CURRICULUM VITÆ

Michail Loulakis

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D.O.B.: 1st January 1973.

EDUCATION

1996–2001	Courant Institute of Mathematical Sciences, New York University. MSc & PhD in Mathematics.
1995–1996	Graduate programme in Mathematics, University of Crete.
1990–1995	School of Electrical Engineering, National Technical University of Athens. Diploma in Electrical Engineering

EMPLOYMENT HISTORY

2017–	Institute of Applied & Computational Maths, Foundation for Research and Technology-Hellas. Affiliated Faculty.
2015–	School of Applied Mathematical & Physical Sciences, TU Athens, Greece. Associate Professor.
Spring 2019	CNRS, Université de Rouen, Chercheur en Probabilités et mécanique statistique, catégorie A.
2011–2015	School of Applied Mathematical & Physical Sciences, TU Athens, Greece. Assistant Professor.
2005–2011	Department of Applied Mathematics, University of Crete, Greece. Assistant Professor.
2002–2005	Department of Pure Mathematics and Mathematical Statistics, University of Cambridge. Marie Curie Fellow (interrupted for 6 months for military service)
2001–2002	Forschungsinstitut für Mathematik, ETH Zentrum, Zürich. Research Fellow.

RESEARCH INTERESTS

Probability Theory, Stochastic Analysis. In particular, Interacting particle systems, Large Deviations, and Stochastic Control.

AWARDS & GRANTS

2021-2022	Uncertainty quantification in wind power forecasting (scientific co-ordinator), *industrial project* funded by Protergia Mitilineos SA.
2020-2023	Scaling stochastic dynamics: from microscopic interactions to macroscopic phenomena (member of the research team), Research programme *HFRI grant for faculty members and researchers, category II* , funded by the HFRI.
2018-2021	Biometric analysis of retinal photoabsorption (scientific co-ordinator for NTUA), Research programme *Competitiveness, Entrepreneurship, Innovation*, funded by the EDRF and national funds.
2012-2015	Analysis Modeling and Simulation of Complex and Stochastic Systems (member of the research team), Research programme *Thales*, funded by the ESF and national funds.
2012-2015	Optimal management of dynamic systems of the economy and the environment (member of the research team), Research programme *Thales*, funded by the ESF and Greek national funds.
2013-2015	Analytical and probabilistic methods in Banach spaces and their operators (member of the research team), Research programme *Excellence*, funded by the ESF and national funds.
2012-2013	Basic research grant (scientific co-ordinator), awarded by TU Athens but not funded.
2012-2013	Stochastic Methods in Finance and Physics (scientific co-ordinator for greek team), Research programme *IKYDA*, funded by the Greek and German academic exchange services.
2010-2013	Heraclitus II scholarship to support a PhD student (scientific co-ordinator), funded by the ESF and national funds.

2008-2009 Basic Research Grant (scientific co-ordinator), funded by the University of Crete.
2005-2007 Marie Curie European Reintegration Grant, funded by the European Commission.
2002-2005 Marie Curie Post-doctoral Fellowship, funded by the European Commission.
1998-2001 Postgraduate Fellowship by Alexander Onassis Foundation.
1996-2001 McCracken Fellowship by New York University.

