Jeffrey D. Adler

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Post-Doctoral Employment

University of Michigan
Paul Halmos Visiting Professor, August–December, 2015

American University, Department of Mathematics and Statistics
Professor: September, 2010 – present
Department Chair: August, 2011 – June, 2016
Associate Professor: September, 2007 – August, 2010

The University of Akron, Department of Theoretical and Applied Mathematics
Associate Professor: September, 2004 – August, 2007
Assistant Professor: September, 1998 – August, 2004

The University of Toronto, Department of Mathematics
Postdoctoral Fellow: July, 1996 – June, 1998.

Education

Ph.D. in Mathematics, The University of Chicago, Chicago, IL, June 1996
Dissertation: "Anisotropic refined minimal K-types and supercuspidal representations."
Advisor: Paul J. Sally, Jr.

M.S. in Mathematics, The University of Chicago.

A.B. in Mathematics (with high honors), Princeton University.

Awards, Grants, Misc. Positions

(submitted) National Science Foundation, *REU Site: Undergraduate research in mathematical sciences*, 2/2016–1/2019, $323,107. I am the PI. Monica Jackson is the co-PI.

National Security Agency, *Liftings and symmetric spaces over p-adic fields*, 9/2013–8/2015, $145,723. This is a joint award with Jeffrey Hakim and Joshua Lansky.

National Science Foundation, *Focused Research Group: Characters, liftings, and types*, 09/01/2009–08/31/2013, $521,588. I was the PI. Joshua Lansky and Jeffrey Hakim were co-PIs. This grant was tied to a collection of proposals at other universities with a total budget of just over $1.3 million.

American University Faculty Research Award AY 2009–10, "Lifting of Representations", $7,000.

External Examiner, PhD thesis of Jeremy Sylvestre, University of Toronto, 2008.

National Security Agency Young Investigator Grant, 2007–08. $32,300.

Visiting Associate Professor, University of Toronto, Spring, 2006.

Visiting Scholar, University of Michigan, Fall, 2005.

National Security Agency Young Investigator Grant, 2005–07. $30,000.

National Science Foundation, *Algebra, Number Theory, and Applications: a research experience for undergraduates*, 2005–07. $162,921. (I became PI in July, 2006.)

University of Akron Faculty Research Grant #1604, Summer, 2005.

Honors Examiner, Oberlin College, April, 2004.

Buchtel College of Arts and Sciences Early Career Research Award, April, 2004.

Distinguished Visiting Professor, Bucknell University, March, 2004.

Office of Naval Research, *N03-T004 Optimizing Human Resource Management Models*, July, 2003, $14,336.01.

Member, Institute for Mathematical Sciences, Singapore, August, 2002.

National Security Agency Young Investigator Grant, 2002–04. $29,000.

Distinguished Visiting Professor, Bucknell University, March, 2002.

Buchtel College of Arts and Sciences, Department Chairs' Early Career Award, 2001.

American Mathematical Society, Mathematical Challenges Travel Grant, August, 2000. $1,000.

University of Akron Faculty Research Grant #1470, Summer, 2000.

University of Akron Faculty Research Grant #1432, Summer, 1999.

Postdoctoral Fellow, University of Toronto, 1996–98.

National Science Foundation Graduate Fellowship 1988–90, 1992–93.

College Fellowship in Mathematics, The University of Chicago, 1988–1989.

University Fellowship in Mathematics, The University of Chicago, 1987-1988.

Publications and Preprints

Representation theory and harmonic analysis

Character relations for a lifting of representations of finite reductive groups, (with Michael Cassel, Joshua Lansky, Emma Morgan, and Yifei Zhao). Accepted for publication in Involve. E-print available at `arXiv:1205.6448`.

Liftings of representations of finite reductive groups II: Explicit conorm functions, (with Joshua Lansky). Under revision. E-print available at `arXiv:1109.0794`.

Liftings of representations of finite reductive groups I: Semisimple conjugacy classes, (with Joshua Lansky), Canad. J. Math.. **66** (2014), no. 6, pp. 1201–1224. DOI: http://dx.doi.org/10.4153/CJM-2014-013-6. E-print available at `arXiv:1106.0786`.

Extensions of representations of p-adic groups, (with Dipendra Prasad), Nagoya Math. J. **208** (2012), pp. 171–199. E-print available at `arXiv:1108.3668`.

