ANDREA AGAZZI

Piazza San Paolo all'Orto 15 • 56127 Pisa • ⓒ +41 76 426 46 02
⊠ andrea.agazzi@unipi.it • ⓞ github.com/agazzian

ACADEMIC BACKGROUND

2022–	**Assistant Professor (TT - RTD/B)** Mathematics Department, University of Pisa (IT)
2019–22	**Griffith Research Assistant Professor** Mathematics Department, Duke University (USA)
2018–22	**Postdoc** Mathematics Department, Duke University (USA) **Supervisor**: Prof. J. C. Mattingly
2015	**Research stay** at Stanford University (10 months) **Supervisor:** Prof. A. Dembo
2013–17	**PhD in Theoretical Physics** at University of Geneva (CH) **Supervisor**: Prof. J.-P. Eckmann
2012–13	**MSc Theoretical and Mathematical Physics** at Imperial College London (UK) **Supervisor:** Prof. G. M. Graf (ETHZ)
2009–12	**BSc Physics** at ETH Zurich (CH)

PUBLICATIONS AND PREPRINTS

"Random splitting of point vortex flows",
with F. Grotto and J. C. Mattingly. submitted (arXiv:2311.06643),

"Global optimality of Elman-type Recurrent Neural Networks in the mean-field regime",
with J. Lu, S. Mukherjee, 40th International Conference on Machine Learning,

"Random splitting of fluid models: Positive Lyapunov exponents",
with J. C. Mattingly and O. Melicheki. submitted (arXiv:2210.06643),

"Random splitting of fluid models: Unique ergodcty and convergence",
with J. C. Mattingly and O. Melicheki. Communications in Mathematical Physics (2023), **401**, 497–549,

"A homotopic approach to policy gradients for linear quadratic regulators with nonlinear controls", with C. Chen. IEEE 61st Conference on Decision and Control (2022), 1588-1595,

"Large deviations for jump Markov processes with uniformly diminishing rates",
with L. Andreis, R. Patterson and D. R. M. Renger. Stoch. Proc. Appl. (2022), **152**, 533-559,

"Global optimality of softmax policy gradient with single hidden layer neural networks in the mean-field regime ", with J. Lu. 9th International Conference on Learning Representations (2021),

"Temporal-difference learning with nonlinear function approximation: lazy training and mean field regimes ", with J. Lu. MSML21: Mathematical and Scientific Machine Learning (2021),

"Urgency-aware Optimal Routing in Repeated Games through Artificial Currencies",
with M. Salazar, D. Paccagnan and W. P. M. H. Heemels. European Journal of Control (2021), **62**, 22-32,

"Chemical kinetics can be stable, marginally stable or unstable",
with J. C. Mattingly. Communications in Mathematical Sciences (2020), **18** (6), 1605 - 1642,

"On the geometry of chemical reaction networks: Lyapunov function and large deviations",
with A. Dembo and J.-P. Eckmann. Journal of Statistical Physics (2018), **172** (2), 321-352,

"Large Deviations Theory for Markov Jump Models of Chemical Reaction Networks",
with A. Dembo and J.-P. Eckmann. Annals of Applied Probability (2018), **28** (3), 1821-1855,

"Metabolomics identifies a biomarker revealing in vivo loss of functional ß-cell mass before diabetes onset",
with L. Li, P. Krznar et al. Diabetes, **28** (12), 2272-2286 (2019),

"The colored Hofstadter Butterfly for the Honeycomb Lattice",
with J.-P. Eckmann and G. M. Graf. Journal of Statistical Physics (2014), **156**, 417-426.

