Curriculum Vitæ

Maria Pia Gualdani

PERSONAL INFORMATION

Department of Mathematics,
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Italian Citizenship.
Visa Status: H-1B Visa.

EDUCATION

Ph.D. in Mathematics	2005	Mainz University, Germany (Adviser: A. Jüngel)
Laurea in Matematica	2000	University of Florence, Italy (Adviser: A. Fasano)

EMPLOYMENT

Starting 09/2012	Assistant Professor at the Department of Mathematics, George Washington University, Washington DC, USA
08/2010-08/2012	Research Assistant Professor at the Department of Mathematics, The University of Texas at Austin, Austin TX, USA
01/2007 - 08/2010	Instructor position at the Department of Mathematics, The University of Texas at Austin, Austin TX, USA
01/2006 - 01/2007	Postdoctoral fellowship, financed by the Alexander von Humboldt Foundation, ICES, The University of Texas at Austin, Austin TX, USA

AWARDS

2014-2017 **NSF Grant DMS-1412748** (Single PI), *Analysis of nonlocal effects in nonlinear parabolic partial differential equations.* Amount: $ 170,000.

2014-2019 **NSF Grant DMS-1406984** (Co-PI, jointly with Yongwu Rong (PI, Mathematics), Yinglei Lai (Statistics), Rahul Simha (Computer Science) and Murli Gupta (Mathematics)), *EXTREEMS-QED: GW Mathematics and Statistics Training, Education, & Research (MASTER)*. Amount: $ 600,000.

2011 - 2014 **NSF Grant DMS-1109682** (Single PI), *Analysis of Diffusion Equations with Nonlinear Singular Sources in Mean Field Games*. Amount: $ 208,430.

2008 - 2011 **NSF Grant DMS-0807636** (Single PI), *Existence Analysis and Qualitative Behavior of High Nonlinear Partial Differential Equations*. Amount: $ 78,000.

2006, 2007: **Feodor-Lynen Fellowship** (Single PI), Alexander von Humboldt Foundation (Germany).

PUBLICATIONS

Submitted:

- M.P.Gualdani, S. Mischler and C. Mouhot.
  Factorization of non-symmetric operators and exponential H-Theorem.
  http://arxiv.org/pdf/1006.5523.pdf.
- M.d.M Gonzalez, M.P. Gualdani and J.Sola-Morales.
  Instability and bifurcation in a trend depending price formation model.
  http://arxiv.org/pdf/1306.1116.pdf.
- M.P. Gualdani and N. Guillen.
  Estimates for radial solutions of the homogeneous Landau equation with Coulomb potential.
  http://arxiv.org/pdf/1412.0146.pdf.

Preprints:

- M.P. Gualdani, X. Ren and I. Sorribes.
  Global well-posedness for a mathematical model in tumor growth.

In preparation:

- M.P. Gualdani and N. Guillen. In preparation.
- M.d.M Gonzalez, M.P. Gualdani and H. Shahgholian.
  Regularity of the free boundary for a singular perturbation problem.
  In preparation.

Papers published in internationally reputed periodicals which have been subject to referees' assessment:

- M.d.M Gonzalez, M.P. Gualdani and H. Shahgholian.
  A discrete Bernoulli free boundary problem.
  Proceedings of the St. Petersburg Mathematical Society, Volume XV: Advances in Mathematical Analysis of Partial Differential Equations, 2014, 119-140.
- J. A. Carrillo, M.d.M Gonzalez, M.P.Gualdani and M.E. Schonbek.
  Classical Solutions for a nonlinear Fokker-Planck equation arising in Computational Neuroscience.
  Comm. Partial Differential Equations 38 (2013), no. 3, 385-409.
- A. Arnold, I.M.Gamba, M.P.Gualdani, S. Mischler, C. Mouhot and C. Sparber.
  The Wigner-Fokker-Planck equation: Stationary states and large time behavior.
  Math. Models Methods Appl. Sci. 22 (2012), no. 11, 1250034-1250065.
- M.d.M Gonzalez, M.P. Gualdani.
  Some non-standard Sobolev spaces: interpolation and its application to PDE.
  Acta Appl. Math. 121 (2012), 57-67.

