Ian Petrow: Curriculum Vitae

Contact Information

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Research Interests

Number theory, especially the analytic theory of automorphic forms and L-functions

Employment

University College London	Associate Professor	**Oct 2021 – Present**
University College London	Lecturer in Pure Mathematics	**Oct 2019 – Sept 2021**
ETH Zürich	Ambizione Fellow	**Feb 2017 – Oct 2019**
EPF Lausanne	Post-Doc	**Aug 2013 – Jan 2017**

Education

Stanford University	Ph.D.	**Sep 2013**
University of Cambridge	M.A.St.	**Jun 2008**
Princeton University	A.B.	**Jun 2007**

Grants and Awards

Frontiers of Science Award in Mathematics, ICBS Beijing	**2024**
EPSRC New Investigator Award	**2022-2025**
Ambizione Fellowship, Swiss NSF	**2017-2020**
AMS-Simons Travel Grant	**2014-2016**
Cambridge Overseas Trust Bursary	**2007-2008**

Research Publications

1. The Weyl Law for Algebraic Tori.
   J. Eur. Math. Soc. (JEMS), to appear (2025).
2. The Fourth Moment of Dirichlet L-functions Along a Coset and the Weyl Bound, (with M.P. Young).
   Duke Math. J. **172** no. 10, pp. 1879-1960 (2023).
3. The Volumes of Miyauchi Subgroups, (with D. Lesesvre).
   Arch. Math. (Basel). **119**, pp. 37-51 (2022).
4. The Weyl Bound for Dirichlet L-functions of Cube-Free Conductor, (with M.P. Young).
   Ann. of Math. (2). **192** no. 2, pp. 437-486 (2020).
5. Oscillatory Integrals with Uniformity in Parameters, (with E.M. Kıral and M.P. Young).
   J. Théor. Nombres Bordeaux. **31** no. 1, pp. 145-159 (2019).
6. Bounds for Traces of Hecke Operators and Applications to Modular and Elliptic Curves Over a Finite Field.
   Algebra Number Theory. **12** no. 10, pp. 2471-2498 (2018).
7. A Generalized Cubic Moment and the Petersson Formula for Newforms, (with M.P. Young).
   Math. Annalen. **373** no. 1-2, pp. 287-353 (2019).
8. Counting Automorphic Forms on Norm One Tori, (with E.H. Brooks).
   Acta Arithmetica. **183** no. 2, pp. 117-143 (2018).

9. Elliptic Curves Over a Finite Field and the Trace Formula, (with N. Kaplan).
   Proc. Lond. Math. Soc. **115** no. 6, pp. 1317-1372 (2017).
10. Traces of Hecke Operators and Refined Weight Enumerators of Reed-Solomon Codes, (with N. Kaplan).
    Trans. Amer. Math. Soc. **370** no. 4, pp. 2537-2561 (2018).
11. A Twisted Motohashi Formula and Weyl-Subconvexity for L-functions of Weight Two Cusp Forms.
    Math. Annalen. **363** no. 1-2, pp. 175-216 (2015).
12. A Recursion Formula for Moments of Derivatives of Random Matrix Polynomials, (with A. Altuğ, S. Bettin, Rishikesh, and I. Whitehead).
    Quarterly J. Math. **65** no. 4, pp. 1111-1125 (2014).
13. Moments of $L'(1/2)$ in the Family of Quadratic Twists.
    Int. Math. Res. Notices. **2014** no. 6, pp. 1576-1612 (2014).
14. Transition Mean Values of Shifted Convolution Sums.
    J. Number Theory. **133** no. 10, pp. 3264-3282 (2013).

Theses, Essays, and Reports

1. Cubic Moments and a Distance Function on Cuspidal Representations, (with M.P. Young).
   in Automorphic Forms and Arithmetic, *Oberwolfach Reports.* no. 26, pp. 31-34 (2020).
2. Moments of Automorphic L-functions and Related Problems.
   Ph.D. Thesis. Stanford University (2013).
3. Vinogradov's Three Primes Theorem.
   Part III Essay. University of Cambridge (2008).
4. Numerical Evidence for a Conjecture of Hooley.
   Undergraduate Thesis. Princeton University (2007).

