

# Petru Constantinescu

## Research Interests

Analytic Number Theory, Automorphic Forms and their Spectral Theory, Additive Combinatorics

## Employment

2021–present **Postdoctoral Fellow**, *Max Planck Institute for Mathematics, Bonn*, mentored by Valentin Blomer.

## Education

2017–2021 **PhD Mathematics**, *University College London*, supervised by Yiannis Petridis.

Thesis: *Distribution results for automorphic forms, their periods and masses*

2016–2017 **MASt in Mathematics (Part III)**, *University of Cambridge*.

Distinction (85%)

2013–2016 **BSc Mathematics**, *Imperial College London*.

First Degree Honours, Ranked 3rd in my year (91.4 %)

## Publications and Preprints

2021 *Dissipation of Correlations of Automorphic Forms*, [arXiv:2112.01427](https://arxiv.org/abs/2112.01427)

2021 *Residual equidistribution of modular symbols and cohomology classes for quotients of hyperbolic  $n$ -space*, with A.C. Nordentoft, accepted to **Trans. Amer. Math. Soc.** [arXiv:2010.12403](https://arxiv.org/abs/2010.12403)

2020 *Distribution of modular symbols in  $\mathbb{H}^3$* , accepted to **IMRN**, [DOI:10.1093/imrn/rnaa241](https://doi.org/10.1093/imrn/rnaa241)  
[arXiv:2005.07629](https://arxiv.org/abs/2005.07629)

## Scholarships and Awards

2017–2021 **EPSRC PhD Studentship**, *London School of Geometry and Number Theory*.

2020 **Davenport Prize in Pure Mathematics**, *University College London*.

2017 **Santander Master's Prize**, *University of Cambridge*.

Academic excellence in Part III

2016 **IBM Prize for excellence in Pure Mathematics**, *Imperial College London*.

Awarded to one final year student

2015 **Gloucester Research Ltd Prize**, *Imperial College London*.

2015 **Winton Capital Management Prize in Mathematics**, *Imperial College London*.

Best 2nd year group project

2015 **UROP Prize**, *Imperial College London*.

Best summer research project

2013 Prize for the best student in my year at the Romanian Mathematical Olympiad

2010,2011,2013 Gold medal at the Romanian National Mathematical Olympiad

## Projects

2017-2018 LSGNT First Year Projects

- *Large Gaps between Primes*, supervised by Andrew Granville
- *The Gauss Circle Problem*, supervised by Igor Wigman
- 2017 Part III Essay, Cambridge
  - *The Erdős Distinct Distances Problem*, supervised by Timothy Gowers
- 2015 Summer Undergraduate Project, Imperial College London
  - *Additive structure of integers*, supervised by Martin Liebeck

