

# Karol Kozioł

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Citizenship: Poland, USA

## Employment

- 6/2024 – **Doctoral Faculty, CUNY Graduate Center**  
Present
- 8/2022 – **Assistant Professor, CUNY Baruch College**  
Present
- 9/2019 – **Postdoctoral Assistant Professor, University of Michigan**  
7/2022 Supervisor: Stephen DeBacker
- 8/2018 – **Postdoctoral Fellow, University of Alberta**  
7/2019 Supervisor: Manish Patnaik
- 9/2014 – **NSF Postdoctoral Fellow, University of Toronto**  
7/2018 Sponsoring Scientist: Florian Herzig
- 3/2016 – **EPDI Postdoctoral Fellow, Max Planck Institute for Mathematics**  
8/2016 Supervisor: Geordie Williamson
- 9/2015 – **EPDI Postdoctoral Fellow, Institut des Hautes Etudes Scientifiques**  
2/2016 Supervisor: Ahmed Abbes

## Education

- 9/2009 – **Ph.D. in Mathematics, Columbia University**  
5/2014 Advisor: Rachel Ollivier
- 9/2005 – **B.A. in Mathematics (Honors), Minor in Music, New York University**  
5/2009 Magna Cum Laude, Phi Beta Kappa

## Awards/Honors/Funding

- 2023 – 2026 PSC-CUNY Traditional B Research Award (×3), \$6,000 each
- 2021 – 2024 NSF Standard Grant [DMS-2101836](#) (transferred to [DMS-2310225](#)), \$124,050
- 2019 U(M) Math Department Holiday Party Baking Contest – 1<sup>st</sup> place
- 2019 – AIM SQuaRE Funding
- 2019 BIRS Research in Teams
- 2019 Funding to attend workshop “Hot Topics: Recent progress in Langlands Program” at MSRI
- 2017 Université Montpellier Travel Grant
- 2015 – 2016 EPDI Fellowship
- 2014 – 2018 NSF Mathematical Sciences Postdoctoral Research Fellowship, \$150,000
- 2013 Funding to attend summer school “New Geometric Techniques in Number Theory” at MSRI
- 2010 NSF Graduate Research Fellowship Honorable Mention
- 2009 – 2014 Faculty Fellow/Teaching Fellow in the Department of Mathematics, Columbia University
- 2009 – 2014 Funded by NSF RTG Grant DMS-0739400 in Number Theory, Columbia University
- 2009 Hollis Cooley Memorial Prize for Excellence in Mathematics, New York University

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## Publications and preprints

- *Parahoric Hecke Ext-algebras in characteristic  $p$*   
(with Rachel Ollivier and Jacob Stockton, and a joint appendix with David Schwein)  
Preprint.
- *Derived Satake morphisms for  $p$ -small weights in characteristic  $p$*   
(with Cédric Pépin)  
Math. Ann. **392** (2025), no. 4, 5725–5785.
- *Gelfand–Kirillov dimension for mod  $p$  representations of  $p$ -adic unitary groups of rank 2*  
(with Stefano Morra)  
Representation Theory **29** (2025), 893–967.
- *Derived right adjoints of parabolic induction: an example*  
Pacific J. Math. **321** (2022), no. 2, 345–358.
- *Functorial properties of pro- $p$ -Iwahori cohomology*  
J. London Math. Soc. (2) **104** (2021) 1572–1614.
- *On the existence of admissible supersingular representations of  $p$ -adic reductive groups*  
(with Florian Herzig and Marie-France Vignéras, and an appendix by Sug Woo Shin)  
Forum of Mathematics, Sigma **8** (2020), e2.
- *Serre weight conjectures for  $p$ -adic unitary groups of rank 2*  
(with Stefano Morra)  
Algebra & Number Theory **16** (2022), no. 9, 2005–2097.
- *The first pro- $p$ -Iwahori cohomology of mod- $p$  principal series for  $p$ -adic  $GL_n$*   
Trans. Amer. Math. Soc. **372** (2019), 1237–1288.
- *Hecke module structure on first and top pro- $p$ -Iwahori cohomology*  
Acta Arithmetica **186** (2018), 349–376.
- *Irreducible admissible mod- $p$  representations of metaplectic groups*  
(with Laura Peskin)  
Manuscripta Math. **155** (2018), no. 3-4, 539–577.
- *Homological dimension of simple pro- $p$ -Iwahori–Hecke modules*  
Math. Res. Lett. **26** (2019), no. 3, 769–804.
- *Pro- $p$ -Iwahori invariants for  $SL_2$  and  $L$ -packets of Hecke modules*  
International Mathematics Research Notices (2016), no. 4, 1090–1125.
- *A classification of the irreducible mod- $p$  representations of  $U(1, 1)(\mathbb{Q}_{p^2}/\mathbb{Q}_p)$*   
Annales de l’Institut Fourier **66** (2016), no. 4, 1545–1582.
- *Hecke modules and supersingular representations of  $U(2, 1)$*   
(with Peng Xu)  
Representation Theory **19** (2015), 56–93.

