

# Karol Koziol

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Citizenship: Poland, USA

## Employment

- 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 Abbès

## 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

- 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 Workshop
- 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

- [Derived right adjoints of parabolic induction: an example](#)  
To appear in Pacific Journal of Mathematics

- *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.

## Seminar Talks

- 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

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

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## Outreach

- **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

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## Service

Referee/quick opinion for: Advances in Mathematics, Algebra and Number Theory, American Journal of Math, Bulletin of the LMS ( $\times 2$ ), Compositio Mathematica, International Journal of Number Theory, Israel Journal of Math, Journal de Théorie des Nombres de Bordeaux, Journal of Number Theory, Journal of the EMS, Manuscripta Mathematica, Math Annalen, Math Research Letters, Representation Theory ( $\times 6$ ), Transactions of the AMS

- 2022 Summer REU co-mentor for Gahl Shemy at the University of Michigan (with Charlotte Chan)
- 2022 Thesis committee member for Yiwang Chen
- 2021 – 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 – 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 – 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