- M.d.M Gonzalez, M.P. Gualdani.
Asymptotics for a free-boundary problem in price formation.
Nonlinear Analysis 74 (2011), pp. 3269-3294.

- L. Chayes, M.d.M Gonzalez, M.P. Gualdani and I. Kim.
Global existence and uniqueness of solutions to a model in price formation.
SIAM J. Math. Anal. 41 (2009), no. 5, 2107-2135.

- I.M. Gamba, M.P. Gualdani and R. Sharp.
An Adaptable Discontinuous Galerkin Scheme for the Wigner-Fokker-Planck Equation.
Comm. Math. Sci. (2009) Vol. 7, No. 3, 635-664.

- M.d.M Gonzalez, M.P. Gualdani.
Asymptotics for a symmetric equation in price formation.
Applied Mathematics and Optimization: Volume 59, Issue 2 (2009), 233-246.

- I. M. Gamba, M. Gualdani and P. Zhang.
On the blowing up of solutions to a quantum hydrodynamic model on a bounded domain.
Monatsh. Math 157 (2009), 37-54.

- I.M. Gamba, M.P. Gualdani, C. Sparber.
A note on the time-decay of solutions for the linearized Wigner-Poisson system.
Kinetic and Related Models (2009), Volume: 2, Number: 1 (2009), 181-189.

- J.A. Carrillo, M. Gualdani and A. Jüngel.
Convergence of Entropy Decay Schemes for nonlinear Fokker-Planck equations.
Publ. Mat. 52 (2008), 413-433.

- J. A. Carrillo, M. Di Francesco, M. P. Gualdani.
Semidiscretization and long-time asymptotics of nonlinear diffusion equations.
Commun. Math. Sci. Supplemental Issue, No.1, 21-53 (2007).

- M. P. Gualdani, A. Jüngel, G. Toscani.
A nonlinear fourth-order parabolic equation with non-homogeneous boundary conditions.
SIAM J. Math. Anal. 37 (2006), No. 6, 1761-1779.

- J. A. Carrillo, M. P. Gualdani, G. Toscani.
Finite speed of propagation in porous media by mass transportation methods.
C. R. Acad. Sci. Paris, Ser. I 338 (2004) 815-818.

- M. P. Gualdani, A. Jüngel.
Analysis of the viscous quantum hydrodynamic equations for semiconductors.
Europ. J. Appl. Math., (2004) vol. 15, 577-595.

- M. P. Gualdani, A. Jüngel, and G. Toscani.
Exponential decay in time of solutions of the viscous quantum hydrodynamic equations.
Appl. Math. Lett. 16 (2003), 1273-1278.

- M. P. Gualdani.
On a Mathematical model for the crystallization of Polymers.
Bollettino U.M.I. (8) 6-B (2003), 161-179.

TEACHING

Reading courses:

At George Washington University:

- Spring 2015: Reading and Research course (Math 6995) with graduate student Chubo Deng on Partial Differential Equations and Mean Field Games.
- Spring 2015: Reading and Research course (Math 6995) with master student Weiyi Wang on Differential Equation in finance.
- Spring 2015: Reading and Research course (Math 6995) with master student Ning Liu on mathematical models in tumor growth.
- Fall 2013: Reading and Research course (Math 6995) with graduate student Anudeep Kumar on Hypocoercivity for Kinetic Equations.
- Fall 2013: Reading and Research course (Math 6995) with master student Chubo Deng on Partial Differential Equations in Finance.
- Fall 2013: Reading and Research course (Math 6995) with master student Inmaculada Sorribes on Modeling for Tumor Growth.
- Fall 2012: Reading and Research course (Math 6995) with master student Joshua Fuhrer on Stochastic Differential Equations.

At The University of Texas at Austin:

- Fall 2010: Reading course with Candice DiPaolo on Stochastic Tools in Mathematics and Sciences.

