



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

Report 2011

March 2012

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1 Research Projects and Special Grants

The following research projects were coordinated by members of the Center in 2011:

Algebraic Geometry in Portugal

(Started 25/1/2010, duration 36 months)

Funding agency: Fundação para a Ciência e a Tecnologia

Reference: PTDC/MAT/099275/2008

Principal investigator: Margarida Mendes Lopes

Number of participants: 14

This project aims to promote the interaction between algebraic geometers in Portugal and is focused on problems linked to moduli spaces and classification of objects of algebraic geometry.

Algebraic geometry of moduli spaces

(July, 2010 – July, 2011)

Funding agency: Seventh Framework Programme (FP7), European Union

Reference: 251974 Marie-Curie-FP7-People-2009-IIF

Contact person: Rui Loja Fernandes

Fellow: Rahul Pandharipande

The central questions attacked concern cohomology, Virasoro constraints, and map/sheaf equivalences. The methods used are new localization/degeneration techniques related to the virtual classes of the corresponding moduli questions. The project, while in pure mathematics, is related also to topological string theory. The research program will be pursued with mathematicians in the geometry group at the Instituto Superior Técnico in Lisbon and collaborators across Europe.

Gulbenkian Mid-career fellowship

(July, 2010 – July 2011)

Funding agency: Gulbenkian Foundation

Reference: 2501 - Matemática-Presidência

Contact person: Rui Loja Fernandes

Fellow: Rahul Pandharipande

Applied Mathematics: from Dynamical Systems to Cryptography

(Started September 1, 2009, duration 48 months)

Funding agency: Fundação para a Ciência e a Tecnologia & UT Austin

Reference: UTAustin/MAT/0057/2008

Principal investigator: Diogo Gomes

Number of participants: 28

In this project we bring together researchers from several areas in Applied Mathematics including Dynamical Systems, Financial Mathematics, Game Theory, Optimal Control, Viscosity Solutions, Number Theory, and Cryptography. In all these areas there are strong research groups both in Portuguese Universities as well as in the University of Texas at Austin. The UTAustin—Portugal initiative presents a unique opportunity to foster scientific interactions between groups in Portugal and UT Austin.

Black Holes, Duality and String Theory

(Started 24/6/2010, duration 12 months)

Funding agency: Fundação para a Ciência e a Tecnologia & Deutscher Akademischer Auslandsdienst (DAAD)

Reference: Transnational Cooperation grant FCT/DAAD 2010-2011

Principal investigator: Gabriel Lopes Cardoso

Number of participants: 10

This project studies various aspects of duality in string theory that include the interplay between mirror symmetry and geometric transitions, and attractors and the fluid-gravity correspondence.

CMU — Portugal: ICTI Program in Applied Mathematics

Funding agency: Fundação para a Ciência e a Tecnologia

Director: Diogo Gomes

The Center for Mathematical Analysis, Geometry, and Dynamical Systems is one of the participating research units in this cooperation program between portuguese institutions and Carnegie Mellon University.
<http://icti.math.cmu.edu/>

CoLab Program UT Austin — Portugal

Funding agency: Fundação para a Ciência e a Tecnologia

Director: Diogo Gomes

The Center for Mathematical Analysis, Geometry, and Dynamical Systems is one of the participating research units in this cooperation program between portuguese institutions and University of Texas at Austin.

<http://math.utaustinportugal.org/>

Contact and symplectic topology

(Started January 27, 2010, duration 60 months)

Funding agency: European Science Foundation (Research Networking Programme)

Reference: CAST

Member of Steering Committee in Portugal: Sílvia Anjos

Other Members in the Steering Committee: Frédéric Bourgeois – Programme Chair, Vincent Colin, Kai Cieliebak, András Stipsicz, Michael Entov, Paolo Lisca, Robert Vandervorst, Aleksy Tralle, Francisco Presas, Tobias Ekholm, Felix Schlenk, Ivan Smith

The goal of this network is to stimulate exchange between researchers from all branches of contact and symplectic topology, in order to create a comprehensive perspective on the field and make progress on some of the basic open questions. The European scale of the network reflects the global nature of these questions as well as the European strength in the subject. The planned activities include workshops, research collaborations, and the exchange of PhD students and postdocs.

The research themes of CAST include: Fukaya categories and mirror symmetry, Floer homology and Hamiltonian dynamics, Symplectic field theory, Contact Topology, Complex geometry and Stein manifolds, Topology of symplectic manifolds, Groups of symplectomorphisms and contactomorphisms.

<http://cast.ulb.ac.be/>

New Geometry and Topology

(Started 1/1/2010, duration 36 months)

Funding agency: Fundação para a Ciência e a Tecnologia

Reference: PTDC/MAT/101503/2008

Principal investigator: Roger Picken

Number of participants: 11

This project addresses questions in new areas of geometry and topology, including Khovanov homology, the categorification of quantum groups, parallel transport for abelian and non-abelian gerbes, invariants of knots and knotted surfaces, and questions related to quantum gravity.

Nonperturbative String Theory and Black Holes at LHC

(Started 2/2/2010, duration 12 months)

Funding agency: Fundação para a Ciência e a Tecnologia

Reference: CERN/FP/109344/2009

Principal investigator: Ricardo Schiappa

Number of participants: 9

This project is divided into two tasks, respectively addressing nonperturbative partition functions and quantization, and black holes and string theory.

Poisson Geometry and Applications

(Started 1/3/2010, duration 24 months)

Funding agency: Fundação para a Ciência e a Tecnologia/GRICES and Centre National de la Recherche Scientifique

Reference: 4.1.3/CAPES/CPLP

Principal investigator: Rui Loja Fernandes

Number of participants: 5

Cooperation project involving researchers from CAMGSD, Coimbra University and University of Poitiers, in the area of Poisson geometry.

Quantum Geometry and Quantum Gravity

(Started July, 2006, duration 60 months)

Funding agency: European Science Foundation (Research Networking Programme)

Reference: QG

Member of Steering Committee in Portugal: Roger Picken

Other Members in the Steering Committee: Harald Grosse, Glenn Barnich, Larisa Jonke, Hermann Nicolai, Jerzy Lewandowski, Victor Aldaya, Ingemar Bengtsson, Juerg Froehlich, John Barrett (Chair), Thomas Thiemann, Carlo Rovelli, Mauro Carfora

The research programme will study several approaches to quantum gravity, namely loop quantum gravity, spin foam models, dynamical triangulations and matrix models. The common theme is the occurrence of quantum geometry in all these approaches. The research programme will study mathematical tools and techniques in non-commutative geometry and quantum groups and their applications to quantum gravity.
<http://www.maths.nottingham.ac.uk/qg/>

Research Chair in String Theory

(started 01/10/2009, duration 60 months)

Funding agency: Fundação para a Ciência e a Tecnologia and IST

Researcher: Gabriel Lopes Cardoso

Gabriel Lopes Cardoso holds the Invited Research Chair on Mathematical Physics & String Theory. The main research goals are in the area of String Theory, with very strong links to Mathematical Physics, Geometry and Topology. This is a most promising venue for future research, lying at the interface between Mathematics and Theoretical Physics, and with proven major contributions to both fields.
<http://alfa.fct.mctes.pt/apoios/outros/catedras/index.phtml.en>

Symplectic and Related Geometries

(Started 1/2/2010, duration 36 months)

Funding agency: Fundação para a Ciência e a Tecnologia

Reference: PTDC/MAT/098936/2008

Principal investigator: Rui Loja Fernandes

Number of participants: 10

Research project in symplectic geometry and related subjects. It provides funding for post-doctoral grants and junior research grants.

Symplectic Topology and Poisson Geometry

(Started 1/1/2011, duration 24 months)

Funding agency: Fundação para a Ciência e Tecnologia
and Ministério da Educação do Brasil/CAPES

Reference: FCT/CAPES - 2011/2012 - 4.4.1.00

Principal investigator: Miguel Abreu

Number of participants: 8

Cooperation project involving researchers from CAMGSD, the Univ. Federal do Rio de Janeiro, and IMPA, in the area of symplectic topology and Poisson geometry.

