Vlad Dumitru Mărgărint

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Appointments

2023-	Tenure-Track Assistant Professor at the University of North Carolina at Charlotte.
2022-**2023**	Visiting Assistant Professor via Burnett Meyer Fellowship at the University of Colorado Boulder
2019-**2022**	Postdoctoral Fellow NYU Shanghai.

Research visits

2025	Probability seminar and research visit at KTH Stockholm. Sweden
2025	Seed Seminar invitation at IHES, Paris, France
2025	Probability Seminar invitation at Duke University, USA
	Invitation for a themed research program in Cambridge, UK
2024	Invited research at Alan Turing Institute in London and the University of Warwick
2024	Invited research visit in Paris
2024	Invitation at the Random Conformal Geometry workshop, South Korea.
2023	Invitation at the 'The 24th Midrasha Mathematicae: Random Schrödinger Operators and Random Matrices', Israel Institute for Advanced Studies
2023	Invitation and talk at the 10th Congress of Romanian Mathematicians.
2023	Invitation at the Seminar on Stochastic Processes Annual Conference of the IMS (March 2023), University of Arizona, USA
2023	Invited research visit at the University of Utah, USA.
2023	Invited research visit at the IAS Princeton, USA.
2023	Invited 'SLE' workshop talk and research visit at the University of University of Pennsylvania.
2022	Invited research visit at the University of Chicago, USA.
2022	Invited research visit at the University of Tennessee, USA.
2022	Research visit at Kyoto University, Japan.
2022	Invited research visit at ISI, Delhi, India
2022	Invited research visit at NUS, Singapore.
2020	Invited research visit at the University of Luxembourg.
2020	Invited research visit at Max Planck Institute for Mathematics in the Sciences, Leipzig.

Education

10/2015-08/2019	**University of Oxford, Oxford, United Kingdom** DPhil (PhD) in Mathematics under the supervision of Prof. Dmitry Belyaev and Prof. Terry Lyons in *Pathwise and Probabilistic Analysis in the context of Schramm-Loewner Evolutions* under Terry Lyons's Grant: ERC No.291244 Esig, University of Oxford.
2018 09/2013 - 09/2015	**ETH Zürich, Zürich, Switzerland** Graduated Master of Science in Mathematics supervised by Prof. Dr. Antti Knowles.
10/2010 - 06/2013	**University of Bucharest, Faculty of Mathematics, Bucharest, Romania** Graduated Bachelor's in Mathematics supervised by Prof. Dr. Victor Vuletescu. Thesis: "Differential Geometry and General Relativity".

Work on Brownian motion on the Continuum Random Tree: Aldous' Conjecture -34 years problem

17. "On the cover time of Brownian motion on the Brownian continuum random tree-" *with G. Andriopoulos, David A. Crodyon, and Laurent Menard.* https://arxiv.org/pdf/2410.03922 ' **To appear in Annals of Probability.**

Work in Probabilistic Number Theory-as part of the extended research program of developing tools and studying Random Riemann Zeta functions, their properties and zeros

16. "On the analytic extension of Random Riemann Zeta Functions for some probabilistic models of the primes-" *with S. Molchanov* https://arxiv.org/pdf/2410.03044

Work in the mathematical analysis of Statistical Mechanics models-as part of the extensive research program to create tools for studying challenging long-range, general spins models and their scaling limits

15. " Local Central Limit Theorem for unbounded long-range potentials-" *with E. Endo, R. Fernandez, T. Xuan,* https://www.arxiv.org/abs/2408.04542

14. [2025] " Scaling Limits of Disorder Relevant Non-Binary Spin Systems-" *with L.Li and R.Sun, appeared in Stochastics and Partial Differential Equations: Analysis and Computations* https://arxiv.org/pdf/2410.00579

13. [2022] "Local Central Limit Theorem for Two-Body Potentials at Sufficiently High Temperatures" *with Eric O. Endo-*appeared in Journal of Statistical Physics https://link.springer.com/article/10.1007/s10955-022-02994-4

Work at the interface between Schramm-Loewner Evolutions and Random Matrix Theory as part of the wide research program aimed at studying one field with fundamental techniques from another such as bringing techniques corresponding to the nicer analytical object that is the resolvent, as an alternative to the analysis of the singular SLE drivers, .etc.

