Nimit Rana

Curriculum Vitae

Academic Work Experience

Oct 2023 – present **Lecturer**, *Department of Mathematics, University of York, UK*

Oct 2022 – Sept 2023 **Research Associate**, *Imperial College London, UK*
Funded by the Royal Society

Mentor Prof. Martin Hairer, EPFL, Switzerland and Imperial College London, UK

Dec 2019 – Sept 2022 **Research Associate**, *Universität Bielefeld, Germany*
Associated to Forschergruppe FOR 2402 Rough paths, stochastic partial differential equations and related topics. My research is funded by the German Science Foundation (DFG)

Mentor Prof. Martina Hofmanová, Universität Bielefeld, Germany

Industrial Work Experience

2010–2012 **Analyst**, *Nomura Services India Pvt. Ltd*, Mumbai, India
Part of the development team to setup an analytics platform for various financial dervatives.

Education

2015–2019 **Doctor of Philosophy**, *University of York, UK*

Supervisor Prof. Zdzisław Brzeźniak, University of York, UK

Thesis Title A few problems on stochastic geometric wave equations

2012–2015 **Master of Science in Mathematics**, *Indian Institute of Science, Education and Research Thiruvananthapuram (IISER-TVM)*, India

Supervisor Prof. Anindya Goswami, IISER Pune, India

Thesis Title Portfolio Optimization in a Jump Diffusion Model with Regimes

2006–2010 **Bachelor of Technology in Electrical and Electronics Enginering**, *National Institute of Technology Calicut (NITC)*, India

Project Title Design and development of a Feature extraction system using wavelet

Publications, Preprints and Proceedings

2024 A. Goswami and N. Rana, *A market resilient data-driven approach to option pricing*, preprint 24 pages, arXiv:2409.08205.

Z. Brzeźniak, J. Jendrej and N. Rana, *Wave maps in dimension 1+1 with an external forcing*, preprint 47 pages, arXiv:2404.09195

B. Gess, S. Kassing and N. Rana, *Stochastic Modified Flows for Riemannian Stochastic Gradient Descent*, SIAM J. Control Optim. 62 (2024), no. 6, 3288–3314

M. Gubinelli, M. Hofmanová and N. Rana, *Decay of correlations in stochastic quantization: the exponential Euclidean field in two dimensions*, Stoch. Partial Differ. Equ. Anal. Comput. (2024)

A. Gumber, N. Rana, J. Toft and R. Üster, *Pseudo-differential calculi and entropy estimates with Orlicz modulation spaces*, J. Funct. Anal. 286 (2024), no. 3, Paper No. 110225, 47 pp

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	F. Bechtold, F. A. Harang and N.Rana, *Non-linear Young equations in the plane and pathwise regularization by noise for the stochastic wave equation*, Stoch. Partial Differ. Equ. Anal. Comput. 12 (2024), no. 2, 857–897
2022	Z. Brzeźniak and N. Rana, *Local solution to an energy critical 2-d stochastic wave equation with exponential non-linearity in a bounded domain*, J. Differential Equations 340 (2022), 386-462
	A. Goswami, N. Rana and T. K. Siu, *Regime switching optimal growth model with risk sensitive preferences*, J. Math. Econom. 101 (2022), Paper No. 102702, 18 pp
	Z. Brzeźniak, B. Goldys, M. Ondreját and N. Rana, *Large deviations for* $(1+1)$*-dimensional stochastic geometric wave equation*, J. Differential Equations 325 (2022), 1-69
	J. Cardona, M. Hofmanová, T. Nilssen and N. Rana, *Random dynamical system generated by the 3D Navier-Stokes equation with rough transport noise*, Electron. J. Probab. 27 (2022), Paper No. 88, 27 pp
2020	Z. Brzeźniak and N. Rana, *Low regularity solutions to the stochastic geometric wave equation driven by a fractional Brownian sheet*, C. R. Math. Acad. Sci. Paris 358 (2020), no. 6, 633-639
2018	M. K. Das, A. Goswami and N. Rana, *Risk sensitive portfolio optimization in a jump diffusion model with regimes*, SIAM J. Control Optim. 56 (2018), no. 2, 1550-1576
2014	P.K. Prasanna, M. Thenmozhi and N. Rana, *Determinants of non-performing advances in Indian banking system*, Banks and Bank Systems, Volume 9, Issue 2, 2014
2011	M.P. Rajan and N. Rana, *A Robust Portfolio Optimization in Indian Stock Market*, 2011 World Congress on Information and Communication Technologies, Mumbai, 2011, pp. 645-650

