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EDUCATION

- 2000** **PhD, Mathematics, University of North Carolina**, Chapel Hill, NC
Dissertation title: *Analysis of the Navier-Stokes and other non-linear evolution equations with initial data in Besov-type spaces*
Adviser: **Michael E. Taylor**
- 1994** **Laurea (BS/MS), Università degli Studi di Milano**, Milan, Italy
Major: **Physics**, GPA: 4.0, graduated with Highest Honors
Research area: Mathematical Physics
Thesis title: *2-nodi, Equazione del Tetraedro e Teorie di Campo Topologiche in 4D* (in Italian)
Adviser: **Paolo Cotta-Ramusino**

EMPLOYMENT

- | | | |
|-----------------------|------------------------------|---|
| 2009-present | Associate Professor | Pennsylvania State University |
| 2003-2009 | Assistant Professor | Pennsylvania State University |
| 2000-2003 | Gibbs Instructor | Yale University (on-leave 2001-2002) |
| Jan-June 2002 | Post-doctorate Fellow | Institute for Mathematics and its Applications |
| Aug-Dec 2001 | Post-doctorate Fellow | Mathematical Sciences Research Institute |
| June-July 2000 | Liftoff Mathematician | Clay Mathematics Institute |

GRANTS AND AWARDS

- 2007-2010** **National Science Foundation, Division of Mathematical Sciences**
Grant 0708902: *Aspects of Fluid Mechanics and Elasticity from the Point of View of Microlocal and Fourier Analysis* (Sole PI),
- 2004-2008** **Grant 0405803:** *A Micro-Local and Fourier-Analytical Approach to Some Non-Linear Problems in Fluid Mechanics and Elasticity* (Sole PI)
- 2004** **Association for Women in Mathematics** Travel Grant
2001 **Association for Women in Mathematics** Travel Grant
1999-2000 **Dissertation Completion Fellowship**, UNC-Chapel Hill

VISITING POSITIONS

December, 2008	University of Florence, Italy
October, 2008	Mathematical Sciences Research Institute, Berkeley
May, 2009	IMECC, UniCamp, Brazil
May 2007, 2006	
August, 2002	

PUBLICATIONS

Articles in peer-refereed journals

- [1] A. L. Mazzucato, V. Nistor, Well-posedness and regularity for the elasticity equation with mixed boundary conditions on polyhedral domains and domains with cracks, *Archive for Rational Mechanics and Analysis*, **195** (2009) n. 1, 25–73.
- [2] A. L. Mazzucato, On the zero viscosity limit in incompressible fluids. *Physica Scripta* **T132** (2008), 0140002 (6 pp).
- [3] M. C. Lopes Filho, A. L. Mazzucato, H. J. Nussenzveig Lopes, M. Taylor, Vanishing viscosity limits and boundary layers for circularly symmetric 2D flows. *Bulletin of the Brazilian Mathematical Society, New Series*, **39** (2008), n. 4, 471–513.
- [4] A. Mazzucato, M. Taylor, Vanishing viscosity plane parallel channel flow and related singular perturbation problems, *Analysis & PDE* **1** (2008), No. 1, 35–93.
- [5] M. C. Lopes Filho, A. L. Mazzucato, H. J. Nussenzveig Lopes, Vanishing viscosity limit for incompressible flow inside a rotating circle, in "Perspectives in Fluid Dynamics", *Physica D: Nonlinear Phenomena* **237** (2008), no. 10–12, 1324–1333.
- [6] A. L. Mazzucato, L. V. Rachele, On transversely isotropic elastic media with ellipsoidal slowness surfaces, *Mathematics and Mechanics of Solids*, **13** (2008), no. 7, 611–638.
- [7] A. L. Mazzucato, L. V. Rachele, On uniqueness in the inverse problem for transversely isotropic elastic media with a disjoint wave mode, *Wave Motion* **44** (2007), no. 7–8, 605–625.
- [8] A. L. Mazzucato, V. Nistor, Mapping properties of heat kernels, maximal regularity, and semi-linear parabolic equations on noncompact manifolds, *Journal of Hyperbolic Differential Equations* **3** (2006), no. 4, 599–629.
- [9] A. L. Mazzucato, L. V. Rachele, Partial uniqueness and obstruction to uniqueness in inverse problems for anisotropic elastic media. *Journal of Elasticity* **83** (2006), no. 3, 205–245.
- [10] M. C. Lopes Filho, A. L. Mazzucato, H. J. Nussenzveig Lopes, Weak solutions, renormalized solutions and enstrophy defects in 2D turbulence, *Archive for Rational Mechanics and Analysis* **179** (2006), no. 3, 353–387.
- [11] A. L. Mazzucato, On the energy spectrum for weak solutions of the Navier-Stokes equations, *Nonlinearity* **18** (2005), no. 1, 1–19.

