D. CATANIA

EDUCATION

UNIVERSITY OF PISA — Pisa, ITALY
PhD in Mathematics — February 2008
Thesis: *Linear and Nonlinear Perturbed Wave Equations*
Advisor: Prof. Vladimir Georgiev
Final evaluation: Excellent

UNIVERSITY OF PISA — Pisa, ITALY
Honor Degree in Mathematics (equivalent to MSc) — July 2003
Thesis: *Global existence and blow-up for nonlinear wave and Klein–Gordon equation*
Advisor: Prof. Vladimir Georgiev
Graduated with Honors (110/110 cum laude)

MARCHE POLYTECHNIC UNIVERSITY — Ancona, ITALY
Postgraduate Diploma in Vegetarian Nutrition and Dietetics — January 2025
Thesis: *The Environmental Impact of Dietary Patterns and the Contribution of Plant-Based Diets to Mitigating Environmental Damage*
Advisor: Prof. Maurizio Battino
Graduated with Honors (110/110 cum laude)

TECHNOLOGICAL UNIVERSITY DUBLIN — Dublin, IRELAND
MSc in Energy Management — October 2025 (expected)
Thesis: *Improving Electrolyser Performance Through Digital Twinning: A Neural Network Approach*
Advisor: Prof. David Dorran
In progress

AWARDS AND HONORS

London Mathematical Society Research Grant, with Prof. Michele Bartuccelli (University of Surrey, UK), 2016. Project: "Explicit and sharp embedding constants in interpolation inequalities for dissipative PDEs".

National Scientific Qualification (ASN) – Associate Professor in Mathematical Analysis, Probability and Mathematical Statistics (01/A3), Italy, valid 2017–2029.

TEACHING EXPERIENCE

eCAMPUS UNIVERSITY — Novedrate (CO), ITALY

Instructor, Department of Theoretical and Applied Sciences: *Mathematical Methods for Engineering*, eCampus University, 2019–present
Lectures, tutorials, tutoring and exams for M.E. in Information and Automation Engineering (6 ECTS); emphasis on complex analysis, distributions and transforms.

Instructor, Department of Theoretical and Applied Sciences: *Mathematics and Statistics*, eCampus University, 2019–present
Lectures, tutorials, tutoring, laboratory and exams for BSc in Biological Sciences (9 ECTS); emphasis on limits, derivatives, integrals, ordinary PDEs, linear algebra, and statistics for biology students.

Instructor, Department of Theoretical and Applied Sciences: *Mathematical Analysis*, eCampus University, 2014–present
Lectures, tutorial, tutoring and exams for B.E. in Industrial, Civil, and Computer Engineering (12 ECTS); emphasis on differential and integral calculus, sequences and series, and elements of ordinary PDEs.

UNIVERSITY OF BRESCIA — Brescia, ITALY

Instructor, Departments of Civil Engineering, Architecture, Land and Environment, and Mathematics: *Mathematics*, University of Brescia, Fall 2019
Lectures, tutoring and exams for B.D. in Sustainable Agricultural Systems, and for the Professional Degree in Building Techniques (6 ECTS); emphasis on differential and integral calculus, and elements of ordinary PDEs.

Graduate Teaching Assistant, Departments of Engineering: *Mathematical Analysis 1, 2 and C*, University of Brescia, 2009–2020
Tutorials, tutoring, and exams for B.E. in several Engineering Courses (6–9 ECTS); emphasis on differential and integral calculus, sequences and series, and elements of ordinary PDEs.

Graduate Teaching Assistant, Departments of Engineering: *Probability and Statistics*, University of Brescia, 2007–2009
Tutorials, tutoring, and exams for B.E. in Computer Science Engineering (6 ECTS); emphasis on combinatorial calculus, probability, and descriptive and inferential statistics.

Graduate Teaching Assistant, Departments of Engineering: *Mathematics*, University of Brescia, Fall 2008
Lectures, tutorials, tutoring, and exams for the preparation course in Engineering;

emphasis on elementary algebra, equalities, inequalities and algebraic systems, logarithms, goniometry, and analytic geometry.

UNIVERSITY OF PISA Pisa, ITALY

Graduate Teaching Assistant, Department of Science: *Mathematics and Statistics*, University of Pisa, Fall 2004
Lectures, tutorials, tutoring and exams for B.D. in Biological Sciences; emphasis on combinatorial calculus, probability and descriptive statistics.

Repeated courses and overlapping terms have been condensed; only representative teaching activities are listed.