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## Seminar Talks

- 5/2025 **Number Theory Seminar**, POSTECH-PMI
- 12/2024 **Number/Representation Theory Seminar**, University of Toronto
- 3/2024 **Automorphic Forms and Representation Theory Seminar**, Purdue University
- 11/2023 **Philadelphia Area Number Theory Seminar**
- 10/2023 **Colloquium**, Southern Illinois University
- 11/2022 **Automorphic Forms and Representation Theory Seminar**, Purdue University

- 5/2022 **Iwahori–Hecke algebras and the mod- $p$  Langlands program (4-part lectures series)**, Université Sorbonne Paris Nord (Paris XIII)
- 3/2022 **Number Theory Seminar**, Penn State
- 11/2021 **RTG Seminar**, University of Michigan
- 10/2021 **Joint Number Theory Seminar**, Columbia–CUNY–NYU
- 11/2020 **RTG Seminar**, University of Michigan
- 10/2020 **Number Theory Seminar**, Harvard
- 8/2020 **New Developments in Number Theory**, hosted by POINT, online
- 2/2020 **Topology, Analysis & Geometry Seminar**, Central Michigan University
- 11/2019 **Algebra, Combinatorics, and Geometry Seminar**, University of Pittsburgh
- 10/2019 **Algebra and Number Theory Seminar**, University of Arizona
- 4/2019 **Number Theory Seminar**, Northwestern
- 2/2019 **Research Presentation**, Trinity College Dublin
- 2/2019 **Number Theory Seminar**, University of British Columbia
- 1/2019 **Number Theory/Representation Theory Seminar**, University of Alberta
- 4/2018 **Number Theory Seminar**, UCLA
- 4/2018 **Number Theory Seminar**, UC San Diego
- 4/2018 **Number Theory Seminar**, Caltech
- 10/2017 **Séminaire de Géométrie Algébrique**, Université Montpellier 2
- 9/2016 **Number/Representation Theory Seminar**, University of Toronto
- 7/2016 **Séminaire de Théorie des Nombres**, Université Montpellier 2
- 6/2016 **Mittagsseminar zur Arithmetik**, Universität Münster
- 4/2016 **Oberseminar**, Max Planck Institute for Mathematics
- 11/2015 **Séminaire Groupes Réductifs et Formes Automorphes**, Institut de Mathématiques de Jussieu
- 11/2015 **Postdoc Seminar**, IHES
- 3/2015 **Number/Representation Theory Seminar**, University of Toronto
- 3/2015 **Arithmetic Geometry Seminar**, McMaster University
- 4/2014 **Princeton/IAS Junior Faculty Number Theory Seminar**, Princeton University
- 4/2014 **Group, Lie and Number Theory Seminar**, University of Michigan
- 2/2014 **Representation Theory Seminar**, CUNY Graduate Center
- 10/2013 **Number Theory Seminar**, University of British Columbia
- 6/2013 **Séminaire Groupes Réductifs et Formes Automorphes**, Institut de Mathématiques de Jussieu
- 6/2013 **Séminaire de Théorie des Nombres**, Université Montpellier 2