- [12] A. L. Mazzucato, Decomposition of Besov-Morrey spaces, in "Harmonic Analysis at Mount Holyoke", 279–294, *Contemporary Mathematics* **320**, American Mathematical Society, 2003.
- [13] A. L. Mazzucato, Besov-Morrey spaces: function space theory and applications to non-linear PDE, *Transactions of the American Mathematical Society* **355** (2003), no. 4, 1297–1364.

Manuscripts Accepted in Refereed Journals

- [12] H. Li, A. Mazzucato, V. Nistor, Analysis of the Finite Element Method for transmission/mixed boundary value problems on general polygonal domains, 30 pages. To appear in *Electronic Transactions on Numerical Analysis*.

Manuscripts Submitted to Refereed Journals

- [14] C. Bacuta, A. L. Mazzucato, V. Nistor, L. T. Zikatanov, Interface and mixed boundary value problems on n -dimensional polyhedral domains, 47 pages.
- [15] Approximate Solutions to Second Order Parabolic Equations I: analytical estimates, with R. Costantinescu, N. Costanzino, and V. Nistor. Arxiv preprint 0910.1562v2.

STUDENTS

PhD students:

- 2008–present** **Wen Cheng**, co-advised with Victor Nistor,
Thesis project on Approximate Solutions to Parabolic Equations with applications to Volatility Models.
- 2007–present** **Qingqin Qu**, co-advised with Victor Nistor,
Thesis project on GFEM for Transmission Problems.

Undergraduate students

- 2007–2009** **Fara Delitsky**, supervised with V. Nistor,
Project Title: *Numerical methods for elliptic equations and linear algebra*
- 2008–present** **Anirban Roy**, supervised with V. Nistor,
Project Title: *Numerical computation of eigenvalues*
- 2009–present** **Lance Boyer**, in progress
- 2009–present** **Carol Gaertner**, in progress

SELECTED INVITED TALKS

Talks at University Seminars

- 1 Dissipation in turbulent flows, Mathematics Colloquium, Drexel University, November 19, 2009.
- 2 *Uniqueness in the boundary inverse problem for elasticity*, PDE Seminar, Georgia Institute of Technology, Atlanta, Georgia (November 11, 2008)