TEACHING INTERESTS

Mathematics (including calculus, advanced mathematical analysis, mathematical fluid dynamics, linear algebra, geometry, probability, statistics, and mathematical methods for AI and engineering); LaTeX editing and scientific writing; teaching mathematics using software tools such as Python and R; renewable energies and energy sustainability; vegetarian nutrition and dietetics; sustainability in nutrition.

LEADERSHIP AND SERVICE

Volunteer Facilitator, Technological University Dublin & Fáilte Isteach, Ireland, 2025
Helped organize and lead English conversation groups for newcomers and migrants, supporting language integration and community inclusion.

Coordinator, Faculty of Engineering, eCampus University, Italy, B.E. and M.E. in Information and Automation Engineering, 2019–2021
Oversaw curriculum development, course planning, and faculty coordination for both bachelor's and master's programs.

Coordinator, Faculty of Engineering, eCampus University, Italy, M.E. in Industrial Engineering, 2016–2017
Oversaw curriculum development, course planning, and faculty coordination for both bachelor's and master's programs.

Guest Speaker and Scientific Dissemination, various high schools and teacher training initiatives in Brescia and Pisa, Italy, 2005–2013
Organized and delivered public talks, math festivals, and refresher courses for teachers on mathematical topics and teaching strategies.

Trainer and Organizer, Mathematics Competitions (Disfida Matematica), Brescia Universities, Italy, 2008–2011

Trained students and coordinated high school-level mathematical challenges in collaboration with local institutions.

Organizer, International Summer School on Mathematical Fluid Dynamics, Levico Terme, Italy, 2010 and 2012
Contributed to planning, logistics, and communications for advanced training programs in PDEs and fluid mechanics.

Organizer, IPERPISA National Meeting on Hyperbolic Equations, Department of Mathematics, University of Pisa, Italy, 2004
Contributed to planning, logistics, and communications for a national conference on hyperbolic equations and mathematical physics.

PROFESSIONAL EXPERIENCE

ECAMPUS UNIVERSITY Novedrate (CO), ITALY
Associate Professor, Department of Theoretical and Applied Sciences June 2019 – present

Taught core and advanced courses in mathematical analysis for B.E. and M.E. students in engineering, as well as mathematics and statistics for biology programs. Led research in mathematical fluid dynamics, focusing on turbulence models and PDEs. Contributed to curriculum development and supervised undergraduate theses. Served as member of the academic quality assurance committee, supporting program accreditation and course evaluation processes.

ECAMPUS UNIVERSITY Novedrate (CO), ITALY
Researcher, Department of Engineering April 2014 – May 2019

Developed and taught mathematics courses for engineering programs, with focus on calculus, differential equations, and real analysis. Conducted research on PDEs and mathematical modeling in fluid mechanics. Coordinated the M.E. in Industrial Engineering (2016–2017). Participated in GNAMPA and PRIN research projects. Served on the academic quality assurance committee to support internal evaluations and program improvement.

UNIVERSITY OF BRESCIA Brescia, ITALY
Research Fellow, Department of Engineering – Mathematics June 2008 – April 2014

Conducted theoretical and applied research on nonlinear hyperbolic equations and free boundary problems in magnetohydrodynamics. Collaborated on five consecutive research fellowships under the supervision of Prof. Paolo Secchi. Published extensively in peer-reviewed journals and supported teaching activities in engineering mathematics.

UNIVERSITY OF PISA Pisa, ITALY
Research Fellow, Department of Mathematics "L. Tonelli" April 2007 – September 2007

Investigated decay estimates and well-posedness for dispersive and hyperbolic systems. Contributed to research projects in mathematical physics under the guidance of Prof.

Vladimir Georgiev. Presented preliminary findings at academic workshops and conferences.

TECHNICAL SKILLS

Mathematical modeling, partial differential equations, LaTeX, Python, R, MATLAB, Jupyter, SymPy, NumPy, SciPy, Pandas, Matplotlib, Excel, PowerPoint, Moodle, neural networks (basic implementation), scientific writing, academic publishing, data visualization. **Languages:** Italian (native), English (IELTS 8, fluent), Spanish (intermediate), French (pre-intermediate).