12. [2025] "Rate of convergence in Multiple SLE using Random Matrix Theory" *with A. Campbell, and K. Luh- appeared in Random Matrix Theory and Applications* https://www.worldscientific.com/doi/10.1142/S201032632450028X **We show how one can apply modern tools in Random Matrix Theory in the different field of SLE.**

Work on deterministic Loewner Theory, Schramm-Loewner Evolutions (and its connections with Rough Path Theory)-as part of the extensive research program to develop a pathiwse approach to SLE theory, and study approximations and stability in parameters of objects in SLE theory described by singular equations as analogies with the classical stochastic dynamics theory

11.[2025] **"Splitting algorithm and normed convergence for drawing the random Loewner curves"** with J. Chen, to appear in Proceedings of the Royal Society A-
https://arxiv.org/pdf/2507.02776

10.[2024] **"On Loewner chains driven by semimartingales and complex Bessel-type SDEs"** *with A. Shekhar and Y. Yuan* https://tinyurl.com/3p9tdx37 **appeared in the 'Annals of Applied Probability'**

9.[2024] **"Convergence to closed-form distribution for the backward SLE at some random times and the phase transition at** $\kappa = 8$**. "** *with Terry Lyons and Sina Nejad*
https://www.sciencedirect.com/science/article/abs/pii/S0167715223001827
appeared in 'Statistics and Probability Letters'

8.[2023] **"Deterministic Loewner Theory: Drivers, hitting times, and weldings in Loewner's equation"** *with T. Mesikepp appeared in Journal of the London Mathematical Society* https://londmathsoc.onlinelibrary.wiley.com/doi/abs/10.1112/jlms.12843 **My first joint result in deterministic Loewner theory that uses different methods from the Probability tools that I used so far.**

7.[2023] **" A Gaussian free field approach to the natural parametrisation of SLE4-"** *with L. Schoug-appeared in Electronic Communications in Probability* https://tinyurl.com/3sn4td5a

6.[2023] **"Law of the SLE tip"** *with O. Butkovski and Y. Yuan* - appeared in Electronic Journal of Probability
https://tinyurl.com/tcv9kudhf

5.[2022[**"Perturbations of Simultaneously Growing Multiple Schramm-Loewner Evolutions"** *with J. Chen* - appeared in Stochastic processes and their Applications
https://www.sciencedirect.com/science/article/abs/pii/S0304414922001508f

4.[2022] **"An asymptotic radius of convergence for the Loewner equation and simulation of SLE traces via splitting"** *with Terry Lyons and James Foster* - appeared in Journal of Statistical Physics
https://link.springer.com/article/10.1007/s10955-022-02979-3

3.[2021] **"Continuity of Zero-Hitting Times of Bessel Processes and Welding Homeomorphisms of SLE$_\kappa$"** *with Atul Shekhar and Dmitry Belyaev* - appeared in ALEA- Latin American Journal of Probability and Mathematical Statistics
https://alea.impa.br/articles/v18/18-04.pdf

2.[2021] **"Continuity in** κ **in SLE theory using a constructive method and Rough Path Theory"** *with Terry Lyons and Dmitry Belyaev* - appeared in Annales de l'Institut Henri Poincaré
https://encr.pw/Qocxu

Work on Random Matrix Theory

1.[2018] **"Convergence of Quantum Diffusion in a Random Band Matrix Model"** - appeared in the Journal of Statistical Physics
https://link.springer.com/article/10.1007/s10955-018-2065-2

Research projects with undergraduate students

2.[2025] **"Schramm-Loewner Evolutions and Neural Networks"** *with Neilesh Shrotri, Columbia University- available upon request, submitted to a journal.*

1.[2025] **"Fluctuations of the multiple SLE driven by Dyson Brownian Motion"** *with Phillip Kim, Geoergia Tech, available upon request, submitted to a journal.*

Academic Awards and Honours

2024   **Recipient of a Travel Award sponsored by the NSF and IMS after a national competition for new Assistant Professors, to attend the New Researchers Conference in Portland Oregon, (NRC 2024) .**

