Patrick K. McFaddin

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Education

Ph.D., Mathematics — May 2016
University of Georgia — Athens, GA

- · Advisor: Daniel Krashen
- · Dissertation: K-cohomology of generalized Severi-Brauer varieties

M.A., Mathematics — August 2011
University of Georgia — Athens, GA

- · Advisor: Robert Varley

B.A., with Honors in Mathematics — May 2010
University of Southern California — Los Angeles, CA

Employment

Fordham University — Aug. 2019 - Present
Assistant Professor

University of South Carolina — Aug. 2016 - June 2019
Visiting Research Assistant Professor

University of Georgia — June 2010- May 2016
Graduate Research and Teaching Assistant

Research Interests

Algebra and algebraic geometry: algebraic K-theory, derived categories, algebraic cycles, motives and motivic cohomology, central simple algebras, algebraic groups, homogeneous and toric varieties, and Galois cohomology.

Publications

1. (with M. Ballard and A. Duncan) On derived categories of arithmetic toric varieties. Ann. K-Theory 4 (2019), no. 2, 211-242.

2. Zero-cycles with coefficients for the second generalized symplectic involution variety of an algebra of degree 4, J. Pure Appl. Algebra, 223 (2019), no. 7, 2822-2830.

3. (with M. Ballard and A. Duncan) The toric Frobenius morphism and a conjecture of Orlov, Eur. J. Math. 5 (2019), no. 3, 640-645.

4. The group of K_1-zero-cycles on the second generalized Severi-Brauer variety of an algebra of index 4. J. Algebra 479 (2017), 192-202.

5. (with V. Alexeev, et al.) Extended Torelli map to the Igusa blowup in genus 6, 7, and 8. Exp. Math. 21 (2012), no. 2, 193-203.

Submitted articles and preprints

6. (with M. Ballard, N. Chidambaram, D. Favero, and R. Vandermolen) Kernels for Grassmann flops. arXiv:1904.12195, 2019.

7. (with M. Ballard and A. Duncan) Derived categories of centrally-symmetric smooth toric Fano varieties. arXiv:1812.09392, 2018.

Physics and Astronomy Research

8. (with E. J. Rhodes, et al.) Temporal changes in the frequencies and widths of the solar p-mode oscillations. Proceedings of SOHO 24/GONG 2010, pp. 134-138, 2011.

9. (with E. J. Rhodes, et al.) Temporal changes in the frequencies of the solar p-mode oscillations during solar cycle 23. Proceedings of the IAU, Vol. 6, Symposium S273, pp. 389-393, 2011.

Awards

AMS–Simons Travel Grant   July 2018 - June 2020
American Mathematical Society and the Simons Foundation

Great Lakes National Scholarship   Aug. 2015
Great Lakes Educational Loan Services

Outstanding Teaching Assistant   March 2015
University of Georgia

VIGRE Graduate Fellowship   Aug. 2011 - July 2012
National Science Foundation

Selected Talks

Twisted forms of toric varieties, their derived categories, and rationality   Nov. 2019
Brauer Groups, Derived Categories and Birational Geometry, BIRS

Arithmetic and geometry of algebraic cycles   Oct. 2019
Lincoln Center Math Seminar, Fordham University

Resolutions of tori and derived categories of toric varieties   Sept. 2019
Emerging Research in Alg. Groups, Motives, and K-Theory, St. Petersburg, Russia

Toric varieties and their derived categories   Feb. 2019
Mathematics Department Colloquium, Georgia Southern University

Geometric study of subfields of some non-commutative algebras   Nov. 2018
Carolina Math Seminar, University of South Carolina

Algebraic cycles on homogeneous varieties   Oct. 2018
Algebra, Geometry, and Number Theory Seminar, Tufts University

