

Mathilde Gerbelli-Gauthier

Curriculum Vitae

Department of Mathematics
Bahen Centre for Information Technology, University of Toronto
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Positions Held

2024-present **Assistant Professor**, *University of Toronto*, Toronto
2020-2024 **Postdoctoral Fellow**, *Centre de Recherches Mathématiques and McGill University*, Montréal
2021-2022 **Member**, *Institute for Advanced Study*, Princeton

Education

2020 **Ph.D. in Mathematics**, *University of Chicago*, Advisor: Matthew Emerton
Thesis: Growth of Cohomology of Arithmetic Groups and the Stable Trace Formula.
2014 **B.Sc. in Mathematics**, *McGill University*, First Class Honours

Publications

2023 **Limit multiplicity for unitary groups and the stable trace formula**
Algebra and Number Theory. 17:12

2016 **The order of nilpotence of Hecke operators mod 2: a new proof**
Research in Number Theory, 2:7

Preprints

2024 **Root Number Equidistribution for Self-Dual Automorphic Representations on GL_N , with R. Dalal**
Submitted. ArXiv: 2410.01976

A note on large sums of divisor-bounded multiplicative functions, with C. Frechette, A. Hamieh, and N. Tanabe
To appear in *Research Directions in Number Theory*. ArXiv: 2405.00658

Cohomology of Fuchsian groups and Fourier interpolation, with A. Venkatesh
Submitted. ArXiv: 2406.1951

2023 **The Cohomological Sarnak-Xue Density Hypothesis for SO_5 , with S. Evra and H. Gustafsson**
Submitted. ArXiv: 2309.12413

Large sums of Fourier coefficients of cusp forms, with C. Frechette, A. Hamieh, and N. Tanabe
To appear in *Journal de Théorie des Nombres de Bordeaux*. ArXiv: 2308.06311

Mod ℓ gamma factors and a converse theorem for finite general linear groups, with J. Bäkeberg, H. Goodson, A. Iyengar, G. Moss, and R. Zhang
Submitted. ArXiv: 2307.07593

2022 **Statistics of cohomological automorphic representations via the endoscopic classification, with R. Dalal**
Submitted. ArXiv: 2212.12138

Awards

2020 **Postdoctoral Fellowship**, NSERC
Kowalsky Fellowship, Department of Mathematics, University of Chicago

2018 **Lawrence and Josephine Graves Prize for Excellence in Undergraduate Teaching**,
Department of Mathematics, University of Chicago

2016 **Postgraduate Scholarship - Doctoral**, NSERC
Alexander Graham Bell Canada Graduate Scholarship, NSERC, *declined*
Doctoral Scholarship, FRQNT, *declined*

2014 **Masters Scholarship**, FRQNT
McCormick Fellowship, University of Chicago

Talks

2024 Québec-Maine Number Theory Conference, Université Laval.
Canadian Number Theory Association XVI, Fields Institute.
Women⁺ and Mathematics Program: Postdoc Talks, Institute for Advanced Study.
Bhaskaracharya celebrating Harish-Chandra, Bhaskaracharya Pratishthana and IISER Pune,
Online.
Ottawa-Carleton Number Theory Seminar, University of Ottawa.
Beyond Voganish Seminar, University of Calgary, *Online*.
AMS Spring Sectional: Special Session on Automorphic Forms and Trace Formulae, Howard
University.
QVNTS, McGill University.
Number Theory Seminar, Rutgers University, *Online*.
Colloquium, Boston College.
Undergraduate Colloquium, Bowdoin College.
Colloquium, University of Utah.
Representation Theory/Number Theory Seminar, University of Utah.

2023 Colloquium, University of Toronto.
Colloquium, Georgia Tech.
Number Theory Seminar, Johns Hopkins University.
Maine-Québec Number Theory Conference, University of Maine.
Heilbronn Number Theory Seminar, University of Bristol.
Clay Workshop: New Perspectives in the Analytic Theory of Automorphic Forms, Oxford.
Conference on Automorphic forms, Endoscopy and Trace Formulas, CIRM.
International Automorphic Forms Seminar, *Online*.
Group, Lie, and Number Theory Seminar, University of Michigan.
Number Theory Seminar, Northwestern University.
Number Theory Seminar, University of Chicago.
AMS Spring Sectional Meeting: Special Session on Arithmetic Statistics, University of
Cincinnati.
Number Theory Speaker Series, Ohio State University.
Automorphic Forms and Arithmetic Seminar, Columbia University.
Princeton-IAS Number Theory Seminar, Princeton University.