2024	**Recipient of Travel award to attend a research program at the University of Cambridge.**
2023	**Recipient of Travel Grant to attend the Seminar on Stochastic Processes Annual Conference of the IMS, University of Arizona, USA**
2023	**Recipient of Travel Grant to attend the 'Random Conformal Geometry' workshop, Jeju Island, South Korea**
2022	**Recipient of NYU Travel Grant.**
2021	**Recipient of Chebyshev Grant** offered by the **International Mathematical Union** covering full local expenses and airfare to attend the **International Congress of Mathematicians 2022**.
08/2020	**Invited talk** (one of the four) at the Rough Path Section at the "10th World Congress in Probability and Statistics", Seoul, Korea, 2020 (postponed 2021).
2019	**St. John's College Oxford Travel Scholarship.**
2018	**James Fund Travel Scholarship.**
2017-2018	**Mathematical Institute Department Award, £7000, University of Oxford.**
2016	**St. John's College Travel Scholarship.**
2016	**3rd Prize in the Posters Presentations at the UK meeting in Probability, Lancaster.**
2015-2018	**EPSRC 1657722 Studentship, University of Oxford.**
2014-2015	**ETH Zürich Master's scholarship for academic achievement**.
2013	**Finalist (top 5) at Romanian Student of the year 2013** offered by the Romanian Academy.
2012-2013	**Young Researcher Performance Scholarship** awarded by the University of Bucharest for the highest undergraduate achievement and research potential.
2012	**Dean's Summer Student Scholarship** offered by the Physics Department of UCL. Supervisors: Prof. Filipe Abdalla, Prof. Jason McEwen(UCL). I developed algorithms in Matlab for implementing Shapelets mathematical formalism and integrated them in the Compressive Sensing solver.
2010	**Bronze Medal** -International Olympiad of Astronomy and Astrophysics, China.
2009	**Silver Medal** -International Olympiad of Astronomy and Astrophysics, Iran.
2009-2010	Member of the extended team of Romania for the International Physics Olympiad (IPhO) in 2009 and 2010.

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Presentations

04/2026	**Invited Talk** at the Probability Seminar at University of Maryland.
10/2025	**Invited Talk** Discrete/Stochastic Analysis Seminar at NC State University.
07/2025	**Invited Talk** at a Contributed Session of Stochastic Processes and their Applications in 2025 in Poland.
06/2025	**Invited Short Talk** at the Workshop on stochastic interacting particle systems and random matrices workshop, Renyi Institute, Budapest
04/2025	**Invited Talk** at the Stochastic Equations and particle systems workshop, La Sapienza University, Rome
03/2025	**Invited Talk** at the Probability Seminar at Aalto University, Finland
03/2025	**Invited Talk** at the Probability Seminar at KTH Stokholm, Sweden
03/2025	**Invited Talk** at Seed Seminar, IHES, Paris, France.
09/2024	**Invited Talk** at Duke University Probability Seminar.
03/2023	**Invited Talk** at the University of Utah Probability Seminar.
11/2022	**Invited Talk** at the University of Chicago Probability Seminar.
11/2022	**Invited Talk** at the University of Tennessee Probability Seminar.
06/2022	**Invited Talk** at the 'Kansai Probability Seminar' Kyoto University.
06/2022	**Invited Talk** at the ISI Delhi Probability Seminar.
05/2022	**Invited Talk** at the National University of Singapore Probability Seminar.
05/2022	**Invited Mini-course** at the University of Colorado Boulder in ' Schramm-Loewner Evolutions'.
03/2022	**Invited Talk** at the Institute of Mathematics of the Romanian Academy Potential Theory Seminar.
11/2021	**Invited Plenary Talk** at the 'Young Researchers Workshop', organizer: Romanian Probability Society.
03/2021	**Invited talk** at the Probability Seminar, East-China Normal University.