Supercuspidal characters of of SL_2 over a p-adic field, (with Stephen DeBacker, P. J. Sally, Jr., and Loren Spice), in Harmonic analysis on reductive, p-adic groups, Robert S. Doran, Paul J. Sally, Jr., and Loren Spice, eds., *Contemporary Mathematics*, vol. 543, pp. 19–69. American Mathematical Society, Providence, RI, 2011. E-print available at `arXiv:1012.5548`.

Depth-zero base change for ramified $U(2,1)$, (with Joshua Lansky), Trans. Amer. Math. Soc., **362** (2010), 5569–5599. E-print available at `arXiv:0807.1528`.

Supercuspidal characters of reductive p-adic groups (with Loren Spice), Amer. J. Math. **131** (2009), no. 4, 1137–1210. E-print available at `arXiv:0707.3313`.

Good product expansions for tame elements of p-adic groups (with Loren Spice), Int. Math. Res. Pap. vol. 2008, 95 pages. E-print available at `arXiv:math.RT/0611554`.

The local character expansion near a tame, semisimple element (with Jonathan Korman), Amer. J. Math., **129** (2007), no. 2, 381–403.

On certain multiplicity one theorems (with Dipendra Prasad), Israel J. Math, **153** (2006), 221–245.

Depth-zero base change for unramified $U(2,1)$, (with Joshua Lansky), J. Number Theory **114** (2005), no. 2, pp. 324–360. Printer's error corrected in vol. **121** (2006), no. 1, 186.

Discrete series representations of unipotent p-adic groups, (with Alan Roche), J. Lie Theory **15** (2005), 261–267.

Injectivity, projectivity, and supercuspidal representations, (with Alan Roche), J. London Math. Soc. (2) **70** (2004), no. 2, 356–368.

Murnaghan-Kirillov theory for supercuspidal representations of tame general linear groups, (with Stephen DeBacker), J. Reine Angew. Math. **575** (2004), 1–35.

Discrete series characters of division algebras and GL_n over a p-adic field (with L. Corwin and P. J. Sally, Jr.), in *Contributions to Automorphic Forms, Geometry, and Number Theory*, pp. 57–64. Edited by H. Hida, D. Ramakrishnan, and F. Shahidi. Johns Hopkins University Press, 2004.

A generalization of a result of Kazhdan and Lusztig, (with Stephen DeBacker), Proc. Amer. Math. Soc., **132** (2004), no. 6, 1861–1868.

Some applications of Bruhat-Tits theory to harmonic analysis on the Lie algebra of a reductive p-adic group (with Stephen DeBacker), Mich. Math. J. **50** (2002), No. 2, 263–286. (An early version of this work was distributed under the title "Moy-Prasad filtrations and harmonic analysis".) MR:2003g:22016.

A construction of types, Analyse harmonique sur le groupe Sp_4, (CIRM, Luminy, June, 1998), Paul Sally, ed. University of Chicago Lecture Notes in Representation Theory, 1999.

An intertwining result for p-adic groups, (with Alan Roche), Canad. J. Math., **52** (2000), no. 3, 449–467.

Refined anisotropic K-types and supercuspidal representations, Pacific J. Math., **185** (1998), no. 1, 1–32. MR:2000f:22019. Zbl 924.22015.

Self-contragredient supercuspidal representations of GL_n, Proc. Amer. Math. Soc., **125** (1997), No. 8, 2471–2479. MR:97j:22038. Zbl 886.22011.

Other subjects

The Poster Session: A Tool for Education, Assessment, and Recruitment (with Ethel R. Wheland, Timothy W. O'Neil, and Kathy J. Liszka), *Mathematics and Computer Education*, **43** (Spring, 2009), no. 2, 141–150.

Reading encrypted diplomatic correspondence: An undergraduate research project, (with Ryan Fuoss, Michael Levin, and Amanda Youell), *Cryptologia*, **32** (2008), Issue 1, pp. 1–12.

Undergraduate research in mathematics at the University of Akron, *Proceeding of the Conference on Promoting Undergraduate Research in Mathematics (Chicago, 2006)*, Joseph A. Gallian, ed., American Mathematical Society, pp. 145–148.

Groups of order p^4 made less difficult (with Michael Garlow and Ethel R. Wheland), preprint.

The Neighborhood Covering Heuristic (NCH) Approach for the General Mixed Integer Programming Problem, (with A. A. Sterns, Douglas Kline, and Scott Collins), Final Report completed for the Navy Personnel Research, Science, and Technology Division, Contract N00014-03-M-0254, Office of Naval Research, 2004.