2 Visitors

The following researchers visited the Center in 2011:

Jaume Amoros, UPC-Barcelona, Feb 3

Camilo Arias-Abad, Zurich University, May 10

Fiammetta Battaglia, University of Florence, Apr 28

Arnaud Beauville, Nice University, Mar 14

Mark Behrens, MIT, Jun 26 – Jul 1

Indranil Biswas, TIFR, Bombay, Feb 10 – Feb 20

Marco Bonacini, SISSA, Jul 20

Matthew Borman, University of Chicago, Jun 21

Pedro Brito, University of Aberdeen, Oct 22

Tomasz Brzezinski, University of Wales Swansea, UK, Jan 26

Philip Candelas, Oxford University, Jan 19

Pawel Caputa, Niels Bohr Institute, Nov 21

Marius Crainic, Utrecht University, Jun 20

Dan Christensen, University Western Ontario, May 30 – May 31

Luís Diogo, Stanford University, Jun 1 – Jun 25

Marko Djuric, Brown University, May 2

Andreas Doering, Oxford University, Jul 26 – Aug 01

José Edelstein, Universidade de Santiago de Compostela, May 16

Gavril Farkas, Humboldt Universität zu Berlin, Germany, Sep 4 – Sep 9

Bernold Fiedler, Free University of Berlin, Mar 03 – Mar 17, Oct 03 – Oct 26

Cristina Ferreira, Universidade do Minho, Jan 25 – Jan 26

Agnes Gadbled, Cambridge University, Nov 11

Humberto Gomez, Universidade Estadual Paulista, Sep 12

Stephane Guillermou, Grenoble University, Jul 7

François Hamel, Aix-Marseille Université & Institut Universitaire de France, Nov 08 – Nov 12

Inês Henriques, University of California at Riverside, Jul 7

Benjamin Himpel, Aarhus University, Jan 19

John Huerta, Australian National University, Dec 04 – Dec 08

Stephen Huggett, Plymouth University, Jul 10 – Jul 15

Hiroataka Irie, National Taiwan University, Jul 4
Nitu Kitchloo, Johns Hopkins and UCSD, Jun 26 – Jul 1
Sándor Kovács, University of Washington, Aug 31 – Sep 8
Sean Lawton, U. Texas Pan American, Jan 09 – Jan 16, Jul 03 – Jul 10
Paulo Lima-Filho, Texas A and M University, June 16
Ezequiel Maderna, Universidade de la Republica, Nov 05 – Nov 12
Jan Manschot, University of Bonn, Nov 28
Mauro Mariani, Université Aix-Marseille, Oct 26 – Oct 30
Johan Martens, University of Aarhus, Dec 11 – Dec 14
José F. Mendes, Universidade de Aveiro, Nov 08 – Nov 08
Luca Migliorini, University of Bologna, Apr 28
Joana Mohr, UFRGS, Jan 03 – Feb 10
Philippe Monnier, Toulouse University, May 3
Hector Morgado, Universidad Nacional Autónoma de México, Mar 26 – Apr 02
Suresh Nampuri, LMU Munich, Jun 27
Paul Norbury, University of Melbourne, Sep 20
Niels Obers, Niels Bohr Institute, Mar 29
Bruno Oliveira, University of Miami, Jul 14
George Papadopoulos, Kings College London, Jan 18 – Jan 22
Jihun Park, Pohang University of Science and Technology, Feb 1
Andres Pedroza, Colima University, Mexico, Feb 22
Erik Plauschinn, Utrecht University, Nov 14
Sanjaye Ramgoolam, Queen Mary - London, Nov 11
Tudor Ratiu, EPFL, May 5—9
Rui Reis, University of Aberdeen, May 12
Filipe Rivero, Uversidad de Sevilla, May 23 – 24
Yongbin Ruan, Michigan University, Apr 29
Rudolfo Russo, Queen Mary - London, Dec 5
Slava Rychkov, Ecole Normale Superieure, Jun 2
Silvia Sabatini, EPFL, Jan 22 – Fev 20, Mai 29 – Jun 03, Nov 14 – Nov 18
Hector Sanchez, Universidad Nacional Autónoma de México, Dec 14
Alistair Savage, Univ. of Ottawa, Canada, Jun 8

Vivek Shende, Princeton University, Feb 15 – Mar 15
Diogo Oliveira e Silva, University of California, Berkeley, Jun 22
Rafael Sousa, UFRGS, Jan 03 – Feb 10
Eduardo Teixeira, Universidade F. Ceara, Mar 26 – Apr 02
Richard Thomas, Imperial College, Feb 28
Pietro Tortella, SISSA, Feb 7
Dimitrios Tsimpis, IPNL Lyon, Oct 17
Daniel Tubbenhauer, Gottinger University, Nov 06 – Nov 12
Florent Schaffhauser, Universidad de Los Andes, Colombia, Jul 5
Michael Viscardi, Harvard University, Mar 21
Filippo Viviani, University Rome 3, Apr 29
Cornelia Vizman, University of Timisoara, May 31
Marcel Vonk, Utrecht University, Jul 25 – Jul 29
Yasuyoshi Yonezawa, University of Bonn, Jul 28

3 Seminar Series & Working Seminars

3.1 Analysis, Geometry, and Dynamical Systems Seminar

This is the main seminar of the Center. It included the following talks in 2011:

- Bernold Fiedler (Institute of Mathematics, Free University of Berlin), Negative Bendixson-Dulac criteria in several dimensions? A chemostat example, 15/03/11.
- Felipe Rivero (Universidad de Sevilla), Structure stability of pullback attractors, 24/05/11.
- Diogo Oliveira e Silva (University of California, Berkeley), On trilinear oscillatory integrals, 22/06/11.
- Bernold Fiedler (Institute of Mathematics, Free University of Berlin), Schoenflies spheres in Sturm attractors, 18/10/11.

all sessions of this seminar

3.2 Algebra Seminar

This included the following talks in 2011:

- Pedro Resende (IST, CAMGSD), Facets of topos theory, 17/03/11.
- Ayhan Gunaydin (CMAF), Small multiplicative subgroups of fields, 05/05/11.
- Rui Reis (University of Aberdeen), Manifold functor calculus and h-principles, 12/05/11.
- Dan Christensen (University of Western Ontario), Categories of smooth spaces, 31/05/11.
- Paulo Lima-Filho (Texas A and M), Explicit examples of regulator maps, 16/06/11.
- Inês Henriques (University of California at Riverside), Free resolutions over quasi complete intersections, 07/07/11.
- Pedro Brito (University of Aberdeen), Enriched manifold calculus and operads, 22/09/11.
- Stavros Papadakis (CAMGSD, IST), Betti bounds for the Stanley-Reisner ring of a stellar subdivision, 17/11/11.
- Mike Paluch (IST), A simplicial guide to Voevodsky's motives, 15/12/11.

all sessions of this seminar

3.3 Algebraic Geometry / Moduli Seminar

This included the following talks in 2011:

- Pietro Tortella (SISSA), Moduli spaces for Lie-algebroid connections, 07/02/11.
- Indranil Biswas (TIFR, Bombay), Brauer group of some moduli of bundles on a curve, 14/02/11.
- Vivek Shende (Princeton University), Hilbert schemes of plane curve singularities and the singularities of Severi varieties, 21/02/11.
- Richard Thomas (Imperial College), Nodal curves old and new, 28/02/11.
- Vivek Shende (Princeton University), Hilbert schemes of singular curves and the HOMFLY polynomial of their links, 07/03/11.
- Arnaud Beauville (Nice University), Involutions of holomorphic symplectic manifolds, 14/03/11.
- Michael Viscardi (Harvard University), Alternate compactifications of the moduli space of genus one maps, 21/03/11.
- Yongbin Ruan (Michigan University), Gromov-Witten theory of elliptic orbifold \mathbb{P}^1 and quasi-modular form, 29/04/11.
- Filippo Viviani (University Rome 3), On the birational geometry of the universal Picard variety, 29/04/11.

all sessions of this seminar

3.4 Geometria em Lisboa Seminar

This included the following talks in 2011:

- Florian Schaetz (IST), Integrating representations up to homotopy, 11/01/11.
- Ana Cristina Ferreira (Universidade do Minho), Three-forms and moduli spaces of instantons, 25/01/11.
- Jihun Park (Pohang University of Science and Technology), Kahler-Einstein metrics on Fano manifolds, 01/02/11.
- Jaume Amorós (UPC-Barcelona), Holomorphic tangent vector fields in compact Kahler and projective manifolds, 03/02/11.
- Andres Pedroza (Colima University, Mexico), On the Bounded Isometry Conjecture, 22/02/11.

