David Stolnicki

Curriculum Vitae

Education

- 2019–2023 PhD in Mathematics (Partial Differential Equations), Sapienza Università di Roma, Rome, Italy
- 2017–2019 Master of Science in Mathematics (Partial Differential Equations), *PUC-Rio*, Rio de Janeiro, Brazil
- 2014–2016 Bachelor of Science in Mathematics, PUC-Rio, Rio de Janeiro, Brazil
- 2014–2019 Bachelor of Science in Eletrical Engineering, PUC-Rio, Rio de Janeiro, Brazil

Post-Doctoral Research

- 2024 Coimbra University
- 2023-2024 Technion Israel Institute of Technology

PhD thesis

- Title Existence and qualitative proprieties of positive solutions of a class of fully nonlinear elliptic equations
- Advisor Prof. Filomena Pacella
- Scholarship Sapienza Università di Roma
- from
- Description We study existence and nonexistence of radial positive solutions for a class of fully nonlinear equations involving Pucci's extremal operators. By analyzing the periodic orbits of an associated dynamical system we are able to give estimates on the range of the exponents for which entire oscillating solutions exist. In dimensions greater or equal than three our results improve the previously known bounds while in dimension 2 we prove the existence of a critical exponent. It is also presented a symmetry result for exterior domains under some decay assumptions.

Master thesis

- Title Regularity theory for nonlocal partial differential equations
- Advisor Prof. Boyan Sirakov
- Coadvisor Prof. Edgard Pimentel

Scolarship Conselho Nacional de Desenvolvimento Científico e Tecnológico from

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Description In this work, we put forward a brief introduction to the nonlocal diffusion operators. Our object of study are the fractional Laplacian and some variants. We start with a brief review stochastic processes, motivating the fractional Laplacian by the study of the infinitesimal generator of a Lévy process. Then, we present a number of properties and proceed with the establishment of an ABP estimate and the Harnack inequality. As an application, we examine the regularity of the solutions in Hölder spaces.

Teaching Assistant Experience

- 2014–2015 Linear Algebra
- 2015–2016 Discrete Mathematics
 - 2016 Honors Calculus II
- 2014–2015 Signals & Systems
 - 2018 Introduction to Partial Differential Equations

Participation in events

- July 2024 Satellite Conference Regularity Theory and Free Boundary Problems: from PDE to Interfaces, Coimbra, Portugal Plenary Speaker
 - 2022 Mostly Maximum Principle, Cortona
 - 2018 International School on Extrinsic Curvature Flows, *ICTP*, Trieste Attendence to a two weeks long School at the International Centre for Theoretical Physics.
 - 2018 ICM 2018 Satellite Conference on Nonlinear Partial Differential Equations, Fortaleza

 $\label{eq:presentation} Presentation of a poster entitled "Regular Theory for Non Local Operators".$

Talks Given

- December Seminar at the Mathematical Institute of the Polish Academy of Sciences, 2024 INPAM, Warsaw, Poland
- November Online talk at the Stochastics and PDEs Seminar, University of Jyväskylä, 2024 Jyväskylä, Finland
- July 2024 **Plenary Lecture**, *Satellite Conference Regularity Theory and Free Boundary Problems: from PDE to Interfaces*, Coimbra, Portugal
- June 2024 **Talk at the Encontro Nacional da SPM 2024**, *Universidade do Minho*, Braga, Portugal
- April 2024 Talk at the PDE and Applied Mathematics Seminar, Technion Israel Institute of Technology, Haifa, Israel
- March 2024 **Talk at the Nonlinear Analysis and Optimization Seminar**, *Technion Israel Institute of Technology*, Haifa, Israel
 - 2023 Online talk at the CMUC, University of Coibra, Coimbra, Portugal
 - 2022 Online talk at the CMM, Universidad de Chile, Santiago, Chile

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2021 Talk at the P/N(p) seminary, Sapienza Università di Roma, Rome

Publications

- Filomena Pacella, David Stolnicki, On a class of fully nonlinear elliptic equations in dimension two, Journal of Differential Equations, Volume 298, 2021
- Filomena Pacella, David Stolnicki; Oscillatory solutions and critical exponents for fully nonlinear equations, Electronic Journal of Differential Equations, Special Issue 01 (2021)
- David Stolnicki; A symmetry result for fully nonlinear problems in exterior domains, Nonlinear Differential Equations and Applications NoDEA (2024)
- Edgard Pimentel, David Stolnicki; Differentiability of solutions for a degenerate fully nonlinear free transmission problem, (preprint on ARXIV or https://www.mat.uc.pt/ david.stolnicki/work)
- David Jesus, Edgard Pimentel, David Stolnicki; Boundary regularity for a fully nonlinear free transmission problem, (preprint on ARXIV or https://www.mat.uc.pt/ david.stolnicki/work)

	Languages
English	Fluent
Portuguese	Native
Italian	Intermediate
Hebrew	Intermediate

Academic Visits

December Iwona Chlebicka, Warsaw University, Poland 2024 May 2024 Edgard Pimentel, Coimbra University, Portugal

Extended Academic CV

Courses Taken

- 1. Complex Analysis (During BSc)
- 2. Measure and Integration
- 3. Functional Analysis
- 4. Probability Theory I
- 5. Modern theory of 2^{nd} order PDE's Strong Solutions
- 6. Modern theory of 2^{nd} order PDE's Weak Solutions
- 7. Non Linear methods and applications
- 8. PDE I (As a listener)
- 9. Measure theory (Electrical Engineering Department)
- 10. Digital Signal Processing (Electrical Engineering Department)
- 11. Oriented Study 1 Degree Theory
- 12. Oriented Study 2 Measure Theory (Reference Book:Real Analysis: A Comprehensive Course in Analysis- Barry Simon)
- 13. Oriented Study 3 Fully Nonlinear PDE's (Reference Book: Fully Nonlinear Elliptic Equations-Caffarelli Cabré)
- 14. Oriented Study 4 Introduction to Geometric Measure Theory (Reference Book: Measure Theory and Fine Properties of Functions- Evans Gariepy)
- 15. Seminary I Functional Spaces from Elliptic PDE Theory (Reference Book: Functional Spaces

for the Theory of Elliptic Partial Differential Equations- Demengel and Demengel)

- 16. Non Linear Differential Equations (PhD)
- 17. Partial Differential Equations (PhD)
- 18. Variational and Topological Methods in Nonlinear Analysis I (PhD)
- 19. Variational and Topological Methods in Nonlinear Analysis II (PhD)
- 20. Geometric Evolution Problems (PhD)
- 21. Optimal Control, Maurizio Falcone (PhD)

Academic Activities during the Graduate Course

- Teaching duties toward the Undergraduate course (Introduction to PDE)
- $_{\odot}$ Helped in the confection and application of Rn Analysis tests
- $_{\odot}$ Helped in the confection and application of PDE I tests