

MANUELA GIROTTI

Colorado State University

Department of Mathematics
1874 Campus Delivery
Fort Collins, CO 80523, USA

tel. : (+1) 970-491-0725
e-mail: Manuela.Girotti@colostate.edu

Status	Italy - citizen Canada - permanent resident United States - H1-B visa worker	since 05/2017 01/2017–12/2019
Current position	Department of Mathematics Colorado State University, Fort Collins, CO Postdoctoral Fellow Department of Mathematics and Statistics Concordia University, Montréal, Québec, Canada Affiliate Assistant Professor	01/2017–12/2019 10/2017–09/2020
Past position	Institut de Recherche en Mathématique et Physique Université Catholique de Louvain, Louvain-la-neuve, Belgium Postdoctoral Fellow / Assistante de recherche	11/2014–10/2016
Education	Concordia University , Montréal, Québec, Canada Ph.D. in Mathematics, supervisor Dr. Marco Bertola Thesis title: “ <i>Riemann-Hilbert approach to Gap Probabilities of Determinantal Point Processes</i> ”. External examiner: Dr. Alexander R. Its (IUPUI). Thesis ranking: excellent. Università degli Studi di Milano , Milan, Italy Laurea Magistrale (M.Sc.) in Mathematics, 110/110 <i>cum laude</i> * supervisor Dr. Elisabetta Rocca Thesis title: “ <i>Time relaxation of a phase-field model with entropy balance</i> ”. Università degli Studi di Milano , Milan, Italy Laurea Triennale (B.Sc.) in Mathematics, 110/110 <i>cum laude</i> * supervisor Dr. Dietmar Klemm Thesis title: “ <i>Dirac’s magnetic monopole</i> ”. Liceo Classico Valsalice , Turin, Italy Maturità classica (high school diploma), 100/100 Project title: “ <i>Turris Babel</i> ”.	2010–2014 2008–2010 2005–2008 2000–2005
Qualifications	<i>Qualifiée aux fonctions de Maître de Conférence</i> Section 25 - Mathématiques Ministère de l’Éducation nationale, de l’Enseignement supérieur et de la Recherche, France.	02/2016–12/2020

*Performance in the final examination is graded from 66 to 110. A *cum laude* can be added to the maximum grade as a special distinction.

Publications

- M. Girotti, “Vanishing time-relaxation for a phase-field model with entropy balance”, *Adv. Math. Sci. Appl.*, **22(2)**, 553-575, 2012.
- M. Girotti, “Riemann-Hilbert approach to gap probabilities for the Generalized Bessel process”, *Math. Phys. Anal. Geom.* **17** (1), 183-211, 2014.
- M. Girotti, “Asymptotics of the Tacnode process: a transition between the gap probabilities from the Tacnode to the Airy process”, *Nonlinearity* **27**, 1937-1968, 2014.
- M. Girotti, “Riemann-Hilbert approach to gap probabilities for the Bessel process”, *Phys. D*, 295-296C, 103-121, 2015.
- T. Claeys, M. Girotti, D. Stivigny, “Large gap asymptotics at the hard edge for product random matrices and Muttalib-Borodin ensembles”, *Internat. Math. Res. Notices*, rnx202, 2017.
- M. Girotti, T. Grava, K. McLaughlin, “Rigorous asymptotics of a KdV soliton gas”, submitted, 2018.

Affiliations

- **2010–2011:** member of Italian National Group for Mathematical Analysis, Probability and their Applications (GNAMPA).
- **2010–2014 and 2017-2018:** member of American Mathematical Society (AMS).
- **2011–2014:** member of the organization Italian Scientific Community in Canada - Québec section (CSIC).
- **2014–2016:** member of Interuniversity Attraction Poles - Dynamics, Geometry and Statistical Physics (DYGEST).
- **2014–2016:** member of the ERC projet “Critical phenomena in random matrix theory and integrable systems” (CRaMIS), principal investigator Dr. Tom Claeys.
- **2017–2018:** member of the International Presidential Fellow program, Colorado State University.