COGENT Seminar, *Online*.

Joint Mathematics Meeting: Automorphic Forms and Representation Theory, Boston.

2022 Modern Math Workshop, San Juan.

Québec-Maine Number Theory Conference, Université Laval.

Connecticut Summer School in Number Theory, University of Connecticut.

“What is...” Seminar, Institute for Advanced Study.

Philadelphia Area Number Theory Seminar, Bryn Mawr College.

Mathematics Colloquium, Dalhousie University. *Remote*

2021 Automorphic Forms and Number Theory Seminar, Purdue University. *Remote*

Members’ Colloquium, Institute for Advanced Study.

Workshop on Cohomology of Arithmetic Groups: Duality, Stability, and Computations, Banff.

Boston University Number Theory Seminar. *Remote*

Séminaire représentations des groupes réductifs, Institut Mathématique de Marseille. *Remote*

CMS 75th+1 Anniversary Summer Meeting, Ottawa. *Remote*

Séminaire de géométrie arithmétique et motivique, Université Sorbonne-Paris-Nord. *Remote*

Arbeitsgemeinschaft: Derived Galois Deformation Rings and Cohomology of Arithmetic Groups, Oberwolfach. *Remote*.

Joint IAS/Princeton Number Theory Seminar, *Remote*.

(w/ Clara del Junco) CONSTRAIN Researcher Forum, University of Leeds. *Remote*.

2020 CMS Virtual Winter Meeting, University of Ottawa. *Remote*.

Number Theory Seminar, University of Oregon. *Remote*.

Québec-Vermont Number Theory Seminar, McGill University. *Remote*.

Members’ Seminar, CRM Special Semester on Cohomology in Arithmetic. *Remote*

Number Theory Seminar, University of Wisconsin-Madison.

Representation Theory and Number Theory Seminar, University of Utah.

Group, Lie, and Number Theory Seminar, University of Michigan.

2019 Junior Number Theory Days, Johns Hopkins University.

Number Theory Seminar, MIT.

Number Theory Seminar, Johns Hopkins University.

AMS Fall Sectional Meeting: Special Session on Automorphic Forms and L -functions, University of Wisconsin–Madison.

Linfoot Seminar, University of Bristol.

2018 Women in Automorphic Forms, Technische Universität Darmstadt.

Selected Workshops and Conferences

2024 **Women⁺ and Mathematics: Symmetry and Arithmetic, Princeton**

2023 **Clay Workshop: New Perspectives in the Analytic Theory of Automorphic Forms, Oxford**

Conference on Automorphic forms, Endoscopy and Trace Formulas, Marseille

Women in Numbers 6, Banff

Joint Mathematics Meeting, Boston

2022 **Modern Math Workshop and National Diversity in STEM Conference, San Juan**

Québec-Maine Number Theory Conference, Québec

Connecticut Summer School in Number Theory, Storrs

Arizona Winter School: Automorphic Forms Beyond GL_2 , Tucson

2021 **Cohomology of Arithmetic Groups: Duality, Stability, and Computations, Banff**
Rethinking Number Theory, Online
CMS 75th+1 Anniversary Summer Meeting, Ottawa, Remote
Arbeitsgemeinschaft: Derived Galois Deformation Rings and Cohomology of Arithmetic Groups, Oberwolfach, Remote

2020 **CMS Winter Meeting, Ottawa, Remote**
CRM Workshop: Arithmetic Quotients of Symmetric Spaces and Their Cohomology, Montreal

2019 **CMO Workshop: Modularity and Moduli Spaces, Oaxaca**
A Conversation on Professional Norms in Mathematics, Baltimore
AMS Fall Sectional Meeting: Special session on Automorphic Forms and L -functions, Madison

2018 **Sixth Abel Conference: A Mathematical Celebration of Robert P. Langlands, Minneapolis**
Women in Automorphic Forms, Darmstadt
IAS Workshop: Representation Theory and Analysis on Locally Symmetric Spaces, Princeton

2017 **IAS Workshop: Motives, Galois Representations and Cohomology Around the Langlands Program, Princeton**
MSRI Summer School: Automorphic Forms the Langlands Programme, Berkeley
Arizona Winter School: Perfectoid Spaces, Tucson
Barcelona Graduate School of Mathematics: p -adic Methods in Galois Representations and Modular Forms, Barcelona

Teaching

Instructor of Record

University of Toronto

2024-2025 Algebra I, *Fall*, Introduction to Number Theory, *Spring*.