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## Conference Talks

- 11/2025 **Arithmetic Geometry in Shenzhen**, Shenzhen
- 10/2024 **AMS Sectional Meeting**, SUNY Albany
- 9/2024 **Iwahori Ext-algebras and mod- $p$  representations of  $p$ -adic groups (mini-course)**, IIT Jammu
- 6/2023 **CMS Summer Meeting**, University of Ottawa

- 5/2023 **Hecke Algebras as a Unifying Theme**, University of British Columbia  
5/2023 **Representation Theory, L-functions, and Arithmetic**, University of Pittsburgh  
6/2022 **Journées Arithmétiques du LAGA**, Université Sorbonne Paris Nord (Paris XIII)  
5/2022 **AMS Sectional Meeting**, University of Denver  
3/2022 **Midwest Representation Theory Conference**, University of Michigan  
7/2021 **Mathematical Congress of the Americas**, Buenos Aires, Argentina (online)  
8/2019 **Nonassociative Algebras and Geometry**, Bonne Bay Marine Station  
6/2019 **CMS Summer Meeting**, Regina (unable to attend)  
5/2019 **Padova school on Serre conjectures and the  $p$ -adic Langlands program**, Padova  
5/2019 **Alberta Number Theory Days XI**, BIRS  
10/2018 **AMS Sectional Meeting**, University of Michigan  
4/2018 **Upstate Number Theory Conference**, SUNY Buffalo  
4/2017 **AMS Sectional Meeting**, University of Indiana, Bloomington  
6/2016 **Geometric methods in the mod  $p$  local Langlands correspondence**, Centro di Ricerca Matematica Ennio De Giorgi  
12/2015 **CMS Winter Meeting**, Montreal (unable to attend)  
3/2014 **Conference on Modular Iwahori-Hecke Algebras**, Humboldt-Universität zu Berlin  
12/2013 **Local Langlands Conjecture and Galois Representations**, Tata Institute  
10/2013 **AMS Sectional Meeting**, Temple University  
5/2013 **Hecke algebras in Number Theory and Categorification**, Columbia University  
4/2013 **Modular Representation Theory of Finite and  $p$ -adic Groups**, IMS Singapore

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## Teaching

- **Baruch College:**
  - Elements of Calculus I (S23)
  - Calculus II (F22, F23, F25)
  - Elementary Probability (S25)
  - Linear Algebra (S24, F25)
  - Mathematical Analysis (F22)
  - Graph Theory (S25)
  - Introduction to Probability (S23, S24)
- **University of Michigan:**
  - Calculus I (F19)
  - Linear Algebra (F21)
  - Linear Algebra – IBL (W21)
  - Applied Modern Algebra (F19, F20)
  - Elementary Number Theory (W20, W21)
  - Number Theory Lab (W20)
  - Probability Theory (W22)
  - Representation Theory of  $p$ -adic Groups (Graduate) (F20)
- **University of Alberta:**
  - Calculus I (F18)

- **University of Toronto:**
  - Linear Algebra I (F16)
  - Linear Algebra II (W17, Sum17)
- **Columbia University:**
  - Calculus III (Sum11)
  - Calculus IV (Sum12, Sum14)

## Outreach

- **CUNY Baruch College:**
  - mentored a high school student research project about continued fractions and fundamental units
  - mentored a high school student research project about elliptic curves
- **University of Michigan:**
  - participated in Super Saturdays for the [Ypsilanti Math Corps](#)
  - gave talks at Michigan Math Circle, U(M) Undergraduate Math Club
- **University of Alberta:**
  - Science Fair Judge for middle school students at Aurora Academic Charter School
  - participated in weekly JAMES (Junior Alberta Math for Eager Students) Math Circle
- **University of Toronto:**
  - gave numerous presentations to high school students about algebraic topology, modular arithmetic, Arrow's theorem, the stable marriage problem, random walks, partial differential equations, and Fermat's theorem on two squares
  - mentored high school student Behshad Jahanpour's research project about  $p$ -adic numbers
- **Columbia University:**
  - gave presentations to Undergraduate Math Society about  $p$ -adic numbers and mathematical puzzles
- **New York University:**
  - gave presentations to high school students about modular arithmetic, algebraic topology, and elliptic curves at cSplash (one day mathematics outreach event at NYU)
  - co-organizer of cSplash, 2007 – 2009