PUBLICATIONS

a. In Journals

- Quantum advantage in biometric authentication with single photons (with I.K. Kominis) *J Appl Phys* **131** (2022), 084401
- A simple network of nodes moving on the circle (with D. Cheliotis, I. Kontoyannis and S. Toumpis) *Random Struct Algor* **57** (2020), no.2, 317–338
- Quantum trajectories in spin-exchange collisions reveal the nature of spin-noise correlations in multispecies alkali-metal vapors (with K. Mouloudakis and I.K. Kominis), *Phys. Rev. Research* **1** (2019), 033017
- The Deterministic and Stochastic Shallow Lake Problem (with G.T. Kossioris and P.E. Souganidis), in: Friz P., König W., Mukherjee C., Olla S. (eds) *Probability and Analysis in Interacting Physical Systems*, VAR75 2016. Springer Proceedings in Mathematics & Statistics, vol 283 (2019), pp 49-74.
- Metastable Markov Chains: from the convergence of the trace to the convergence of finite-dimensional distributions, (with C. Landim and M. Mourragui), *Electron. J. Probab.* **23** (2018), no. 95, 1-34.
- Quantum Biometrics with Retinal Photon Counting, (with G. Blatsios, I.K. Kominis & C.S. Vrettou), *Phys. Rev. Applied* **8** (2017), 044012.
- Metastability in a Condensing Zero Range Process in the Thermodynamic Limit, (with Inés Armendáriz and S.W. Grosskinsky), *Probab. Th. Rel. Fields* **169** (2017), no. 1-2, 105–175.
- Cross-Layer Design of Wireless Multihop Networks over Stochastic Channels with Time-Varying Statistics (with E. Stai and S. Papavassiliou), *IEEE Trans. Wireless Commun.* **14** (2015), no. 12, 6967–6980
- Spin-noise correlations and spin-noise exchange driven by low-field spin-exchange collisions (with A.T. Dellis and I.K. Kominis), *Phys Rev A*, **90** (3), 032905
- Zero Range Condensation at Criticality, (with Inés Armendáriz & Stefan Grosskinsky), *Stoch. Proc. and Appl.* **123** (2013), no. 9, 3466–3496
- Conditional Distribution of Heavy Tailed Random Variables on Large Deviations of their Sum. (with Inés Armendáriz), *Stoch. Proc. and Appl.* **121** (2011), no. 5, 1138–1147.
- Thermodynamic Limit for the Invariant Measures in Supercritical Zero Range Processes, (with Inés Armendáriz), *Probab. Th. Rel. Fields.* **145** (2009), no. 1-2, 175–188.
- On the Symmetry of the Diffusion Coefficient in Asymmetric Simple Exclusion, *J. Stat. Phys.* **119** (2005), no. 3-4, 853–860.
- Mobility and Einstein Relation for a Tagged Particle in Asymmetric Mean Zero Random Walk with Simple Exclusion, *Ann. Inst. H. Poincaré, Probab. & Statist.* **41** (2005), no. 2, 237–254.
- Einstein Relation for a Tagged Particle in Simple Exclusion Processes, *Comm. Math. Phys.* **229** (2002), no. 2, 347–367.

b. Books

- Large Deviations Theory (2022) (with M.G. Stamatakis), Hellenic Academic Libraries (in preparation)
- Stochastic Processes (2016), Hellenic Academic Libraries available at `http://hdl.handle.net/11419/6003`
- Introduction to Mathematical Finance (2016), Hellenic Academic Libraries available at `http://hdl.handle.net/11419/3481`

c. In conference proceedings

- Analysis of a One-Dimensional Continuous Delay-Tolerant Network Model (with D. Cheliotis, I. Kontoyiannis and S. Toumpis), *IEEE SPAWC 2018*
- Exact Speed and Transmission Cost in a Simple One-Dimensional Wireless Delay-Tolerant Network (with D. Cheliotis, I. Kontoyiannis and S. Toumpis), *IEEE ISIT* 2017, pp 476–480.
- Congestion & Power Control of Wireless Multihop Networks over Stochastic LTF Channels (with E. Stai and S. Papavassiliou), *IEEE WCNC* 2015, pp 1769–1774.
- Thermodynamic Limit for the Invariant Measures of Zero Range Processes at the Critical Density. *Mathematische Forschungsinstitut Oberwolfach Report 50/2010*, pp 61–64.
- Thermodynamic Limit of the Equilibrium Measures for Supercritical Zero Range Processes, *Mathematische Forschungsinstitut Oberwolfach Report 42/2007*, pp 2469–2472.

d. Preprints

- Generalized Young measures and the Hydrodynamic limit of condensing Zero Range Processes (with Marios-Georgios Stamatakis), arXiv math.PR 1910.00493
- Shot Noise in Spin Noise Spectroscopy (with Angeliki Koutsimpela and I.K. Kominis)
- Discrete Gradient Flow Approximations of High Dimensional Evolution Partial Differential Equations via Deep Neural Networks (with E.H. Georgoulis and Asterios Tsiourvas)
- Spin-exchange collisions in dual-species hot alkali vapors spontaneously produce positive inter-species quantum correlations (with K. Mouloudakis, G. Vasilakis, IK Kominis et al)
- Optimal control and the Eyring-Kramer formula for the shallow lake problem (with Angeliki Koutsimpela)
- Properties of the optimally controlled deterministic and stochastic shallow lake (with Angeliki Koutsimpela)

e. Patents

- Quantum biometric identification of ultrahigh security based on the quantum statistics of photodetection by the human retina (with I.K. Kominis), *US Patent* US011275937B21 – 3/15/2022

