

# NATHANAËL BERESTYCKI

## Academic Positions

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| Chair of Stochastics, Universität Wien                     | since 2018 |
| Professor of Probability, University of Cambridge          | 2015-2018  |
| Reader in Probability, University of Cambridge             | 2012-2015  |
| Lecturer, University of Cambridge                          | 2007-2012  |
| Fellow of King's college, Cambridge                        | 2009-2019  |
| Postdoctoral fellow, University of British Columbia & PIMS | 2005-2007  |

## Research Interests

Probability theory, geometry and analysis. More precisely: Brownian motion, random geometry, Liouville quantum gravity, Gaussian free field, SLE, dimer model, imaginary geometry, branching and coalescing systems and relation to partial differential equations, random walks on groups, mixing times.

## Visiting positions

MSRI, Berkeley CA (Spring 2022); Indiana University (July 2008); Microsoft Research (various occasions); Weizmann Institute (various occasions).

## Education

Joint PhD (Cornell 2005 and ENS Paris 2006). Advisors: R. Durrett and J.F. Le Gall.

## Invited Lecture Courses

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| MSRI, Analysis and geometry of random spaces<br>Title: <i>Introduction to Gaussian free field</i> (2 hrs)  | 2022           |
| U.K. Probability “Easter Conference”, Manchester<br>Title: <i>Dimers and Imaginary Geometry</i> (4 hrs)  | 2020 postponed |
| Gaussian Free Fields and Related Topics, Kyoto (RIMS), Japan.<br>Title: <i>Dimers and imaginary geometry</i> (3 hrs)   | Sept 2018      |
| Lectures in Probability and Statistics XII, Kolkata, India.<br>Title of lectures: <i>Introduction to the GFF and Liouville quantum gravity</i> (8 hrs)               | December 2017  |
| Les Diablerets, Switzerland<br>Title of lectures: <i>Universality for the dimer model</i> (3 hrs)  | February 2017  |
| Chicago summer school in probability.<br>Title of lectures: <i>Introduction to the GFF and Liouville quantum gravity</i> (12 hrs)                                    | July 2016      |
| Darmstadt spring school in probability.<br>Title of lectures: <i>Introduction to the GFF and Liouville quantum gravity</i> (7.5 hrs)                                 | April 2016     |
| Marseille, Workshop on random walks.<br>Title of lectures: <i>Random walks on random graphs</i> (4 hrs)  | October 2015   |
| Clay Institute, Oxford / LMS school “modern developments in probability”,<br>Title of lectures: <i>Introduction to the GFF and Liouville quantum gravity</i> (6 hrs) | July 2015      |

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| Probability and Representation Theory, Edinburgh<br>Title of lectures: <i>Mixing times and representation theory</i> (3 hrs) | February 2014 |
| Ecole Polytechnique (Paris)<br>Title of lectures: <i>Mixing times</i> . (6 hrs)  | October 2011  |
| Young European Probabilists, Eindhoven,<br>Title of lectures: <i>Recent progress in coalescent theory</i> .                  | March 2009    |
| IMPA, Rio de Janeiro,<br>Title of lectures: <i>Recent progress in coalescent theory</i> .                                    | January 2009  |

## Selected Invited Lectures

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| Ascona (Switzerland), Random Matrices and Random Landscapes,                                 | July 2022     |
| Jeju (South Korea), Analysis and Geometry of Random Spaces                                   | postponed     |
| Tel-Aviv University, Horowitz Analysis Seminar (online)                                      | April 2020    |
| One World Probability Seminar (online),  | March 2020    |
| Banff, <i>Dimers, Ising model and their interactions</i> ,                                   | Nov 2019      |
| CIRM, Marseille. Self-interacting Random Walks, Polymers and Folding                         | Sept 2019     |
| Münster, workshop on probability, SPDEs and statistical mechanics                            | August 2019   |
| Porquerolles, Probability and quantum field theory. CFT, SLE, constructive aspects           | June 2019     |
| Les Diablerets, Switzerland. Workshop on Statistical Mechanics                               | Feb 2019      |
| Banff, <i>Stochastic Analysis and Applications</i> , in honour of K. Burdzy's 60th birthday, | Sept. 2017    |
| SPA, Moscow, invited session Lattice models and scaling limits.                              | July 2017     |
| Oberwolfach <i>Stochastic Analysis: Geometry of Random Processes</i>                         | May 2017      |
| SLE, GFF and LQG in NYC. Columbia University, New York                                       | March 2017    |
| Oberwolfach, Heat Kernels, Stochastic Processes and Functional Inequalities.                 | Dec. 2016     |
| British Mathematical Colloquium. <b>Morning speaker.</b>                                     | April 2016    |
| Clay Institute: Advances in Probability  | Sept. 2014    |
| Banff, <i>Front Propagation and Particle Systems</i> ,                                       | August 2014   |
| Spin Glasses and Related Topics, Banff   | July 2014     |
| School and Workshop on Random Interacting Systems, Bath,                                     | June 2014     |
| Mathematical biology, particle systems and reaction-diffusion, Toulouse                      | March 2014    |
| Random Walks on Groups, IHP, Paris,  | January 2014  |
| German Probability and Statistics Days, Mainz  | March 2012    |
| Stochastic Processes and Applications, Oaxaca (Mexico). <b>Plenary speaker.</b>              | June 2011     |
| Branching processes and coalescent processes, Beijing,                                       | April 2011    |
| Random Structure and Dynamics, Oxford  | April 2011    |
| Northeast Probability Seminar, New York,   | November 2010 |
| Discrete probability and geometry: the mathematics of Oded Schramm, Jerusalem,               | Dec. 2009     |

