Karol Kozioł

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Citizenship: Poland, USA

Employment

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

Education

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

Awards/Honors/Funding

2024 – 2025	PSC-CUNY Traditional B Research Award, $6,000
2023 – 2024	PSC-CUNY Traditional B Research Award, $6,000
2021 – 2024	NSF Standard Grant DMS-2101836 (transferred to DMS-2310225), $124,050
2019	U(M) Math Department Holiday Party Baking Contest – 1st 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

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)
  Preprint.

- *Gelfand–Kirillov dimension for mod p representations of p-adic unitary groups of rank 2*
  (with Stefano Morra)
  Preprint.

- *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 $\mathrm{U}(1,1)(\mathbb{Q}_{p^2}/\mathbb{Q}_p)$*
  Annales de l'Institut Fourier **66** (2016), no. 4, 1545–1582.

- *Hecke modules and supersingular representations of $\mathrm{U}(2,1)$*
  (with Peng Xu)
  Representation Theory **19**, (2015), 56–93.

Seminar Talks

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

Conference Talks

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

Teaching

- **Baruch College:**
  - Elements of Calculus I (S23)
  - Calculus II (F22, F23)
  - Linear Algebra (S24)
  - Mathematical Analysis (F22)
  - 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 Gaussian integers

- **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, International Journal of Number Theory, Israel Journal of Math, Journal of Algebra, Journal de Théorie des Nombres de Bordeaux ($\times 2$), Journal of Number Theory, Journal of the EMS, Manuscripta Mathematica, Math Annalen, Math Research Letters, Proceedings of the LMS, Representation Theory ($\times 6$), Transactions of the AMS

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)

Languages

English, Polish