís Barreira, Poincaré recurrence: from qualitative to quantitative, Facultat de Matemàtiques, Universitat de Barcelona, September 10, 2008.
- Ana Cannas da Silva, From hermitian matrices to symplectic geometry and back, Colloquium, Bryn Mawr College, February 18, 2008.
- Ana Cannas da Silva, From hermitian matrices to symplectic geometry and back, What’s Happening in Fine Hall? Princeton Univ., April 4, 2008.
- Diogo Gomes, Discrete time finite state space mean field games, Viscosity, Metric and Control Theoretic Methods in Nonlinear PDEs: Analysis, Approximations, Applications, Univ. Roma I, September 3–5, 2008.

- Diogo Gomes, Stationary ergodic Mather problem, ICTI Workshop in Applied Mathematics, FCT-UNL, Costa da Caparica, September 11, 2008.
- Rui Loja Fernandes, Hidden symmetries and Lie's third theorem, Colloquium Dep. de Matemàtiques, Universitat Autònoma de Barcelona, April 16, 2008.
- Rui Loja Fernandes, Stability of symplectic leaves, short course (3 lectures) at GESTA 2008 Meeting, CRM, Barcelona, May 2008.
- Rui Loja Fernandes, Stability of leaves, 9th Conference on Geometry and Topology of Manifolds, Kraków, July 3, 2008.
- Rui Loja Fernandes, Poisson structures of compact type, Poisson 2008, EPFL, Lausanne, July 7–11, 2008.
- Rui Loja Fernandes, Poisson geometry and topology, CSIC, Madrid, September 16, 2008.
- Rui Loja Fernandes, Stability of symplectic leaves, Geometry and Topology Seminar, Univ. Utrecht, November 3, 2008.
- Rui Loja Fernandes, Integrability of Lie algebroids, Department of Mathematics, Indian Institute of Technology, Mumbai, November 21, 2008.
- Rui Loja Fernandes, Stability of symplectic leaves, short course (6 lectures) at Workshop on Topology and Geometry of Foliations, Indian Statistical Institute, Kolkata, November–December 2008.
- Marco Mackaay, The 1,2-coloured HOMFLY-PT link homology, Columbia Symplectic Geometry and Gauge Theory Seminar, Columbia Univ., October 3, 2008.
- Margarida Mendes Lopes, The algebraic fundamental group of surfaces with $K^2 < 3d$ symplectic 4-manifolds, Univ. Warwick, February 12, 2008.
- Margarida Mendes Lopes, Campedelli surfaces with large fundamental group, WAG Concluding Conference, Univ. Warwick, June 22, 2008.
- Margarida Mendes Lopes, Superfícies algébricas: taxonomia (plenary session), Encontro Nacional da Sociedade Portuguesa de Matemática, Coimbra, June 25–28, 2008.
- Margarida Mendes Lopes, On surfaces with $p_g = 2q - 3$, Workshop on Algebraic Surfaces, Centro De Giorgi, Scuola Normale Superiore, Pisa, October 30, 2008.