- Miguel Abreu (IST), Remarks on Lagrangian Intersections in Toric Manifolds, 15/03/11.
- Fiammetta Battaglia (University of Florence), The Betti numbers of the Penrose kite, 28/04/11.
- Luca Migliorini (University of Bologna), Topological properties of a class of algebraically completely integrable systems with C^* action, 28/04/11.
- Philippe Monnier (Toulouse), Rigidity of Hamiltonian actions, 03/05/11.
- Camilo Arias-Abad (Zurich), Reidemeister torsion for flat superconnections, 10/05/11.
- José Mourão (IST), Examples of complexification of Lagrangian fibrations and quantization, 17/05/11.
- Cornelia Vizman (University of Timisoara), Current algebra functors, 31/05/11.
- Luís Diogo (Stanford), Floer homology and holomorphic curves, 14/06/11.
- Matthew Borman (U. Chicago), Symplectic reduction of quasi-morphisms and quasi-states, 21/06/11.
- William Kirwin (IST), Momentum space for compact Lie groups, 05/07/11.
- Florent Schaffhauser (Universidad de Los Andes, Colombia), Topology of moduli spaces of vector bundles on a real algebraic curve, 05/07/11.
- Stephane Guillermou (Grenoble), Microlocal theory of sheaves and link with symplectic geometry, 07/07/11.
- Bruno Oliveira (U. Miami), Closed symmetric differentials of rank 1 and 2 on surfaces and their geometry, 14/07/11.
- Paul Norbury (U. Melbourne), Gromov-Witten invariants of \mathbb{P}^1 and Eynard-Orantin invariants, 20/09/11.

all sessions of this seminar

3.5 Informal Geometry Seminar

This included the following talks in 2011:

- Stavros Papadakis (IST), Automatic Theorem Proving for Euclidean Geometry, 15/03/11.

- Remi Leclercq (IST), Introduction to the Hamiltonian diffeomorphism group (with particular focus on Hofer's distance), 29/03/11.
- Alessia Mandini (IST), On the moduli spaces of polygons and hyper-polygon, 05/04/11.
- Hassan Najafi Alishah (IST), KAM theory (Kolmogorov-Arnold-Moser), 12/04/11.
- Sebastian Guttenberg (IST), Gradification of Everything, Supermetry and Superbock, 03/05/11.
- Marcin Szamotulski (IST), Hopf Algebras and Hopf-Galois Extensions, 13/09/11.
- Olivier Brahic (IST), Closed forms on fiber bundles, 20/09/11.
- Stavros Papadakis (IST), Introduction to the McKey correspondence - I, 27/09/11.
- Stavros Papadakis (IST), Introduction to the McKay Correspondence - II, 04/10/11.
- Sinan Eden (IST), Open books and pseudo-Anosov maps - I, 11/10/11.
- Sinan Eden (IST), Open books and pseudo-Anosov maps - II, 18/10/11.
- Filippo Cagnetti (IST), Stability of the Steiner symmetrization of convex sets - I, 25/10/11.
- Filippo Cagnetti (IST), Stability of the Steiner symmetrization of convex sets - II, 08/11/11.
- Marco Volpe (IST), Natural (and less natural) deduction systems for classical (and less classical) logics, 15/11/11.
- Hassan Najafi Alishah (IST), Existence of KAM tori for degenerate Hamiltonian Systems, 22/11/11.
- Stavros Papadakis (IST), Stanley's proof of the g -conjecture for simplicial convex polytopes - I, 29/11/11.
- Stavros Papadakis (IST), Stanley's proof of the g -conjecture for simplicial convex polytopes - II, 06/12/11.

web page of this seminar

3.6 LARSyS Lecture Series in Engineering and Mathematics

New Lecture Series. Started in November 2011:

- José Fernando Mendes (Universidade de Aveiro) Complex Networks: an Introduction, 8/11/11.

all sessions of this series

3.7 Partial Differential Equations Seminar

This included the following talks in 2011:

- Marco Bonacini (SISSA), A variational model of epitaxial growth: stability of at morphologies in presence of anisotropic surface energies, 20/7/11.
- Mohammad El Smaily (CAMGSD), Speed up of fronts by large incompressible drifts, 12/10/11.
- Filippo Cagnetti (CAMGSD), Stability of the Steiner symmetrization of convex sets, 19/10/11.
- Mauro Mariani (Université Aix-Marseille), Singular limits for backward-forward, 26/10/11.
- Carolin Kreisbeck (Universidade Nova de Lisboa), Thin-film limits of functionals on A -free vector fields and applications, 02/11/11.
- François Hamel (Université Aix-Marseille), Reaction-diffusion equations and traveling waves, 09/11/11.
- Ezequiel Maderna (Universidad de la República, Montevideo, Uruguay), Hölder estimates for the critical action potential of N -body problems, 09/11/11.
- Gabriele Terrone (IST), Mather theory for lower semicontinuous Lagrangians, 16/11/11.
- Jorge Tiago (IST), Numerical methods for the stabilization of partial differential equations, 23/11/11.
- Stefania Patrizi (IST), Stochastic homogenization for porous medium type equations, 30/11/11.
- Diogo Gomes (IST), Mean field games - an introduction, 07/12/11.
- Hector Sanchez (Universidad Nacional Autónoma de México), A stochastic version of Evans PDE methods for Aubry-Mather theory, 14/12/11.

all sessions of this seminar

3.8 String Theory Seminar

This included the following talks in 2011:

- George Papadopoulos (Kings College London), Topology of black hole horizons, 19/01/11.
- Niels Obers (Niels Bohr Institute), Blackfold approach to higher-dimensional black holes, 29/03/11.
- Filipe Moura (Universidade do Minho), Spherically symmetric Gauss-Bonnet black holes in d dimensions: perturbations and absorption cross section, 04/04/11.
- Murad Alim, Video Talk: Hints for Off-Shell Mirror Symmetry, 11/04/11.
- Diego Bombardelli (Universidade do Porto), S-matrix and finite-size corrections of deformed AdS/CFT, 18/04/11.
- Marko Djuric (Universidade do Porto), Deep Inelastic Scattering at Small x Using the AdS Pomeron, 02/05/11.
- Masahito Yamazaki, Video Talk: Crystal Melting and Toric Calabi-Yau Manifolds, 09/05/11.
- José Edelstein (Universidade de Santiago de Compostela), Lovelock gravities and AdS/CFT, 16/05/11.
- Pedro Vieira, Video Talk: Integrability in gauge/string dualities, 23/05/11.
- Slava Rychkov (Ecole Normale Supérieure), Conformal Field Theories and Bootstrap, 02/06/11.
- Filipe Paccetti (Universidade do Porto), Hermitian YM instantons on (resolved) Calabi-Yau cones, 06/06/11.
- Nikolay Gromov, Video Talk: Integrability and spectrum of field theories, 20/06/11.
- Suresh Nampuri (LMU Munich), Attractors and fluxes- a first-order approach, 27/06/11.
- item Hirotaka Irie (National Taiwan University), Stokes phenomena and integrable structures in non-critical string/M theory, 04/07/11.
- Humberto Gomez (Universidade Estadual Paulista), Scattering Amplitudes in the pure Spinor Formalism, 12/09/11.
- Yuji Tachikawa, Video Talk: Instantons and conformal blocks, 19/09/11.
- Erik Verlinde, Video Talk: The Emergence of Gravity, 26/09/11.