McGill University

2023-2024 Linear Algebra and Geometry, *Winter*.

2022-2023 Linear Algebra and Geometry, *Fall*.

University of Chicago

2019-2020 Calculus III, *Fall*.

2018-2019 Mathematical Methods for the Social Sciences, *Fall*.

2017-2018 Mathematical Methods for the Social Sciences, *Fall and Summer*.

2016-2017 Calculus III, *Fall*, Mathematical Methods for the Social Sciences, *Spring*.

Teaching Assistant

Arizona Winter School

2022 Automorphic Forms and the Theta Correspondance, Study Group Leader. *Arizona Winter School on Automorphic Forms Beyond GL_2* .

University of Chicago

2018-2019 Mathematics Study Abroad at the University of Chicago Center in Paris: Arithmetic in Function Fields, Introduction to p -groups, Random Walks and The Heat Equation, *Spring*.

2015-2016 Calculus I-II-III, Inquiry-Based Learning, *Fall, Winter, and Spring*.

Workshops Attended

2023 Equity Discussion Group, *Department of Mathematics and Statistics, McGill University*.
 2022 Pedagogy Discussion Group, *Department of Mathematics and Statistics, McGill University*.
 2019 Fundamentals of Teaching Mathematics, *Chicago Center for Teaching*.
 2018 Inclusive Teaching in STEM, *Race and Pedagogy working group at the University of Chicago*.

Service and Outreach

Refereeing

I have served as a referee for *Transactions of the American Mathematical Society*, *GAFA*, and *Essential Number Theory*.

Volumes Edited

2021 **A Conversation on Professional Norms in Mathematics**, *American Mathematical Society*, ISBN: 978-1-4704-6780-7
Burnout: a zine about academia, travel, and climate change, *self-published*, knowledge.uchicago.edu/record/2773

Conferences and Seminars Organized

2023 **Scientific Session: Automorphic representations and p-adic aspects of the Langlands program**, *CMS Winter Meeting*, Co-organizer.
AMS Special Session: Women in Automorphic Forms, *Joint Mathematics Meeting*, Co-organizer.
 2022 **Mathematical Conversations**, *Institute for Advanced Study*, Co-organizer
 2020 **CRM Women's Seminar**, *Centre de Recherche Mathématiques*, Co-organizer
 2016-2017 **Student Number Theory Seminar**, *University of Chicago*, Organizer
 Fall-Winter 2016: *p*-adic geometry, Summer 2017: the Local Langlands correspondance for GL_2

Other

2023 **EDI assesment**, *Banff International Research Station*, Evaluator
 Assess the merits of workshop proposals on the basis of Equity, Diversity, and Inclusion.
 2022 **Lunch in the Time of Covid**, Panelist
 Discussion on the role and responsibility of academics in climate change.
 2022-2023 **Part B Exam**, *McGill University*, Secondary Examiner
 Topics: Growth in the torsion of cohomology of arithmetic groups, Hilbert modular forms.
 2021-2022 **Women's Lunches**, *Institute for Advanced Study*, Co-organizer
 Organized a monthly lunch meeting for female members at the Institute's School of Mathematics.
 2019-2020 **Arts + Science Collaboration Grant**, *University of Chicago*, Fellow
 Recipient of a \$3000 grant for an interdisciplinary arts and science project with two students at the School of the Art Institute of Chicago. Title: *Numerical Alternatives*
 2018-2020 **Lunchtime Ado with Female Speakers**, *University of Chicago*, Co-organizer
 Organized and moderated a series of biquarterly lunchtime conversations with women speaking in the department's research seminars. Recipient of an \$800 grant in 2019-2020.
 2017-2020 **Directed Reading Program**, *University of Chicago*, Co-organizer
 Managed a program pairing undergraduate and graduate students for quarter-long reading projects.
 2018-2019 **Graduate Students United**, *University of Chicago*, Steward
 Union representative for graduate workers in the mathematics department.

2018 **Department of Mathematics Climate Survey, University of Chicago**
Co-development of a climate survey to assess the experiences of graduate students.

2016-2018 **Directed Reading Program, University of Chicago**, Mentor
Projects: Class field theory, Pythagorean triples, Fermat's theorem on the sum of two squares, Algebraic Varieties, Fourier Series, Arithmetic of Elliptic Curves.

2013-2014 **Program in Mathematics for Young Scientists, Boston University**, Counselor
Mentorship of high-school students in a 6-week number theory summer camp.