MANUELA GIROTTI

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Current position

Emory University 09/2023–now
Department of Mathematics, Atlanta, GA
Assistant Professor

Past positions

Saint Mary's University 07/2021–07/2023
Department of Mathematics and Computing Science, Halifax, NS
Assistant Professor *(promoted to Associate Professor without tenure in May 2023)*

Mila – Québec Artificial Intelligence Institute 08/2020–06/2021
Université de Montréal, Montréal, QC
Postdoctoral Fellow

John Abbott College 03/2019–01/2020
Department of Mathematics, Sainte-Anne-de-Bellevue, QC
Instructor

Colorado State University 01/2017–12/2018
Department of Mathematics, Fort Collins, CO
Postdoctoral Fellow

Institut de Recherche en Mathématique et Physique 11/2014–10/2016
Université catholique de Louvain, Louvain-la-neuve, Belgium
Postdoctoral Fellow / Assistante de recherche

Visiting Positions

Institute for Pure & Applied Mathematics (IPAM) 03/2025–06/2025
University of California – Los Angeles, CA
thematic program: *Non-commutative Optimal Transport*
Senior Research Member

Isaac Newton Institute for Mathematical Sciences 07/2024–08/2024
Northumbria University and Newcastle University, UK
satellite thematic program: *Emergent Phenomena in Nonlinear Dispersive Waves*
Research Member, Simons Foundation Fellowship

Isaac Newton Institute for Mathematical Sciences 07/2022–12/2022
University of Cambridge, UK
thematic program: *Dispersive hydrodynamics: mathematics, simulation and experiments, with applications in nonlinear waves*
Research Member, Simons Foundation Fellowship

Simons Laufer Mathematical Sciences Institute (SLMath) 08/2021–12/2021
(former Mathematical Sciences Research Institute - MSRI)
University of California – Berkeley, CA
thematic program: *Universality and Integrability in Random Matrix Theory and Interacting Particle Systems*
Research Member

Professional Affiliations

Mila – Québec Artificial Intelligence Institute 08/2021–12/2023
Université de Montréal, Montréal, QC
Associate Member / Collaborator

Concordia University 10/2017–09/2023
Department of Mathematics and Statistics, Montréal, QC
Affiliate Assistant Professor

Education

Concordia University, Montréal, QC Canada 2010–2014
Ph.D. in Mathematics, supervisor Prof. Marco Bertola
Thesis title: *"Riemann-Hilbert approach to Gap Probabilities of Determinantal Point Processes"*.
External examiner: Prof. Alexander R. Its (IUPUI). Thesis ranking: excellent.

Università degli Studi di Milano, Milan, Italy 2008–2010
Laurea Magistrale (M.Sc.) in Mathematics, supervisor Prof. Elisabetta Rocca
Thesis title: *"Time relaxation of a phase-field model with entropy balance"*.
Thesis grade: 110/110 *cum laude*[*].

Università degli Studi di Milano, Milan, Italy 2005–2008
Laurea Triennale (B.Sc.) in Mathematics, supervisor Prof. Silke (Dietmar) Klemm
Thesis title: *"Dirac's magnetic monopole"*.
Thesis grade: 110/110 *cum laude*[*].