- Waldyr Oliva, Rolling ball problems, ICMC Summer Meeting in Differential Equations, Univ. São Paulo, São Carlos, January 28, 2008.
- Roger Picken, A quantum Goldman bracket in $2 + 1$ quantum gravity, Encontro Nacional da Sociedade Portuguesa de Matemática, Coimbra, June 25–28, 2008.
- Roger Picken, A quantum Goldman bracket in $2 + 1$ quantum gravity, QG2 2008 Quantum Geometry and Quantum Gravity Conference, Nottingham, June 30 – July 4, 2008.
- Roger Picken, Mini-course on gerbes, Univ. Oporto, December 10 and 17, 2008.
- Paulo Pinto, C^* -algebras irreps from interval maps, International Conference on Operator Algebras and Applications, Marrakesh, Morocco, 14–18 April, 2008.
- Pedro Resende, Noncommutative geometry and Bohr’s doctrine of classical concepts, Applications of Noncommutative Geometry, Minisymposium at 5ecm, Amsterdam, July 17, 2008.
- Pedro Resende, Sheaves on groupoids and quantales (2 lectures), Workshop on Sheaves in Geometry and Quantum Theory, Radboud Univ., Nijmegen, September 3–5, 2008.
- Carlos Rocha, Global attractors for semilinear parabolic equations on the circle, ICMC Summer Meeting in Differential Equations, Univ. São Paulo in São Carlos, January 29, 2008.
- Carlos Rocha, Morse–Smale attractors for semilinear parabolic equations on the circle, Silesian Univ. in Katowice, May 6, 2008. Conference, EPFL, Lausanne, July 8, 2008.
- Carlos Rocha, Morse–Smale attractors for semilinear parabolic equations on the circle, Dynamics & Applications, Univ. Minho, September 11, 2008.
- Carlos Rocha, Semilinear Parabolic Equations on the Circle, Dynamics of Patterns, Oberwolfach, December 18, 2008.
- Ricardo Schiappa, Instantons and matrix models, Centro de Física Teórica e Computacional, Faculdade de Ciências, Lisbon, June 11, 2008.
- Ricardo Schiappa, Instantons and matrix models, National Meeting of Sociedade Portuguesa de Matemática, Coimbra, June 27, 2008.

- Ricardo Schiappa, Instantons and matrix models, Centro de Física do Porto, Faculdade de Ciências, Porto, December 5, 2008.
- Ricardo Schiappa, Greybody factors for d -dimensional black holes, Black Holes Workshop, Oporto (Portugal), December 23, 2008.

5 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 opening date 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 the Notices and in the Data Base of the American Mathematical Society. In addition, the Center hosts postdoctoral fellows supported directly by the FCT or by other research projects.

The following fellows have stayed in the Center during the whole or part of 2008:

- José Agapito, PhD in Mathematics, Univ. California, Santa Cruz, USA, 2004. Research areas: symplectic geometry, discrete mathematics. Supported by an FCT postdoctoral grant (Jan. 2005–present).
- Rogier Bos, PhD in Mathematics, Radboud Univ., Nijmegen, The Netherlands, 2007. Research areas: representations of groupoids, geometric quantization, K -theory. Supported by CAMGSD (Sep. 1, 2007–Aug. 31, 2008) and an FCT postdoctoral grant (Sep. 2008–Dec. 2008).
- Olivier Brahic, PhD in Mathematics, Univ. Montpellier II, France, 2004. Research areas: Poisson geometry, Lie groupoids and algebroids, representation theory. Supported by an FCT postdoctoral grant (Jan. 2006–present).
- Rachel Dawe Martins, PhD in Mathematical Physics, Nottingham Univ., 2006. Research areas: Noncommutative geometry, spectral triples, standard model of particle physics, K -theory. Supported by an FCT postdoctoral grant (Oct. 2006–present).
- Oana Dragulete, PhD in Mathematics, Ecole Polytechnique Fédérale de Lausanne, 2007. Research areas: Contact geometry, symplectic geometry. Supported by an FCT research grant (Nov. 2007–Sep. 2008).