Regular courses:

At George Washington University:

- Mathematical Modeling (Math 3359), Spring Semester 2015
- Topic Course in Applied Mathematics (Math 6350 graduate course), Fall Semester 2014
- Applied Mathematics 1 (Math 6318 graduate course), Fall Semester 2012, Fall Semester 2013
- Single Variable Calculus (Math 1231), Fall Semester 2013, Fall Semester 2014
- Real analysis (Math 4239), Fall Semester 2012

At The University of Texas at Austin:

- Probability, Spring Semester 2012
- Probability, Fall Semester 2011
- Differential and Integral Calculus, Fall Semester 2010
- Differential and Integral Calculus, Spring Semester 2010
- Differential and Integral Calculus, Fall Semester 2009
- Differential and Integral Calculus, Fall Semester 2008
- Matrices and Matrix calculation, Spring Semester 2008
- Differential and Integral Calculus, Fall Semester 2007
- Advanced Calculus For Applications I, Spring Semester 2007

At the University of California Los Angeles:

- Real analysis, Winter Quarter 2009

Recitation Sessions for:

At Johannes Gutenberg University, Germany:

- Mathematical Modeling (for students in Mathematics) Summer Semester 2005
- Numerical Analysis , Part 2 (for students in Mathematics) Winter Semester 2005
- Ordinary Differential Equations (for students in Chemistry) Summer Semester 2004
- Mathematical Analysis (for students in Computer Science) Winter Semester 2004
- Mathematical Modeling for industry problems (for student in Mathematics) Summer Semester 2003
- Modeling and Numerical Approximation of Traffic Flow Problems (for students in Mathematics) Winter Semester 2003

STUDENTS SUPERVISED

- Since Fall 2013: Advisor of graduate student Chubo Deng.
- Academic year 2013-2014: Co-advisor of Master student Inmaculada Sorribes (graduated Spring 2014).

ORGANIZED EVENTS

- Session *PDEs in Continuum Mechanics* AWM Research Symposium, U. Maryland, April 11 -12, 2015.
- Workshop *PDEs in the social and life sciences: emerging challenges in modeling, analysis and computations.* BIRS, Banff, Canada, Mar 31 - Apr 05, 2013.
- Session *Mean-field and Kinetic Models in Socio-economics and Life Sciences* at ICIAM, Vancouver (Canada), July 18-22, 2011.
- Minisymposium *Parabolic dynamics, mean-field equations and related particle systems* at SIAM DSPDEs, Barcelona (Spain), May 31- June 4 2010.
- Minisymposium *Nonlinear fluid equations: dissipated energies and equilibration* at SIAM Nonlinear Wave, July 21 - 24 2008 Rome (Italy).
- Minisymposium at SIAM PDE, December 2007, Temple, AZ.
- Session at ICIAM07, Zurich (Switzerland), July 16-20 2007.
- Minisymposium at SIAM PDE, Boston, MA, July 10-12 2006.

SELECTED INVITED WORKSHOP'S and CONFERENCE'S TALKS

- 2014

- Conference *Optimization, transportation and equilibrium in economics* at the Fields Institute, Toronto (Canada) Sept 15-19 2014.
- Session *PDE models of collective phenomena in life sciences and socioeconomics* at The Joint Annual Meeting of the Japanese Society for Mathematical Biology and the Society for Mathematical Biology, Osaka, 28 July - 1 Aug 2014.
- Session *Kinetic equations: theory and applications* in the 10th AIMS conference on Dynamical Systems, Differential Equations and Applications", 7 - 11 July 2014 , Madrid, Spain.
- Recent Developments and Challenges in Interface and Free Boundary Problems, 25 - 28 March 2014, University of Warwick (UK).

• 2013

- Meeting on *Classical and Quantum Mechanical Models of Many-Particle Systems*, Oberwolfach (Germany), December 1-7, 2013.
- Session *Mathematics in the Sciences and Technology*, DMV-OeMV Kongress, September 23-27 2013, Innsbruck (Austria).
- Introductory Workshop on Optimal Transport: Geometry and Dynamics, MSRI Berkeley, August 26 - 30, 2013.
- Minisymposium *Microscopic modeling and mean field limits in socioeconomics and life sciences* in SIAM Applications of Dynamical Systems, May 19-23, 2013 Utah, USA.
- Session on Newtonian and Non-Newtonian fluids, AWM Research Symposium, Santa Clara University, California, March 16-17 2013.

