

Danilo Gregorin Afonso, Ph.D.

 Università degli Studi di Urbino Carlo Bo



Academic positions

Since 2024 **Assegnista di Ricerca** - Dipartimento di Scienze Pure e Applicate, Università degli Studi di Urbino Carlo Bo

Education

- 2024 **Ph.D. in Mathematics, *cum laude***, Sapienza Università di Roma
Thesis: *Energy instability and overdetermined elliptic problems in cones and cylinders: an approach via domain variations*
Advisor: Filomena Pacella
Co-advisor: Alessandro Iacopetti
- 2020 **M.Sc. in Mathematics**, Universidade de São Paulo
Dissertation: *Normalized solutions to a Schrödinger-Bopp-Podolsky system*
Advisor: Gaetano Siciliano
- 2018 **Naval Engineer**, Universidade de São Paulo
Dissertation: *Dynamics of a moored ship in a harbor*
Advisor: Celso P. Pesce

Publications

Research

- Afonso, D. G., Iacopetti, A., & Pacella, F. (2024). **Energy stability for a class of semilinear elliptic problems**. *J. Geom. Anal.*, 34(75). <https://doi.org/https://doi.org/10.1007/s12220-023-01525-1>
- Afonso, D. G. (2023). **Semilinear equations in bounded cylinders: Morse index and bifurcation from one-dimensional solutions**. *arXiv:2311.15236*.
- Afonso, D. G., Iacopetti, A., & Pacella, F. (2023). **Overdetermined problems and relative Cheeger sets in unbounded domains**. *Atti Accad. Naz. Lincei Cl. Sci. Fis. Mat. Natur.*, 34(2), 531–546.
- Afonso, D. G., & Siciliano, G. (2021). **Normalized solutions to a Schrödinger-Bopp-Podolsky system under Neumann boundary conditions**. *Commun. Contemp. Math.*, 25(2).

Outreach

- Afonso, D. G., et al. (2020). **Intercultural Science-Art Project "Magritte Meets Science"**. *arXiv:2009.14084*.

Talks

- 2024 **Symmetry-breaking for nonlinear elliptic equations in cylinders** - Seminario (Università degli Studi di Urbino Carlo Bo, Italy)
- An energy approach to relative overdetermined problems** - Seminario (Università degli Studi di Urbino Carlo Bo, Italy)

Talks (continued)

- Overdetermined problems: what differential equations tell us about shapes** - PhDDays 2024 (Università degli Studi di Milano Statale, Italy)
- 2023 **Semilinear elliptic equations under geometric constraints** - Seminario $P(n)$ (Sapienza Università di Roma, Italy)
- Introduction to Spectral Geometry, or "how to hear the shape of a drum"** - MathTalks: Math After Thesis seminars (Sapienza Università di Roma, Italy)
- Nonlinear overdetermined problems in cones: a shape optimization approach** - PDEs in Cogne: a friendly meeting in the snow (Cogne, Italy.)
- 2022 **Serrin meets Cheeger** - Seminário de EDP (Pontifícia Universidade Católica - Rio de Janeiro, Brasil)
- A Schrödinger-Bopp-Podolsky system with Neumann conditions** - I Encontro Paulista de Pós-Graduação em Matemáticas (online)
- A Schrödinger-Bopp-Podolsky system with Neumann conditions** - Seminario $P(n)$ (Sapienza Università di Roma, Italy)
- 2021 **An overview of variational methods, and how a particle talks to itself** - Encontro de (ex)-alunos IME-USP (online)

Other contributions

- 2022 **Poster: Serrin meets Cheeger** - Summer School in Analysis and PDEs (Caserta, Italy)
- Poster: Overdetermined problems in unbounded domains - first steps** - Shape Optimization, Related Topics and Applications (Roscoff, France)
- 2020 **Poster: A Schrödinger-Bopp-Podolsky system with Neumann conditions** - ICMC Summer Meeting on Differential Equations (São Carlos, Brasil)
- 2019 **Artwork: Resolvendo sem resolver** - Heidelberg Laureate Forum (Heidelberg, Germany)
- Poster: Critical points and topology - a beautiful love affair** - 32 Colóquio Brasileiro de Matemática (Rio de Janeiro, Brasil)
- 2018 **Poster: Análise Funcional e Espaços de Sobolev** - Workshop de Verão 2018 - ICMC-USP (São Carlos, Brasil)

Grants and scholarships

- 2023 – 2024 **Research grant Avvio alla Ricerca** - Sapienza Università di Roma

Grants and scholarships (continued)

2020 – 2024 **Ph.D. scholarship** - Sapienza Università di Roma

2020 **Ph.D. scholarship** - Capes/CNPq

2018 – 2020 **M.Sc. scholarship** - CNPq

Teaching

2023 **Analisi I per Fisica (Teaching Assistant)** - Dipartimento di Matematica Guido Castelnuovo, Sapienza Università di Roma

2022 **Analisi I (Teaching Assistant)** - SBAI, Sapienza Università di Roma

2020 **MAT 5709 - Cálculo em Espaços de Banach (Instructor)** - Instituto de Matemática e Estatística, Universidade de São Paulo

2019 **MAT 0417 - Cálculo Diferencial e Integral II para Economia (Teaching Assistant)** - Instituto de Matemática e Estatística, Universidade de São Paulo

MAP 0413 - Equações de Derivadas Parciais (Teaching Assistant) - Instituto de Matemática e Estatística, Universidade de São Paulo

Organization of scientific and outreach activities

2024 **Two nonlinear days in Urbino 2024** (Urbino, Italia)

2023 **European Researchers' Night** (Roma, Italia)

2022 **European Researchers' Night** (Roma, Italia)

Volunteering

2020 POLI-USP Mentorship Program - mentor

2018 General Assembly of the International Mathematical Union (São Paulo) - staff

Skills

Mathematics Nonlinear analysis, partial differential equations, overdetermined elliptic problems, shape optimization

Languages Strong reading, writing, and speaking competencies in English, Italiano, and Português.

Misc. Academic research, teaching, scientific communication.