- João Faria Martins, PhD in Mathematics, Nottingham Univ., UK, 2004. Research areas: quantum topology, quantum groups, knot theory, applications of categorical groups to low dimensional topology. Supported by an FCT postdoctoral grant (Jan. 2005–May 2008).
- Sharon Hollander, PhD in Mathematics, MIT, 2001. Research areas: algebraic topology and algebraic geometry. Supported by CAMGSD (Nov. 1, 2006–Dec. 31, 2008), and by the CIÊNCIA 2007 Program (Jan. 1, 2008–Dec. 31, 2012).
- Sang Seon Kim, PhD in Mathematics, Stanford Univ., USA, 2001. Research areas: symplectic and contact geometry. Supported by an FCT postdoctoral grant (Jul. 2005–Nov. 2008).
- Sean Lawton, PhD in Mathematics, Univ. Maryland, USA, 2006. Research areas: algebraic geometry, invariant theory, moduli theory. Supported by an FCT postdoctoral grant (Aug. 2007–Jul. 31 2008, to be resumed).
- Nuno Luzia, Doutorado em Matemática, IMPA, Brazil, 2004. Research areas: dynamical systems. Supported by an FCT postdoctoral grant (May 2005–Apr. 2008).
- Michal Málek, PhD in Mathematics, Silesian Univ., Opava, Czech Republic, 2002. Research areas: discrete dynamical systems. Supported by CAMGSD (Sep. 1, 2008–Aug. 31, 2009).
- Alessia Mandini, PhD in Mathematics, Univ. Bologna, Italy, 2007. Research areas: symplectic geometry. Supported by the CAMGSD funding (Sep. 1, 2007–Aug. 31, 2009).
- David Martinez Torres, PhD in Mathematics, Univ. Carlos III de Madrid, 2003. Research areas: symplectic, contact and Poisson geometry. Supported by the CIÊNCIA 2007 Program (Jul. 1, 2008–Jun. 30, 2013).
- Dmitry Matsnev, PhD in Mathematics, Penn State Univ., 2005. Research areas: operator algebra K -theory, noncommutative geometry, coarse geometry, Baum–Connes conjecture. Supported by CAMGSD (Sep. 1, 2006–Jul. 31, 2008).
- Elismar Oliveira, Doutorado em Matemática, Univ. Federal do Rio Grande do Sul, Brazil, 2007. Research areas: dynamical systems, Aubry–Mather theory. Supported by an FCT postdoctoral grant (Nov. 2007–Feb. 2008).

- Mahendra Panthee, Doutorado em Matemática, IMPA, Brazil, 2004. Research areas: partial differential equations, harmonic analysis. Supported by CAMGSD (Dec. 15, 2004–Jan. 14, 2006) and an FCT postdoctoral grant (Jan. 15, 2006–Dec. 2008).
- Stavros Papadakis, PhD in Mathematics, Warwick Univ., UK, 2002. Research areas: birational geometry, commutative algebra, computer algebra methods in algebraic geometry, algebraic surfaces, unprojection. Supported by an FCT postdoctoral grant (Jul. 2006–present).
- Paulo Pires Pacheco, PhD in Physics, Imperial College, London, UK, 2007. Research areas: string theory. Supported by an FCT postdoctoral grant (Oct. 2008–present).
- Radu Popescu, Doctorat de Mathématiques, Univ. Claude Bernard, Lyon 1, France, 2000. Research areas: C^* -algebras, bivariant K -theory, groupoids, foliations, quantales. Supported by an FCT postdoctoral grant (since Apr. 2005, suspended since Jul. 2008).
- Nuno Sousa, PhD in Physics, Katholieke Univ. Nijmegen (now Radboud Univ.), The Netherlands, 2003. Research areas: string theory, conformal field theory, topological string theory, geometric quantization, matrix models. Supported by an FCT postdoctoral grant (Mar. 2006–May 2008).
- Gláucio Terra, Doutorado em Matemática Aplicada, Univ. São Paulo, Brazil, 2003. Research areas: geometric mechanics, nonholonomic mechanics, variational mechanics, vakonomic mechanics. Supported by a CAPES (Brazil) grant (Feb. 10, 2008–Feb. 10, 2009).
- Gabrielle Terrone, PhD in Mathematics, Univ. Padova, 2008. Research areas: Viscosity solutions of Hamilton–Jacobi equations. Supported by UTAustin-Portugal program (Sep. 1, 2008–Sep. 1, 2011).
- Claudia Valls, Doctor in Mathematics, Univ. Barcelona, Spain, 1999. Research areas: dynamical systems. Supported by two FCT postdoctoral grants (Oct. 2003–Jan. 2008) and by the CIENCIA 2007 Program (Feb. 1, 2008–Jan. 31, 2013).
- Bart Van Steirteghem, PhD in Mathematics, Columbia Univ., USA, 2004. Research areas: algebraic groups, symplectic geometry. Supported by CAMGSD (Nov. 1, 2004–Jan. 31, 2006) and an FCT postdoctoral grant (Feb. 1, 2006–Sep. 2008).
- Marcel Vonk, PhD in Physics, Univ. Amsterdam, The Netherlands, 2003. Research areas: string theory. Supported by CAMGSD (Sep. 1, 2008–Aug. 31, 2009).