## Service

Referee/quick opinion for: Advances in Mathematics, Algebra and Number Theory, American Journal of Math, Bulletin of the LMS ( $\times 2$ ), Compositio Mathematica, Duke Math Journal, Forum Mathematicum, IMRN, International Journal of Number Theory ( $\times 2$ ), Israel Journal of Math, Journal of Algebra, Journal de Théorie des Nombres de Bordeaux ( $\times 2$ ), Journal of Number Theory, Journal of the EMS, Journal of the LMS ( $\times 2$ ), Manuscripta Mathematica ( $\times 2$ ), Math Annalen, Math Research Letters, Math Zeitschrift, Proceedings of the AMS, Proceedings of the LMS, Representation Theory ( $\times 8$ ), Transactions of the AMS

- 2025 Co-organizer of special session on *Automorphic Forms and Representation Theory: current trends* (with A. Raghuram), AMS Sectional Meeting, Tulane University
- 2025 Problem Session Leader, [Arizona Winter School 2025: Representation theory of  \$p\$ -adic groups](#) (included compiling exercise sheet)
- 2024 Project Leader, [Rethinking Number Theory](#)
- 2023 Research mentor for 3 undergraduate students at CUNY Baruch
- 2023 – Co-organizer of [Baruch College Distinguished Lecture Series](#) (with Adam Sheffer)
- 2023 – Proposal reviewer for PSC CUNY Grant
- 2023 Co-organizer of special session on [Homological Aspects of  \$p\$ -adic Groups and Automorphic Representations](#) (with A. Raghuram), AMS Sectional Meeting, University at Buffalo
- 2023 – Putnam exam training sessions, Baruch College
- 2022 Summer REU co-mentor for Gahl Shemy at the University of Michigan (with Charlotte Chan)
- 2022 Thesis committee member for Yiwang Chen
- 2021 – 2022 Co-organizer of RTG seminar on Representation Theory (with Charlotte Chan)
- 2021 Co-organizer of [Michigan Algebra and Number Theory Intercity Symposium \(MANTIS\)](#) (with Yuan Liu)
- 2021 Summer REU co-mentor for Drew Keisling and Dylan Pentland at the University of Michigan (with Tasho Kaletha)
- 2021 Co-organizer of special session on [Representations of  \$p\$ -adic groups and Langlands correspondences](#) (with Monica Nevins), 2021 CMS Summer Meeting, Ottawa.
- 2021 Panelist for session on applying to academic jobs for graduate students at University of Michigan
- 2020 – 2023 Co-organizer of [POINT: New Developments in Number Theory](#)
- 2020 Summer REU mentor for Alexander Wang at the University of Michigan
- 2020 Co-organizer of the [Cross Atlantic Representation Theory and Other topics ONline \(CARTOON\) conference](#) (with Jessica Fintzen) — online conference with over 400 registrants
- 2019 – 2020 Co-organizer for Group, Lie and Number Theory Seminar at the University of Michigan
- 2019 – 2022 Mentor, Postdoc-Grad Student Mentorship Program, University of Michigan
- 2019 Co-organizer for Number Theory/Representation Theory Seminar at the University of Alberta
- 2016 – 2018 Co-organizer for Number Theory/Representation Theory Seminar at the University of Toronto
- 2013 Transcribed notes for Florian Herzig's Mini-Course "[p-modular Representations of  \$p\$ -adic Groups](#)" at the summer school "Modular Representation Theory of Finite and  $p$ -adic Groups"
- 2012 – 2014 Departmental graduate student representative in Mathematics Department at Columbia University
- 2011 – 2014 Organized/co-organized student number theory seminars on Deligne–Lusztig theory, theta correspondence, deformation theory, and perfectoid spaces at Columbia University
- 2011 Co-organizer of Summer REU on Apollonian Circle Packings (with Tim Heath and Ian Whitehead)

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## Languages

English, Polish