Teaching and Working Experience

2024	**Deep Learning Theory** (PhD course, Mathematics Department, University of Pisa), **Mathematical Statistics** (Mathematics Department, University of Pisa), **Statistics I** (Engineering Department, University of Pisa),
2023	**Probability and Statistics** (Mathematics Department, University of Pisa), **Statistics I** (Engineering Department, University of Pisa),
2022	**Stochastic Processes (STA 210)** (Mathematics Dept, Duke Kunshan University), **Probability and Statistics** (Mathematics Department, University of Pisa), **Statistics I** (Engineering Department, University of Pisa),
2021	**Probability (MATH 230)** (Mathematics Department, Duke University), **Statistical Learning Theory (STA 303)** (Mathematics Dept, Duke Kunshan University), **Stochastic Processes (STA 210)** (Mathematics Dept, Duke Kunshan University),
2020	**Probability (MATH 230)** (Mathematics Department, Duke University), **Stochastic Calculus (MATH 545)** (Mathematics Department, Duke University), **Supervision of a graduation project** (Mathematics Department, Duke University),
2019	**Stochastic Calculus** (Mathematics Department, Duke University),

Grants and Felowships

2023	**Progetto di Rilevante Interesse Nazionale (PRIN)** grant (local PI of UNIPI unit), **Istituto Nazionale di Alta Matematica**: "GNAMPA" fellowship (PI),
2022	**Istituto Nazionale di Alta Matematica**: "GNAMPA" fellowship (member),
2018–19	**Swiss National Research Foundation**: "Early PostDoc mobility" fellowship (PI),
2015	**Swiss National Research Foundation**: "Doc. mobility" fellowship (PI),

Supervision of students

PhD Students:

- Eloy Mosig Garcia (UNIPI, 2023-)
- Omar Melikechi (Duke University, 2018-22, co-supervised with Jonathan Mattingly)

Graduate Students:

- Emanuele Angile (UNIPI, 2023-)
- Mario Correddu (UNIPI, 2023-)
- Craig Chen (Duke, 2020-21)

Scientific events organized

2024	**Mathematics of machine learning workshop**, Roma, IT **Stochastics, machine learning and statistical physics conference**, Cetraro, IT
2022	**Mathematical physics at coffee: the first 50 years**, Geneva, CH **Stochastic dynamics of chemical reaction networks workshop**, Bologna, IT
2021	**AIM Workshop "Limits and control of stochastic reaction networks"**, San Jose, CA,
2014	**Nonequilibrium problems in physics and mathematics**, Ascona, CH

Achievements

2017	**UNIGE:** Thesis with "Félicitations du Jury",
2015	**National Model of United Nations**: "Outstanding position paper award",
2013	**Imperial College London:** MSc with Distinction,
2012	**Membership of the Swiss Study Foundation for Excellence**,
2010	**Schweizer Jugend Forscht contest**: "Excellence prize" and "Simply science prize", **European Union Contest for Young Scientists**: "European Patent Office, prize for originality",
2009	**EPFL**: "Best graduation project in material science in Switzerland".

