

# **Theses already defended**

## **UC|UP Joint PhD Program in Mathematics**

Title: Pseudovarieties: Idempotent-Generated Semigroups and Representations of DA

Student: Ana Isabel Pereira de Moura (2007 edition)

Supervisor: Jorge Almeida

Defense date: May 2010

Title: Skew-Product Maps and Heterodimensional Cycles

Student: Salette Esteves (2007 edition)

Supervisors: Jorge Rocha, Lorenzo Justiniano Díaz

Defense date: July 2011

Title: Heteroclinic Phenomena

Student: Alexandre Artur Pinho Rodrigues (2007 edition)

Supervisors: Isabel Labouriau, Manuela Aguiar

Defense date: January 2012

Title: Ergodic and Geometric Theory of Conservative and Hamiltonian Flows

Student: Célia Manuela Fernandes Ferreira (2007 edition)

Supervisors: Jorge Rocha, Mário Bessa

Defense date: February 2012

Title: Regularity for the Singular Trudinger's Equation

Student: Rojbin Ozlem Laleoglu (2007 edition)

Supervisor: José Miguel Urbano

Defense date: February 2012

Title: Rationality of the Zeta Function

Student: Mário Alexandre Duarte Magalhães (2007 edition)

Supervisor: Maria Pires de Carvalho

Defense date: April 2012

Title: Statistical Stability for Rovella Maps and Lorenz-like Flows

Student: Mohammad Soufi Neyestani (2007 edition)

Supervisor: José Ferreira Alves

Defense date: April 2012

Title: Smoothing and Worst Case Complexity for Direct-Search Methods in Non-Smooth Optimization

Student: Rohollah Garmanjani (2008 edition)

Supervisor: Luís Nunes Vicente

Defense date: December 2012

Title: Mapping Spaces of Gray-Categories

Student: Björn Gohla (2008 edition)

Supervisors: João Nuno Martins, Peter Gothen

Defense date: March 2013

Title: Contributions to Variational Image Segmentation

Student: Juan Carlos Moreno Briceño (2008 edition)

Supervisor: Isabel Narra de Figueiredo

Defense date: March 2013

Title: Inexactness in Decomposition Methods for MINLP

Student: Min Li (2008 edition)

Supervisor: Luís Nunes Vicente

Defense date: March 2013

Title: Extreme Values and Recurrence for Deterministic and Stochastic Dynamics

Student: Hale Aytaç (2008 edition)

Supervisors: Jorge Milhazes de Freitas, Sandro Vaienti

Defense date: June 2013

Title: A Class of Equivalent Problems Related to the Riemann Hypothesis

Student: Sadegh Nazardonyavi (2008 edition)

Supervisor: Semyon Yakubovich

Defense date: June 2013

Title: Statistical Properties for Systems with Weak Invariant Manifolds

Student: Davide Manuel Santos Azevedo (2007 edition)

Supervisor: José Ferreira Alves

Defense date: September 2013

Title: Gibbs-Markov-Young Structure with (Stretched) Exponential Recurrence Times for Partially Hyperbolic Attractors

Student: Li Xin (2009 edition)

Supervisor: José Ferreira Alves

Defense date: October 2013

Title: Injective Hulls of Simple Modules over some Noetherian Rings

Student: Osman Can Hatipoglu (2009 edition)

Supervisor: Christian Edgar Lomp

Defense date: October 2013

Title: On the Numerical Analysis of Non-Fickian Flows in Porous Media

Student: Somaye Gholami Bardeji (2008 edition)

Supervisors: José Augusto Ferreira, Sílvia Barbeiro

Defense date: October 2013

Title: Higher Structures: Gerbes and Nijenhuis Forms

Student: Mohammad Jawad Azimi (2009 edition)

Supervisors: Joana Nunes da Costa, Camille Laurent-Gengoux

Defense date: December 2013

Title: Parabolic Partial Differential Equations: Superconvergence Estimates and Applications

Student: Luís Miguel Dias Pinto (2007 edition)