- Konstantin Zarembo, Video Talk: Exact results in the AdS/CFT correspondence, 03/10/11.
- Inês Aniceto (CAMGSD), The Resurgence of Instantons in String Theory, 10/10/11.
- Dimitrios Tsimpis (IPNL Lyon), From superstrings to the periodic table, 17/10/11.
- Konstantin Zarembo, Video Talk: AdS_3/CFT_2 and integrability, 24/10/11.
- Shlomo Razamat, Video Talk: Holographic Dual of Free Field Theory, 31/10/11.
- Sanjaye Ramgoolam (Queen Mary - London), Representation theory of symmetric groups and local operators in gauge theory, 11/11/11.
- Erik Plauschinn (Utrecht University), Non-geometric fluxes, asymmetric strings and nonassociative geometry, 14/11/11.
- Pawel Caputa (Niels Bohr Institute), String Scattering and Minimal Surfaces, 21/11/11.
- Jan Manschot (University of Bonn), Wall-crossing from a string theory perspective, 28/11/11.
- Rudolfo Russo (Queen Mary - London), Microstate geometries from string amplitudes, 05/12/11.
- Rajesh Gopakumar, Video Talk: A Large N Dual to 2d CFTs, 12/12/11.

all sessions of this seminar

3.9 Topological Quantum Field Theory Club

This included the following talks in 2011:

- Benjamin Himpel (Aarhus University), The asymptotic expansion of the Witten-Reshetikhin-Turaev invariants, 19/01/11.
- Tomasz Brzezinski (Department of Mathematics, University of Wales Swansea, UK), Toward synthetic noncommutative geometry, 26/01/11.
- Aleksandar Mikovic (Univ. Lusófona), Quantum gravity and spin foams I, 02/02/11.
- Sebastian Guttenberg (IST), A short introduction to string theory I, 02/02/11.

- Aleksandar Mikovic (Univ. Lusófona), Quantum gravity and spin foams II, 04/02/11.
- Sebastian Guttenberg (IST), A short introduction to string theory II, 04/02/11.
- Alistair Savage (Univ. of Ottawa, Canada), Hecke algebras and a categorification of the Heisenberg algebra, 08/06/11.
- Marco Mackaay (Univ. of the Algarve), The Schur quotient of the Khovanov-Lauda categorification of quantum sl_n and colored HOMFLY homology, 08/06/11.
- Stephen Huggett (University of Plymouth), Seifert graphs, Eulerian subgraphs, and partial duality, 13/07/11.
- João Faria Martins (Univ. Nova de Lisboa), Categorifying the Knizhnik-Zamolodchikov connection, 13/07/11.
- Yasuyoshi Yonezawa (Univ. of Bonn), A specialized Kauffman polynomial using 4-valent planar diagrams, 28/07/11.
- Andreas Döring (Univ. of Oxford), Towards Noncommutative Gel'fand Duality, 28/07/11.
- Jeffrey Morton (IST), Extended TQFT in a Bimodule 2-Category, 28/07/11.
- Pedro Vaz (IST), Categorified q -Schur algebra and the BMW algebra, 09/11/11.
- John Huerta (Australian National University, Canberra), Superstrings, higher gauge theory, and division algebras, 06/12/11.

all sessions of this seminar

3.10 Working Seminar on Contact/Symplectic Topology/Geometry

This included the following talks in 2011:

- Luís Diogo (Stanford), Symplectic quasi-states and intersections, three sessions on Jun.07, Jun.14 and Jun.21.

all sessions of this seminar

4 Conferences and short courses

The following Conferences and Short Courses were organized or co-organized by members of the Center in 2011:

The Interface Between Mathematics, Science and Engineering

Instituto Superior Técnico, Lisbon, Portugal, February 10–12, 2011

Organizing committee: A. Pedro Aguiar (ISR), Diogo Gomes (CAMGSD), João Xavier (ISR) and Miguel Rodrigues (IT, Universidade do Porto)

<http://www.dcc.fc.up.pt/mathise/events/mathise2011.htm>

Aubry-Mather Theory and Optimal Transport Summer School and Nonlinear PDEs Workshop

Instituto Superior Técnico, Lisbon, Portugal, June 13 – June 24, 2011

<http://math.utaustinportugal.org/summer011>

Organization: Diogo Gomes.

School, June 13 – 17, 2011

<http://math.utaustinportugal.org/summer011/programs.php>

School Courses:

- * Patrick Bernard, *The Lax-Oleinik semigroup*
- * Yann Brenier (CNRS, Universite de Nice-Sophia), *Optimal transport and fluid mechanics: from Euler to Monge and Kantorovich*
- * Alessio Figalli (University of Texas at Austin), *Optimal transport, functional inequalities and Riemannian geometry*

Workshop, June 20 – 24, 2011

<http://math.utaustinportugal.org/summer011/programw.php>

XII Lisbon Summer Lectures in Geometry

Instituto Superior Técnico, Lisbon, Portugal, June 27 – July 1, 2011

Organizing committee: Gustavo Granja and Sharon Hollander.

Lectures:

- Mark Behrens (MIT), *Topological Automorphic Forms*
- Nitu Kitchloo (Johns Hopkins and UCSD), *Geometry, Topology and Representation Theory of Loop Groups.*

<http://www.math.ist.utl.pt/~ggranja/SummerLect11.html>

VI IST Courses on Algebraic Geometry

Instituto Superior Técnico, Lisbon, Portugal, September 5–8, 2011

Organizer: Margarida Mendes Lopes.

Lecturers:

- Gavril Farkas (Humboldt Universität zu Berlin, Germany)
- Sándor Kovács (University of Washington, USA)

<http://www.math.ist.utl.pt/~mmlopes/ISTCOURSES11/>

5 Seminars and lectures by Center members

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

- Miguel Abreu, Existence and uniqueness of complete scalar-flat Kähler metrics on non-compact toric 4-manifolds, Workshop on Extremal Metrics: evolution equations and stability, CIRM, Marseille, France, February 7–11, 2011.
- Miguel Abreu, Remarks on Lagrangian intersections in toric manifolds, Workshop on Symplectic Geometry and Topology, Kyoto University, Japan, February 14–18, 2011.
- Miguel Abreu, Remarks on Lagrangian Intersections in Toric Manifolds, Geometria em Lisboa Seminar, IST, March 15, 2011.
- Miguel Abreu, Existence and uniqueness of complete scalar-flat Kähler metrics on non-compact toric 4-manifolds, Workshop on Extremal Kähler Metrics, Simons Center for Geometry and Physics, Stony Brook, EUA, March 21–25, 2011.
- Miguel Abreu, Remarks on Lagrangian intersections in toric manifolds, Workshop on Conservative Dynamics and Symplectic Geometry, IMPA, Rio de Janeiro, Brazil, August 1–5, 2011.
- Miguel Abreu, Remarks on Lagrangian intersections in toric manifolds, CAST Workshop on Contact and Symplectic Topology, Israeli-Polish Mathematical Meeting, University of Lodz, Poland, September 12–15, 2011.
- Miguel Abreu, Lagrangian intersections in toric manifolds, EMS-RSME Joint Mathematical Weekend, Bilbao, Spain, October 7–11, 2011, main speaker of Symplectic Geometry session.
- Hassan Najafi Alishah, KAM theory (Kolmogorov-Arnold-Moser), Informal Geometry Seminar, IST, April 12, 2011.
- Hassan Najafi Alishah, Existence of KAM tori for degenerate Hamiltonian Systems, Informal Geometry Seminar, IST, November 22, 2011.
- Inês Aniceto, The Resurgence of Instantons in String Theory, String Theory Seminar, IST, October 10, 2011. 10/10/11.
- Inês Aniceto, Real and Virtual Bound States in \mathbb{CP}^3 : Finite Size Corrections for Giant Magnons String Theory Seminar, CQUEST, Seoul, S. Korea, December 15, 2011