Math Publications

- "Soliton versus the gas: Fredholm determinants, analysis, and the rapid oscillations behind the kinetic equation", *Comm. Pure Appl. Math*, 10.1002/cpa.22106, 2023 (with T. Grava, R. Jenkins, K. McLaughlin and A. Minakov).
- "Rigorous asymptotics of a KdV soliton gas", *Comm. Math. Phys.*, 384, 2021 (with T. Grava, R. Jenkins and K. McLaughlin).
- "Fredholm determinant solutions of the Painlevé II hierarchy and gap probabilities of determinantal point processes", *Internat. Math. Res. Notices*, rnz168, 2019 (with T. Claeys and M. Cafasso).
- "Large gap asymptotics at the hard edge for product random matrices and Muttalib-Borodin ensembles", *Internat. Math. Res. Notices*, rnx202, 2017 (with T. Claeys and D. Stivigny).
- "Riemann-Hilbert approach to gap probabilities for the Bessel process", *Phys. D*, 295-296C, 103-121, 2015.
- "Asymptotics of the Tacnode process: a transition between the gap probabilities from the Tacnode to the Airy process", *Nonlinearity* **27**, 1937-1968, 2014.
- "Riemann-Hilbert approach to gap probabilities for the Generalized Bessel process", *Math. Phys. Anal. Geom.* **17** (1), 183-211, 2014.
- "Vanishing time-relaxation for a phase-field model with entropy balance", *Adv. Math. Sci. Appl.*, 22(**2**), 553-575, 2012.

[*]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.

ML Publications

- "Neural Networks Efficiently Learn Low-Dimensional Representations with SGD", *International Conference on Learning Representations (ICLR)*, 2023 (with M. Erdogdu, I. Mitliagkas, A. Mousavi, S. Park).

  Spotlight presentation at the workshop on Optimization for Machine Learning OPT 2022 - NeurIPS. AC's recommendation: *Accept: notable-top-25%*

- "Convergence Analysis and Implicit Regularization of Feedback Alignment for Deep Linear Networks", *arXiv:2110.10815* (with G. Gidel, I. Mitliagkas).

  Spotlight talk at the workshop Beyond First-Order Methods in ML Systems - ICML 2021.

- "A study of condition numbers for first-order optimization", *Proceedings of The 24th International Conference on Artificial Intelligence and Statistics*, PMLR 130:1261-1269, 2021 (with C. Guille-Escuret, B. Goujaud and I. Mitliagkas).

  Spotlight presentation and *Student Paper Award* at the workshop on Optimization for Machine Learning OPT 2020 - NeurIPS.

Research projects

- *American Institute of Mathematics*, SQuaREs program 2024–2025

  project: "Dispersive PDEs with randomness".

  role: team leader.

Grants

- *NSERC Discovery Grant – Early Career Researcher*, 2022–2027;

  project: "Integrable Probability and Universality in Mathematical Physics and Machine Learning".

  role: Principal Investigator.

  [terminated due to relocation to the United States]

- *University Grant in Aid of Research* of Saint Mary's University, 2021–2022;

  project: "Integrable Probability Models".

  role: Principal Investigator.

- *CIFAR AI Catalyst Grant*
  with Ioannis Mitliagkas (Mila, Université de Montréal) and Murat Erdogdu (Vector Institute, University of Toronto), 2020–2022;

  project: "Rethinking generalization and model diagnostics in modern Machine Learning".

  role: co-applicant.

Student supervision

- supervisor of one NSERC USRA student, Saint Mary's University, Summer 2023;

  project title: "Painlevé equations: nonlinear special functions";

- supervisor of one NSERC USRA student, Saint Mary's University, Summer 2022;

  project title: "The Aztec Diamond: enumeration, random tilings and integrable probability";

  contributed talk at the Mathematics Science Atlantic Conference 2023.

- supervisor for a Honor project of the course MATH 345, Colorado State University, Spring 2018;

  project title: "The Van der Pol oscillator".