Supervisor: José Augusto Ferreira

Defense date: January 2014

Title: An Analogue of the Robinson-Schensted-Knuth Correspondence, Growth Diagrams, and Non-symmetric Cauchy Kernels

Student: Aram Emami Dashtaki (2009 edition)

Supervisor: Olga Azenhas

Defense date: February 2014

Title: Recent Developments in Non-Fickian Diffusion: A New Look at Viscoelastic Materials

Student: Elias Alfredo Gudiño Rojas (2010 edition)

Supervisors: José Augusto Ferreira, Paula Oliveira

Defense date: February 2014

Title: Limit Problems in Nonlinear PDEs: Asymptotic Behaviour of the Doubly Nonlinear Diffusion Equation

Student: Maria do Rosario Astudillo Rojas (2010 edition)

Supervisor: José Miguel Urbano

Defense date: March 2014

Title: The Cerny Conjecture and other Synchronization Problems

Student: Ângela Filipa Pereira Cardoso (2007 edition)

Supervisor: Jorge Almeida

Defense date: July 2014

Title: The Depth of a Hopf Algebra in its Smash Product

Student: Christopher Young (2009 edition)

Supervisor: Lars David Kadison

Defense date: September 2014

Title: Mathematical Economics Sunspot Equilibrium and International Trade with Tariffs

Student: Mohammad Choubdar Soltan Ahmadi (2010 edition)

Supervisor: Alberto Adrego Pinto

Defense date: September 2014

Title: Diffusion, Viscoelasticity and Erosion: Analytical Study and Medical Applications

Student: Ebrahim Azhdari (2009 edition)

Supervisors: José Augusto Ferreira, Paula Oliveira

Defense date: October 2014

Title: Worst Case Complexity of Direct Search under Convexity

Student: Mahdi Dodangeh (2010 edition)

Supervisor: Luís Nunes Vicente

Defense date: November 2014

Title: Non-Fickian Models for Biodegradable Drug Eluting Stents

Student: Jahed Naghipoor (2010 edition)

Supervisors: José Augusto Ferreira, Paula Oliveira

Defense date: January 2015

Title: Reaching the Minimum Ideal in a Finite Semigroup

Student: Nasim Karimi (2010 edition)

Supervisors: Jorge Almeida, Pedro Silva

Defense date: February 2015

Title: Weighted Sums of Associated Random Variables

Student: Tonguç Cagin (2007 edition)

Supervisor: Paulo Eduardo Oliveira

Defense date: February 2015

Title: Homotopy Groups of the Moduli Space of Higgs Bundles

Student: Ronald Alberto Zúñiga-Rojas (2010 edition)

Supervisor: Peter Gothen

Defense date: February 2015

Title: Forest Algebras,  $\Omega$ -Algebras and a Canonical Form for Certain Relatively Free  $\Omega$ -Algebras

Student: Saeid Alirezazadeh (2009 edition)

Supervisor: Jorge Almeida

Defense date: May 2015

Title: The Robust Shortest Path Problem with Discrete Data

Student: Marisa Cristina Marquês Neto de Matos Resende (2010 edition)

Supervisor: Marta Pascoal

Defense date: July 2015

Title: Aspects of Non-commutative Differential Geometry

Student: Serkan Karacuha (2010 edition)

Supervisor: Christian Edgar Lomp

Defense date: May 2015

Title: Trust-Region Methods without using Derivatives: Worst Case Complexity and the Non-Smooth Case

Student: Diogo Corte Real Alarcão Júdice (2011 edition)

Supervisor: Luís Nunes Vicente

Defense date: December 2015

Title: Hitchin Pairs for Indefinite Unitary Group

Student: Azizeh Nozad (2010 edition)

Supervisor: Peter Gothen

Defense date: February 2016

Title: The word problem and some reducibility properties for pseudo-varieties of the form DRH

Student: Célia Mariana Rabaçal Borlido (2011 edition)