- Inês Aniceto, Instanton Effects in String Theory (short course) APCTP Focus Program on Liouville, Integrability and Branes (7), Pohang, S. Korea, December 1 – 14, 2011
- Inês Aniceto, Real and virtual bound-states in $\mathbb{C}\mathbb{P}^3$ (short course) APCTP Focus Program on Liouville, Integrability and Branes (7), Pohang, S. Korea, December 1 – 14, 2011
- Sílvia Anjos, The topology of symplectomorphism groups of 3-fold blow-ups of the projective plane, Séminaire Géométrie - Topologie Dynamique, Université Paris Sud 11, Paris, France, December 1, 2011.
- Sílvia Anjos, The topology of symplectomorphism groups of some blow-ups of the projective plane, Seminário do Centro de Matemática da Universidade do Porto, Porto, Portugal, July 8, 2011.
- Olivier Brahic, Closed forms on fiber bundles, Informal Geometry Seminar, IST, September 20, 2011.
- Filippo Cagnetti, Stability of the Steiner symmetrization of convex sets - II, Informal Geometry Seminar, IST, November 8, 2011.
- Filippo Cagnetti, Stability of the Steiner symmetrization of convex sets - I, Informal Geometry Seminar, IST, October 25, 2011.
- Filippo Cagnetti, Stability of the Steiner symmetrization of convex sets, Partial Differential Equations Seminar, IST, October 19, 2011.
- Filippo Cagnetti, Convergence of a numerical scheme for the Hamilton-Jacobi equation: a new approach with the adjoint method. Weak KAM Theory in Italy, Cortona (AR), Italy. September 16, 2011.
- Filippo Cagnetti, Adjoint Methods for Obstacle Problems and Weakly Coupled Systems of PDE. Nonlinear PDEs workshop, Instituto Superior Técnico, Lisbon, Portugal. June 24, 2011.
- Filippo Cagnetti, La k -quasi-convessità si riduce alla quasiconvessità. Università degli studi di Firenze, Florence, Italy. April 29, 2011.
- Filippo Cagnetti, Stability of the Steiner Symmetrization of Convex Sets. Universidade de Évora, Évora, Portugal. March 3, 2011.
- Filippo Cagnetti, Stabilità della Simmetrizzazione di Steiner per Insiemi Convessi. XXI Convegno Nazionale di Calcolo delle Variazioni, Levico (TN), Italy. February 7, 2011.
- Filippo Cagnetti, Stability of the Steiner Symmetrization of Convex Sets. Universidade Nova de Lisboa, Lisbon, Portugal. January 26, 2011.

- Gabriel Lopes Cardoso, Non-Holomorphic Deformations of Special Geometry and Black Hole Entropy (short course), School on Black Objects in Supergravity (BOSS2011), Frascati, Italy, May 9–13, 2011.
- Gabriel Lopes Cardoso, Nernst branes in gauged supergravity, IV Workshop on Black Holes, Aveiro, Portugal, December 19, 20, 2011.
- Michele Cirafici, Quivers and Noncommutative Donaldson-Thomas Invariants, Contemporary problems in Theoretical Physics, Vietri sul Mare, Italy, April 15-20 2011
- Fernando Costa, A nonautonomous predator-prey system arising from coagulation theory, Applied Analysis Seminar, University of Strathclyde, Glasgow, UK, April 19, 2011
- Fernando Costa, A nonautonomous predator-prey system arising from coagulation theory, Minisymposium on Kinetic Equations, EQUAD-IFF 2011, Loughborough, UK, August 4, 2011
- João L. Costa, Linear spherical waves in de Sitter, Spanish Relativity Meeting, Madrid, Spain, August 29 – September 2, 2011.
- João L. Costa, Towards the Einstein-scalar field system with positive cosmological constant, Third Minho Meeting on Mathematical Physics, Braga, Portugal, November 4, 2011.
- Radoslaw Czaja, Pullback exponential attractors for reaction-diffusion systems, ICMC Summer Meeting in Differential Equations 2011 Chapter, Sao Carlos, Brazil, February 5–10, 2011.
- Radoslaw Czaja, Pullback attracting sets, Helmholtz Center Munich, Munich, Germany, March 14, 2011.
- Radoslaw Czaja, Pullback exponential attractors for reaction-diffusion systems, Helmholtz Center Munich, Munich, Germany, March 15, 2011.
- Sinan Eden, Open books and pseudo-Anosov maps - I, Informal Geometry Seminar, IST, October 11, 2011.
- Sinan Eden, Open books and pseudo-Anosov maps - II, Informal Geometry Seminar, IST, October 18, 2011.
- Rui L. Fernandes, Stability of leaves, in BiHamiltonian Systems and all That, Conference in Honour of Franco Magri's 65th Birthday, Universidade Bicocca, Milano, Italy, September 2011.

- Rui L. Fernandes, A h -principle in Poisson Geometry, XX International Workshop on Geometry and Physics, Madrid, Spain, September 2011
- Rui L. Fernandes, Non-commutative integrable systems, Workshop on Mathematical Physics, SigmaPhi2011 - International Conference on Statistical Physics, Cyprus, July 2011.
- Rui L. Fernandes, Stability of Leaves, Seminário de Física-Matemática, IMPA, April 2011.
- Rui L. Fernandes, An introduction to Lie groupoids through Poisson geometry (short course), The 5th Summer School on Geometry, Mechanics and Control, La Cristalera, Miraflores de la Sierra, Spain, July 2011.
- Pedro Girão, Bifurcation curves of a diffusive logistic equation with harvesting, Instituto de Ciências Matemáticas e de Computação Meeting on Differential Equations 2011, Universidade de São Paulo, São Carlos, Brasil, 7 a 9 de Fevereiro de 2011.
- Diogo Gomes, Finite state space, continuous time mean field games: ODE and PDE methods, Mean Field Games and related topics Università di Roma I, Rome, Italy, May, 2011.
- Diogo Gomes, Mather measures for discontinuous Lagrangians Dynamique en Cornouaille Fouesnant, France, July, 2011.
- Diogo Gomes, Continuous time, finite state space mean field games, 49th Annual Allerton Conference on Communication, Control and Computing Allerton, USA, September 2011.
- Diogo Gomes, On the Stochastic Evans Aronsson's problem, Weak KAM Theory in Italy, Cortona, Italy, September 2011.
- Diogo Gomes, Mean field games - an introduction, Partial Differential Equations Seminar, IST, December 7, 2011.
- Diogo Gomes, Calculus of variations methods in mean-field games, Bordeaux, France, December, 2011.
- Sebastian Guttenberg, A short introduction to string theory (short course), Topological Quantum Field Theory Club, IST, February, 2011.
- Sebastian Guttenberg, Gradification of Everything, Supermetry and Superbock, Informal Geometry Seminar, IST, May 3, 2011.