Invited Presentations

"Transferring representations between finite reductive groups", Paul J. Sally Midwest Representation Theory Conference Columbia, MO, November 13–15, 2015.

"An education reform that passed the test of time", Mathematics Education Seminar, University of Toronto, October 20, 2015.

"Lifting representations of finite reductive groups", Mathematics Seminar, IISER Pune, July 30, 2014.

"Representation theory and p-adic numbers: What and why?", Mathematics Colloquium, IISER Pune, July 24, 2014.

"The dual of a reductive group", Special Session on Recent Progress in the Langlands Program, Joint Mathematics Meetings, Baltimore, January 15, 2014.

"The dual of a reductive group", Session on Harmonic Analysis on Groups over Local Fields, 2013 Canadian Mathematical Society Winter Meeting, Ottawa, December 6–9, 2013.

"Towards a lifting of representations of finite reductive groups", Algebra and Combinatorics Seminar, North Carolina State University, March 11, 2013.

"Liftings and Deligne-Lusztig theory" Conference on Representation Theory of Finite Groups of Lie Type: Deligne-Lusztig Theory, Tata Institute of Fundamental Research, Mumbai, India, December 16, 2011.

"Towards a lifting of representations of finite reductive groups", Lie Theory Seminar, University of Minnesota, April 8, 2011.

"Representation theory and p-adic numbers: What and why?" Frank Stones Lecture, Texas Christian University, March 10, 2011.

"Lifting representations of finite reductive groups", Representation Theory Seminar, University of Oklahoma, March 4, 2011.

"Tamely ramified tori", AMS Special Session on Harmonic Analysis and Representations of Reductive p-adic Groups, Joint Mathematics Meetings, San Francisco, January 16, 2010.

"Nonstandard analysis", University of Vlora, July 16, 2009.

"Towards a lifting of representations of finite reductive groups", University of Zagreb, July 7, 2009.

"Towards a lifting of representations of finite reductive groups", Fields Institute Workshop on Geometry Related to the Langlands Programme, University of Ottawa, May 30, 2009.

"Representation theory and p-adic numbers: What and why?" Colloquium: United States Naval Academy, March 4, 2009.

"Towards a lifting of representations of finite reductive groups", Special Session on p-adic Groups and Automorphic Forms, AMS Meeting #1041, Vancouver, Canada, October 4–5, 2008.

"Towards a lifting of representations of finite reductive groups", Special Session on Geometric and Combinatorial Representation Theory, AMS Meeting #1037, Lousiana State University, Baton Rouge, March 30, 2008.

"Towards a lifting of representations of finite reductive groups", University of California, San Diego, January 10, 2008.

"Representation theory and p-adic numbers: What and why?", Colloquium: Georgetown University, October 19, 2007.

"Towards a lifting of representations of finite reductive groups", University of Maryland, October 3, 2007.

"Multiplicity one upon restriction", Purdue University, April 12, 2007.

"Representation theory and p-adic numbers: What and why?", American University, February 1, 2007.

"Multiplicity one upon restriction", Fields Institute Workshop on the Representation Theory of Reductive Algebraic Groups, University of Ottawa, January 21, 2007.

"Nonstandard analysis", University of Michigan Undergraduate Math Club, November 16, 2006.

"Multiplicity one upon restriction", University of Toronto, March 8, 2006.

"Representations of nilpotent groups", Colloquium: Tata Institute of Fundamental Research, Mumbai, India, November 17, 2005.

"Connectedness of centralizers: work of Steinberg", Harish-Chandra Research Institute, Allahabad, India, November 9–10, 2005.

"The local character expansion near a tame, semisimple element", Recent Trends in Endoscopy and Representation Theory (a conference in honor of E.-W. Zink), Berlin, October 20, 2005.

"Undergraduate research programs: How to start one; how to get your students into one," Ohio NExT Workshop, March 31, 2005.

"Base change and K-types," Purdue University, March 29, 2005.

"Nonstandard analysis," American University, February 9, 2005.

"Nonstandard analysis: calculus without ε and δ," Oberlin College, April, 2004.

"Nonstandard analysis: calculus without ε and δ," Bucknell University, March, 2004.

"Base change and p-adic groups," Colloquium, Bucknell University, March, 2004.

"Categorical properties of supercuspidal representations," Purdue University, November, 2003.

"Categorical properties of supercuspidal representations," University of Michigan, November, 2003.

"Base change, with an explicit example," Tata Institute of Fundamental Research, Mumbai, India, July 1, 2003.

