

# CHRISTOPHER E. H. LUTSKO

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## BIOGRAPHICAL

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Born: April 1994

Pronouns: He/Him

Citizen: USA/UK

Spoken Languages: English, French (proficient), Spanish (proficient), German (beginner).

## CAREER

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**University of Zurich**

2023-2025

Postdoctoral researcher (Sponsor: Alex Gorodnik)

**Rutgers University**

2020-2023

Hill Assistant Professor (Mentor: Alex Kontorovich)

## EDUCATION

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**University of Bristol**

2016-2020

PhD in Mathematics

Advisor: Jens Marklof

Nominated for doctoral dissertation prize for outstanding excellence

**University of Texas at Austin**

2012-2016

B.S Mathematics

Dean's Scholars Honors Program

William's Scholar Honored Graduate

## PUBLICATIONS

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### Preprints:

14. *Hyperbolic lattice point counting in unbounded rank* with V. Blomer, arXiv:2309.00522 (2023) [Submitted].
13. *Mean square bounds on Eisenstein series* with D. Kelmer and A. Kontorovich, arXiv:2305.14162 (2023) [Submitted].
12. *An abstract spectral approach to horospherical equidistribution*, arXiv:2211.01900 (2022) [Submitted].
11. *m-Point Correlations of the Fractional Parts of  $\alpha n^\theta$* , with N. Technau, arXiv:2112.11524 (2021) [Submitted].

### Papers:

10. *Full poissonian local statistics of slowly growing sequences*, with N. Technau, arXiv:2206.07809 [Under revision **Compositio Mathematica**] (2022).
9. *Effective counting in sphere packings*, with A. Kontorovich, arXiv:2205.13004 [Under revision: **Journal of the Association for Mathematical Research**] (2022).

8. *Sarnak's spectral gap question*, with D. Kelmer, and A. Kontorovich, arXiv:2210.13969 [Accepted for publication: **Journal d'Analyse Mathématique**] (2022).
7. *Pair correlation of the fractional parts of  $\alpha n^\theta$* , with A. Sourmelidis, N. Technau, arXiv:2106.09800 [Accepted for publication: **Journal of the European Mathematical Society (JEMS)**] (2021).
6. *Long-range correlations of sequences modulo 1*, **Journal of Number Theory**, **234**, 333-348 (2022).
5. *Farey sequences for thin groups* **International Mathematics Research Notices (IMRN)**, **15**, 11642-11689 (2022).
4. *Invariance principle for the random wind-tree process*, with B. Tóth, **Annales Henri Poincaré**, **22**(10), 3357-3389 (2021).
3. *Invariance principle for the random Lorentz gas – beyond the Boltzmann-Grad limit*, with B. Tóth, **Communications in Mathematical Physics (CMP)**, **379**, 589-632, (2020).
2. *Directions in orbits of geometrically finite hyperbolic subgroups* **Mathematical Proceedings of the Cambridge Phil. Soc.** **171**(2), 277-316 (2021)
1. *A microscopic approach to nonlinear Reaction-Diffusion: the case of morphogen gradient formation* with J.P. Boon, J.F. Lutsko, **Physical Review E** **85**:021126 (2016)

#### PhD Thesis:

Statistical Properties of Dynamical Systems: From Statistical Mechanics to Hyperbolic Geometry, 2020 (Bristol University). [Nominated for doctoral dissertation prize]

#### Conference Proceedings:

1. *Invariance principle for random Lorentz gas in the Boltzmann-Grad Limit*, Oberwolfach Report 10/2019 p. 33-35 (2019)
2. *Invariance principle for random Lorentz gas — Beyond the Boltzmann-Grad Limit*, Oberwolfach Report 42/2019 p. 12-15 (2019)

## TEACHING

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#### Instructor:

Rutgers: Math 152 Calculus II (Math/Physics)	Spring 2023
Rutgers: Math 152 Calculus II (Math/Physics)	Spring 2023
Rutgers: Math 356 Theory of Numbers	Fall 2022
Rutgers: Math 437 History of Mathematics	Spring 2022
Rutgers: Math 152 Calculus II (Math/Physics)	Spring 2022
Rutgers: Math 356 Theory of Numbers	Fall 2021
Rutgers: Math 356 Theory of Numbers	Spring 2021
Rutgers: Math 152 Calculus II (Math/Physics)	Spring 2021
Rutgers: Math 152 Calculus II (Math/Physics)	Fall 2020