12/2020	**Invited talk** at "Probability: Models and Applications", organized by NUS (Singapore) and ECNU, Shanghai.
08/2020	**Online Talk** at the One-World Bernoulli-IMS Conference.
07/2020	**Online Talk** at the 13th Berlin-Oxford Meeting.
07/2020	**Invited Talk** at the 15th Franco-Romanian Colloquium in Mathematics.
03/2020	**Invited Talk** at the NYU Shanghai-Kyoto University Probability Workshop (Japan).
01/2020	**Invited Talk** at the IMAR (Institute of Mathematics of the Romanian Academy).
01/2020	**Invited Talk** at the Analysis Seminar -Max Planck Institute -Leipzig.
01/2020	**Invited Talk** at the Probability Seminar -Freie Universitaet Berlin.
12/2019	**Invited Talk** at the Probability Seminar - Beijing Normal University.
09/2019	**Invited Talk** at the Probability Seminar - NYU Shanghai.
08/2019	**Invited mini-course** at TU Berlin from the work of my PhD Thesis.
07/2019	**Invited Talk** at the "The 20th INFORMS Applied Probability Society Conference"-Brisbane Australia.
06/2019	**Invited Talk** at the Workshop of Young Romanian Researchers in Mathematics-University of Bucharest.
01/2019	**Invited Talk** at the Probability Seminar-Bielefeld University.
07/2018	**Invited Talk** at the Summer School "Geometry and scaling of random structures", Buenos Aires, Argentina.
06/2018	**Invited Talk** at the 9th Oxford-Berlin meeting.
06/2018	**Contributed Talk** at "Stochastic Processes and Applications" (SPA), Gothenburg, Sweden.
06/2018	**Invited Talk** at the conference "Conformal Random Geometry and Related Fields", KIAS, Seoul, South Korea.
04/2018	**Invited Talk** at the "Pathwise SLE Meeting", TU Berlin.
10/2017	**Invited Talk** at the 8th Oxford-Berlin Meeting, Oxford, United Kingdom.
10/2017	**Invited Talk** at the Seminar of Stochastic Analysis, University of Oxford.
04/2017	**Invited Talk** at the workshop "Afternoon meeting in Rough Paths Theory", University of Reading, United Kingdom.
08/2016	**Invited Talk** at the 5th Oxford-Berlin Meeting, Berlin, Germany.
07/2016	**Contributed Talk** at the World Congress of Probability, Toronto, Canada.
06/2016	**Contributed Talk** at the Research Students Conference, Dublin, Ireland.
06/2016	**Poster Presentation** at the 3rd BCN Summer School on Stochastic Analysis, Barcelona, Spain.
04/2016	**Poster Presentation** at the UK Easter Probability Meeting, Lancaster University, UK.

Teaching experience

UNCC	Introduction to Probability and Statistics (Fall 2023 and Fall 2024), and **'Introduction to Probability Theory' Graduate course, part of the Qualification Exams (Spring 2024).**
CU Boulder	**Lecturer** for 'Linear Algebra for Non-Mathematics Majors' (Fall 2022), and 'Introduction to Probability and Statistics' (Fall 2022).
NYU Shanghai	**Course Leader/Lecturer** for Calculus summer course (2022) Mathematics for Economics II (2021) for NYU Courant.
	The course was in mixed-mode in the beginning and covered three main topics all with applications in Economics: Multivariable functions, Linear Algebra, and Calculus. The design included weekly quizzes as well as homework and 3 midterm exams (and two make-up exams).
	Instructor for Calculus (mixed-mode) (Fall 2020) (First year, ~ 300 students), Linear Algebra (online) (Spring 2020) (First year, ~ 30 students), Honors Analysis I (online) (Spring 2020) (Second year, ~ 30 students), Calculus (Fall 2019) (First year, ~ 320 students).
	Attended the Course Design Studio for online teaching offered by Prof. Jace Hargis (2020).
	Attended course at the Center for Teaching and Learning offered by Prof. Jace Hargis: An introduction to College Teaching (2019).
	Nominated for "Making a Difference Award" at NYU.
University of Oxford	**Revision classes** for Stochastic Differential Equations (Spring 2017), Applied Probability (Spring 2017).

ETH Zürich

Tutor for: Distribution Theory and Fourier Analysis (Winter 2018) (Master, $\sim$ 20 students) Statistics and Data Analysis (Spring 2017, Spring 2018)(First year, $\sim$ 10 students), Statistical Mechanics (Winter 2017)(Master, $\sim$ 20 students), Continuous Martingales and Stochastic Calculus (Spring 2017)(3rd year, $\sim$ 30 students), Complex Analysis: Conformal maps and Geometry (Winter 2017) (Master, 4 students), Applied Probability (Winter 2017), Stochastic differential equations (Winter 2017) (Master, $\sim$ 20 students), Numerical Analysis (Spring 2016) (First year, 6 students).