Teaching activities

- MATH 785R - Topics in Computational Mathematics: Approximation Theory, Emory University, Fall 2024;
- MATH 318 - Complex Variables, Emory University, Fall 2024;
- MATH 250 - Foundations of Mathematics, Emory University, Spring 2024;
- MATH 2303 - Differential Equations I (*course coordinator)*, Saint Mary's University, Spring 2023;
- MATH 3441 - Real Analysis I, Saint Mary's University, Fall 2022;
- MATH 3406 - Differential Equations II, Saint Mary's University, Spring 2022;
- MATH 4442 - Real Analysis II, Saint Mary's University, Spring 2022;
- MATH 3441 - Real Analysis I, Saint Mary's University, Fall 2021;
- MATH 015 - Algebra&Trigonometry, John Abbott College, Winter 2019 and Fall 2019;
- MATH NYB - Calculus II, John Abbott College, Winter 2019 and Fall 2019;
- MATH 530 - Mathematics for Scientists and Engineers, Colorado State University, Fall 2018;
- MATH 345 - Differential Equations (Honors option), Colorado State University, Spring 2018;
- MATH 317 - Advanced Calculus of one variable, Colorado State University, Fall 2017;
- MATH 369 - Linear Algebra I, Colorado State University, Spring 2017;
- 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;
- MATH 205 - Differential and Integral Calculus II, Concordia University, Winter 2011 and Fall 2011.

Invited lectures

- lectures on Determinantal Point Processes and Random Matrices, during the INdAM meeting "Quantum Optimal Transport and Applications", Scuola Normale di Pisa, Cortona (Italy), Fall 2024;
- lectures on Random Matrix Theory, Saint Mary's University, Spring 2022;
- lectures on Determinantal Point Processes and Random Matrices, Tulane University, Fall 2019;
- lectures on Determinantal Point Processes, Colorado State University, Fall 2017.

Service activities

- member of the scientific and organizing committee for the workshop in honor of Arno Kuijlaar's 60th birthday and the 2024 PIICQ Annual Meeting (Probabilités Intégrables, Intégrabilité Classique et Quantique), Leuven (Belgium), May 2024.
- member of the evaluation committee for the doctoral program MathPhdInFrance, Fondation Sciences Mathématiques de Paris (France), Spring 2024.
- secretary of the SIAM Activity Group "Nonlinear Waves and Coherent Structures", 2023–2025.
- member of the scientific and organizing committee for the 2023 PIICQ Annual Meeting, Angers (France), May 2023.
- member of the hiring committee (comité de sélection) at Université d'Angers (France), Spring 2022.
- member of the Students selection Committee, Mila Insitute, 2020–2021.
- organizer of the Job Market Panel Series, Mila Institute, 2020–2021.
- Lab Representative, Mila Institute, 2020–2021.
- organizer of the Postdoc Seminar series, Colorado State University, 2017–2018.
- organizer of seminar series of the Mathematical Physics group, UC Louvain, 2015–2016.
- organizer of the Graduate Students Seminar series, Concordia University, 2012–2013.

- member of the Departmental Appraisal Committee, Concordia University, 2012–2013.
- president of the Mathematics&Statistics Graduate Students Association (MASGSA) and Graduate Students Representative, Concordia University, 2011–2013.

Editorial activities

Referee to the following journals:
- SIAM Journal on Mathematical Analysis
- Annales Henri Poincaré
- Symmetry, Integrability and Geometry: Methods and Applications (SIGMA)
- Journal of Machine Learning Research
- European Physical Journal Plus
- Communications in Mathematical Physics
- Journal of Differential Equations
- Acta Applicandæ Mathematicæ
- Journal of Nonlinear Science
- Studies in Applied Mathematics

Referee to the following ML conferences:
- Conference on Neural Information Processing Systems 2021 (NeurIPS), workshop Optimization for Machine Learning
- International Conference on Learning Representations 2022 (ICLR), Blog Post Track
- Conference on Neural Information Processing Systems 2023 (NeurIPS), workshop Optimization for Machine Learning
- Conference on Neural Information Processing Systems 2024 (NeurIPS), workshop Optimization for Machine Learning

Area Chair to the following ML conferences:
- International Conference on Learning Representations 2023 (ICLR), Blog Post Track
- International Conference on Learning Representations 2024 (ICLR), Blog Post Track