"Depth-zero base change for $U(3)$", International workshop on K-types for p-adic reductive groups, Westfälishe-Willems Universität Münster, Germany, June 13, 2003.

"Base change, with an example", Institute for Mathematical Sciences, Singapore, 31 July, 2002.

"Supercuspidal character germs for classical and other groups", Institute for Mathematical Sciences, Singapore, 26 July, 2002.

"P-adic groups: some analogies and contrasts", J. Clarence Karcher Colloquium, University of Oklahoma, April, 2002

"Harmonic analysis on groups: some analogies and contrasts", Bucknell University, March, 2002.

"P-adic groups: what and why", Bucknell University, March, 2002.

"Character germs and orbits," University of Pittsburgh, March, 2002.

"Harmonic analysis on p-adic groups: What it is," University of Michigan, March, 2002.

"Supercuspidal character germs for classical groups", PIMS Workshop on Representations of Reductive p-adic Groups, Banff, Canada, February, 2002.

"Characters of Lie groups: What are they?", Kent State University, October–November, 2001.

"Kirillov theory and supercuspidal characters of p-adic groups," Cleveland State University, June, 2001.

"Murnaghan-Kirillov Theory for supercuspidal representations," Harmonische Analysis und Darstellungstheorie topologischer Gruppen, Mathematisches Forschungsinstitut Oberwolfach, Germany, July, 2000.

"Supercuspidal characters and coadjoint orbits," Mini-colloque: Harmonic analysis on p-adic groups, Institut Henri Poincaré, Paris, June, 2000.

"Representations of p-adic groups: What and Why?" Cleveland State University, May, 2000.

"Supercuspidal characters and coadjoint orbits," Workshop on Lie Groups, Lie Algebras, and Their Representations, The University of Utah, November, 1999.

"Murnaghan's Kirillov theory," Group and Lie Theory Seminar, The University of Michigan, October, 1999.

"Asymptotic properties of Moy-Prasad filtrations," Representation Theory Seminar, The University of Chicago, June, 1999.

"Wild ramification and Galois descent," Workshop on Representations of Reductive p-adic Groups, Centre de Recherches Mathématiques, Université de Montréal, May, 1999.

"Some examples and consequences of wild ramification," Automorphic Forms and Group Representation Theory Seminar, Purdue University, April, 1999.

"Wild ramification and Moy-Prasad filtrations," Lie Theory and Number Theory Seminar, The University of Toronto, March, 1999.

"Treacherous barbs: Wild Galois descent in buildings," Representation Theory Seminar, The University of Chicago, January, 1999.

"Bushnell-Kutzko types," Harmonic Analysis and Automorphic Representations Seminar, The Ohio State University, October, 1998.

"A construction of types," Analyse harmonique sur le groupe Sp_4, Centre International de Rencontres Mathématiques, Luminy, France, June, 1998.

"P-adic groups: What and Why?," Colloquium Talk, The University of Akron, March, 1998.

"P-adic groups in number theory," Colloquium Talk, Rutgers University—Newark, February, 1998.

"Supercuspidal representations of lots of groups," Group and Lie Theory Seminar, The University of Michigan, November, 1997.

"The support of certain Hecke algebras," Group and Lie Theory Seminar, The University of Michigan, April, 1997.

"Moy-Prasad filtrations and anisotropic K-types," Lie Theory and Number Theory Seminar, The University of Toronto, October–November, 1996.

"Supercuspidal representations of classical groups," Group and Lie Theory Seminar, The University of Michigan, April, 1995.

"Harmonic analysis on p-adic groups," Colloquium Talk, Bowling Green State University, March, 1995.

Contributed Presentations

"Four questions on lifting of semisimple conjugacy classes", Characters, Liftings, and Types II: Boulder, Colorado, June 8, 2011.

"Nonstandard analysis", American University Math Club, Spring, 2010.

"Infinity", American University Math Club, 24 March 2009.

"Nonstandard analysis", Akron REU program, 7 July, 2006; and 17 July, 2007.

"Distributions: How (and why) to differentiate discontinuous functions", Akron SMAC, 15 October, 2002.

"Calculus without ε and δ", Akron SMAC, 8 October, 2002.

"Pointless spaces and valueless functions," University of Akron Mathematics Seminar, 12 February, 2002.

"Harmonic analysis on groups", Akron Algebra Alliance Seminar, University of Akron, 25 September, 2001.

"Profinite groups", Akron Algebra Alliance Seminar, University of Akron, 18 September, 2001.

"Infinity," Natural Sciences Colloquium, Honors Program, University of Akron, September, 2000.

