Vlad Dumitru Mărgărint

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Current position and research visits

2019-2021 Postdoctoral Fellow at NYU Shanghai, mentored by Prof. Gérard Ben Arous.
2020 Research visit at Max Planck Institute for Mathematics in the Sciences, Leipzig.

Education

10/2015-08/2019 **University of Oxford, Oxford, United Kingdom**
DPhil 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 Appointed as Research Assistant of Prof. Dmitry Belyaev under the EPSRC Grant EP/M002896/1.

09/2013 - 09/2015 **ETH Zürich, Zürich, Switzerland**
Graduated Master of Science in Mathematics supervised by Prof. Dr. Antti Knowles.
Thesis: "Proof of the Weak Local Law for Wigner Matrices using Resolvent Expansions".

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".

Publications and preprints

9. "Quasi-Sure Stochastic Analysis through Aggregation and SLE theory"
https://arxiv.org/pdf/2005.03152.pdf

8. "Continuity of Zero-Hitting Times of Bessel Processes and Welding Homeomorphisms of SLE_κ" *with Atul Shekhar and Dmitry Belyaev-* to appear in ALEA
https://arxiv.org/pdf/2004.10262.pdf

7. "Continuity in κ in SLE theory using a constructive method and Rough Path Theory" *with Terry Lyons and Dmitry Belyaev-*to appear in AIHP (B)
https://arxiv.org/pdf/2002.08308.pdf

6. "An asymptotic radius of convergence for the Loewner equation and simulation of SLE traces via splitting" *with Terry Lyons and James Foster*
https://arxiv.org/pdf/1912.06424.pdf

5. "Complex Solutions to Bessel SDEs and SLEs" *with Atul Shekhar*
https://arxiv.org/pdf/2001.02735.pdf

4. "A new approach to SLE phase transition" *with Dmitry Beliaev and Terry Lyons*
https://arxiv.org/pdf/2001.10987.pdf
Updated PDF at https://vladmargarint.com/resources/pt.pdf

3. "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://arxiv.org/pdf/1910.05519.pdf

2. "Proof of the Weak Local Law for Wigner Matrices using Resolvent Expansions" to appear in 'Theory of Probability and its Applications' by SIAM
https://arxiv.org/pdf/1808.07092.pdf

1. "Convergence of Quantum Diffusion in a Random Band Matrix Model" Journal of Statistical Physics, 2018
https://arxiv.org/pdf/1808.07106.pdf

Work in preparation

1. "On Aldous' Cover Time Conjecture" *with George Andriopoulos*
https://vladmargarint.com/covertime.pdf
2. "Random Matrices and Multiple SLEs"
https://vladmargarint.com/ergodicityDBMandSLE.pdf
3. "Weak symmetries/Transversal Calculus"
https://vladmargarint.com/WSTC.pdf

Academic Awards and Honours

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.

Presentations

08/2020 **Invited talk** at the Rough Path Section at the "10th World Congress in Probability and Statistics", Seoul, Korea, 2020 (postponed 2021).
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

NYU Shanghai	**Mathematical Institute**: Calculus (mixed-mode) (Fall 2020), Linear Algebra (online) (Spring 2020), Honors Analysis I (online) (Spring 2020), Calculus (Fall 2019). 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	**Mathematical Institute**: **Revision classes** for Stochastic Differential Equations (Spring 2017), Applied Probability (Spring 2017); **Tutor** for: Distribution Theory and Fourier Analysis (Winter 2018), Statistics and Data Analysis (Spring 2017, Spring 2018), Statistical Mechanics (Winter 2017), Continuous Martingales and Stochastic Calculus (Spring 2017), Complex Analysis: Conformal maps and Geometry (Winter 2017), Applied Probability (Winter 2017), Stochastic differential equations (Winter 2017), Numerical Analysis (Spring 2016); **Teaching Assistant** for Master courses: Complex Analysis: Conformal maps and Geometry (Spring 2017), Stochastic Analysis and PDE's (Spring 2016), Approximations of functions(Winter 2015); Nominated for the University prize "Student-Led Teaching Award", University of Oxford.
ETH Zürich	**Mathematics Department**: **Teaching Assistant** for Methods of Mathematical Physics II (Spring 2015), Analysis I (Fall 2014), Analysis II (Spring 2014).

Editorial Service

Referee for **Probability Theory and Related Fields (PTRF)** and **Electronic Communications in Probability (ECP).**

Service and Organization

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 Zev 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

Academic:

1. **Prof. Dmitry Belyaev, University of Oxford**: belayev@maths.ox.ac.uk;
2. **Prof. Terry Lyons, University of Oxford**: terry.lyons@maths.ox.ac.uk;
3. **Prof. Peter Friz, TU Berlin**: friz@math.tu-berlin.de;
4. **Prof. Antti Knowles, University of Geneva**: Antti.knowles@unige.ch;
5. **Prof. Filipe Abdalla, University College London**: fba@star.ucl.ac.uk;

Service and teaching:

6. **Prof. Jan Obłój, University of Oxford**: obloj@maths.ox.ac.uk.

Teaching:

7. **Prof. Jace Hargis, Director CTL, NYU Shanghai**: jace.hargis@gmail.com