Teaching/Supervising experience

Oct 2024 –	Currently serving as a personal tutor for four students in the online MSc in Mathematical Finance at the University of York, UK.
Sept - Dec 2024	Lectures on Mathematical Methods of Finance at University of York, UK
Sept 2024 –Apr 2025	Supervised two BSc in Mathematics final year projects at the University of York, UK
Sept 2024 –	Currently acting as the Careers & Employability Coordinator for the Department of Mathematics at the University of York, UK
June - Sept 2024	Supervised five MSc dissertations in Mathematical Finance at the University of York, UK
Oct - Dec 2023	Lectures on Mathematical Methods of Finance at the University of York, UK
Apr - May 2022	Lectures on Martingale Measure Approach to SPDEs (to PhDs and post-docs)
Oct 2018	Lectures on Stochastic Processes (PG level)
Sept - Oct 2017	Lectures on Stochastic Wave Equation (PG level)

Grants / Fellowships and awards

2024	Recipient of LMS grant (with ref. 52335) under Scheme 5 “Collaborations with Developing Countries”
2023	Recipient of LMS grant (with ref. 42234) under Scheme 4 “Research in Pairs”
2021	Anand Ramachandran Memorial Prize for the best PhD thesis, Department of Mathematics, University of York, UK.

Oct - Nov 2019 Visiting Scientist Fellowship by the Universität Bielefeld, Germany for a research visit to the Fakultät für Mathematik.

July - Aug 2019 Visiting Scientist Fellowship by the Australian Research Council Projects DP160101755 and DP190103451 to visit the University of Sydney.

2019 WW Smith Fund, Maths and Physics Departments, University of York, UK.

2019 Best Graduate Teaching Assistant, Department of Mathematics, University of York, UK.

2015–2019 Departmental Teaching Studentship, Department of Mathematics, University of York, UK.

2015–2018 Overseas Research Scholarship, University of York, UK.

2015 Awardee of National Board of Higher Mathematics (NBHM) PhD scholarship, India.

2015 Certificate of Distinction, IISER-TVM, India.

2012–2015 Integrated PhD Fellowship, IISER-TVM, India.

Selected seminars, schools, workshops/conferences and periods of visit

Speaker

Jul 2025 **Applications of stochastic processes in FX options**, The Clearing Corporation of India Ltd, India

Jun 2025 **Wave maps in dimension 1+1 with an external forcing**, One-day workshop on SPDEs, University of Pavia, Italy

Mar 2025 **A market resilient data-driven approach to option pricing**, Departmental Math & Computing Lecture Series, MIT Manipal, India

Dec 2024 **Stochastic Modified Flows for Riemannian Stochastic Gradient Descent**, Mathematics Research Seminar, IISER Pune, India

Aug 2024 **Singular quasilinear wave equations with spatial noise in two dimensions**, VII Congresso Latino-Americano e do Caribe de Matemática CLAM 2024, João Pessoa, Brazil

June 2024 **Singular 2D quasilinear wave equations**, Workshop on New developments and challenges in Stochastic Partial Differential Equations, Bernoulli Center, EPFL, Switzerland

June 2023 **Decay of correlation for elliptic stochastic quantization associated with exponential interaction**, Stochastic Analysis Seminar, University of York, UK

Sept 2022 **Wave maps with external forcing**, *The SPDEvent*, Universität Bielefeld, Germany

Feb 2022 **Stochastic geometric wave equation with rough data driven by a fractional Brownian sheet**, *Conference on Mathematics of Wave Phenomena*, Collaborative Research Center 1173, Karlsruhe Institute of Technology, Germany

Dec 2021 **Random dynamical system and stochastic Navier-Stokes equation**, *GDR TRAG 2021 - Young researchers meeting*, Institut Henri Poincaré, Paris, France