#### Teaching Assistant:

Zürich: Lie Groups	Fall 2023
Bristol: Probability II	Fall 2018
Bristol: Measure Theory and Integration	Fall 2018
Bristol: Analysis & Group Theory - 2 groups	Spring 2018
Bristol: Analysis & Proofs - 2 groups	Fall 2017
Bristol: Calculus & Calculus & Mechanics - 2 groups	Spring 2017
Bristol: Calculus & Computational Mathematics - 2 groups	Fall 2016

Texas: Intro to Math	Spring 2016
Texas: Intro to Math	Fall 2015
Texas: Intro to Physics	Summer 2013

## UNDERGRADUATE MENTORSHIP

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Ozan Acikgoz	Spring 2021
Saketh Sitaram	Spring 2023

## ORGANIZATIONAL DUTIES

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Organizer: Linfoot Number Theory Seminar (Bristol)	Fall 2019 - Spring 2020
Organizer: Rutgers Number Theory Seminar	Fall 2021 - Spring 2023

## ACADEMIC INVITATIONS

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1 week - Budapest University of Technology (BME)	2017
2 weeks - University of Bonn	2023

## SEMINAR TALKS

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University of Bristol	2017
Budapest University of Technology	2017
University of Bristol	2017
University of Warwick	2018
University of Bristol	2018
University of Bristol	2018
Univ. Libre de Bruxelles	2018
University of Bristol	2018
Rutgers University	2019
University of Texas at Austin	2019
University of Houston	2019
University of Exeter	2019
Manchester University	2019
University of Bristol	2019
University of Loughborough	2020
University of Oklahoma	2020
Yeshiva University	2020
Rutgers University	2021
Tata Institute of Fundamental Research	2021
New England Dynamics and Number Theory Seminar (recording: <a href="https://www.youtube.com/watch?v=EODTepggUuU">https://www.youtube.com/watch?v=EODTepggUuU</a> )	2021
Hong Kong University	2022
University of Illinois Urbana-Champaign	2022
Stony Brook <b>Colloquium</b> (recording: <a href="https://www.youtube.com/watch?v=SOHhKdno2jA">https://www.youtube.com/watch?v=SOHhKdno2jA</a> )	2022
Rutgers University	2022
New England Dynamics and Number Theory Seminar (recording: <a href="https://nednt.wescreates.wesleyan.edu/fall-2022-schedule/">https://nednt.wescreates.wesleyan.edu/fall-2022-schedule/</a> )	2022
University of Maryland	2022
Philadelphia Area Number Theory Seminar (Bryn Mawr)	2023
Rutgers University	2023
University of Bonn	2023

Paderborn University	2023
University of Graz ( <i>Upcoming</i> )	2023
University of Zurich( <i>Upcoming</i> )	2023

## CONFERENCE TALKS

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MINGLE post-graduate event - University of Bristol	2017
Dynamics Days Europe (Billiards Minisymposium) - University of Loughborough	2018
Probability and NonLocal PDEs - University of Swansea	2018
Mini-Workshop: Lorentz Gas Dynamics: particle systems and scaling limits - Mathematisches Forschungsinstitut Oberwolfach	2019
Large Scale Stochastic Dynamics - Mathematisches Forschungsinstitut Oberwolfach	2019
MINGLE post-graduate event - University of Bristol	2019

## OUTREACH

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Volunteer Chemistry Tutor – Garza high school (Austin Texas)	2015
Help with Bristol maths day	2018
Participant in “Skype a Scientist”	2021
Speaker at Chicago public schools teen mentoring program STEM event	2021
Contributor to EMS magazine problems section	2022
Help with Museum of mathematics’ polyplane project	2023

## REFEREEING/REVIEWING

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AMS Mathematical Reviews/MathSciNet [4 papers]  
 Annales de l’Institut Henri Poincaré  
 Chaos, Solitons and Fractals  
 Ergodic Theory and Dynamical Systems  
 International Mathematics Research Notices [2 papers]  
 Journal of the European Mathematical Society  
 Journal of Number Theory  
 Mathematical Proceedings of the Cambridge Philosophical Society  
 Research in Number Theory  
 Stochastic Processes and their Applications