Supervisor: Jorge Almeida

Defense date: April 2016

Title: Compound Poisson Integer-Valued GARCH Processes

Student: Filipa Alexandra Cardoso da Silva (2011 edition)

Supervisors: Nazaré Mendes Lopes, Esmeralda Gonçalves

Defense date: July 2016

Title: Numerical ranges of linear pencils

Student: Fatemeh Esmaeili (2012 edition)

Supervisor: Natália Bebiano

Defense date: July 2016

Title: The quotient module, coring depth and factorisation algebras

Student: Alberto Hernández Alvarado (2011 edition)

Supervisor: Lars David Kadison

Defense date: September 2016

Title: Bifurcation of projected patterns

Student: Juliane Fonseca de Oliveira (2011 edition)

Supervisors: Isabel Laboriau, Sofia Castro Gothen

Defense date: January 2017

Title: Modelling and numerical simulation of local scattering effects in the human retina using discontinuous Galerkin methods for Maxwell equations.

Student: Maryam Khaksar Ghalati (2010 edition)

Supervisors: Adérito Araújo, Sílvia Barbeiro

Defense date: February 2017

Title: Representations of generalized quivers

Student: Artur Duarte Ferreira de Araújo (2012 edition)

Supervisor: Peter Gothen

Defense date: June 2017

Title: On semisimple Hopf actions

Student: Deividi Ricardo Pansera (2013 edition)

Supervisor: Christian Edgar Lomp

Defense date: June 2017

Title: Descent theory of  $(T,V)$ -categories: global descent and étale descent

Student: Pier Giorgio Basile (2012 edition)

Supervisor: Maria Manuel Clementino

Defense date: September 2017

Title: Forward-backward stochastic differential equations and applications

Student: Rui Manuel Tavares Pinto de Sá Pereira (2010 edition)

Supervisor: Evelina Shamarova

Defense date: January 2018

Title: Descent theory and exponentiability in (generalized) enriched categories

Student: Fernando Lucatelli Nunes (2012 edition)

Supervisor: Maria Manuel Clementino

Defense date: January 2018

Title: Profinite topologies on the free group

Student: Khadijeh Alibabaei (2013 edition)

Supervisor: Jorge Almeida

Defense date: March 2018

Title: Statistical instability in chaotic dynamics

Student: Muhammad Ali Khan (2011 edition)

Supervisor: José Ferreira Alves

Defense date: March 2018

Title: Sharp regularity for nonlinear evolution equations

Student: Anderson Feitoza Leitão Maia (2013 edition)

Supervisor: José Miguel Urbano

Defense date: March 2018

Title: Generalised enriched categories: exponentiation and injectivity

Student: Willian Ribeiro Valencia da Silva (2015 edition)

Supervisor: Maria Manuel Clementino

Defense date: September 2019

Title: Entropy formulas for systems with singular sets

Student: David Mesquita (2015 edition)

Supervisor: José Ferreira Alves

Defense date: December 2019

Title: On some norm equations over cyclotomic fields

Student: Peter Lombaers (2015 edition)

Supervisor: António Machiavelo

Defense date: January 2020

Title: Extremal behaviour of chaotic dynamics

Student: Jorge Valentim Soares (2015 edition)

Supervisor: Jorge Milhazes Freitas

Defense date: January 2020

Title: A semidefinite approach to algebraic optimization

Student: Mina Saeed Bostanabad (2015 edition)

Supervisor: João Gouveia

Defense date: February 2020

Title: Smoothing and interpolation on the essential manifold

Student: Maria de Fátima Alves de Pina (2010 edition)

Supervisor: Fátima Silva Leite

Defense date: June 2020

Title: The Hurwitz and Lipschitz integers and some applications

Student: Nikolaos Tsopanidis (2015 edition)

Supervisor: António Machiavelo

Defense date: November 2020

Title: Drug transport enhanced by temperature: mathematical analysis and numerical simulation

Student: Maria Elisa Barbosa Silveira (2015 edition)