• 2011

- Nonlinear PDEs Workshop CoLab Program UT Austin - Portugal - Mathematics, Instituto Superior Tecnico, Lisbon, June 20-24, 2011.

• 2010

- Special Program *Partial Differential Equations in Kinetic Theories,* at the Isaac Newton Institute for Mathematical Sciences, Cambridge UK, Nov. 23, 2010.
- Minisymposium *Nonlinear transport PDE's in biology and physics: asymptotics and entropies.* SIMAI 2010 Universita' di Cagliari (Italy) June 21-25, 2010.
- Minisymposium *Mathematics in decisions, economics, finance and games.* SIMAI 2010 Universita' di Cagliari (Italy) June 21-25, 2010.
- *Optimal transportation and applications* April 18-23, 2010 at Banff International Research Station (Canada).
- Conference *9th International Conference on Operations Research,* February 22- 26 2010, La Habana (Cuba).

• 2009

- Minisymposium *Kinetic description, hyperbolic dynamics, and wave propagation* in SIAM Analysis of Partial Differential Equations, December 7-10 2009, Miami, FL.
- Workshop *Kinetic and Mean-field models in the Socio-Economic Sciences,* July 27 - 31 2009, ICMS Edinburgh (UK).
- *Theory and Applications of Classical and Quantum Kinetic Theory*. June 22- 26 2009 at Banff International Research Station (Canada).
- Special Program *Geometric Partial Differential Equations* , IAS Princeton NJ, April 2 2009.
- Workshop *Kinetic Description of Multiscale Phenomena,* CSCAMM University of Maryland, College Park, 3 - 5 March 2009.

• 2008

- Workshop *Numerics and Dynamics for Optimal Transport*, April 14 - 18, 2008 in IPAM, UCLA, Los Angeles CA, USA.

- 2006
  - Meeting on *Classical and Quantum Mechanical Models of Many-Particle Systems*, Oberwolfach (Germany), December 1-8, 2006.
  - *Nonlinear Diffusions: Entropies, Asymptotic Behavior and Applications*, April 15 -20, 2006 at Banff International Research Station (Canada).

- 2003
  - Meeting on *Classical and Quantum Mechanical Models of Many-Particle Systems*, Oberwolfach (Germany), November 23-29, 2003.

Other Talks, Lectures and Short Courses:

- 2015
  - University of Pennsylvania, Department of Mathematics, February 3rd 2015.
  - University of California Riverside, Department of Mathematics, January 21st 2015.
  - University of California Irvine, Department of Mathematics, January 20th 2015.

- 2014
  - North Carolina State University, Department of Mathematics, October 28th 2014.
  - Academia Sinica, Institute of Mathematics, Taiwan, July 30th 2014.
  - Short Course at the National Taiwan University on *Issues on Global well-posedness for the homogeneous Landau equations and related results.* July 17-18th 2014.
  - Center for Interdisciplinary Mathematics Seminar, Uppsala University (Sweden), June 3rd 2014.
  - PDE/Applied Math Seminar, KTH Stockholm (Sweden), May 21st 2014.

- 2013
  - Short Course at the National Taiwan University on *Entropy Methods for Nonlinear Partial Differential Equations*, June 2013.

- 2012
  - Applied and Computational Math Seminar, George Mason University, Nov. 16th, 2012.
  - Analysis Seminar, Dept. of Mathematics, George Washington University, Oct. 19th 2012.
  - Seminar at Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland at College Park, Oct. 10th 2012.
  - Day of PDE and applications, Girona, Spain, May 24th. 2012.
  - AMS Western Section Meeting, *Special Session on Nonlinear Partial Differential Equations of Fluid and Gas Dynamics*, Honolulu, Hawaii, March 3-4th 2012.

- 2011
  - SIAM PDE, Minisymposium *" Nonlocal Equations: Perspectives from Probability and PDEs "* San Diego, November 14-17th 2011.
  - AWM's Celebration of Women in Mathematics: 40 Years and Counting. Section *"Advances in Nonlinear Dynamics."* Brown University, September 17-18th 2011.
  - IMA Seminar, University of Minnesota, April 26th 2011.
  - Mathematics and its Applications Seminar, University of Illinois at Chicago, April 20th 2011.