Teaching Assistant for Master courses: Complex Analysis: Conformal maps and Geometry (Spring 2017)(Master, $\sim$ 20 students), Stochastic Analysis and PDE's (Spring 2016)(Master, $\sim$ 20 students), Approximations of functions(Winter 2015)(Master, $\sim$ 20 students).
Nominated for the University prize "Student-Led Teaching Award", University of Oxford.
Teaching Assistant for Methods of Mathematical Physics II (Spring 2015)(Third-year, $\sim$ 10 students), Analysis I (Fall 2014)(First year, $\sim$ 10 students), Analysis II (Spring 2014)(First year, $\sim$ 20 students).

Mentoring Experience

2 REU summer projects students in 2024: One from Georgia Tech and one from Columbia University.
6 REU summer projects students in 2023, all from CU Boulder.
Andrew Campbell (now at ISTA Austria).
Jionji Guo (now at the University of Geneva)
Yiyang Shao (Senior Thesis supervision at NYU Shanghai)
Jiaming Chen (NYU student that couldn't return to the USA, now accepted at ETH Zurich).

Professional Memberships

Member of the Bernoulli Society, Institute of Mathematical Statistics, and the American Mathematical Society.

Editorial Service

Invited referee for **Journal of Statistical Physics**, **Annales de l'Institut Henri Poincare**, **Mathematical Reviews/MathSciNet** by the **American Mathematical Society**. Referee for **Probability Theory and Related Fields (PTRF)**, **Electronic Communications in Probability (ECP), Annales de L'Instititute Henri Poincaré (AIHP (B))**, **Foundations of Data Science**, **Stochastic Analysis and Applications**, and **American Mathematical Society** (book).

Service and Organization

2024	Member of the Colloquium Organization Committee at the University of North Carolina at Charlotte.
2023-**2024**	Member of the Qualification Exam for Probability Theory I 8120 and of the Number theory Qualification Exam in 2024 at the University of North Carolina at Charlotte Chair of the committee in Spring 2024.
2022	Member of the Diversity Committee at CU Boulder, USA (volunteer at organizing ' Math for All in Boulder' conference - invited talk at this conference as well- , Co-organizer of the 'Unconscious bias in the classroom workshop'; worked with graders and assistants from under-represented groups such as LGBTQ+ community members, etc. As I am myself coming from one of the poorest areas in Europe, it is my mission also to help others in similar situations.)
2021	Panel member invitation to Oxford Mathematrix.
2020	Member of a jury for an international technology competition organized by OMV and Vodafone.
2020	Organizer of the Course-Design Studio for Online Teaching, Romania.
2019, 2020	One of the organizers of the NYU Shanghai Probability Seminar.
2019	Attended Committee meetings at NYU Shanghai.
2016-**2018**	**Academic Assistant for Prof. Jan Obłój at St. John's College**:

	Organization committee for the one-week Conference **Robust Techniques in Quantitative Finance, Oxford, September 2018**; organizing a database in "Papers", marking collections in Probability and Statistics, giving tutorials in Statistics, writing various codes for simulations.
12/2017	**Member of the organizing committee of the 8th Oxford-Berlin meeting**
	The workshop took place in Oxford and gathered researchers working on Rough Paths Theory and Regularity Structures.
11/2017	**Member of the selection committee for undergraduate admissions at St. John's College, Oxford.**
04/2017	**Member of the committee for a Master's Thesis.**
	Examiner of Patrick Kidger's Master Thesis "Polynomial Approximations of Holomorphic Functions" at the University of Oxford.
12/2016	**Member of the organizing committee of the 6th Oxford-Berlin meeting.**
03/2016	**Preparation for the International Olympiad of Astronomy and Astrophysics.**
	Training the team for the theoretical exam of the International Olympiad of Astronomy and Astrophysics 2016 by solving various Physics and Celestial Mechanics problems.