- 3 *Dissipation in turbulent flows*, Colloquium, Center for Applied Mathematical Sciences, University of Southern California, Los Angeles, California (October 20, 2008)
- 4 *Dissipation in turbulent flows*, Mathematics Colloquium, University of California, Santa Cruz, California (October 14, 2008)
- 5 *Incompressible Fluid Flow in the Zero Viscosity Limit*, Scattering and Spectral Theory Seminar, Purdue University, West Lafayette, Indiana (April 3, 2008)
- 6 *On the vanishing viscosity limit for incompressible fluids*, PDE/Applied Math Seminar, Indiana University, Bloomington, Indiana (March 24, 2008)
- 7 *On uniqueness in an inverse problem for anisotropic elastic media* (in Italian), Analysis Seminar, Università degli Studi, Florence, Italy, (January 11, 2008)
- 8 *Vanishing viscosity limit for 2D flows inside an unsteadily rotating circle*, Analysis Seminar, University of Warwick, Coventry, UK (August 1, 2007)
- 9 *On the regularity and self-similarity of solutions to the 3D Navier-Stokes equations*, PDE Seminar, Ohio State University, Columbus, Ohio (March 7, 2007)
- 10 *On unique determination of elastic parameters for anisotropic elastic media from dynamic boundary measurements*, Analysis Seminar, University of Southern California, Los Angeles, California (November 28, 2006)
- 11 *Vanishing viscosity limit for 2D flows in an unsteadily rotating circle*, Applied Mathematics Seminar, University of California, Irvine, California (November 27, 2006)
- 12 *Some harmonic analysis results for the Euler and Navier-Stokes equations*, Fluid Mechanics Seminar, UniCamp, Campinas, Brazil (May 30, 2006)
- 13 *Some uniqueness results in the inverse problem for anisotropic elastic media*, Applied Mathematics Seminar, University of Delaware, Newark, Delaware (November 15, 2005)
- 14 *Irregular transport and enstrophy dissipation in two-dimensional incompressible flows*, Analysis Seminar, Princeton University, Princeton, New Jersey (October 6, 2005)
- 15 *Enstrophy dissipation and irregular transport in two-dimensional incompressible flows*, Applied Mathematics Seminar, S.I.S.S.A., Trieste, Italy (July 19, 2005)
- 16 *Uniqueness and Nonuniqueness in the Inverse Problems for Anisotropic Elastic Media*, Partial Differential Equations Seminar, Brown University, Providence, Rhode Island (April 22, 2005)
- 17 *Enstrophy dissipation for two-dimensional incompressible flows*, Applied Mathematics and Analysis Seminar, Duke University, Durham, North Carolina (February 28, 2005)
- 18 *Enstrophy dissipation in 2D turbulence*, Analysis Seminar, Cornell University, Ithaca, New York (March 15, 2004)
- 19 *The Navier-Stokes equations in spaces of Besov-type*, Mathematics Department Colloquium, Universidade Federal de São Carlos, São Carlos, Brazil (August 28, 2002)
- 20 Minicourse *The Navier-Stokes equation in critical spaces*, UNICAMP, Campinas, Brazil (August 12, 14, 19, 2002)
- 21 *Mild Solutions to the Navier-Stokes equation and Besov-Morrey spaces* (in Italian), Applied Mathematics Seminar, Università Statale di Milano, Milan, Italy (July 12, 2002)

- 22 *A class of function spaces and the Navier-Stokes equation*, Partial Differential Equations Seminar, University of Minnesota, Minneapolis, Minnesota (April 3, 2002)
- 23 *Function Spaces and Non-linear PDEs*, Analysis Seminar, University of California at Berkeley, Berkeley, California (November 27, 2001)
- 24 *Pseudo-differential calculus in Besov-like spaces*, Analysis Seminar, Brown University, Providence, Rhode Island (April 25, 2001)

Talks at Conferences and Professional Meetings

- 1 *On the vanishing viscosity limit in incompressible flows*, Special Session "Fluid Mechanics", Fall SouthWestern AMS Meeting, Riverside, CA, Nov 7-8, 2009
- 2 *Approximate solutions to parabolic equations*, Special Session "Harmonic analysis and PDE", Fall SouthCentral AMS Meeting, Waco, TX, Oct 16-17, 2009
- 3 *Determination of material properties from boundary measurements in anisotropic elastic media*, Minisymposium "Inverse Problems in Elasticity" AIP 09, Vienna, July 20, 2009.
- 4 *Vorticity concentration for 2D circularly symmetric flows in the presence of moving boundaries*, Special Session "Advances in Classical and Geophysical Fluid Dynamics", AMS Spring Central Meeting, Bloomington, Indiana (April 6, 2008)
- 5 *Vanishing viscosity limit for flow in a channel and related singular perturbation problems*, Special Session "Harmonic Analysis Methods in Mathematical Fluid Mechanics", AMS Spring Central Meeting, Bloomington, Indiana (April 5, 2008)
- 6 *Enstrophy dissipation in 2D incompressible fluids*, Special Session "Recent developments in 2D turbulence", AMS Fall Southwestern Meeting, Albuquerque, New Mexico (October 14, 2007)
- 7 *Vanishing viscosity limit in boundary-driven 2D flow*, Special Session "The Euler and Navier-Stokes", AMS Fall Central Meeting, Chicago, Illinois (October 5, 2007)
- 8 *On uniqueness in the boundary inverse problem for anisotropic elastodynamics*, Minisymposium "Inverse Problems for Systems", International Conference "Applied Inverse Problems 07", Vancouver, Canada (June 28, 2007)
- 9 *On the energy spectrum for weak solutions of the Navier-Stokes equation*, Special Session on Harmonic Analysis and Partial Differential Equations, AMS Southeastern Meeting, Miami, Florida (April 1, 2006)
- 10 *Harmonic Analysis for the Navier-Stokes and Euler equations*, Workshop "Euler equations: theory and numerical simulations", Wolfgang Pauli Institute, Vienna, Austria (March 14, 15, 2006)
- 11 *Nonuniqueness in the parameter identification for anisotropic elastodynamics*, Special Session on Inverse Problems, AMS Fall Southeastern Meeting, Vanderbilt University, Nashville, Tennessee (October 17, 2004)
- 12 *Enstrophy dissipation for two-dimensional incompressible flows*, Workshop "Analytical and Computational Challenges of Incompressible Flows at High Reynolds Number", CSCAMM, College Park, Maryland (May 18, 2004)
- 13 *Enstrophy dissipation in 2D Turbulence*, Special Session on Fluid Problems and Related Questions, AMS Western Meeting, University of Southern California, Los Angeles, California (April 3, 2004)