Supervisors: José Augusto Ferreira, Paula de Oliveira

Defense date: November 2020

Title: Coupling hyperbolic and parabolic IBVP: applications to drug delivery

Student: Daniela Jordão (2016 edition)

Supervisor: José Augusto Ferreira

Defense date: December 2020

Title: On some problems in the theory of orthogonal polynomials

Student: Dieudonne Mbouna (2016 edition)

Supervisors: José Carlos Petronilho, Kenier Castillo

Defense date: March 2021

Title: Convolution-like structures, differential operators and diffusion processes

Student: Rúben Sousa (2016 edition)

Supervisor: Semyon Yakubovich

Defense date: April 2021

Title: Finding dissimilar paths: formulations and variants

Student: Ali Moghanni Dehkharghani (2016 edition)

Supervisor: Marta Pascoal

Defense date: May 2021

Title: Non-standard ranks of matrices

Student: António Pedro Goucha (2016 edition)

Supervisor: João Gouveia

Defense date: June 2021

Title: Stable and convergent numerical methods for nonlinear parabolic systems: application to sunspots

Student: Sara Carvalho (2014 edition)

Supervisors: José Augusto Ferreira, Teresa Barata

Defense date: July 2021

Nota: Aprovada com Distinção

Topic: Quantum generalized Heisenberg algebras

Student: Farrokh Razavinia (2017 edition)

Supervisor: Samuel Lopes

Defense date: November 2021

Topic: Modelling Hessian-vector products in nonlinear Optimization: new Hessian-free methods

Student: Lili Song (2016 edition)

Supervisors: Luís Nunes Vicente, João Gouveia

Defense date: 4 January 2022

Nota: Aprovada com Distinção

Topic: On lax orthogonal factorisation systems

Student: Leonardo Larizza (2017 edition)

Supervisor: Maria Manuel Clementino

Defense date: 12 April 2022

Topic: On completeness of Halphen systems and of pseudo-Riemannian geodesic flows

Student: Ahmed Elshafei (2016 edition)

Supervisor: Helena Reis

Defense date: 27 April 2022

Topic: Symplectic keys and Demazure atoms in type C

Student: João Miguel Magalhães Santos (2017 edition)

Supervisor: Olga Azenhas

Defense date: 2 May 2022

Topic: Anomalous diffusion with reaction and memory

Student: Carla Jesus (2017 edition)

Supervisor: Ercília Sousa

Defense date: 3 May 2022

Topic: Estimation of geometric or topological features of a set

Student: Nuno Amaral Picado (2016 edition)

Supervisor: Paulo Eduardo Oliveira

Defense date: **Did not renovate matriculation in 2021/2022**

Topic: A point-free study of hedgehog topologies

Student: Igor Arrieta Torres (2018 edition)

Supervisors: Jorge Picado, Javier Gutiérrez García

Defense date: 1 July 2022

Topic: Schützenberger groups of minimal shift spaces

Student: Herman Goulet-Ouellet (2018 edition)

Supervisors: Alfredo Costa, Jorge Almeida

Defense date: 14 September 2022

Topic: Dowling and Rhodes Orders for Nontrivial Groups

Student: Maria Inês Gomes da Rocha Couto (2018 edition)

Supervisor: Pedro Ventura Alves da Silva

Defense date: **Did not renovate matriculation in 2021/2022**

Topic: Parametrization of anisotropic filters in medical imaging

Student: Diogo de Castro Lobo (2017 edition)

Supervisor: Sílvia Barbeiro

Defense date: **Did not renovate matriculation in 2022/2023**

Topic: Geometric tangential analysis and sharp regularity for semilinear and fully nonlinear elliptic equations

Student: David João Brandligt de Jesus (2018 edition)

Supervisors: José Miguel Urbano, Edgard A. Pimentel

Defense date: 13 April 2023

Topic: Zero sublocales, normality and z-embeddings

Student: Ana Belén Avilez García (2018 edition)