Working Seminars presentations

05/2018	**Talk at the Reading Group on "Random Planar Waves":** Local statistics of lattice points on the sphere by Jean Bourgain, Peter Sarnak and Zeév Rudnick.
03/2018	**Talk at the Reading Group "Theory of Regularity Structures":** Wick products and renormalization in Regularity Structures.
11/2017	**Talk at the Reading Group "Theory of Regularity Structures":** Schauder estimates in PDEs and Regularity Structures.
04/2017	**Talk at the Oxford Junior Probability Seminar:** SLE with Rough Paths Theory.
06/2017	**Talk at the Oxford Junior Probability Seminar:** Quantum Diffusion and Random Matrix Theory.
04/2016	**Talk at the Reading Group "Machine Learning and Rough Paths":** Kernel methods in Machine Learning.

Outreach and Public Engagement

2020	**Talk at the Romanian Science Festival**: "Applied Mathematics in problems of dynamics: motion of planets and spread of viruses".
2017	**Talk at the The Oxford Invariants** : "An evening flight over two modern Mathematical Theories: Random Fractal Planar Curves and Rough Path Theory."
2017	**Talk at the Oxford Research Forum (organized by the Oxford Romanian Society)**: Probabilistic and deterministic modelling of "reality" (Markov Chains, Brownian motion and the study of the Brownian Motion Paths in Rough Paths Theory).
2017	**Mentor** for Romanian Students studying Mathematics on United Kingdom Universities via LSRS mentoring scheme.
2018	**Mini-Course at the one-week Oxford for Romania Summer School** in "Fractals".
2017	**Mini-Course at the one-week Oxford for Romania Summer School** in "Examples and Counterexamples in Analysis", based on the book of Bernard R. Gelbaum, John M. H. Olmsted "Counterexamples in Analysis".
2016	**Mini-Course at the one-week Oxford for Romania Summer School** in "Basic ideas in Differential Geometry".
2015	**Talk at the Oxford Research Forum (organized by the Oxford Romanian Society)**: Mathematical Theorems on Randomness (Survey talk: open questions in Random Matrix Theory).
2014	**National TV-Series: "Road to Success"** interviewed in Season 1, Episode 1.
2012	**Second prize and public favorite in the Romanian National Finals-Famelab 2012**- presenting "The Universe between Mathematics and Magic- the Gauss Egregium Theorem".

Skills and Interests

Languages:	*Romanian*: mother tongue.

	English: fluent (TOEFL iBT Score 102/120).
	French: intermediate knowledge.
	Spanish: Basic knowledge.
	Chinese: Basic Knowledge (Attending Beginners Classes offered by NYU Shanghai).
IT and Data Skills:	*Operating Systems*: Linux, Windows.
	Programming: Matlab (advanced level), Python, R (medium level).
	Others: LATEX, Wolfram Mathematica, Papers, Inkscape, Microsoft Office.
Other Interests:	Arts, Football, Tennis. Research oriented discussions and debate events.

References

Research:	**1. Prof. Terry Lyons, University of Oxford**: terry.lyons@maths.ox.ac.uk;
	2. Prof. Peter Friz, TU Berlin: friz@math.tu-berlin.de;
	3. Prof. Rongfeng Sun, NUS Singapore: matsr@nus.edu.sg
	4. Prof. David Croydon, RIMS, Kyoto, Japan: croydon@kurims.kyoto-u.ac.jp
	5. Prof. Roberto Fernandez, NYU Shanghai: rf87@nyu.edu;
	6. Prof. Dmitry Belyaev, University of Oxford: belyaev@maths.ox.ac.uk;
	7. Prof. Laurent Ménard, NYU Shanghai/Paris-Nanterre: lm1346@nyu.edu;
	8. Prof. Antti Knowles, University of Geneva: Antti.knowles@unige.ch;
	9. Prof. Filipe Abdalla, University College London: fba@star.ucl.ac.uk;
Service and teaching:	**10. Prof. Jan Obłój, University of Oxford**: obloj@maths.ox.ac.uk.
Teaching:	**11. Prof. Jace Hargis, Kean University**: jace.hargis@gmail.com
If any extra information needed:	**12. Prof. Jason Miller**: jpmiller@statslab.cam.ac.uk