## Seminars Organised

2019-2020 London Analytic Number Theory Study Group

## Selected Talks

- Feb 2022 *Dissipation of Correlations of Automorphic Forms*, Oberseminar Algebra und Geometrie, Goethe Universität Frankfurt am Main
- Dec 2021 Bonn-Paris hybrid workgroup on automorphic forms
- Nov 2021 *Distribution of modular symbols*, MPIM Number Theory Lunch Seminar
- Oct 2021 *Dissipation of Correlations of Automorphic Forms*, Oberseminar Analytic Number Theory and Automorphic Forms Bonn
- Jun 2021 *Distribution of modular symbols*, Bristol Linfoot Number Theory Seminar
- Jun 2021 *Dissipation of Correlations of Automorphic Forms*, Young Researchers in Mathematics
- Apr 2021 *Distribution of modular symbols*, Sheffield Number Theory Seminar
- Feb 2021 *The delta-symbol method of Duke, Friedlander and Iwaniec*, London Analytic Number Theory Study group
- Feb 2021 *Distribution of modular symbols*, London Junior Number Theory Seminar
- Nov 2020 *Distribution of modular symbols*, The London-Paris Number Theory Seminar
- Nov 2020 *Distribution of modular symbols*, London Mathematical Society's Virtual Graduate Student Meeting
- Feb 2020 *Quantum unique ergodicity for holomorphic cusp forms*, London Analytic Number Theory Study Group
- Jan 2020 *Spectral Theory of Automorphic Forms*, UCL Postgrad Seminar
- Nov 2019 *Distribution of modular symbols*, London Analytic Number Theory Study Group
- Oct 2019 *Distribution results for modular symbols*, London Junior Number Theory Seminar
- May 2019 *Matomaki and Radziwill theorem for the Liouville function*, London Analytic Number Theory Study Group
- March 2019 *Duke's Equidistribution Theorem*, London Analytic Number Theory Study Group
- Nov 2018 *Prime Geodesic Theorem*, London Analytic Number Theory Study Group
- Oct 2018 *The Selberg Trace Formula*, London Junior Number Theory Seminar
- May 2018 *Gauss Circle Problem*, London Analytic Number Theory Study Group
- May 2018 *Number Theory in Function Fields*, London Analytic Number Theory Reading Group
- Jan 2018 *Conditional Upper Bounds on Zeta*, London Analytic Number Theory Study Group
- Jan 2018 *Probabilistic Number Theory*, London Analytic Number Theory Reading Group
- Nov 2017 *Erdős distinct distances problem*, London Analytic Number Theory Study Group
- Nov 2017 *The Circle Method*, London Analytic Number Theory Reading Group
- Jan 2017 *The (surprising) equivalence of three theorems in Combinatorics*, Part III Seminars in Cambridge
- Mar 2016 *Additive Structures on Integers*, Imperial Undergraduate Mathematics Colloquium
- Feb 2016 *Geometry of Numbers*, Imperial Undergraduate Mathematics Colloquium

Nov 2015 *Crystals and Symmetry*, Imperial Undergraduate Mathematics Colloquium

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## Teaching Experience

- 2020-2021 Moderator and Marking for Number Theory course, UCL
- 2017-2021 Organised problem solving classes and prepared the UCL team for the International Mathematics Competition
- Summer 2018 Instructor at AwesomeMath Summer Program, University of Puget Sound
- Summer 2017 Instructor at AwesomeMath Summer Program, Cornell University and San Jose State University
- Summer 2016 Instructor at AwesomeMath Summer Program, Cornell University
- Summer 2015 Teaching Assistant at AwesomeMath Summer Program, UC Berkeley
- 2014-2016 Tutoring volunteer as part of Imperial College Outreach Programme

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## Conferences/Workshops attended

- Jun 2021 Young Researchers in Mathematics (*online*)
- Jun 2021 Ninth Bucharest Number Theory Days (*online*)
- Nov 2020 The London-Paris Number Theory Seminar (*online*)
- Sep 2020 Research visit, Copenhagen
- Jun 2020 Online Conference in Automorphic Forms
- Dec 2019 Zeta Functions, Marseille, France
- Sep 2019 Warwick-Oxbridge-Manchester-Bristol-London (WOMBL) 1-day meeting, Oxford, UK
- Jul 2019 Second Symposium on Analytic Number Theory, Cetraro, Italy
- Jun 2019 Arithmetic, geometry, and modular forms: a conference in honour of Bill Duke, Zurich, Switzerland
- Apr 2019 Analytic Aspects of Automorphic Forms, Lille, France
- Jan 2019 Trace functions and their applications, Monte Verita, Switzerland
- Nov 2018 The London-Paris Number Theory Seminar, Paris, France
- Nov 2018 Young Researchers in Algebraic Number Theory (Y-RANT), Sheffield, UK
- Oct 2018 Srinivasa Ramanujan: in celebration of the centenary of his election as FRS, London, UK
- Sep 2018 Arithmetic Ramsey Theory, Manchester, UK
- Sep 2018 Elementare und Analytische Zahlentheorie (ELAZ), Bonn, Germany
- Jul 2018 Building Bridges: 4th EU/US Summer School + Workshop on Automorphic Forms and Related Topics, Budapest, Hungary

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## Skills

- Languages English (**Fluent**), Romanian (**Native**), French (**Basic**)
- IT Mathematica, Matlab, Python