6 Doctoral supervision

The following doctoral degrees have been obtained under supervision of members of the Center:

- Paulo Doutor, Univ. Técnica Lisboa, October 31, 2008. Thesis title: Thermodynamic formalism and multifractal analysis. Supervised by Luís Barreira.
- Misha Protin, Univ. Técnica Lisboa, November 5, 2008. Thesis title: Quantaes of open groupoids. Supervised by Pedro Resende.
- Carlos Rito, Univ. Trás-os-Montes e Alto Douro, January 25, 2008. Thesis title: On surfaces with $p_g = q = 1$ and an involution. Supervised by Margarida Mendes Lopes.
- Rafael Silva Sasportes, Univ. Aberta, April 24, 2008. Thesis title: Dynamical problems in coagulation equations. Supervised by Fernando Pestana da Costa.
- Pedro Vaz, Univ. Algarve, July 8, 2008. Thesis title: A categorification of the quantum $sl(N)$ -link polynomials using foams. Supervised by Marco Mackaay.

7 Publications in 2008

Publications which appeared in 2008

Books

L. Barreira (editor), Special issue dedicated to Yakov Pesin on the occasion of his 60th birthday, *Discrete Contin. Dyn. Syst.* **22** (2008), 1–464.

L. Barreira, *Dimension and Recurrence in Hyperbolic Dynamics*, Progress in Mathematics, vol. 272, Birkhäuser, 2008.

L. Barreira and C. Valls, *Stability of Nonautonomous Differential Equations*, Lecture Notes in Mathematics, vol. 1926, Springer, 2008.

Proceedings

R. Loja Fernandes and R. Picken (editors), Geometry and Physics: XVI International Fall Workshop, AIP Conference Proceedings volume 1023, American Institute of Physics, 2008.

Articles in refereed international journals

M. Abreu, A personal tour through symplectic topology and geometry, *São Paulo J. Math.* (2008), no. 2, 175–202.

M. Abreu, E. Dryden, P. Freitas, and L. Godinho, Hearing the weights of weighted projective planes, *Ann. Global Anal. Geom.* (2008), no. 33, 371–395.

J.-F. Babadjian, M. Baía, and P.M. Santos, Characterization of two-scale gradient Young measures and applications to homogenization, *Appl. Math. Optim.* (2008), no. 1, 69–97.

L. Barreira and G. Iommi, Partial quotients of continued fractions and β -expansions, *Nonlinearity* **21** (2008), 2211–2219.

L. Barreira and V. Saraiva, Multifractal nonrigidity of topological Markov chains, *J. Statist. Phys.* **130** (2008), 387–412.

L. Barreira, C. Silva, and C. Valls, Integral stable manifolds in Banach spaces, *J. London Math. Soc. (2)* **77** (2008), 443–464.

L. Barreira, C. Silva, and C. Valls, Regularity of invariant manifolds for nonuniformly hyperbolic dynamics, *J. Dynam. Differential Equations* **20** (2008), 281–299.

L. Barreira and C. Valls, Analytic invariant manifolds for sequences of diffeomorphisms, *J. Differential Equations* **245** (2008), 80–101.

L. Barreira and C. Valls, Asymptotic behavior of distribution of frequencies of digits, *Math. Proc. Cambridge Philos. Soc.* **145** (2008), 177–195.

L. Barreira and C. Valls, Characterization of stable manifolds for nonuniform exponential dichotomies, *Discrete Contin. Dyn. Syst.* **21** (2008), 1025–1046.