"A Formula for Fibonacci Numbers," Seminar on Linear Algebra and Number Theory, The University of Akron, November, 1999.

"Calculus without ε and δ," Mathematics Division Colloquium, The University of Akron, March, 1999.

"A construction of supercuspidal representations," Joint AMS-MAA-SIAM Meeting, Baltimore, January, 1998.

Teaching Experience

American University

Linear Algebra
Calculus I
Calculus II
Calculus I (Honors)
Calculus II (Honors)
Summer Project: Categories, limits, and infinite Galois theory
Summer Project: Factorization and primality testing
Summer Project: Isometry groups
Modern Algebra
Rings and Fields

The University of Akron

Abstract Algebra I
Abstract Algebra II
Fundamentals of Advanced Mathematics
Seminar in Pure Mathematics: Module Theory
Algebraic Number Theory
Abstract Algebra (independent study)
Calculus I
Master's Project: Small Groups
Master's Project: p-adic Numbers

Master's Thesis: Groups of order 81
Master's Thesis: Nonstandard hulls of groups
Topics in Algebra
Senior Honors Project: Algebraic Topology
Topics in Mathematics (a third course in abstract algebra)
Introduction to Discrete Structures
Calculus with Business Applications
Theory of Numbers
Excursions in Mathematics (formerly Mathematics for Liberal Arts)
Seminar on Chaos and Fractals
Precalculus
Discrete Mathematics

The University of Toronto
Linear Algebra, 2006
Galois Theory, 1998
Chaos, Fractals, and Dynamics, 1997–98

The University of Chicago
Studies in Mathematics, 1990–92, 1993–94.

Service—Professional

Invited Participant: Open Problem Library Workshop, Phoenix, AZ, December 14–17, 2013.
Invited Participant: Open Problem Library Workshop, Charlottesville, VA, June 17–20, 2013.
Selected Participant: INGenIOuS Workshop, Alexandria, VA, July 15–17, 2013.
Organizing Committee: FRG Conference on Characters, Liftings, and Types, American University, June 19–24, 2012.
Ohio Section MAA Committee on Student Members, 2002–07
Reviewer for *Mathematical Reviews*, 2003–present
Reviewer for *Zentralblatt für Mathematik*, 2000–present
Referee for *J. reine angew. Math.*, *J. Lie Theory*, *Int. Math. Res. Not.*, and the *College Math Journal*
Referee for the National Science Foundation, AY2000, 2004, 2005
Panelist for the National Science Foundation, 2006, 2008.
Referee for the Natural Sciences and Engineering Research Council of Canada, January, 2009.
Referee for the Center for Integrative Natural Science and Mathematics, 2002
Co-organizer: Special Session on Representations of Reductive Groups, AMS Regional Meeting, Evanston, October, 2004.

Scientific Organizing Committee: Midwest Representation Theory Conference, Ann Arbor, Michigan, September 30 – October 2, 2005.

Service—American University

Honors 101 Faculty Mentor, Fall, 2009.

Putnam Team co-organizer, 2008.

Math Club co-organizer, 2009–.

Hiring Committee, 2007–09.

Undergraduate Studies Committee, 2007–08.

Faculty Advisor, American University Hawaii Club, January 2008–May 2008.

Service—The University of Akron

Seminars Organized

Pure Mathematics Graduate Seminar (co-organized), Spring, 2004.

Akron Séminaire Mathématiques Appliquées et Cetera, 2002–03.

Akron Mathematics Seminar, Spring, 2002. Speakers came from four universities.

Akron Algebra Alliance seminar, Fall, 2001. Participants came from three universities.

Seminar on Linear Algebra and Number Theory for undergraduates and graduates, November, 1999. (co-organized)

Colloquium Committee, 1999–2000, 2002–03 (Chair), 2003–07
Restarted the colloquium series in the fall of 2002.

Mathematics Graduate Advisor, June 2006–07.

Committee to Revise Mathematics Reappointment, Promotion, and Tenure Guidelines, 2007.

Hiring
Mathematics Search Committee: 2006–07.
Department Chair Search Committee: 2000–01.
Computer Science Search Committee: 1999–2000.

Scholarship Committee, 2005–07.

Hearing Board Pool, 2001–2002

Faculty Advisory Committee, Zips Programming Network, 2004–05

Library Committee, 1998–99 and 2002–03.

Enrichment and outreach Co-organizer of student poster sessions (2003, 2004, and 2006). Typical participation: about 100 students per session.