

# Laura Monk

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## Research experience

- 2024 – ... **Lecturer**, *University of Bristol (UK)*
- 2022 – 23 **Research associate**, *University of Bristol (UK)*, PI: Jens Marklof  
Researcher Co-Investigator on EPSRC Standard grant EP/W007010/1
- 2021 – 22 **Postdoctoral fellow**, *Max Planck Institute for Mathematics, Bonn (DE)*,  
mentored by Ursula Hamenstädt

## Education

- 2018 – 21 **PhD in Mathematics** under the supervision of Nalini Anantharaman,  
*Université de Strasbourg (FR)*  
Geometry and spectrum of typical hyperbolic surfaces
- 2014 – 18 **École Normale Supérieure** in Mathematics with minor in Physics, *Paris*
- 2017 – 18 **Master's degree in Mathematics** (with honours), *Paris-Sud University*
- 2017 **Agrégation of Mathematics** (7th place)  
Secondary-school and University teaching degree
- 2014 – 15 **Bachelor's degree in Mathematics** (with honours), *Paris-Sud University*
- 2014 – 15 **Bachelor's degree in Physics** (with honours), *Paris-Sud University*
- 2012 – 14 **Preparatory class**, *Lycée Privé Sainte Geneviève, Versailles (FR)*

## Publications

- (4) Anantharaman N., Monk L., *A high-genus asymptotic expansion of Weil-Petersson volume polynomials*, *Journal of Mathematical Physics*, 63, 043502 (2022).
- (3) Monk L., Thomas J., *The tangle-free hypothesis on random hyperbolic surfaces*, *International Mathematics Research Notices*, Volume 2022, Issue 22, November 2022, Pages 18154–18185.
- (2) Monk L., *Benjamini-Schramm convergence and spectrum of random hyperbolic surfaces of high genus*, *Analysis & PDE*, Vol. 15 (2022), No. 3, 727–752.
- (1) Fouvry J.B., Pichon C., Chavanis P., Monk L., *Resonant thickening of self-gravitating discs: imposed or self-induced orbital diffusion in the tightly wound limit*, *Monthly Notices of the Royal Astronomical Society*, Volume 471, Issue 3, November 2017, Pages 2642–2673.

## Preprints

- 2024 Anantharaman N., Monk L., *A Moebius inversion formula to discard tangled hyperbolic surfaces*, arXiv:2401.01601.
- 2023 Monk L., Stan R., *Spectral convergence of the Dirac operator on typical hyperbolic surfaces of high genus*, arXiv:2307.01074.
- 2023 Anantharaman N., Monk L., *Friedman-Ramanujan functions in random hyperbolic geometry and application to spectral gaps*, arXiv:2304.02678.

## Awards and grants

- 2024 Maryam Mirzakhani New Frontiers Prize.
- 2022 – 25 Researcher Co-Investigator on EPSRC Standard Grant EP/W007010/1.
- 2022 Best PhD in Mathematics prize from the University of Strasbourg.
- 2021 Prize L’Oréal-UNESCO Young Talents France for Women in Science.
- 2021 Postdoctoral fellowship at the Max Planck Institute for Mathematics.
- 2019 Best poster in Mathematics prize from the Doctoral School.
- 2018 – 21 PhD grant from the ENS (Paris, FR).
- 2014 – 18 Full scholarship at the ENS (Paris, FR).

## Invited talks at international conferences

- Dec 2022 Brunel–Bielefeld Workshop on Random Matrix Theory and Applications, *London (UK)*.
- Sept 2022 Shape Optimisation and Geometric Spectral Theory, *Edinburgh (UK)*.
- July 2022 ANR workshop “Quantum Chaos, Randomness and Spectral Problems in Mathematical Physics”, *Paris (FR)*.
- July 2022 Journées Nancéennes de Géométrie, *Nancy (FR)*.
- June 2022 Young women in Geometric Analysis, *Bonn (DE)*.
- May 2022 Laplacians on random hyperbolic surfaces and on random graphs, *Northwestern (US)*.
- March 2022 Mathematics & Statistics Colloquium, *Dalhousie University (CA)*.
- Feb 2022 14th Meeting of the GdR Quantum Dynamics, *Toulouse (FR)*.
- Feb 2022 Spectra and Dynamics on (Locally) Symmetric Spaces, *Paderborn (DE)*.
- Nov 2021 ANR “Aléatoire, Dynamique et Spectre” meeting, *Nantes (FR)*.
- Sept 2021 Hyperbolic dynamical systems and resonances, *Porquerolles (FR)*.
- Dec 2020 Jeunes géomètres dynamiques, *GdR Platon, Rennes (FR)*.
- Oct 2020 Billiards and Surfaces à la Teichmüller and Riemann Online.
- Nov 2019 8th Strasbourg / Zurich Meeting: Frontiers in Analysis and Probability, *Zurich (CH)*.
- May 2019 Spectral Theory and pRObability in Mathematical physics, *Strasbourg (FR)*.
- Apr 2019 Dynamics of geodesic flows and applications to PDEs, *Palaiseau (FR)*.