L. Barreira and C. Valls, Conjugacies between linear and nonlinear nonuniform contractions, *Ergodic Theory Dynam. Systems* **28** (2008), 1–19.

L. Barreira and C. Valls, Delay equations and nonuniform exponential stability, *Discrete Contin. Dyn. Syst.* **1** (2008), 219–223.

L. Barreira and C. Valls, Growth rates and nonuniform hyperbolicity, *Discrete Contin. Dyn. Syst.* **22** (2008), 509–528.

L. Barreira and C. Valls, Hausdorff dimension and quadratic relations between frequencies of digits, *São Paulo J. Math.* **2** (2008), 161–173.

- L. Barreira and C. Valls, Optimal estimates along stable manifolds of nonuniformly hyperbolic dynamics, *Proc. Roy. Soc. Edinburgh Sect. A* **138** (2008), 693–717.
- L. Barreira and C. Valls, Robustness of nonuniform exponential dichotomies in Banach spaces, *J. Differential Equations* **244** (2008), 2407–2447.
- F. Bogomolov and B. de Oliveira, Symmetric tensors and geometry of \mathbb{P}^N subvarieties, *Geom. Funct. Anal.* **18** (2008), no. 3, 637–656.
- A. Calabri, M. Mendes Lopes, and R. Pardini, Involutions on numerical Campedelli surfaces, *Tohoku Math. J. (2)* **60** (2008), no. 1, 1–22.
- F. Camilli, D. Capuzzo and D. Gomes, Error estimates for the approximation of the effective Hamiltonian, *Appl. Math. Optim.* **57** (2008), no. 1, 30–57.
- X. Carvajal and M. Panthee, Well-posedness for some perturbations of the *KDV* equation with low regularity data, *Electron. J. Differential Equations* **2008** (2008), no. 2, 1–18.
- J. Cholewa, R. Czaja, and G. Mola, Remarks on the fractal dimension of bi-space global and exponential attractors, *Boll. Unione Mat. Ital. Sez. A Mat. Soc. Cult. (8)* **9** (2008), no. 1, 121–145.
- C. Correia Ramos, N. Martins, P. Pinto, and J. Sousa Ramos, Cuntz–Krieger algebras representations from orbits of interval maps, *J. Math. Anal. Appl.* **341** (2008), 825–833.
- R. Czaja and M. Efendiev, A note on attractors with finite fractal dimension, *Bull. London Math. Soc.* **40** (2008), 1–8.
- R. Czaja and C. Rocha, Transversality in scalar reaction-diffusion equations on a circle, *J. Differential Equations* **245** (2008), no. 3, 692–721.
- P. Damianou and R. Loja Fernandes, Integrable hierarchies and the modular classes, *Ann. Inst. Fourier (Grenoble)* **58** (2008), no. 1, 107–137.
- J. Duarte, C. Januário, and N. Martins, Chaos in Ecology: the topological entropy of a tritrophic food chain model, *Discrete Dyn. Nat. Soc.* **2008** (2008), 1–12.
- J. Duarte, C. Januário, and N. Martins, Topological invariants in the study of a chaotic food chain system, *Chaos* **18** (2008).
- J. Faria Martins and A. Mikovic, Invariants of spin networks embedded in three-manifolds, *Comm. Math. Phys.* **279** (2008), no. 2, 381–399.