Academic outreach

- organizer of the Math outreach event *"Mathematics down to Earth"/"La Mathématique terre à terre"*, during the Science Literacy Week, Saint Mary's University, 2022.
- invited panelist to the event *"Work/life balance in academia"*, within the Connection and Introductory Workshop: Universality and Integrability in Random Matrix Theory and Interacting Particle Systems, MSRI, Berkeley (CA), 2021.
- invited talk *"Solitons 101"* at $(MD)^2$ Math Day, John Abbott College, 2019.
- invited talk *"A Peek into the Math world: randomness and matrices"* for the International Presidential Fellow program, 2018.
- volunteer for Math Day 2017 and Math Day 2018, Colorado State University, 2017–2018.
- co-organizer of the Mathematics installations at Exposcience - Stewart Hall Science&Technology Exhibition (Concordia University), Pointe-Claire (QC), 2012–2013.
- invited talk *"A Peek into the Math world: from abstraction to applications"* at the Institut Italien de Culture de Montréal, 2012.

Mentoring

- mentor for the Association for Women in Mathematics (AMW).

Certifications

Mental Health Commission of Canada since 2021
Mental Health First Aider

Membership

Member of the following associations:
- American Mathematical Society (AMS)
- Society for Industrial and Applied Mathematics (SIAM), activity group Nonlinear Waves and Coherent Structures

Academic visits

(for periods going from one to four weeks)

- May 2022, Université d'Angers (France), upon invitation of Prof. Mattia Cafasso.
- February 2022, Colorado State University (CO), upon invitation of Prof. Ken McLaughlin.
- August 2020, visitor of École de Physique des Houches (France) during the workshop *Statistical Physics and Machine Learning*.
- June 2018, SISSA (Italy), upon invitation of Prof. Tamara Grava.
- October 2019, Tulane University (LA), upon invitation of Prof. Victor Moll.
- May 2018, Université catholique de Louvain (Belgium), upon invitation of Prof. Tom Claeys.
- June 2017, SISSA (Italy), upon invitation of Prof. Marco Bertola and Prof. Tamara Grava.
- May 2015 and February 2016, Université d'Angers (France), upon invitation of Prof. Mattia Cafasso.
- March 2014, Université catholique de Louvain (Belgium), upon invitation of Prof. Tom Claeys.
- June 2012, *PIMS-Mprime Summer School in Probability*, University of British Columbia (Canada).

Scholarships and awards

2000–2005 (high school)

- SKF Industrie S.p.A. scholarship, 2000–2005.
- 2nd qualified for Certamen Taurinense (Latin literature provicial competition), May 2005.

2005–2008 (undergraduate)

- Fondo per il sostegno dei giovani e per favorire la mobilità degli studenti (partial tuition waiver), Università degli Studi di Milano, 2005–2008.

2010–2014 (doctorate)

- 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 (ISM, Montréal), 2011–2012.
- ISM Travel Scholarship, Institut des Sciences Mathématiques (ISM, Montréal), June 2011;
- 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.
- Campaign for a New Millennium Graduate Scholarship - Faculty of Arts&Science, Concordia University, 2013-2014.
- Concordia Accelerator Award, Concordia University, 2014.

2017–2018 (postdoc)

- International Presidential Fellow program, Colorado State University, 2017–2018.
- SIAM OPSFA (Orthogonal Polynomials and Special Functions) travel bursary, 2017.

2019 (college professor)

- Professional Development funding, John Abbott College, 2019.

2021–now (assistant professor)

- Simons Foundation Fellowship to attend the program "Dispersive hydrodynamics: mathematics, simulation and experiments, with applications in nonlinear waves" at the Isaac Newton Institute, Cambridge (UK), 2022.
- NSF financial support for early career researchers to attend the program "Emergent Phenomena in Nonlinear Dispersive Waves" in Newcastle (UK), 2024.
- Simons Foundation Fellowship to attend the program "Emergent Phenomena in Nonlinear Dispersive Waves" in Newcastle (UK), 2024.