TALKS IN CONFERENCES

21-25/6/2022	Conference in honor of S.R.S. Varadhan's 80th birthday, Jeju island, S. Korea
13-27/3/2022	Interacting Particle Systems & Hydrodynamic Limits, CRM Montreal
2-6/7/2018	IMS Annual Meeting on Probability and Statistics, Vilnius
10-11/5/2018	Numerical Analysis of PDE, in Honor of Vassilios Dougalis, NKU Athens.
11-17/2/2018	Interplay of Analysis and Probability in Applied Maths, Math. Forschungsinstitut Oberwolfach.
15-19/8/2016	Probability and Analysis in Interacting Physical Systems, in Honor of S.R.S. Varadhan 75th birthday, Weierstrass Inst. Berlin
4-6/7/2016	Condensation Phenomena in Stochastic systems, U. of Bath
4-8/1/2016	Mathematics of Kinetically Constrained Dynamics and Metastability, U. of Warwick
3-9/8/2014	18$^{\text{th}}$Brazilian Probability School, Mambucaba.
28/7-1/8/14	37$^{\text{th}}$Conference in Stochastic Processes and their Applications, Buenos Aires.
22-23/1/2013	Inhomogeneous Random Systems, Institut Henri Poincaré, Paris.
28/9/2012	Optimal Management of Dynamical Systems of the Economy and the Environment. Economic University of Athens.
24-25/5/2012	Rencontres de Probabilités 2012, Université de Rouen.
7-13/11/2010	Large Scale Stochastic Dynamics, Mathematisches Forschungsinstitut Oberwolfach.
3-9/8/2008	12$^{\text{th}}$Brazilian Probability School, Minas Gerais.
15-17/5/2008	12$^{\text{th}}$ Hellenic Conference in Analysis, University of Athens.
26-31/8/2007	Large Scale Stochastic Dynamics, Mathematisches Forschungsinstitut Oberwolfach.
5-11/8/2007	11$^{\text{th}}$ Brazilian Probability School, Maresias.
25-27/6/2007	Mathematical and Computational Methods for Accelerated Molecular and Stochastic Simulations, Foundation for Research and Technology at Heraklion (FORTH).

24-26/4/2006	Coarse-Grained Multiscale Models, University of Warwick.
22-26/8/2005	Large Scale Behavior of Interacting Particle Systems, Alfred Renyi Institute, Budapest.
8/2004	Large Scale Stochastic Dynamics, Mathematisches Forschungsinstitut Oberwolfach.
6-7/6/2002	IX Mathematical Physics Days, Katholieke Universiteit Leuven.
8-12/10/2001	Trimester in Hydrodynamic Limits, Institut Henri Poincaré, Paris.
8-9/8/2001	Analysis Workshop for young researchers, University of Crete.
9-13/7/2001	27^{th} Conference in Stochastic Processes and their Applications, Cambridge, UK.

TALKS IN SEMINARS/COLLOQUIA

26/5/2022	Probability & Financial Mathematics Seminar, University of Leeds, UK
7/5/2021	Applied Analysis & PDE Seminar, NKUA, Athens
12/2/2019	Probability Seminar, University of Cambridge, UK
18/11/2018	Seminaire en Probabilités, Théorie Ergodique et Systémes Dynamiques, Université de Rouen
20/6/2018	Probability Seminar, University of Warwick, UK
18/6/2018	Control Seminar, University of Oxford, UK
9/2/2017	Applied Mathematics Seminar, University of Leicester, UK
2/2/2017	MASS Seminar, University of Sussex, UK
12/5/2016	Groupe de travail Probabilités, Institut Henri Poincaré, Paris
25-29/4/2016	Minicourse on Metastability, Université de Rouen
4/12/2013	Probability Colloquium, TU Berlin
17/1/2013	Statistical Mechanics Seminar, University of Warwick
30/7/2012	Seminário de Probabilidade e Combinatória, IMPA, Rio de Janeiro.
2-6/7/2012	9^{th} Summer School in Stochastic Finance, Economic University of Athens, Greece.
2/5/2012	Analysis Seminar, University of Crete.
17-24/8/2011	Minicourse on Large Deviations, Universidad san Andrés, Buenos Aires.
5/11/2010	Analysis Seminar, University of Athens.
16/10/2010	Analysis Seminar, University of Crete.
21/1/2010	Statistical Mechanics Seminar, University of Warwick.
20/1/2010	Probability Forum, University of Warwick.
28/5/2009	Statistics & Operational Research Seminar, University of Athens.
14-24/7/2008	5^{th} Summer School in Mathematics, University of Crete.
5/3/2008	Analysis & PDE Seminar, University of Crete.
15/1/2008	Division of Mathematics Seminar, Technical University of Athens.
11/7/2007	Seminario de departamento de Matemática y Ciencias, Universidad san Andrés, Buenos Aires.
18-29/7/2005	4^{th} Summer School in Mathematics, University of Crete.
13/1/2005	Institute of Mathematics, Maria Curie Sklodowska University, Lublin.
16/11/2004	Sminaire du Ceremade Analyse-Probabilits, Université de Paris IX Dauphine.
12/3/2002	Probability Seminar, Statslab, University of Cambridge.
24/10/2001	Seminar on Stochastic Processes, ETH Zentrum, Zürich.