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- D. Gomes, Generalized Mather problem and selection principles for viscosity solutions and Mather measures, *Adv. Calc. Var.* **1** (2008), no. 3, 291–307.
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- D. Gomes and A. Oberman, Viscosity solutions methods for converse KAM theory, *M2AN Math. Model. Numer. Anal.* **42** (2008), no. 6, 1047–1064.
- D. Gomes and J. Silva, Wigner transform and estimates for Schrödinger equation, *São Paulo J. Math.* **2** (2008), no. 1, 85–98.
- G. Granja and S. Hollander, Realizing modules over the homology of a DGA, *J. Pure Appl. Algebra* **212** (2008), 1394–1414.
- S. Hollander, A homotopy theory for stacks, *Israel J. Math.* **163** (2008), 93–124.
- S. Hollander, Characterizing algebraic stacks, *Proc. Amer. Math. Soc.* **136** (2008), no. 4, 1465–1476.
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- L. Kauffman and P. Lopes, On the minimum number of colors for knots, *Adv. in Appl. Math.* **40** (2008), no. 1, 36–53.
- L. Kauffman and J. Faria Martins, Invariants of welded virtual knots via crossed module invariants of knotted surfaces, *Compos. Math.* **144** (2008), no. 4, 1046–1080.
- K. Konno and M. Mendes Lopes, The base components of the dualizing sheaf of a curve on a surface, *Arch. Math. (Basel)*, **90** (2008), no. 5, 395–400.
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- M. Mariño, R. Schiappa and M. Weiss, Nonperturbative effects and the large-order behavior of matrix models and topological strings, *Commun. Number Theory Phys.* **2** (2008), 349–419.
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- D. Matsnev, Asymptotic dimension of one relator groups, *Colloq. Math.* (2008), no. 1, 85–89.
- F. Mena, J. Natário, and P. Tod, Gravitational collapse to toroidal and higher genus asymptotically AdS black holes, *Adv. Theor. Math. Phys.* **12** (2008), 1163–1181.
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- M. Mendes Lopes and R. Pardini, Numerical Campedelli surfaces with fundamental group of order 9, *J. Eur. Math. Soc. (JEMS)* **10** (2008), no. 2, 457–476.
- J. Natário, Tangent Euler top in general relativity, *Comm. Math. Phys.* **281** (2008), 387–400.
- J. Nelson and R. Picken, A quantum Goldman bracket in $(2 + 1)$ quantum gravity, *J. Phys. A* **41** (2008).
- W. Oliva and C. Rocha, Reducible Volterra retarded equations with infinite delay, *São Paulo J. Math.* **2** (2008), no. 1, 37–53.
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- M. Panthee and M. Scialom, On the Cauchy problem for a coupled system of *KDV* equations: critical case, *Adv. Differential Equations* **13** (2008), no. 1-2.
- S. Papadakis, The equations of type II_1 unprojection, *J. Pure Appl. Algebra* **212** (2008), no. 10, 2194–2208.
- M. Perlmutter, M. Rodriguez-Olmos, and M. Sousa Dias, The symplectic normal space of a cotangent-lifted action, *Differential Geom. Appl.* **26** (2008), 277–297.
- F. Pestana da Costa and R. Sasportes, Dynamics of a non-autonomous ODE system occurring in coagulation theory, *J. Dynam. Differential Equations* **20** (2008), no. 1, 55–85.
- R. Saramago, Dieudonné rings associated with $K(n)_*k(n)_*$, *Proc. Amer. Math. Soc.* **136** (2008), no. 8, 2699–2709.
- C. Valls, Bifurcation of limit cycles and integrability conditions for 6-parameter families of polynomial vector fields of arbitrary degree, *Nonlinear Anal.* **69** (2008), 256–275.
- C. Valls, New arbitrary-parameter families of centres for polynomial vector fields of arbitrary degree, *Dyn. Syst.* **23** (2008), 163–166.

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- A. Cannas da Silva, *4-manifolds with a symplectic bias*, Proceedings of the XVI International Fall Workshop on Geometry and Physics, R. Loja Fernandes and R. Picken (editors), AIP Conference Proceedings Volume 1023, pp. 34–54, 2008.
- P. Lopes, Sequences of knots and their limits, Proceedings of the XVI International Fall Workshop on Geometry and Physics, R. Loja Fernandes and R. Picken (editors), AIP Conference Proceedings Volume 1023, pp. 183–186, 2008.
- F. Pestana da Costa, R. Sasportes, and J. Teixeira Pinto, Self-similar behaviour in an addition model with input of monomers, vol. 1048, American Institute of Physics, pp. 935–938, Numerical Analysis and Applied Mathematics: International Conference on Numerical Analysis and Applied Mathematics, AIP Conference Proceedings, 2008.
- C. Ramos, N. Martins and P. Pinto, Orbit representations and circle maps, Operator Algebras, Operator Theory and Applications, M. Bastos, I. Gohberg, A. Lebre and F.-O. Speck (editors), Operator Theory: Advances and Applications, Volume 181, pp. 417–427. Birkhäuser, 2008.