- Sebastian Guttenberg, On projectors to the pure spinor space, Maximilian Kreuzer Memorial Conference, Erwin Schroedinger Institute, Vienna, Austria, June 26, 2011.
- William Kirwin, Momentum space for compact Lie groups, Geometria em Lisboa Seminar, July 5, 2011.
- Remi Leclercq, Introduction to the Hamiltonian diffeomorphism group (with particular focus on Hofer's distance), Informal Geometry Seminar, IST, March 29, 2011.
- Margarida Mendes Lopes, Linear systems on rational surfaces, Advanced course, CIMAT, Guanajuato, Mexico, March 21-24, 2011
- Margarida Mendes Lopes, Low genus curves on irregular surfaces, as invited speaker of the conference: Groups and Algebraic Geometry (A conference in the honor of Wolf P. Barth, , Erlangen, April 26, 2011.
- Margarida Mendes Lopes, Special curves on surfaces, seminar, Scuola Normale Superiore di Pisa, February 23, 2011.
- Margarida Mendes Lopes, Surfaces, nodes and codes, Colloquium, Instituto de Matematica, UNAM, Cuernavaca, Mexico, March 30, 2011.
- Margarida Mendes Lopes, Curves on irregular surfaces, Algebra and Combinatorics Seminar, Univ. Coimbra, May 18, 2011.
- Margarida Mendes Lopes, Curves on irregular surfaces, Departamento de Matematica, Universidad Autonoma de Madrid, May 25, 2011
- Margarida Mendes Lopes, Curves on irregular surfaces, COW Algebraic Geometry Seminar, Imperial College, London, October 13, 2011.
- Margarida Mendes Lopes, A characterization of the symmetric square of a curve, Seminar Geometria em Lisboa, IST, October 25, 2011.
- Marco Mackaay, A diagrammatic categorification of the Schur category, seminar, Gottingen University, Gottingen, Germany, July 5, 2011.
- Marco Mackaay, Foams and link homology, colloquium, Gottingen University, Gottingen, Germany, July 7, 2011.
- Marco Mackaay, The extended Khovanov-Lauda calculus and the colored Rouquier complex, Workshop on Category Theoretic Methods in Representation Theory, University of Ottawa, Ottawa, Canada, October 14-16, 2011.

- Marco Mackaay, The Schur 2-category and Chuang and Rouquier's colored braid complex, Workshop on Representation Theoretical and Categorical Structures in Quantum Geometry and Conformal Field Theory, University of Erlangen, Erlangen, Germany, October 31-November 2, 2011.
- Alessia Mandini, Hyperpolygons and Moduli Spaces of Parabolic Higgs Bundles, Algebraic Geometry Seminar, University of Padova, Italy, December 1, 2011.
- Alessia Mandini, Hyperpolygons and moduli spaces of parabolic Higgs bundles, Closing conference of the Programme on Moduli Spaces, Isaac Newton Institute for Mathematical Sciences, University of Cambridge UK, June 27, 2011.
- Alessia Mandini, Hyperpolygons and Moduli Spaces of Parabolic Higgs Bundles, University of Nantes, France, May 6, 2011.
- Alessia Mandini, On the moduli spaces of polygons and hyperpolygon, Informal Geometry Seminar, IST, April 5, 2011.
- Alessia Mandini, Moduli spaces of parabolic Higgs bundles and Iperpolygons: wall-crossing, intersection numbers and cohomology, University of Bologna, Italy, February 10, 2011.
- David Martinez Torres, Group actions in symplectic geometry (short course) Workshop on Symplectic and Poisson geometry, Universidad de Colima, Colima, Mexico, January 5-9, 2011.
- David Martinez Torres, Non-contractible loops in the diffeomorphism group of coadjoint orbits, Geometry seminar, Sao Carlos University, São Carlos, Brasil, August 9, 2011.
- David Martinez Torres, Non-contractible loops in the diffeomorphism group of coadjoint orbits, Geometry seminar, IMPA, Rio de Janeiro, Brasil, August 12, 2011.
- José Matias, Coupled second order singular perturbations for phase transitions, Workshop in Calculus of Variations- U. Évora, February 10-11, 2011.
- José Matias, Coupled second order singular perturbations for phase transitions, CNA seminar, CMU, September 8, 2011.
Video recorded:
<http://vnc.math.cmu.edu/cna/CNA-JoseMathias-Sep-08-2011.avi>.
- Jeffrey Morton, Extended TQFT in a Bimodule 2-Category, Topological Quantum Field Theory Club, IST, July 28, 2011.

- José Mourão, Examples of complexification of Lagrangian fibrations and quantization, Geometria em Lisboa Seminar, IST, May 17, 2011.
- José Natário, Cosmic censorship in spherical symmetry, Third Minho Meeting on Mathematical Physics, Universidade do Minho, Braga, Portugal, November 4, 2011.
- Nicolas Orantin, Topological recursions in mathematical physics, Theoretical physics seminar, USC, Santiago De Compostela, Spain, November 2, 2011.
- Mohammad El Smaily, Speed up of fronts by large incompressible drifts, Partial Differential Equations Seminar, IST, October 12, 2011.
- Mike Paluch, A simplicial guide to Voevodsky's motives, Algebra Seminar, IST, December 15, 2011.
- Stavros Papadakis, Equivariant degenerations of spherical modules, Algebra and Combinatorics Seminar, Coimbra, Portugal, March 16, 2011.
- Stavros Papadakis, Parallel unprojection of type Kustin–Miller, Grenoble, France, June 14, 2011.
- Stavros Papadakis, Introduction to McKay correspondence I, Informal Geometry Seminar, IST, September 27, 2011.
- Stavros Papadakis, Introduction to McKay correspondence II, Informal Geometry Seminar, IST, October 4, 2011.
- Stavros Papadakis, Betti bounds for the Stanley-Reisner ring of a stellar subdivision, Algebraic Geometry Seminar, Warwick, England, October 19, 2011.
- Stavros Papadakis, Betti bounds for the Stanley-Reisner ring of a stellar subdivision, Algebra and Combinatorics Seminar, Coimbra, Portugal, November 09, 2011.
- Stavros Papadakis, Betti bounds for the Stanley-Reisner ring of a stellar subdivision, Algebra Seminar, IST, November 17, 2011.
- Stavros Papadakis, Stanley's proof of the g -conjecture for simplicial convex polytopes I, Informal Geometry Seminar, IST, November 29, 2011.
- Stavros Papadakis, Stanley's proof of the g -conjecture for simplicial convex polytopes II, Informal Geometry Seminar, IST, December 6, 2011.

- Stefania Patrizi, Homogenization of integro-differential equations describing dislocation dynamics and applications, Nonlinear PDEs workshop, IST, Lisbon, Portugal, June 20–24, 2011.
- Stefania Patrizi, Stochastic homogenization for porous medium type equations, Analysis seminar, Padova, Italy, November 23rd, 2011.
- Stefania Patrizi, Stochastic homogenization for porous medium type equations, Partial Differential Equations Seminar, IST, November 30, 2011.
- Roger Picken, Surface parallel transport based on a crossed module, and beyond, Workshop on Representation Theoretical and Categorical Structures in Quantum Geometry and Conformal Field Theory, Erlangen, Germany, October 31 - November 2, 2011.
- Pedro Resende, Facets of topos theory, Algebra Seminar, IST, March 17, 2011.
- Carlos Rocha, Orbit Equivalence of Sturm Global Attractors, ICMC Summer Meeting on Differential Equations, Universidade de São Paulo em São Carlos, February 7–9, 2011.
- Carlos Rocha, Sturm permutations for S^1 -equivariant Sturm attractors, Institut für Mathematik I of Freie Universität Berlin and Weierstrass Institute Berlin, June 28, 2011.
- Pedro M. Santos, Lower semicontinuity of signed functionals with linear growth in the context of A -quasiconvexity, CNA Seminar, CMU, Pittsburgh, USA, September 8, 2011.
- Florian Schaetz, Integrating representations up to homotopy, Geometria em Lisboa Seminar, IST, January 11, 2011.
- Ricardo Schiappa, Resurgent Thermodynamics of Random Matrices, Centro de Física Teórica e Computacional, Faculdade de Ciências, Lisbon, Portugal, November 2, 2011.
- Ricardo Schiappa, The Resurgence of Instantons in String Theory, Workshop on Selected Topics in Theoretical Physics, Santiago, Spain, October 17–20, 2011.
- Ricardo Schiappa, The Resurgence of Instantons in String Theory, UNIFY Workshop on Frontiers in Theoretical Physics, Porto, Portugal, June 21–23, 2011.
- Ricardo Schiappa, Resurgence and Instantons in Painlevé I, CERN, Geneva, Switzerland, February 21, 2011.