Supervisor: Jorge Picado

Defense date: 14 April 2023

Topic: PDEs related to inextensible strings and surfaces

Student: Ayk Telciyan (2018 edition)

Supervisor: Dmitry Vorotnikov

Defense date: 14 April 2023

Topic: Structure, algorithmics and dynamics of endomorphisms for certain classes of groups

Student: André da Cruz Carvalho (2019 edition)

Supervisor: Pedro Ventura Alves da Silva

Defense date: 28 April 2023

Topic: Coupling light propagation and diffusion in drug delivery: a mathematical approach

Student: Hugo Peña Gómez (2018 edition)

Supervisors: José Augusto Ferreira, Luís Pinto

Defense date: 6 December 2023

Nota: Aprovado com Distinção (UC)

Topic: Comparability between different systems: star-shaped and convex transform orders

Student: Beatriz Ferreira Santos (2019 edition)

Supervisors: Paulo Eduardo Oliveira, Idir Arab

Defense date: 7 December 2023

Topic: On lax idempotent monads in topology

Student: Carlos Miguel Alves Fitas (2019 edition)

Supervisor: Maria Manuel Clementino

Defense date: 20 December 2023

Topic: Compound Poisson distributions for random dynamical systems

Student: Lucas Amorim Vilas Boas (2019 edition)

Supervisors: Jorge Milhazes Freitas, Sandro Vaienti, Ana Cristina Freitas

Defense date: 13 December 2023

Topic: Some aspects of descent theory and applications

Student: Rui Prezado (2019 edition)

Supervisors: Maria Manuel Clementino, Fernando Lucatelli Nunes

Defense date: 8 Janeiro 2024

Topic: Statistical properties and rare events for chaotic dynamical systems

Student: Raquel Brás Sá Couto (2019 edition)

Supervisors: Ana Cristina Freitas, Jorge Milhazes Freitas, Michael Todd

Defense date: 22 Abril 2024

Topic: Higgs Bundles and Geometric Structures

Student: Pedro Miguel Silva (2018 edition)

Supervisor: Peter Gothen

Defense date: April 2024

Topic: Regularity for interface transmission problems

Student: Vincenzo Bianca (2020 edition)

Supervisor: José Miguel Urbano, Edgard A. Pimentel

Defense date: 6 September 2024

Nota: Aprovado com Distinção e Louvor (UC)

Topic: Numerical methods for the robust reconstruction of elasticity

Student: Rafael Oliveira Henriques (2020 edition)

Supervisor: Sílvia Barbeiro

Defense date: 6 January 2025

Topic Summation and Transformation formulas related with Spectral Functions

Student: Pedro Manuel Macedo Ribeiro (2020 edition)

Supervisor: Semyon Borisovich Yakubovich

Defense date: 6 January 2025

## **Theses in preparation**

### **UC|UP Joint PhD Program in Mathematics**

Topic: Some analytic and algebraic problems in the theory of orthogonal polynomials

Student: Alexandre Suzuki (2020 edition)

Supervisor: Kenier Castillo

Topic: Pseudo-riemannian geodesic flows on homogeneous spaces

Student: Laura Rosales Ortiz (2020 edition)

Supervisors: Helena Reis, Júlio Rebelo (Université Toulouse III)

Topic: Numerical semigroups: a conjecture of Wilf and related topics

Student: Neeraj Kumar (2020 edition)

Supervisors: Manuel Delgado, Claude Marion

Topic: Linear Response in Partially Hyperbolic Attractors

Student: Odaudu Reuben Etubi (2020 edition)

Supervisor: José Ferreira Alves

Topic: Measure and randomness in locales

Student: Raquel Viegas Bernardes (2020 edition)

Supervisor: Jorge Picado

---

Topic: Non-Fickian Keller-Segel models: analytical and numerical study

Student: Augusto Fernandes (2021 edition)

Supervisor: José Augusto Ferreira e Maria Paula Oliveira

Topic: Graphs associated to reduced words in classical Weyl groups

Student: Diogo Soares (2021 edition)