Mathematics popularization articles

G. Granja, O que é o grupo fundamental?, *Gazeta da Matemática* **155** (2008), p. 48.

W. Oliva, O que é o bilhar?, *Gazeta de Matemática* **156** (2008), 50–51.

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J. Agapito and L. Godinho, Intersection numbers of polygon spaces, To appear in *Trans. Amer. Math. Soc.*, 2008.

S. Anjos, F. Lalonde, and M. Pinsonnault, The homotopy type of the space of symplectic balls in rational ruled 4-manifolds, To appear in *Geometry and Topology*, 2008.

M. Baía and P. Santos, A note on concentrations for integral two-scale problems, To appear in *Ricerc. Mat.*, 2008.

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- B. Fiedler and C. Rocha, Connectivity and design of planar global attractors of Sturm Type. I: Bipolar orientations and Hamiltonian paths, To appear in *J. Reine Angew. Math.*, 2008.
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- D. Gomes, Selection criteria for Hamilton–Jacobi equations and Aubry–Mather measures, To appear in *Advances in Calculus of Variations*, 2008.
- T. Harmark, J. Natário and R. Schiappa, Greybody factors for d -dimensional black holes, To appear in *Adv. Theor. Math. Phys.*, 2008.
- J. Llibre and C. Valls, Analytic first integrals of the FitzHugh–Nagumo systems, To appear in *Z. Angew. Math. Phys.*, 2008.
- J. Llibre and C. Valls, Centers for polynomial vector fields of arbitrary degree, To appear in *Comm. Pure Appl. Anal.*, 2008.
- J. Llibre and C. Valls, Global analytic integrability of the Belousov–Zhabotinskii system, To appear in *J. Adv. Nonlinear Studies*, 2008.
- J. Llibre and C. Valls, Global analytic integrability of the Rabinovich system, To appear in *J. Geom. Phys.*, 2008.
- J. Llibre and C. Valls, On the limit cycles of polynomial differential systems with homogeneous nonlinearities of degree 3 via the averaging method, To appear in *Dyn. Discrete Contin. Impulsive Sys. A*, 2008.
- M. Mariño, R. Schiappa and M. Weiss, Multi-instantons and multi-cuts, To appear in *J. Math. Phys.*, 2008.
- M. Mendes Lopes and R. Pardini, On surfaces with $p_g = 2q - 3$, To appear in *Adv. Geom.*, 2008.
- M. Mendes Lopes, R. Pardini and M. Reid, Campedelli surfaces with fundamental group of order 8, To appear in *Geom. Dedicata*, 2008.
- F. Pestana da Costa, M. Grinfeld, N. Mottram, and J. Teixeira Pinto, Uniqueness in the Fredericksz transition with weak anchoring, To appear in *J. Differential Equations*, 2008.
- F. Pestana da Costa, E. Gartland Jr., M. Grinfeld, and J. Teixeira Pinto, Bifurcation analysis of the Twist–Fredericksz transition in a nematic liquid crystal cell with pre-twist boundary conditions, To appear in *Euro. J. Applied Mathematics*, 2008.

C. Rito, A note on Todorov surfaces, To appear in Osaka Math. J., 2008.

M. Rodríguez-Olmos and M. Sousa Dias, Nonlinear stability of Riemann ellipsoids with symmetric configurations, To appear in J. Nonlinear Sci., 2008.

R. Saramago, Dieudonné module structures for ungraded and periodically graded Hopf rings, To appear in Algebras and Representation Theory, 2008.

C. Valls, Existence of quasiperiodic solutions for the second order approximation Boussinesq system, To appear in Nonlinear Anal., 2008.