- Rosa Sena-Dias, “40 Years and Counting: AWM’s Celebration of Women in Mathematics”, Differential Geometry session, Brown University, September 17-18 2011.
- Rosa Sena-Dias, Dartmouth College, Geometry seminar, September 23, 2011.
- Rosa Sena-Dias, Dartmouth College Mathematics Colloquium, September 22, 2011.
- Jorge Drumond Silva, Global Well-Posedness for a Critical Perturbation of the Nonlinear Schrödinger Equation, 2011 ICMC Summer Meeting on Differential Equations, USP-São Carlos, Brazil, February 7–9, 2011.
- Jorge Drumond Silva, Boa colocação local para equações generalizadas, de tipo KP-II, em cilindros, Instituto de Matemática - Universidade Federal de Alagoas, Maceió, Brazil, February 18, 2011.
- Jorge Drumond Silva, Local and Global Well-posedness for the Critical Schrödinger-Debye System, Problems in the Dynamics of Nonlinear Dispersive Equations Meeting, Wolfgang Pauli Institute, Viena, Austria, April 26–29, 2011.
- Marcin Szamotulski, Hopf Algebras and Hopf-Galois Extensions, September 13, 2011.
- Gabriele Terrone, Homogenization of some non-coercive Hamilton-Jacobi Equations, Nonlinear PDEs Workshop, IST, June 13-24, 2011.
- Gabriele Terrone, Aubry set and attractors of multivalued dynamics, INdAM workshop Weak KAM in Italy, Cortona, Italy, September 12-17, 2011
- Gabriele Terrone, Mather theory for lower semicontinuous Lagrangians, Partial Differential Equations Seminar, IST, November 16, 2011.
- Anne-Laure Thiel, Catégorification des groupes de tresses virtuelles, Algebraic topology seminar, Laboratoire Analyse, Géométrie et Applications, Villetaneuse, January, 2011.
- Anne-Laure Thiel, Catégorification des groupes de tresses virtuelles, Colloque Tournant - GDR Géométrie, Dynamique et Représentations des Groupes, Poitiers, January, 2011.
- Anne-Laure Thiel, Catégorification des groupes de tresses virtuelles, Topology seminar, Laboratoire Paul Painlevé, Lille, November, 2011.

- Pedro Vaz, Categorification, quantum groups and coloured braids, Séminaire de Topologie, Institut Fourier, Grenoble, France, December 9, 2011
- Pedro Vaz, On a relation between some diagrammatic algebras, Séminaire Géométrie et Systèmes Dynamiques, Institut de Mathématiques de Bourgogne, Dijon, France, December 8, 2011
- Pedro Vaz, What is ... Link Homology, Séminaire Général, Institut de Mathématiques de Bourgogne, Dijon, France, December 7, 2011
- Pedro Vaz, Categorified q -Schur algebras and the BMW algebra, Topological Quantum Field Theory Club, IST, November 9, 2011
- Pedro Vaz, Categorified q -Schur algebras and the BMW algebra, Columbia Informal Categorification and Representation Theory Seminar, Columbia University, New York, October 18, 2011
- Pedro Vaz, A diagrammatic categorification of the q -Schur algebra, Workshop on Category Theoretic Methods in Representation Theory, University of Ottawa, Canada, October 14-16, 2011
- Pedro Vaz, Categorified q -Schur algebra and coloured HOMFLYPT homology, Séminaire de Topologie, Institut de Mathématiques de Jussieu - Paris , 27 Septembre, 2011
- Pedro Vaz, Categorified q -Schur algebra and coloured HOMFLYPT homology, Homological invariants in Low-Dimension Topology Workshop, Simons Center for Geometry and Physics, Stony Brook NY, June 13-17 2011
- Pedro Vaz, Categorification, quantum groups and coloured braids, Séminaire Géométrie et Systèmes Dynamiques, Institut de Mathématiques de Bourgogne, Dijon, 24 Mars 2011
- Pedro Vaz, On Khovanov's categorification of quantum superalgebras, Quantum Topology Seminar, Universität Zürich, Switzerland, March 8, 2011
- Pedro Vaz, Categorification, examples, techniques and perspectives, Talks in Mathematical Physics, ETH, Zürich, Switzerland, March 3, 2011
- Maria Vaz Pinto, A distância mínima de códigos lineares parametrizados, Department of Mathematics Seminar, Universidade Nova de Lisboa, Portugal, January 26, 2011.

- Maria Vaz Pinto, Parameterized linear codes and algebraic invariants, Algebra and Combinatorics Seminar, CMUC, Coimbra, Portugal, February 2, 2011.
- Maria Vaz Pinto, The minimum distance of parameterized linear codes associated to the projective torus, CELC Seminar, Universidade de Lisboa, Portugal, March 18, 2011.
- Joana Ventura, Classifying some reduced fusion systems and amalgams, Master class and Phd-course on fusion systems and p -local group theory, Copenhagen, Denmark, July 18–22, 2011.
- Joana Ventura, Reduced fusion systems and amalgams, Algebraic Topology Seminar, université Paris 13, Paris, France, October 6, 2011

6 Postdoctoral program and research fellows

The Center started a postdoctoral program in the academic year 1998/99 and has also received many postdocs from other programmes. 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 European Commission Euroaxess and in the European Mathematical Society web sites, leading to about 200 applicants every year.

The list of all our postdoctoral fellows since 1998 is available in:
<http://camgsd.ist.utl.pt/posdoc>

The following fellows have stayed in the Center during the whole or part of 2011:

- Inês Aniceto, PhD in Physics, Brown Univ., USA, 2009. Research areas: string theory. Supported by CAMGSD (Sep. 1, 2009–Aug. 31, 2010) and by FCT postdoctoral grant (Sep. 1, 2010–Aug. 31, 2013).
- Farid Bozorgnia, PhD in Applied Mathematics, Stockholm, Sweden, 2009. Research Areas: Partial Differential Equations; Numeric and Theory, Calculus of variations, Spectral Theory. Supported by the UT Austin/Portugal Program (Aug. 1, 2010– Oct. 1, 2011)
- 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–Jan. 2012).
- Filippo Cagnetti, PhD in Applied Mathematics, SISSA, Trieste, Italy, 2007. Research Areas: Calculus of variations and partial differential equations. Supported by the CMU/Portugal Program (Sep. 1, 2009–Feb. 28, 2011) and by the UT Austin/Portugal Program (Mar. 1, 2011–Feb. 28, 2014).
- Michele Cirafici, PhD in Physics, SISSA Trieste, 2004. Research areas: string theory, quantum field theory, geometry. Supported by the CIÊNCIA 2008 Program (Sep. 1, 2009–Aug. 31, 2014).
- Radoslaw Czaja, PhD in Mathematics, Univ. Silesia, Katowice, Poland, 2004. Research areas: continuous dynamical systems, partial differential equations. Supported by the CIÊNCIA 2008 Program (Sep. 1, 2009–Aug. 31, 2014).