Status

Italy - citizen, **Canada** - citizen, **United States** - H1-B visa worker.

Computer skills

Languages: Python, Java, C++, HTML, Perl.
Software: WebWork, MatLab, LaTeX, Maple.
Python libraries: PyTorch, SciKitLearn, Numpy, Matplotlib, Pandas.

Languages

- Italian (native)
- English (full professional proficiency, C2)
- French (full professional proficiency, C2)

Conferences talks (Math)

- *Random solitons, soliton gasses and all that*, special session "Advances in the theory of integrable partial differential equations" during the AMS Southeastern sectional meeting, Savannah (GA), 2024.
- *Asymptotics of random solitons and soliton gasses*, "Women in Dispersive Equations" workshop, Isaac Newton Institute and Northumbria University, Newcastle (UK), 2024.
- *Full Bargmann gas solutions of the mKdV equation*, "Integrable Systems: Geometrical and Analytical Approaches" workshop, SISSA, Trieste (Italy), 2024.
- *The dynamics of random solitons and soliton gasses*, "Riemann-Hilbert problems, Toeplitz matrices, and applications" workshop, American Institute of Mathematics, Pasadena (CA), 2024.
- *Random matrices, random solitons, and random rational functions, and soliton gasses*, special session "Orthogonal Polynomials and Applications" during the Joint Mathematics Meeting, Boston (MA), 2023.
- *Random matrices, random solitons, and soliton gasses*, XVIII Brunel–Bielefeld Workshop on Random Matrix Theory, Brunel (UK), 2022.
- *The dynamics soliton gasses: Fredholm determinants, asymptotics, and kinetic equations*, special session "Recent advances on nonlinear evolution equations" during the Canadian Mathematical Society winter meeting, Toronto (ON), 2022.
- *Soliton versus the gas: Fredholm determinants, asymptotics, and kinetic equations*, "Analysis of dispersive systems" workshop, Isaac Newton Institute, Cambridge (UK), 2022.
- *Soliton versus the gas: Fredholm determinants, asymptotics, and kinetic equations*, 2022 SIAM Conference on Nonlinear Waves and Coherent Structures, session on "Recent Advances on Integrable Nonlinear Wave Equations", Bremen (Germany), 2022.
- *Soliton v. the gas: Fredholm determinants, analysis, and finer details*, "Women in Dispersive Hydrodynamics" workshop, Isaac Newton Institute, Cambridge (UK), 2022.