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M. Crainic and R. Loja Fernandes, A geometric approach to Conn's linearization theorem, 2008.

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J. Faria Martins and R. Picken, A cubical set approach to 2-bundles with connection and Wilson surfaces, 2008.

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P. Girão and H. Tehrani, Positive solutions to logistic type equations with harvesting, 2008.

- P. Girão and J. Gomes, Multibump nodal solutions for an indefinite nonhomogeneous elliptic problem, 2008.
- S. Hollander, Geometric criteria for Landweber exactness, 2008.
- L. Kauffman and P. Lopes, Graded forests and rational knots, 2008.
- R. Loja Fernandes, J.-P. Ortega, and T. Ratiu, The momentum map in Poisson geometry, 2008.
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- F. Mena and J. Natário, Matching stationary spacetimes, 2008.
- E. Monteiro and P. Pinto, On Galois theory from subfactors, 2008.
- J. Natário, Painlevé–Gullstrand coordinates for the Kerr solution, 2008.
- W. Oliva and C. Rocha, Reducible Volterra and Levin-Nohel retarded equations with infinite delay, 2008.
- W. Oliva and G. Terra, Birkhoffian systems in infinite dimensional manifolds, 2008.
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- B. Oliver and J. Ventura, Extensions of linking systems with ρ -group kernel, 2008.
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- F. Pestana da Costa, M. Grinfeld, M. Langer, and J. Teixeira Pinto, A nonlocal operator arising in the analysis of kickback in liquid crystals, 2008.

P. Resende, Grupoid actions as quantale modules, 2008.

P. Resende, Grupoid sheaves as Hilbert modules, 2008.

C. Rocha, Orbit equivalence of global attractors for semilinear parabolic equations on the circle, 2008.

R. Saramago, Connected Hopf algebra maps, 2008.

R. Saramago, Connected Hopf corings and their Dieudonné counterparts, 2008.

R. Sena-Dias, Spectral measures on toric varieties and the asymptotic expansion of Tian–Yau–Zelditch, 2008.

8 Partnership and outreach

In October 2004 the Center submitted to the Minister of Science, Innovation and Higher Education a request for the Statute of Associate 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 (Instituto de Sistemas e Robótica-Lisbon) and with the Institute of Telecommunications (IT) regarding interdisciplinary research cooperation, and also signed partnership protocols with 44 secondary and primary schools, which together enroll more than 38000 students, aiming at the promotion of Mathematics at these education levels through a set of activities oriented towards students and teachers.

While the evaluation of the request for the Statute of Associate Laboratory is still in progress, the Center has nevertheless started to develop various activities in collaboration with the secondary schools and it has also pursued its past collaboration with the “Ciência Viva” Program and with the “Programa Gulbenkian Novos Talentos em Matemática”. Some of these activities are listed below.

Summer Course on Topology. “Topologia - Estágio de iniciação científica para alunos do 11^oano”, July 15–18, 2008.

<http://www.math.ist.utl.pt/~rpicken/estagio/>.

Summer school for undergraduates. “Escola Diagonal 2008”, Lisbon, September 1–5, 2008.

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9 Personal notes

- Luís Barreira was awarded the Ferran Sunyer i Balaguer Prize, Spain, 2008.
- Luís Barreira is a member of the Editorial Board of *Dynamical Systems*.
- Luís Barreira is a member of the Editorial Board of *Revista Matemática Iberoamericana*.
- Rui Loja Fernandes is editor-in-chief of *Portugaliae Mathematica*.
- Rui Loja Fernandes is a member of the Editorial Board of *Journal of Geometric Mechanics*.
- Paulo Pinto received an honorable mention of the Prémio Científico UTL/Santander Totta em Matemática, Portugal, 2008.
- Pedro Resende is a member of the Editorial Board of *Surveys in Mathematics and Applications*.
- Claudia Valls was awarded the Prémio Científico UTL/Santander Totta em Matemática, Portugal, 2008.