- 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–Jul. 2014).
- João Esteves, PhD in Physics, IST, 2011. Research area: Symplectic geometry, geometric quantization and mathematical physics. Supported by a CAMGSD postdoctoral grant (Nov. 2011–Jan. 2012) and by an FCT postdoctoral grant (Feb. 2012–Jan. 2015).
- Sebastian Guttenberg, PhD in Physics, Technical Univ. Vienna, Austria, 2007. Research areas: string theory. Supported by FCT postdoctoral grant (Sep. 1, 2010–Aug. 31, 2013).
- 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).
- Matias del Hoyo, PhD in Mathematics, Universidad de Buenos Aires, 2009. Research areas: Algebraic Topology, Category Theory, Poisson Geometry. Supported by an FCT postdoctoral grant (Oct. 2011 – Sep. 2012)
- William Kirwin, PhD in Mathematics, University of Colorado, Boulder, USA, 2004. Research areas: Symplectic geometry, Lie groups and algebras, quantization. Supported by CAMGSD (Dec. 15, 2009 – Jul. 15, 2011).
- Rémi Leclercq, PhD in Mathematics, University of Montréal, Canada, 2007. Research areas: symplectic topology, spectral invariants for Lagrangian Floer homology, Seidel morphism. Supported by CAMGSD (Sep. 1, 2010–Aug. 31, 2011).
- Éveline Legendre, PhD in Mathematics, University of Québec at Montreal, Canada, 2010. Research areas: Kähler geometry, toric manifolds. Supported by an NSERC (Canada) postdoctoral grant (Sept. 1, 2010 – Aug. 31, 2011).
- Alessia Mandini, PhD in Mathematics, Univ. Bologna, Italy, 2007. Research areas: symplectic geometry. Supported by the CAMGSD funding (Sep. 1, 2007–May 31, 2009), and by an FCT postdoctoral grant (Jun. 1, 2009–May 31, 2015).
- 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).

- Jeffrey Morton, PhD in Mathematics. University of California, Riverside, 2007. Research areas: mathematical physics, topology, category theory. Supported by CAMGSD postdoctoral grant (Sep. 1, 2010–Aug. 31, 2012).
- Nicolas Orantin, PhD in Mathematical Physics, CEA-Saclay, France, 2007. Research areas: string theory. Supported by FCT postdoctoral grant (Sep. 1, 2010–Aug. 31, 2013).
- 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–Jun. 2012).
- Ioannis Parisis, PhD in Mathematics, Univ. Crete, Greece, 2007. Research area: Harmonic Analysis. Supported by the CAMGSD funding (Nov. 1, 2009–Oct. 31, 2011).
- Stefania Patrizi, PhD in Mathematics, “Sapienza Università di Roma”, Italy, 2010. Research Areas: analysis, differential equations, homogenization. Supported by the UT Austin/Portugal Program (April 1, 2010–March 31, 2013).
- Xavier Roulleau, PhD in Mathematics, Université d’Angers, 2007. Research areas: Algebraic geometry, surfaces of general type, cotangent sheaf, hyperbolicity, Shimura surfaces. Supported by an FCT postdoctoral grant (Oct. 1, 2011–Oct. 31, 2014).
- Florian Schätz, PhD in Mathematics, Univ. Zürich, Switzerland, 2009. Research areas: Poisson geometry, homological and homotopical algebra, supergeometry, deformation/moduli problems. Supported by the CAMGSD funding (Sep. 1, 2009–Sep. 30, 2010) and by an FCT postdoctoral grant (Oct. 1, 2010–Sep. 15, 2011).
- Ricardo Schiappa, PhD in Physics, MIT, USA, 1999. Research areas: String theory and mathematical physics. Supported by the CIÊNCIA 2007 Program (Mar. 1, 2008–Dec. 12, 2011).
- 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, 2014).
- Anne-Laure Thiel, PhD in Mathematics, Univ. Strasbourg, France, 2010. Research areas: Categorification, braids, knots. Supported by a postdoctoral grant of the FCT-funded research project: New Geometry and Topology PTDC/MAT/101503/2008 (Sep. 1, 2010–Aug. 31, 2012).

- Pedro Vaz, PhD in Mathematics, Universidade do Algarve, 2008. Research areas: Quantum topology, categorification. FCT postdoctoral grant (Sep. 2011–Sep. 2014).
- Marcel Vonk, PhD in Physics, Univ. Amsterdam, The Netherlands, 2003. Research areas: string theory. Supported by CAMGSD (Sep. 1, 2008–Mar. 31, 2011).

7 Doctoral supervision

The following doctoral degrees have been concluded in 2011 under supervision of members of the Center:

- Pedro Frejlich, IST, June 2011
Thesis title: h -principles around Poisson Geometry.
Supervised by Rui Loja Fernandes.
- Juan Pablo Roggiero Ayala, IST, September 2011
Thesis title: Lie Algebroids over Quotient Spaces.
Supervised by Rui Loja Fernandes.
- Rafael Luís, Universidade da Madeira, September 2011
Thesis title: Nonautonomous Difference Equations with Applications.
Supervised by Henrique Oliveira.

8 Publications in 2011

8.1 Publications which appeared in 2011

Books & Monographs

- Barreira, L. (2011). Thermodynamic Formalism and Applications to Dimension Theory, Volume 294 of Progress in Mathematics. Birkhäuser.
- Barreira, L. (2011). Analyse Complexe et Équations Différentielles. Enseignement Sup - Mathématiques. EDP Sciences.
- Barreira, L. and C. Valls (2011). Analyse Complexe et Équations Différentielles - Exercices Corrigés. Enseignement Sup - Mathématiques, EDP Sciences.
- Barreira, L. and C. Valls (2011). Exercícios de Álgebra Linear. Coleção Apoio ao Ensino g. IST Press.
- Crainic, M. and R. Loja Fernandes (2011). Lectures on Integrability of Lie Brackets. Geom. Topol. Monogr. 17, 1-107. arXiv:math/0611259.
- Natário, J. (2011). General Relativity Without Calculus: A Concise Introduction to the Geometry of Relativity. Springer.

Edition of Proceedings

- J. Alves, S. Elaydi, H. Oliveira, and J. Ferreira (Eds.) (2011), Discrete dynamics and difference equations. World Scientific.

Articles in refereed international journals

- Abad, C. A. and F. Schätz (2011). Deformations of Lie brackets and representations up to homotopy. Indag. Math. (N.S.) 22, 27-54. arXiv:1006.1550.
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9 Partnership and outreach

Participation in the the Gulbenkian Foundation Programme Novos Talentos da Matemática

<http://www.math.ist.utl.pt/talentos/>

Participation in Mathematical Routes of TU Lisbon:

February 14–17, 2011.

Participation in the Winter School for Undergraduates:

Escola de Inverno de Matemática (EIM11), IST, February 9–12, 2011.

<http://www.math.ist.utl.pt/EIM2011>

TED^x O’Porto:

Talk by Ricardo Schiappa on “Finding Extra Dimensions” at TED^x O’Porto.

10 Personal notes

- Miguel Abreu is President of the Portuguese Mathematical Society (Sociedade Portuguesa de Matemática).
- Miguel Abreu was co-organizer of the Symplectic Geometry session of the EMS-RSME Joint Mathematical Weekend, Bilbao, Spain, October 7–11, 2011
- Sílvia Anjos is the Treasurer of the Portuguese Mathematical Society (Sociedade Portuguesa de Matemática).
- Gabriel Lopes Cardoso obtained the “Agregação” in Mathematics at Univ. Técnica de Lisboa in January 2011.
- Gabriel Lopes Cardoso was the convener of the session on Black Holes in String Theory at the UNIFY Workshop on Frontiers in Theoretical Physics, Porto, June 21-23, 2011.
- Rui L. Fernandes became a member of the Executive Committee of the European Mathematical Society on January 1st, 2011.
- Rui L. Fernandes and Roger Picken were members of the Scientific Committee of the XX International Fall Workshop on Geometry and Physics, Madrid, Spain, August 31 - September 3, 2011.
- Carlos Florentino is a member of the Scientific Committee of the annual conference of the VBAC (Vector Bundles on Algebraic Curves) research group.

- Diogo Gomes is a member of the Scientific Council for Exact Sciences and Engineering of the FCT.
- Gustavo Granja is a Member of the Scientific Committee of the Program Novos Talentos em Matemática.
- João Palhoto de Matos was an Adviser to the FCT Board for the area of data processing.
- Ricardo Schiappa received the 2011 Santander/UTL prize in Mathematics.