- Analysis Seminar, Northwestern University, April 18th 2011.

- 2010
  - PDE & Geometric Analysis Seminar, University of Wisconsin Madison, November 8th 2010.
  - PDE/Applied Math Seminar, National Taiwan University, August 9th 2010.
  - PDE/Applied Math/Analysis Seminars University of Toronto (Canada), Febr. 19th 2010.
- 2009
  - PDE Seminars at KTH Stockholm (Sweden), November 2009.
  - PDE Seminars at UPC Barcelona (Spain), July 2nd 2009.
- 2008
  - PDE/Applied Math/Analysis Seminars in Marseille (France) September 16th 2008.
  - PDE Seminars at UPC Barcelona (Spain) June 26th 2008 .
- 2007
  - Workshop "PDE and Variational Tools in Image Inpainting" Vienna (Austria), June 11th 2007.
- 2006
  - Applied Mathematics Seminars, Universita' di Tor Vergata, Roma (Italy), October 3rd, 2006.
  - PDE/Applied Math/Analysis Seminars University of Toronto (Canada), April 7, 2006.
  - Mathematical Physics Seminar, UT Austin, TX, March 8, 2006.
- 2004
  - Fourth Workshop on Multiscale Problems in Quantum Mechanics and Averaging TU München (Germany), November 4-5, 2004.
  - Second annual meeting of the HYKE network "Around HYperbolic and Kinetic Equations", ENS Paris (France), April 14-17, 2004.
- 2003
  - Workshop on Multiscale Problems in Quantum Mechanics and Averaging Techniques, Max-Planck-Institute for Mathematics in the Sciences, Leipzig (Germany), December 11-12, 2003.
  - Seminari d'EDP's i Aplicacions, Universitat Autonoma de Barcelona (Spain), October 16, 2003.
  - Fourth Colloquium DFG-Priority Program on Analysis, Modeling and Simulation of Multiscale Problems, Bonn Röttgen (Germany), June 2-4, 2003.

OTHER PROFESSIONAL ACTIVITIES:

Departmental, school and/or university service assignments at George Washington University:

- Member of Doctoral Exam for David Shoup (Spring 2015)
- Member of Specialty Exam committee for:
  - Chong Wang (Spring 2015)
  - Kai Yang (Fall 2014)
  - Anudeep Kumar (Fall 2014)
- Since Fall 2013: **Faculty Advisor of the GWU Association of Women in Mathematics Student Chapter**

- Since Fall 2012: Co-organizer of the Applied Mathematics Seminar
- 2014-2015: Member of the Search Committee for Post-Doctoral candidate
- 2014-2015: Member of the Search Committee for the Computational Biology Institute
- 2014-2015: Member of the Undergraduate Committee
- 2013-2014: Member of Graduate Committee
- 2013-2014 : Member of Search Committee
- Fall 2013: Member of Outreach Committee
- Fall 2013: Organizer of the Department Colloquium
- Fall 2012: Member of Graduate Committee

Others:

- Panelist for NSF Division of Mathematical Science.
- Referee for several mathematical journals.

LONG-TERM RESEARCH VISITS:

- Participant in the program *Free Boundary Problems, Theory and Applications,* (2 months) in MSRI, Berkeley, CA., January 10-March 10, 2011.
- Participant in the program *Partial Differential Equations in Kinetic Theories,* (1 month) in Isaac Newton Institute for Mathematical Sciences, Cambridge UK, August 6 - December 22 2010.
- Core participant in the program *Quantum and Kinetic Transport: Analysis, Computations, and New Applications* in IPAM University of California Los Angeles, March 9 - June 12 2009.
- Special Program *Geometric Partial Differential Equations* , IAS Princeton NJ, March 26 - April 3 2009.
- Visiting Post-doc position at the Department of Mathematics, University of California Los Angeles, January-March 2009.
- Visiting position at CRM at Universitat Autonoma de Barcelona (Spain), June 22 - July 11 2008.
- Core participant in the program *Optimal Transport* in IPAM, University of California Los Angeles, March 10 - June 13 2008.

LANGUAGES

Italian (native language)
German (fluent)
English (fluent)
Spanish (basic knowledge).