Miguel M. G. Pascual-Caballo

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Summary

PhD student in Fluid Dynamics at ICMAT. My research focuses on the analysis of existence and instability of solutions to partial differential equations in fluid dynamics, using analytical and computer-assisted techniques.

Education

2022 – present **Instituto de Ciencias Matemáticas (ICMAT)** – Madrid, Spain
PhD in Mathematics (Fluid dynamics), Universidad Autónoma de Madrid (UAM)
Advisor: Ángel Castro

2021 – 2022 **Universidad Complutense de Madrid** – Madrid, Spain
Master in Mathematics (Matemáticas Avanzadas) Master's thesis: De Rham theorems in cohomology of manifolds

2017 – 2021 **Universidad Complutense de Madrid** – Madrid, Spain
Bachelor in MathematicsBachelor's thesis: Geometric mechanics of the rigid body

Research visits

2025 **Brown University** – Providence, RI, USA
Visiting researcher (3 months), hosted by Javier Gómez-Serrano

Publications

2026 M. M. G. Pascual-Caballo. *On the instability of De Gregorio excited states.* Preprint, arXiv:2610.03287

2026 Á. Castro, J. Gómez-Serrano, and M. M. G. Pascual-Caballo. *Linear instability of a Burgers–Hilbert traveling wave.* Preprint, arXiv:2605.03920

2025 M. M. G. Pascual-Caballo. *Stationary homogeneous solutions for the inviscid SQG equation.* Preprint, arXiv:2510.03108

Talks

2026 **Linear instability of a Burgers–Hilbert traveling wave**
8th BYMAT Conference, Santiago de Compostela, Galicia, Spain

2026 **Linear instability of a Burgers–Hilbert traveling wave**
Partial Differential Equations and Applications Seminar, IME-USP, São Paulo, Brazil

2025 **A Brief Introduction to Computer-Assisted Techniques in Analysis**
BYMAT, Sevilla, Spain

2024 **Linearization and Stability in Fluid Dynamics**
BYMAT, Valladolid, Spain

2023 **Compactness: Geometry and Topology**
Junior Colloquium (PhD student seminar), Universidad Autónoma de Madrid

Teaching

2024 – 2025 Teaching assistant, Mathematics I (Biomedical Engineering)
Universidad Autónoma de Madrid

2024 – 2025 Teaching assistant, Algebra (Computer Engineering)
Universidad Autónoma de Madrid

2023 – 2024 Teaching assistant, Calculus II
Universidad Autónoma de Madrid

Technical skills

Programming
Python (SageMath)

Mathematical software
MATLAB, Mathematica

Languages
English (Advanced)

Honors and scholarships

2022 JAE Summer School, ICMAT

2017 Bronze Medal, Spanish Mathematical Olympiad