Scholarships and awards (selection)

- Borsa di studio SKF (high school scholarship), SKF Industrie S.p.A., a.y. 2000–2005.
- 2nd qualified for Certamen Taurinense (Latin literature competition), Torino, May 2005;
- Fondo per il sostegno dei giovani e per favorire la mobilità degli studenti (tuition fee remission), Università degli Studi di Milano, 2005–2007.
- Faculty of Arts&Science Graduate Fellowship, Concordia University, 2010–2013.
- Concordia University Partial Tuition Graduate Scholarship for International Students, Concordia University, 2010–2011.
- ISM Scholarship, Institut des Sciences Mathématiques, Montréal, 2011–2012.
- Exemption des frais de scolarité supplémentaires (MEQ), Ministère de l’Éducation, du Loisir et du Sport du Québec, 2011–2013.
- Concordia Merit Scholarship, Concordia University, 2012–2013.
- Concordia Accelerator Award, Concordia University, 2014.

Visits

- June 2012 (30 days), *PIMS-Mprime Summer School in Probability*, University of British Columbia (Canada);
- March 2014 (5 days), Université catholique de Louvain (Belgium), upon invitation of Prof. Tom Claeys;
- May 2015 (5 days) and February 2016 (3 days), Université d’Angers (France), upon invitation of Prof. Mattia Cafasso, ;

- June 2017 (5 days), SISSA (Italy), upon invitation of Prof. Marco Bertola and Prof. Tamara Grava;
- May 2018 (5 days), Université catholique de Louvain (Belgium), upon invitation of Prof. Tom Claeys;
- June 2018 (5 days), SISSA (Italy), upon invitation of Prof. Tamara Grava.

Talks (selection)

- *A Peek into the Math world: from abstraction to applications*, 11/2012, invited talk at Institut Italien de Culture de Montréal, Montréal (Canada).
- *Riemann-Hilbert approach to gap probabilities for the Bessel process*, poster presentation at the conference “Advanced School and Workshop on Random Matrices and Growth Models”, 09/2013, ICTP, Trieste (Italy).
- *Gap Probabilities of the Tacnode process*, poster presentation at the conference “Asymptotics in integrable systems, random matrices and random processes and universality. In honour of Percy Deift’s 70th birthday”, 06/2015, CRM, Montréal (Canada).
- *Smallest singular value distribution and large gap asymptotics for products of random matrices*, invited talk at the workshop “Six-vertex model, dimers, shapes, and all that”, 03/2016, Simons Center for Geometry and Physics, Stony Brook University (NY, USA).
- *“Integrable” gap probabilities for the Generalized Bessel process*, invited talk at the workshop “Painlevé Equations and Discrete Dynamics”, 10/2016, Banff International Research Station, Banff (AB, Canada).
- *Smallest singular value distribution and large gap asymptotics for products of random matrices*, talk at the 14th International Symposium on Orthogonal Polynomials, Special Functions and Applications (OPSFA14), 07/2017, University of Kent, Canterbury (UK).
- *Integrable gap probabilities for the Generalized Bessel process*, invited talk at the workshop “Painlevé Equations and Applications: A Workshop in Memory of A. A. Kapaev”, 08/2017, Michigan Center for Applied and Interdisciplinary Mathematics (MCAIM), Ann Arbor (MI, USA).
- *Rigorous asymptotics of the soliton gas*, invited talk to the special session on Probabilistic Models in Mathematical Physics, AMS Spring Meeting, 04/2018, Vanderbilt University, Nashville (TN, USA).

Invited conferences

- *From-PDE: Frobenius Manifolds and Hamiltonian Partial Differential Equations*, SISSA, Trieste (Italy), September 2013;
- *Integrable Systems, Random Matrices and Combinatorics. Nicholas Ercolani’s 60th Birthday*, University of Arizona, Tucson (AZ, USA), October 2013;
- *Scattering and Inverse Scattering in Multidimensions*, University of Kentucky, Lexington (KY, USA), May 2014;
- *Asymptotics in integrable systems, random matrices, random processes and universality*, Centre de Recherches Mathématiques, Montréal (QC, Canada), June 2015;
- *Probability and asymptotic analysis in strongly coupled systems*, Hausdorff Center for Mathematics, Bonn (Germany), January 2016;
- *Six-vertex model, dimers, shapes, and all that*, Simons Center for Geometry and Physics, Stony Brook University (NY, USA), March 2016;
- *Painlevé Equations and Discrete Dynamics*, Banff International Research Station, Banff (AB, Canada), October 2016;
- *Random Matrices and Determinantal Process*, Centre International de Rencontres Mathématiques (CIRM), Luminy-Marseille (France), March 2017;