SELECTED PUBLICATIONS

1. Bisconti, L., Catania, D. *On the exact controllability of a Galerkin scheme for 3D viscoelastic fluids with fractional Laplacian viscosity and anisotropic filtering.* ZAMM – Journal of Applied Mathematics and Mechanics, **104**(2), e202300056, 2024.
2. Berti, D., Bisconti, L., Catania, D. *A regularity criterion for a 3D tropical climate model with damping.* Journal of Mathematical Analysis and Applications, **518**(1), 126685, 2023.
3. Berti, D., Bisconti, L., Catania, D. *Global attractor for the three-dimensional Bardina tropical climate model.* Applicable Analysis, 2023.
4. Annese, M., Bisconti, L., Catania, D. *Exponential attractors for the 3D fractional-order Bardina turbulence model with memory and horizontal filtering.* Journal of Dynamics and Differential Equations, **34**(1), 505–534, 2022.
5. Bisconti, L., Catania, D. *On the convergence rates for the three-dimensional filtered Boussinesq equations.* Mathematische Nachrichten, **294**(6), 1099–1114, 2021.
6. Berselli, L. C., Catania, D. *A note on the Euler–Voigt system in a 3D bounded domain: Propagation of singularities and absence of the boundary layer.* AIMS Mathematics, **4**(1), 1–11, 2019. DOI:10.3934/Math.2019.1.1
7. Bisconti, L., Catania, D. *On the existence of an inertial manifold for a deconvolution model of the 2D mean Boussinesq equations.* Mathematical Methods in the Applied Sciences, **41**, 4923–4935, 2018. DOI:10.1002/mma.4939
8. Bisconti, L., Catania, D. *Global well-posedness of the two-dimensional horizontally filtered simplified Bardina turbulence model on a strip-like region.* Communications on Pure and Applied Analysis, **16**(5), 1861–1881, 2017. DOI:10.3934/cpaa.2017090
9. Catania, D., Secchi, P., D'Abbicco, M. *Weak stability of the plasma-vacuum interface problem.* Journal of Differential Equations, **261**, 3169–3219, 2016. DOI:10.1016/j.jde.2016.05.023
10. Berselli, L. C., Catania, D. *On the Boussinesq equations with anisotropic filter in a vertical pipe.* Dynamics of Partial Differential Equations, **12**, 177–192, 2015. DOI:10.4310/DPDE.2015.v12.n2.a5

SELECTED PRESENTATIONS

- *On the Euler–Voigt system in a 3D bounded domain*, Surrey University, UK, 2017.

- *Analysis of the Oberbeck–Boussinesq Equations with some anisotropic filters*, Charles University, Prague (Czech Republic), 2013.
- *Well-posedness for the linearized MHD-Maxwell interface problem*, IPERMIB2013, Bicocca University, Milan (Italy), 2013.
- *On the linearized MHD-Maxwell plasma vacuum free interface problem*, 13th School on Mathematical Theory of Fluid Mechanics, Kácov (Czech Republic), 2013.
- *Existence and Convergence of an MHD Approximate Deconvolution Model*, International Conference on Structural Nonlinear Dynamics and Diagnosis, Marrakech (Morocco), 2012.
- *Global attractor and determining modes for a Hyperbolic MHD Turbulence Model*, IPERME11, Messina (Italy), 2011.
- *Some recent results concerning turbulence in MHD theory*, Normal Zhejiang University, China, 2010.
- *Large-time properties of some MHD-α turbulence models*, SISSA, Trieste (Italy), 2010.
- *Length-scale estimates for the 3D Simplified Bardina MHD using the modified Reynolds number*, International Summer School on Mathematical Fluid Dynamics, Levico Terme (Italy), 2010.
- *Length-scale estimates for the 3D Simplified Bardina MHD*, Congress on Mathematical Fluid Dynamics and Applications, Rennes (France), 2010.
- *Global Existence for Two Regularized MHD Models in Three Space-Dimensions*, Intensive Research Month, Parma University, 2010.
- *Global existence for the Bardina Model*, IPERBA09, Bari University, 2009.
- *Global Existence and Properties for two Regularized Magnetohydrodynamic-α Models*, ISAAC Congress, Imperial College London (UK), 2009.
- *Global Existence for a Regularized Magnetohydrodynamic-α Model*, Giornata di Lavoro, Brescia University, 2009.
- *Existence of solutions of the equations of electron magnetohydrodynamics in a bounded domain*, Seminario Matematico, Brescia University, 2009.
- *Black Hole Influence on a Wave Equation*, Navier–Stokes Models Conference, Pisa University, 2008.
- *Blow-up for a semilinear wave equation in the presence of a black hole*, Meeting on Hyperbolic Conservation Laws, L'Aquila University, 2008.
- *Blow-up for the semilinear wave equation in Schwarzschild metric*, Sapienza University, Rome, 2005.

POSTERS

Blow-up for the semilinear wave equation in Schwarzschild metric, poster presented at IPERPISA 2004 – National Meeting on Hyperbolic Equations, Pisa University, October 2004.