## Seminars

- 2023 Analysis, *Bristol (UK)*. Mathematical Physics, *Sussex (UK)*. Topology and Dynamics, *Birmingham (UK)*. Spectral Geometry in the Clouds (*online*). Geometry and Topology, *Bristol (UK)*.
- 2022 London Analysis seminar, *London (UK)*. Spectra/Moduli seminar, *Durham (UK)*. Differential Geometry and Topology, *Cambridge (UK)*. Analysis and Geometry, *Bristol (UK)*. Reading seminar, *Paris Nord (FR)*. Topology and Dynamics, *Orsay (FR)*.
- 2021 Ergodic Theory and Dynamical Systems, *Bristol (UK)*. Probability and Statistics, *Marseille (FR)*. Geometry and Topology, *Jussieu (FR)*. Algebra, Geometry and Physics, *Bonn (DE)*. Young researchers in spectral geometry II, *Spectral geometry in the clouds (online)*. Number theory, *Tel-Aviv (IL)*. Probability and Mathematical Statistics, *Milan-Pavia (IT)*. GdR Platon, *online (FR)*. Geometry and Topology, *Toulouse (FR)*. Dynamical systems and ergodic theory, *Zurich (CH)*.
- 2020 Analysis, *Cardiff (UK)*. Geometry, *Leeds (UK)*. Dynamical systems, *Bremen-Oldenburg (DE)*. Oberseminar Differentialgeometrie, *Bonn (DE)*. Probabilities, *Orsay (FR)*. Geometrical Analysis by Frédéric Naud, *online (FR)*.
- 2019 Spectral theory and Geometry, *Grenoble (FR)*.
- 2018 Analysis, *Strasbourg (FR)*.

## Teaching

### Mini-courses

- March 2023 GEMetric Spectral Theory Online NETWORK minicourse, *CRM (Montréal)*.
- Oct 2022 Mini-course at the summer school “Random walks and related random topics”, *University of Göttingen*.
- May 2022 Advance courses “Spectrum of the Laplacian and Geometry”, *University Cergy-Pontoise*.

- 2024 – ... **Lecturer**, *University of Bristol*
- Jan–Feb 21 **Substitute Lecturer**, *University of Strasbourg*, 2nd year analysis
- 2018 – 21 **Teaching assistant**, *University of Strasbourg*  
2nd and 3rd year exercise sessions, preparation of the agrégation, math club for high-school students, 1st and 2nd year oral exams.
- 2018 **Higher-education teaching degree (“agrégation”)**  
Competition granting a life-long position as a secondary-school or higher-education teacher, ranked 7th out of 315 admitted (1545 candidates).
- 2014 – 18 **Oral examiner in preparatory schools**, 1st and 2nd year

## Organisation of seminars or reading groups

- 2022 – 23 Analysis Reading Group in Bristol, with Antoine Métras and Dan Speed.
- 2022 – 23 Ergodic Theory and Dynamical Systems seminar in Bristol, with Thomas Jordan and Henna Koivusalo.
- 2021 – ... “Spectral Geometry in the Clouds” with Alexandre Girouard and Jean Lagacé.
- 2019 Reading group on Mirzakhani’s work on random hyperbolic surfaces in Strasbourg, with Yohann Bouilly and Federica Fanoni.

## Outreach activities

- 2018 and 19 **Organisation of the RJM, University of Strasbourg**  
Three-day meeting for high school girls to conduct mathematical group activities, meet female researchers and engineers and speak about gender issues.
  - 2017 and 21 **Jury for the TFJM<sup>2</sup>**  
Conference-like mathematical competition for high-school students.
- Outreach talks**
- 2022 Talk for prospective students in context of the program “Access to Bristol”.
  - 2017 Talk for undergraduates in Lycée Privé Sainte-Geneviève.