- 14 *Mild solutions to the Navier-Stokes equation in Besov-Morrey spaces*, Mini-symposium “Analysis and incompressible fluid flow”, AMAM 2003, Nice, France, (February 11, 2003)
- 15 *Analysis in Besov-Morrey Spaces and applications to the Navier-Stokes equation*, Special Session on Function Spaces, Singular Integral and Applications to PDEs, AMS South-eastern Fall Meeting, Orlando, Florida (November 10, 2002)
- 16 *The Navier-Stokes equation in distribution spaces*, Special Session “Mathematical Fluid Dynamics”, 2002 UAB International Conference on Differential Equations and Mathematical Physics, University of Alabama, Birmingham, Alabama (March 29, 2002)

TEACHING AND SERVICE

- **Panel** and **External Reviewer** for the National Science Foundation, **Reviewer** for the US Civilian Research and Development Foundation and for the Canadian Fonds québécois de la recherche sur la nature et les technologies.
- **Associate Editor**, *European Journal of Pure and Applied Mathematics* (2007-present)
- **Referee** for: *Acta Applicanda Mathematicae*, *Archive for Rational Mechanics and Analysis*, *Canadian Mathematical Bulletin*, *Communications in Mathematical Physics*, *Communications in Partial Differential Equations*, *Functiones et Approximatio*, *Journal of Differential Equations*, *Journal of Fluid Mechanics*, *Journal of Mathematical Analysis and Applications*, *Mathematical Methods in the Applied Sciences*, *Michigan Mathematical Journal*, *Nonlinearity*, *Potential Analysis*, *Quarterly Journal of Mechanics and Applied Mathematics*, *SIAM Journal on Mathematical Analysis*, *SIAM Journal on Applied Mathematics*
- **Reviewer** for the AMS *Mathematical Reviews* (2003–present)
- Panel Member, Conference “Trends in Mathematics for Engineering Education”, June 3-5, 2009, UniCamp, Brazil.
- **Mentor**, Association for Women in Mathematics Mentor Network (2003–present)
- **Instructor** for graduate (Introduction to Functional Analysis, Harmonic Analysis, Real & Complex Analysis, PDE) and undergraduate courses (Fourier Series & PDE, Calculus sequence, Real Analysis, Algebra for Teachers, Advanced Calculus for Engineers).
- Co-organized:
 - Special Session “Topics in Mathematical Finance”, with V. Nistor, N. Costanzino, AMS Fall Eastern Meeting, University Park, PA, October 24-25, 2009;
 - Special Session “Nonlinear PDEs and applications”, with Igor Kukavica, AMS spring Central Meeting, Urbana, Illinois (March 28-29, 2009);
 - Minisymposium “Elliptic PDEs on Singular Domains: Computation and Theory”, SIAM APDE, with Victor Nistor, Mesa, Arizona (Dec 10, 2007);
 - Special Session “Microlocal Analysis and PDE (in honor of Michael E. Taylor 60th birthday)”, AMS Spring Southeastern Meeting, with Martin Dindos, Davidson, North Carolina (March 3-4, 2007);
 - Workshop “Partial differential equations on non-compact manifolds”, with Victor Nistor and Juan Gil, State College, Pennsylvania (December 14-15, 2002)
- Supervised NSF VIGRE Summer Program in Mathematics for undergraduates, Yale University (May 15-July 15, 2001)

PROFESSIONAL SOCIETIES

- 2002-present** American Mathematical Society
Association for Women in Mathematics
- 2003-present** Society for Industrial and Applied Mathematics