- *Soliton v. the gas: Fredholm determinants, analysis, and the rapid oscillations behind the kinetic equation*, workshop "Excursions in Integrability", SISSA, Trieste (Italy), 2022.
- *Fredholm Determinant Solutions of the Painlevé II Hierarchy and Gap Probabilities of Determinantal Point Processes*, Connections Workshop: Universality and Integrability in Random Matrix Theory and Interacting Particle Systems, MSRI (UC Berkeley), 2021.
- *A KdV soliton gas: asymptotic analysis via Riemann–Hilbert problem*, workshop New horizons in dispersive hydrodynamics -virtual-, Isaac Newton Institute, Cambridge (UK), 2021.
- *A KdV soliton gas: asymptotic analysis via Riemann–Hilbert problem*, workshop Integrable Systems in Newcastle -virtual-, Newcastle (UK), 2021.
- *Fredholm Determinant Solutions of the Painlevé II Hierarchy and Gap Probabilities of Determinantal Point Processes*, CRM Mathematical Physics Lab virtual seminar series, Montréal (QC), 2020.
- *Rigorous asymptotics of a KdV soliton gas*, workshop "Analysis of dispersive systems", Isaac Newton Institute for Mathematical Sciences, Cambridge (UK), 2020 *(cancelled due to COVID-19)*.
- *Fredholm Determinant Solutions of the Painlevé II Hierarchy and Gap Probabilities of Determinantal Point Processes*, SIAM annual meeting, Toronto (ON), 2020 *(cancelled due to COVID-19)*.
- *A KdV soliton gas: asymptotic analysis via Riemann–Hilbert problems*, Midwestern Workshop on Asymptotic Analysis, Indiana University, Bloomington (IN), 2018.
- *Rigorous asymptotics of a KdV soliton gas*, International Conference in Mathematical Physics, Montréal (QC), 2018.
- *Rigorous asymptotics of a KdV soliton gas*, workshop "Hamiltonian systems & applications", Università degli Studi Milano-Bicocca, Milano (Italy), 2018.
- *Rigorous asymptotics of the soliton gas*, special session "Probabilistic Models in Mathematical Physic" at the AMS Spring Meeting, Vanderbilt University, Nashville (TN), 2018.
- *Asymptotics of gap probabilities via Riemann-Hilbert approach*, AMS Joint Mathematics Meeting, San Diego (CA), 2018.
- *Integrable gap probabilities for the Generalized Bessel process*, workshop "Painlevé Equations and Applications: A Workshop in Memory of A. A. Kapaev", Michigan Center for Applied and Interdisciplinary Mathematics (MCAIM), Ann Arbor (MI), 2017.
- *Smallest singular value distribution and large gap asymptotics for products of random matrices*, 14th International Symposium on Orthogonal Polynomials, Special Functions and Applications (OPSFA14), University of Kent (UK), 2017.
- *"Integrable" gap probabilities for the Generalized Bessel process*, workshop "Painlevé Equations and Discrete Dynamics", Banff International Research Station (BIRS), 2016.
- *Smallest singular value distribution and large gap asymptotics for products of random matrices*, workshop "Six-vertex model, dimers, shapes, and all that", Simons Center for Geometry and Physics, Stony Brook University (NY), 2016.

Colloquium and seminars (Math)

- *Asymptotics of random soliton and soliton gasses*, Applied Analysis (GAMA) seminar series, Universidad Carlos III de Madrid (Spain; virtual), 2024.
- *The dynamics of soliton gasses: Fredholm determinants, asymptotics, and kinetic equations*, Integrable Systems and Nonlinear Mechanics seminar series, Texas A&M University - Corpus Christi (virtual), 2023.
- *The dynamics of random KdV solitons and soliton gasses*, Applied Mathematics Colloquium, Fields Institute, Toronto (ON), 2022.

- *Asymptotic Analysis of the Interaction Between a Soliton and a Regular Gas of Solitons (a.k.a. Gulliver and the Lilliputians)*, AARMS Analysis-Applied Math-Physics seminar, Dalhousie University, Halifax (NS), 2022.
- *Asymptotic Analysis of the Interaction Between a Soliton and a Regular Gas of Solitons (a.k.a. Gulliver and the Lilliputians)*, Integrable Systems and Random Matrix Theory seminar series -virtual-, University of Michigan, Ann Arbor (MI), 2021.
- *Fredholm Determinant Solutions of the Painlevé II Hierarchy and Gap Probabilities of Determinantal Point Processes*, CRM Mathematical Physics Lab virtual seminar series, Montréal (QC), 2020.
- *Fredholm Determinant Solutions of the Painlevé II Hierarchy and Gap Probabilities of Determinantal Point Processes*, Orthogonal Polynomials, Special Functions, Operator Theory and Applications (OPSFOTA) virtual seminar series, 2020.
- *Waves and solitons: the case of a Korteweg-de Vries solitonic gas*, Departmental Colloquium at Tulane University, New Orleans (LA), 2019.
- *Smallest singular value distribution and large gap asymptotics for products of random matrices*, Integrable Systems and Random Matrix Theory seminar series, University of Michigan (MI), 2017.
- *Riemann-Hilbert approach to Gap Probabilities of Determinantal Point Processes*, Classical Analysis seminar, KU Leuven (Belgium), 2015.
- *Gap Probabilities of the Tacnode process*, Mathematical Physics seminar, Centre de Recherche Mathématiques (CRM), Montréal, 2014.
- *Gap probabilities and Isomonodromic τ-function: from integrable systems to non-intersecting Brownian motion*, Mathematical Physics seminar, Università degli Studi Milano-Bicocca, Milan (Italy).