Supervisor: José Luís Santos e Ricardo Mamede

Topic: Asymptotic invariants of Eulerian ideals

Student: Gonçalo Varejão (2021 edition)

Supervisor: Jorge Neves

Topic: Contributions to the theory of metric mean dimension

Student: Gustavo Pessil (2021 edition)

Supervisor: Paulo Varandas e Maria Carvalho

Topic: From the decay of correlations to the recurrence times in dynamical systems with contractive directions

Student: João Manuel Silva Matias (2021 edition)

Supervisor: José Ferreira Alves

Topic: Normal forms for Lie groupoids and Lie algebroids

Student: Lennart Obster (2021 edition)

Supervisor: João Nuno Mestre e Ioan Marcuț (Universidade de Nijmegen, Países Baixos)

Topic: Deformations of Lie groupoids/algebroids and differentiable stacks

Student: Sebastián Alfonso Daza (2021 edition)

Supervisor: João Nuno Mestre

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Topic: Non-Commutative Arithmetic, Hurwitz Integers and Diophantine Equations with Restrictions

Student: Adriana Filipa Carvalho Cardoso (2022 edition)

Supervisor: António Machiavelo (UP)

Topic: Numerical study of a multi-layered viscoelastic mathematical model

Student: Afonso Frias Vazão do Nascimento Costa (2022 edition)

Supervisor: Sílvia Barbeiro (UC)

Topic: Extensions of Higgs bundles and the nilpotent cone  
Student: Gabriel da Silva Martinho (2022 edition)  
Supervisor: Peter Gothen (UP), André Oliveira (UP)

Topic: Structure Preservation Methods in Deep Learning Architectures  
Student: Gonçalo Inocência Oliveira (2022 edition)  
Supervisor: Adérito Araújo (UC)

Topic: Quasi-integrability of Complex ODE's  
Student: Hamza Bakhouch (2022 edition)  
Supervisor: Helena Reis (UP), Arame Diaw (UP)

Topic: Quiver bundles and the Moduli space of Higgs bundles  
Student: Juan Sebastian Numpaque Roa (2022 edition)  
Supervisor: Peter Gothen (UP), André Oliveira (UP)

Topic: Discontinuous Galerkin method for curved boundary domains  
Student: Milene Francisco dos Santos (2022 edition)  
Supervisor: Adérito Araújo (UC)

Topic: Strong Poisson Dixmier-Moeglin Equivalence  
Student: Nirina Albert Razafimandimby (2022 edition)  
Supervisor: Samuel Lopes (UP), Stéphane Launois (UKent)

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Topic: On Some Problems in Orthogonal Polynomials and Special Functions  
Student: Guillermo Gordillo Nunez (2023 edition)  
Supervisor: Kenier Castillo (UC)

Topic: Methods for Learning Decomposable Context-Specific Bayesian Networks  
Student: João Pedrosa Marcelino (2023 edition)  
Supervisor: João Gouveia (UC), Eliana Gélvez (UP)

Topic: Anomalous diffusion: new perspectives at the intersection of analytical and numerical methods  
Student: Ortenilton Filho (2023 edition)  
Supervisor: Edgard Pimentel (UC), Ercília Sousa (UC)

Topic: Unbalanced Optimal Transport, Cross Diffusion and Spatial Ecology

Student: Rodrigo Inigo Vargas (2023 edition)  
Supervisor: Dmitry Vorotnikov (UC)

Topic: A multivariate approach to extreme dynamics  
Student: Alessio Corveddu (2023 edition)  
Supervisor: Jorge Freitas (UP), Ana Cristina Freitas (UP)

Topic: Lagrangians in Higgs bundle moduli spaces  
Student: Rodrigo Pereira (2023 edition)  
Supervisor: Peter Gothen (UP), André Oliveira (UP)

Topic: Contact and Jacobi geometry on b-manifolds  
Student: Vanessa Oliveira (2023 edition)  
Supervisor: Inês Cruz (UP), Alfonso Tortorella (UNISA)