2023	Oberseminar in mathematical optimization*, Technical University of Munich, Machine Learning Seminar*, University of Trento, "A day on Statistical Physics for Machine Learning"*, University of Rome Tor Vergata, Applied Mathematics seminar*, University of Hawaii at Manoa, Honolulu, Ital.IA workshop "Hard Sciences for Machine Learning"*, Pisa MaLGA Seminar*, University of Genoa, Mathematics of Data Science Seminar*, SISSA, Trieste,
2022	Mathematical Stochastics Group Seminar, Univerity of Leipzig, Angewandte Analysis Seminar, Max Planck Institute for Mathematics in the Sciences, Leipzig, Mathematical Data Science Seminar, Purdue University (virtual), Risorgimento della vita felice: a celebration of mathematical physics*, ETH Zurich, Mathematical physics at coffee: the first 50 years, Geneva, Probability Seminar*, University of Indiana, Bloomington (virtual), Third Italian Meeting in Probability and Statistics, Mathematics of machine learning session, Bologna,
2021	International Conference in Learning Representations (virtual), MSML21: Mathematical and Scientific Machine Learning conference (virtual), GeorgiaTech Theoretical Machine Learning Seminar*, GeorgiaTech (virtual), Online Seminar on the Mathematics of Reaction Networks*, (virtual), Bio Dynamics Days Conference*, Courant Institute, NYU (virtual), CSFT Seminar*, EPFL, Lausanne (virtual), One World Seminar Series on the Mathematics of Machine Learning* (virtual), Pisa Online Probability Seminar*, SNS & University of Pisa, Pisa (virtual), SIAM Dynamical Systems conference 2021* (virtual), Probability Seminar*, University of Pisa, Pisa, Probability Seminar*, University of Paris VII, Paris,
2020	Stochastic Processes Seminar*, University of California, San Diego, Interacting Particles Seminar*, IST Austria,
2019	Probability Seminar*, University of Massachusetts, Amherst, Probability Seminar*, University of Wisconsin, Madison, Chemical Reaction Network Seminar*, University of Wisconsin, Madison, Second Italian Meeting in Probability*, Vietri sul Mare, Workshop on Chemical Reaction Networks, Politecnico di Torino, Society of Mathematical Biology Meeting, Montreal, Canada,
2018	Probability Seminar*, Politecnico di Torino, Interacting Random Systems Seminar*, Weierstrass Institute, Berlin, SIAM workshop in Mathematical Biology*, Minneapolis, MN, IST workshop "Advances in Chemical Reaction Network Theory", Vienna, BIRS workshop Computational Statistics and Molecular Simulation*, Oaxaca, Intenational Conference of Mathematical Physics Contributed Talks, Montreal, Young Researcher Symposium at ICMP, Contributed Talks, Montreal,
2017	Probability Seminar*, Courant Institute, NYU, Probability Seminar*, Duke University, Mathematical Physics Seminar*, McGill University, Probability Seminar, Brown University, SwissMAP meeting*, Grindelwald,
2016	Seminar of the Statistical Biophysics group*, EPFL, Swiss Physical Society Annual Meeting, Theoretical Physics section,
2014	Swiss Physical Society Annual Meeting*, Theoretical Physics section, "ETH talks in mathematical physics", ETHZ.

Public outreach

2016–17	**Head Delegate**: Swiss Study Foundation's delegation to National Model of United Nations, NY.

2023	Max Planck Institute for Mathematics in the Sciences, Leipzig,
2022	Max Planck Institute for Mathematics in the Sciences, Leipzig,
2019	Mathematics Department, University of Massachusetts, Amherst,
	Mathematics Department, University of Wisconsin, Madison,
2018	Courant Institute of Mathematical Sciences, New York University,
2017	Courant Institute of Mathematical Sciences, New York University,
	Mathematics Department, McGill University,
	Mathematics Department, Duke University,
2015	Statisticls department, Stanford University.

List of references

Prof. Jean-Pierre Eckmann
Section de physique
Université de Genève
24 rue du Général-Dufour
1211 Genève, Switzerland
+41 (22) 379 63 60
Jean-Pierre.Eckmann@unige.ch

Prof. Jonathan C. Mattingly
Department of Mathematics
Duke University
120 Science Drive
27701 Durham (NC), USA
jonm@math.duke.edu

Prof. Amir Dembo
Department of Statistics
Stanford University
390 Serra Mall
94305 Stanford (CA), USA
ckirby@stanford.edu

Prof. Jianfeng Lu
Department of Mathematics
Duke University
120 Science Drive
27701 Durham (NC), USA
jianfeng@math.duke.edu

Prof. Sayan Mukherjee
Max Planck Institute for
Mathematics in the Sciences
Inselstrasse 22,
04103 Leipzig, Germany
sayan.mukherjee@mis.mpg.de

Prof. Gian Michele Graf
Depatrment of Physics
ETH Zurich
Wolfgang-Pauli-Str. 27
8093 Zurich, Switzerland
gmgraf@ethz.ch

Service to the profession

Reviewer for the following journals and conferences:
- Journal of Machine Learning Research
- ICML conference
- NeurIPS conference
- ICLR conference
- SIAM Journal of Mathematical Analysis
- SIAM Journal of Applied Mathematics
- Stochastic Processes and their Applications
- SIAM Journal of Applied Dynamical Systems
- Journal of Statistical Physics
- IFAC Journal of Systems and Control

Additional Information

Languages	Italian (native), English, German, French (fluent), Spanish and Chinese (CEFR level: A2),
Interests	Fencing, Triathlon, Traveling,
Citizenship	Swiss, Italian.