Conference talks (ML)

- *Neural Networks Efficiently Learn Low-Dimensional Representations with SGD*, "Machine Learning in Infinite Dimensions" workshop, University of Bath, Bath (UK), 2024.
- *Neural Networks Efficiently Learn Low-Dimensional Representations with SGD*, special session "Mathematics of Machine Learning" during the Canadian Mathematical Society winter meeting, Toronto (ON), 2022.
- *Convergence Analysis and Implicit Regularization of Feedback Alignment for Deep Linear Networks*, special session "Scientific Machine Learning" during the Canadian Mathematical Society summer meeting, Memorial University of Newfoundland, St. John's (NL), 2022.
- *Convergence Analysis and Implicit Regularization of Feedback Alignment for Deep Linear Networks*, Beyond First-Order Methods in ML Systems workshop -virtual-, International Conference on Machine Learning, 2021.
- *Condition numbers for first-order optimization*, East Coast Optimization Meeting -virtual-, Fairfax (VA), 2021.
- *A note on condition numbers of first-order optimization*, at the workshop "Statistical Physics and Machine Learning", École de Physique des Houches (France), 2020.

Colloquium and seminars (ML)

- *Neural Networks Efficiently Learn Low-Dimensional Representations with SGD*, One World seminar series - Mathematics of Machine Learning (virtual), 2023.
- *Neural Networks Efficiently Learn Low-Dimensional Representations with SGD*, CRM colloquium, Ottawa (ON), 2023.
- *Physics Informed Neural Networks and Dispersive PDEs*, Early Career Researchers meetings, Isaac Newton Institute, Cambridge (UK), 2022.
- *Convergence Analysis and Implicit Regularization of Feedback Alignment for Deep Linear Networks*, LightOn AI Meetup -virtual-, Paris, 2021.

- *Random Matrix Theory for uninitiated (and ML applications)*, Montréal Machine Learning and Optimization (MTL MLOpt), Montréal, 2020.

Other outreach

- volunteer at the nonprofit restaurant FoCo Cafe, Fort Collins (CO), 2017–2018.
- volunteer at the events Café Scientique 2012 and Café Scientique 2013 (sponsored by CIHR – McGill University Health Center; organized by Comunità Scientifica Italiana in Canada), Montréal, 2012–2013.
- volunteer for the project "Test di usabilità sulla Biblioteca Digitale dell'Università degli Studi di Milano" (test of usability of the university Digital Library), Milano, 2010.
- volunteer at the event amfAR Milano 2009, amfAR - The Foundation for AIDS research, Milano, 2009.
- journalist for the high-school magazine "Il Salice", Torino, 2000–2005.

Other interests

- sailing:
  - Passeport Voile, Niveau 3 Croisière, Fédération Française de Voile, 2019,
  - Pleasure Craft Operator Card, Transport Canada, 2021;
- singing: part of the following choirs as alto singer
  - Schola Gregoriana Mediolanensis (gregorian; 2009–2010),
  - Stella Matutina (gregorian; 2014–2016),
  - *Vêpres de Saint Waudru* concert, Mons – European Capital of Culture 2015,
  - Concordia University Choir (classic and contemporary; 2010–2014 and 2019–2020),
  - Dalhousie Collegium Cantorum (classic and contemporary; 2022–2023).
- skiing (nordic and downhill):
  - SKF Ski competition, category "Junior Women", Sestriere (Italy), 2000;
  - Valsalice Ski competition, category "Women", Sestriere (Italy), 2001;
  - Canadian Ski Marathon, category "Randonneur/Tourer", 2021.