- *Geometry of Integrable systems*, SISSA, Trieste (Italy), June 2017;
- *Critical phenomena for random matrices and integrable systems*, Château de Limelette (Belgium), June 2017;
- *Painlevé Equations and Applications: A Workshop in Memory of A. A. Kapaev*, Michigan Center for Applied and Interdisciplinary Mathematics (MCAIM), Ann Arbor (MI, USA), August 2017;
- *Joint Mathematics Meetings*, special session on Algebraic, Analytic, and Geometric Aspects of Integrable Systems, Painlevé Equations, and Random Matrices, San Diego (CA, USA), January 2018
- *AMS Spring Southeastern Section Meeting*, special session on Probabilistic Models in Mathematical Physics, Nashville (TN, USA), April 2018.

Teaching activities

- instructor of MATH 530 - Mathematics for Scientists and Engineers, Colorado State University, Fall 2018;
- instructor of MATH 345 - Differential Equations (Honors option), Colorado State University, Spring 2018;
- (graduate) lecture course on Determinantal Point Processes and Random Matrices, Colorado State University, Fall 2017;
- instructor of MATH 317 - Advanced Calculus of one variable, Colorado State University, Fall 2017;
- instructor of MATH 369 - Linear Algebra I, Colorado State University, Spring 2017;
- instructor of MATH 205 - Differential and Integral Calculus II, Concordia University, Winter 2011 and Fall 2011;
- teaching assistant of MATH 201 - Elementary Functions, Concordia University, Fall 2013;
- technical assistant of WeBWorK for the courses MATH 200, 201, 202, 203, 204, 205, Concordia University, Fall 2012 - Summer 2014;
- tutor at Math Help Center, Concordia University, Fall 2010 and Fall 2013.

Student supervision

- coordinator of one student for the Honors Option in the course MATH 345, Colorado State University, Spring 2018.

Languages

- Italian (mother tongue)
- English (level C1[†], advanced)

International English Language Testing System (IELTS)
 result (1/2010): 7/9
 written comprehension: 8/9 – written production: 7/9
 oral comprehension: 7/9 – oral production: 6.5/9
 British Council, Italy.
- French (level B2[†], upper intermediate)

Connaissance de la langue Française DELF
 result (1/2016): 79/100
 written comprehension: 22.50/25 – written production: 15,50/25

[†]Classification based upon the Common European Framework of Reference (CEFR)

oral comprehension: 21.00/25 – oral production: 20.00/25
Alliance Française de Bruxelles-Europe, Belgium.

- Persian (level A1[†], beginner)
- Dutch (level A1[†], beginner)

Computer Skills

Languages: C++, HTML, Python, R.
Software: WebWork, MatLab, Latex, Maple.

Leadership and organizational activities

- **09/2011–10/2013:** president of the Mathematics and Statistics Graduate Students Association (MASGSA), Concordia University;
- **09/2012–04/2013:** organizer of the Graduate Students Seminar series, Concordia University;
- **05/2012–04/2013:** member of the Departmental Appraisal Committee (DAC) as Graduate Students Representative at the Department of Mathematics and Statistics, Concordia University;
- **09/2015–10/2016:** organizer of seminar series of the Mathematical Physics group, UC Louvain.

Volunteer experiences

- **09/2009:** volunteer at the event amfAR Milano 2009, amfAR - The Foundation for AIDS research.
- **09/2009–08/2010:** part of the Schola Gregoriana Mediolanensis (gregorian choir), Milano (Italy).
- **05/2010:** volunteer for the project “Test di usabilità sulla Biblioteca Digitale dell’Università degli Studi di Milano” (test of usability on the Digital Library of the University of Milano), Università degli Studi di Milano.
- **01/2011–04/2014:** part of the Concordia University Choir, Concordia University.
- **11/2012 and 11/2013:** creator and organizer of the Mathematics installations at Exposcience - Stewart Hall Science & Technology Exhibition (Concordia University), Pointe-Claire (QC, Canada).
- **10/2014–10/2016:** part of Stella Matutina (gregorian choir), Bruxelles (Belgium).
- **11/2017:** volunteer for Math Day 2017, Colorado State University.
- **02/2017–10/2017 and 08/2018–now:** volunteer at the nonprofit restaurant FoCo Cafe, Fort Collins (CO).

Other interests

singing, sailing, skiing, cooking.