Long-Term Research Visits

Institut Mittag-Leffler, Djursholm, Sweden (invited)	**Jan-Apr 2024**
Institut Mittag-Leffler, Djursholm, Sweden (cancelled; moved online)	**Jan-Feb 2021**
Forschungsinstitut für Mathematik, Zürich, Switzerland (cancelled)	**Jun-Aug 2020**

Selected Lectures

Mini-course, Hausdorff Center for Mathematics Summer School, Bonn, Germany	**Jul 2024**
CMI workshop New Perspectives in Analytic Th. of Aut. Forms, Oxford, UK	**Sep 2023**
Automorphic Forms and L-functions of higher rank, London, UK	**Sep 2023**
Oxford Number Theory Seminar, Oxford, UK	**Nov 2022**
Automorphic Forms Conference, Erdős Center, Budapest, Hungary	**Sep 2022**
L-functions, Circle-Method and Applications, ICTS Bengaluru (via Zoom)	**Jun 2022**
Automorphic Forms and Arithmetic, Oberwolfach, Germany	**Sep 2020**
Second Symposium on Analytic Number Theory, Cetraro, Italy	**July 2019**
Séminaire de Théorie des Nombres de l'IMJ-PRG, Paris, France	**Jan 2019**
Joint IAS/Princeton University Number Theory Seminar, Princeton, NJ	**Mar 2018**
Mini-course, MSRI Introductory Workshop, Berkeley, CA	**Feb 2017**
AMS Special Session, Joint Mathematics Meetings, Atlanta, GA	**Jan 2017**
MAA Invited Paper Session, Joint Mathematics Meetings, Atlanta, GA	**Jan 2017**
Spectral Theory, Automorphic Forms and Arithmetic, Copenhagen, Denmark	**Nov 2016**
Geometric and Analytic Number Theory, Zürich, Switzerland	**Sep 2016**

Teaching Experience

Department of Mathematics, University College London

Lecturer

Prime Numbers and their Distribution	**Fall 2024**
Prime Numbers and their Distribution	**Fall 2023**
Prime Numbers and their Distribution	**Fall 2022**
Prime Numbers and their Distribution	**Fall 2021**
Prime Numbers and their Distribution	**Fall 2020**
Prime Numbers and their Distribution	**Spring 2020**

Post-doc supervised:

Chung-Hang Kwan	EPSRC Research Fellow	**2022-2025**

Students supervised:

Seth Hardy	4th Year MSci Project	**2021-2022**
Sarah Al-Ali	4th Year MSci Project	**2020-2021**

Department of Mathematics, ETH Zürich

Lecturer

Introduction to Analytic Number Theory	**Fall 2018**
Classical Modular Forms	**Fall 2017**

Students supervised:

Fabian Lenz	Bachelor's Thesis	**2019**
Milos Radosavljevic	Bachelor's Thesis	**2018**
Felix Schmid	Master's Thesis	**2017-2018**

Department of Mathematics, École Polytechnique Fédérale de Lausanne

Lecturer **2015-2016**

Analytic Theory of L-Functions (Ph.D. course)
Introduction to Analytic Number Theory

Senior teaching assistant **2013-2016**

Introduction to Algebraic Number Theory
Galois Theory
Introduction to Analytic Number Theory
Linear Algebra for Computer Scientists

Students supervised:

Gauthier Leterrier	Master's Semester Project	**Fall 2016**
Sébastien Comtesse	Bachelor's Semester Project	**Spring 2016**
Joachim Petit	Master's Semester Project	**Fall 2015**
Raphaël Zacharias	Master's Semester Project	**Fall 2014**
Alice Hedenlund	Bachelor's Semester Project	**Spring 2014**
Ilqar Ramazanli	Master's Semester Project	**Fall 2013**

Canada/USA Mathcamp

Teaching mentor with tenure **Summer 2011**
Taught and mentored talented high school students undergraduate and graduate level mathematics in an intensive summer program.

Department of Mathematics, Stanford University

Teaching assistant **2009-2013**
Differential Equations (twice)
Honors Multivariable Calculus
Single Variable Calculus I
Single Variable Calculus II

Champlain Valley Union High School, VT

Long-Term Substitute Teacher **Spring 2005**
Various High School Math Courses

Qualifications

Fellow of the Higher Education Academy, United Kingdom **Nov 2021**
Qualified for associate professor of mathematics in Denmark **Feb 2019**
Qualifié pour le corps des professeurs des universités en France **Feb 2019**

Editorial

Editor of *Mathematika* **2023 -**

Service

Departmental Positions:
4th Year MSci Projects Coordinator **2021-**
Affiliate Tutor (Study Abroad and Liaison) **2020-2023**
2nd Year Group Projects Alg./NT/Combinatorics stream leader **2020-22**
Seminar organization:
London Learning Seminar on Analytic Number Theory **2020-**
Egham, Reading, London Arithmetic Statistics Seminar (ERLASS) **2020-2021**
EPFL Number Theory Seminar **2015-2016**
Referee: ≈ 30 papers for a wide variety of journals
Reviewer: Math Reviews; Zentralblatt Math
Memberships: AMS, LMS

Career Breaks

Paternity Leave - Jan 13, 2020 to Feb 7, 2020
Paternity Leave - Oct 23, 2023 to Nov 17, 2023

Languages

English (Native), French (Fluent), German (B1).