PhD STUDENTS SUPERVISED

M.G. Stamatakis	Interacting Particle models for condensation [2014].
Angeliki Koutsibela	Stochastic environmental models: modelling, analysis, management [2019–]

ORGANISING EXPERIENCE

8–12 July 2019	Summer School in Lévy Processes, TU Athens
6 April 2019	7th Athens Probability Colloquium, University of Athens, TU Athens & Economic University of Athens.
23–27 July 2018	Stochastic methods in Finance & Physics III, TU Athens & Institute of Applied and Computational Maths, FORTH, Heraklion Crete.
25-30 June 2018	Probability & Statistics Session in First Congress of Greek Mathematicians, Hellenic Mathematical Society, Athens.

17 March 2018	6th Athens Probability Colloquium, University of Athens, TU Athens & Economic University of Athens.
19-23 June 2017	Summer School in Nonlinear PDEs, TU Athens
20 May 2017	5th Athens Probability Colloquium, University of Athens, TU Athens & Economic University of Athens.
28 May 2016	4th Athens Probability Colloquium, University of Athens, TU Athens & Economic University of Athens.
20-24 July 2015	Stochastic methods in Finance & Physics II, DAAD & Centre for Quantum Complexity and Nanotechnology, Heraklion Crete.
9 May 2015	3rd Athens Probability Colloquium, University of Athens, TU Athens & Economic University of Athens.
22 December 2014	Christos Papakyriakopoulos Fest, TU Athens.
28-31 July 2014	Contributed Session *Phase transitions in Interacting Particle Systems* in 37^{th} Stochastic Processes and their Applications, Buenos Aires.
31 May 2014	2nd Athens Probability Colloquium, University of Athens, TU Athens & Economic University of Athens.
15-19 July 2013	Stochastic methods in Finance & Physics, Archimedes Centre for Modeling Analysis and Computations (ACMAC), Crete.
1 December 2012	Athens Probability Colloquium, University of Athens, TU Athens & Economic University of Athens.
March 2012-to date	Division of Mathematics Seminar, Technical University of Athens.
9-10 May 2008	Career Opportunities in Finance Open House, Foundation for Research and Technology at Heraklion (FORTH).
11-16 June 2006	Large Scale Stochastic Dynamics and Interactions with Kinetic Theory, Foundation for Research and Technology at Heraklion (FORTH).

SERVICE TO THE COMMUNITY

Associate Editor for the Bulletin of the Hellenic Mathematical Society (2016 – to date)

Proposal evaluator for EPSRC-UK, HFRI-GR

Referee for the Journal of the American Mathematical Society, Journal of Functional Analysis, Annals of Probability, Annals of Applied Probability, Probability Theory and Related Fields, Stochastic Processes and their Applications, Electronic Journal of Probability, Annales de l' Institut Henri Poincaré B, IEEE Communications Letters, Journal of Mathematical Analysis and Applications, Journal of Statistical Physics, Statistics & Probability Letters, European Journal of Control, European Journal of Operational Research, Brazilian Journal of Probability & Statistics

Reviewer for Zentralblatt, Math Reviews.

Coordinator of the national Examination Problems Bank (2020 – to date)

Coordinator of the Stochastics group for the 2021 reform of the national school Mathematics curriculum