Feb 2021 **Random dynamical system generated by the 3D Navier-Stokes equation with rough transport noise**, *14th Annual ERC Berlin-Oxford Young Researchers Meeting on Applied Stochastic Analysis*

June 2020 **1D geometric wave equation perturbed by fractional Brownian sheet**, *13th Annual ERC Berlin-Oxford Young Researchers Meeting on Applied Stochastic Analysis*

May 2020 **Energy critical 2D stochastic wave equation with exponential non-linearity**, *Rough paths, SPDE and related topics Seminar*, Technische Universität Berlin, Germany

Nov 2019 **Large deviations for stochastic geometric wave equation**, *Randomness, PDEs and Nonlinear Fluctuations*, Trimester Program at the Hausdorff Research Institute for Mathematics, Bonn, Germany

Aug 2019 **Stochastic wave equation in energy space**, *Partial Differential Equations and Analysis Seminar*, The Australian National University, Canberra, Australia

Aug 2019 **Large deviations for geometric wave equation with external forcing**, *Workshop on Stochastic Partial Differential Equations*, The University of Sydney, Australia

Sept - Oct 2017 **A short course on stochastic wave equation**, *Mathematical Finance and Stochastic Analysis Seminar*, University of York, UK

May 2017 **A study of nonlinear stochastic wave equation in fractional Sobolev spaces**, *Graduate Research Symposium*, University of York, UK

Feb 2016 **Invariance of Marcus canonical SDE on a sphere in Hilbert space**, *Institute for Analysis, KIT*, Karlsruhe, Germany

Dec 2011 **Portfolio Analysis in Indian Stock Market on Markowitz Model Approach**, *2011 World Congress on Information and Communication Technologies*, Mumbai, India

Nov 2009 **Portfolio Analysis in Indian Stock Market on Markowitz Model Approach**, *International Conference On Information Technology And Business Intelligence*, IMT Nagpur, India

Attendee

Aug 2023 **Summer School on Stochastic Analysis**, *EPFL, Switzerland*

July 2023 **Summer School: Deterministic and random features of fluids**, *EPFL, Switzerland*

May 2023 **Summer School on PDEs and Randomness**, *MPI, Leipzig, Germany*

May 2021 **Beyond the Boundaries**, *University of Leeds, UK*

May 2021 **Stochastic Analysis Afternoon 2021**, *University of Helsinki, Finland*

Feb 2020 **Young researchers between geometry and stochastic analysis**, *Universitetet i Bergen, Norway*

May 2019 **Parabolic Evolution Equations, Harmonic Analysis, and Spectral Theory**, *Bad Herrenalb, Germany*

Sept 2018 **Introductory course on the theory of Rough Paths**, *Lectures by Dr Giovanni Zanco*, School of Mathematics, University of Leeds, UK

June 2018 **Workshop on Analysis, Probability and Applications**, *Mathematical Institute*, University of Oxford, UK

May 2018 **Simons semester "PDEs/SPDEs and functional inequalities"**, *Stefan Banach International Mathematical Center in Warsaw, Poland*

July 2017 **LMS-EPSRC Durham Symposium Stochastic Analysis**, *Durham University, UK*

Sept 2016 **Summer School on Wave Phenomena: Analysis and Numerics**, *Institute for Analysis, KIT*, Karlsruhe, Germany

Aug 2016 **CIME school on "Singular random dynamics"**, *Lectures by M. Hairer on regularity structures , M. Gubinelli on energy solutions, P. Souganidis on Hamilton-Jacobi equations with rough signals and N. Tzvetkov on nonlinear dispersive equations with random initial data*, Cetraro, Italy

Aug 2016 **East Midlands Stochastic Analysis Seminar**, *University of Warwick, UK*

Jan 2016 **Classic and Stochastic Geometric Mechanics, 17^{th} UK-Japan Winter School**, *Imperial College London, UK*

Dec 2015 **Indo-UK workshop on SPDEs and applications**, *IISc Bangalore, India*

Dec 2012 **Winter school on Stochastic Analysis and Control of Fluid Flow**, *IISER-TVM, India*

Programming Knowledge

Intermediate Python, Matlab.

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