## PhD students

Richard Pymar (graduated 2011), Lee Zhuo Zhao (graduated 2013), Bati Sengul (graduated 2014), Ed Mottram (graduated 2014), Henry Jackson (graduated 2016), Ellen Powell (graduated 2017), Mo-Dick Wong (graduated 2019), Antoine Jego (graduated 2021), Lucas Teyssier (current), Diederik van Engelenburg (current, jointly with Marcin Lis), Mingchang Liu (currently, jointly with Hao Wu).

## Postdoctoral Associates

Ariel Yadin (Herschel Smith Fellow, 2009–2010), Arnab Sen (2010–2012), Laure Dumaz (2013–2015), Gourab Ray (2015–2017), Benoit Laslier (2015–2017), Wei Qian (2017–2019), Jonathan Hermon (2017–2019), Marcin Lis (2017–2018), William Da Silva (since 2021)

## Honours

- 1st recipient of Bernoulli Prize, Bernoulli society 2012
- Plenary speaker at Stochastic Processes and Application 2011

## Grants

- FWF grant P33083 on “Scaling limits in random conformal geometry”, €390k, 2020-2024
- EPSRC fellowship, “Geometry and conformal invariance of random systems” (EP/L018896/1), £1.2M. 2014-2019
- EPSRC Programme grant, “New frontiers in Random Geometry” (EP/I03372X/1). Co-PI with G. Grimmett and J. Norris, value £1.65M. 2011-2017
- EPSRC First grant EP/G055068/1, value £290,000 2009-2013

## Organisation of Conferences

- Workshop on Random Geometry, Newton institute  
Co-organisers: J.-F. Le Gall, S. Sheffield. July 2018
- RaGe (random geometry) in Cambridge,  
Co-organisers: G. Grimmett, J. Norris. Cambridge, June 2017.
- Interacting particle systems with applications in biology, ecology, and statistical physics. Southeaster probability colloquium, special edition in honor of Rick Durrett’s 65th birthday.  
Co-organisers: J. Mattingly, J. Nolen, L. Popovic. Duke (NC), May 2017
- American Institute of Mathematics (AIM), workshop on *Mixing times of Markov chains*,  
Co-organisers: E. Lubetzky, R. Oliveira, and Y. Peres. San Jose (CA), June 2016.
- Workshop on the dimer model.  
Co-organisers: B. Laslier and G. Ray. Cambridge, May 2016
- Principal organiser, semester at the Newton Institute on *Random Geometry*.  
Co-organisers: I. Benjamini, J.-F. Le Gall, S. Sheffield. INI (Cambridge), Spring 2015
- Geometry and Analysis of Random Processes (Easter UK Probability meeting)  
Co-organisers: G. Grimmett and J. Norris. Cambridge. April 2013
- Extremes in branching Brownian motion and random walks,  
with L. Addario-Berry and N. Gantert Oberwolfach, September 2013
- The geometry of discrete random structures,  
with C. Goldschmidt (funded by EPSRC) Warwick, June 2012

## Other Services

- Member of the Editorial boards of:  
*International Research Mathematical Notices (IMRN)*, since 2020.  
*Annals of Probability*, since 2018.  
*Annals of Applied Probability*, 2016-2021.

*Electronic Journal of Probability* and *Electronic Communications in Probability*, 2015–2020.  
*Springer Briefs in Mathematical Physics*, since 2014.  
*Mathematical Proceedings of the Cambridge Philosophical Society*, since 2014.  
*Theoretical Population Biology*, 2009-2012 (resigned as part of Elsevier boycott).

External member on the scientific board of the *Heilbronn Institute for Mathematical Sciences*, U.K. (2016-2018)

Scientific advisory board for the Centre of Excellence in Randomness and Structures (FiRST), University of Helsinki, Finland (2022-2029).

I have served as a PhD examiner and been a jury member for “habilitations” in Cambridge, Oxford, Bath, ENS Lyon, Paris Dauphine, ETH Zurich, Paris Diderot, KTH Stockholm, ENS Paris.

Grant proposal reviews for: NSA (United states), ISF (Israel), ANR (France), NWO (Netherlands), NSERC (Canada), Royal Society (UK), EPSRC (UK), National Science Foundation (NSF), European Research Council (ERC), Swiss NSF (SNSF), WWTF (Austria).

Numerous evaluation letters for promotion committees worldwide. External member on various hiring committees (Oxford, Leipzig...)