Galois descent for exceptional collections on toric varieties	Sept. 2018
Algebra Seminar, University of Tennessee, Knoxville	
Exceptional collections on some arithmetic toric varieties	July 2018
K-theory Conference Workshop, Universidad de Buenos Aires	
Derived categories of arithmetic toric varieties	June 2018
The 13th Brauer Group Conference, Pingree Park, CO	
Groups of loops: they're fundamental!	Feb. 2018
PME and Gamecock Math Club, University of South Carolina	
Exceptional collections on toric varieties	Nov. 2017
Algebraic Geometry Seminar, University of South Carolina	
Lectures on non-commutative motives	May-June 2017
K-theory and related fields trimester program, Hausdorff Institute	
Chow groups with coefficients for some twisted homogeneous varieties	March 2017
Algebraic Geometry Seminar, Courant Institute of Mathematical Sciences	
K_1-zero-cycles for some homogeneous varieties of type A_n and C_n	March 2017
Algebra Seminar, University of Alberta	
Zero-cycles with coefficients for some twisted homogeneous varieties	March 2017
Georgia Algebraic Geometry Symposium, University of Georgia	
K_1-zero-cycles on twisted Grassmannians	Sept. 2016
Topological Approaches to Arithmetic and Algebraic Geometry, University of Georgia	
Chow groups with coefficients and generalized Severi-Brauer varieties	Feb. 2016
Algebra and Number Theory Seminar, Emory University	

Teaching and Training

Fordham University
Instructor of Record

· Math 1203- Applied Calculus	Spring 2020
· Math 1205- Applied Statistics	Spring 2020
· Math 1100- Finite Mathematics	Fall 2019
· Math 1108- Math for Business: Finite	Fall 2019

University of South Carolina
Instructor of Record

· Math 599- Abstract Algebra and Music	Fall 2018
· Math 544- Linear Algebra	Spring 2018
· Math 142- Calculus I (2 sections)	Fall 2017
· Math 747- Algebraic Geometry: Schemes	Spring 2017
· Math 242- Elementary Differential Equations (2 sections)	Fall 2016

University of Georgia
Instructor of Record

· Math 2260- Calculus II for Science and Engineering	Fall 2015
· Math 1113- Pre-Calculus	Spring 2015

· Math 2250- Calculus I for Science and Engineering	Spring 2014
· Math 1113- Pre-Calculus	Fall 2013

Recitation Instructor

· Math 2200- Analytic Geometry and Calculus	Spring 2011
	Fall 2010

Mental Health and International Students Nov. 2018
International Accelerator Program, University of South Carolina

FLIP (Focus on Learning, Innovation and Pedagogy) Participant Fall 2017
Center for Teaching Excellence, University of South Carolina

Observer of first-time graduate instructors Spring 2015
University of Georgia, supervised by Lisa Townsley

UGA graduate student teacher training 2010- 2014
Courses with Robert Rumley, Jon Hanke, Matt Mastin, and Lisa Townsley

Professional Activities

Career Day Volunteer Jan. 2020
The Equity Project Charter School

Faculty Advisor for Math-CISC Major Fall 2019- Present
Fordham University

New Beginnings Life Skills Program Volunteer Fall 2018- Summer 2019
South Carolina Department of Juvenile Justice

Magellan Explorer Project Advisor Spring 2017- Spring 2018
for Danielle Wood, University of South Carolina

Top Scholar Review Committee Member and Interviewer Fall 2017-Spring 2018
University of South Carolina

Motives at South Carolina Spring 2018
Seminar Organizer

Comprehensive Exam Committee Member Spring 2017-Fall 2018
University of South Carolina
- · Candace Bethea
- · Tracy Huggins
- · Alicia Lamarche
- · Robert Vandermolen

Referee 2017-2018
Pacific Journal of Mathematics

South Carolina 4 Square Club (SC4SC) Fall 2017- Spring 2019
Club Advisor

USC Graduate Student Seminar April 2019
Job Market Panelist Sept. 2017

UGA conference on algebraic and analytic aspects of quadratic forms July 2017
Co-organizer with D. Krashen, P. Clark, and K. Thompson

University of South Carolina High School Math Competition — Feb. 2017 / Feb. 2018
Volunteer Judge and Proctor

UGA Graduate Student Bootcamp — June 2016
Job Market Panelist/Speaker on "How to give a good math talk"

University of Georgia Math Camp — June 2016 / July 2014
Graduate Instructor

Project REFOCUS — Spring 2016 / Fall 2015
21st Century Skills Program Volunteer

University of Georgia High School Math Tournament — Nov. 2014 / Nov. 2013
Volunteer

A Place Called Home Non-Profit Youth Center — Spring 2008
Volunteer Tutor, K-12, all subjects

Member of the American Mathematical Society

Skills

Technology

Self-instructed coding in Python, HTML, website building, Mathematica, Sage, Git, LaTeX, MyMathLab, WebAssign, WebWork, BlackBoard, experience with Windows, Mac, Linux (via Ubuntu) operating systems.

Language

- French, limited working proficiency
- Spanish, elementary proficiency

Conferences and Workshops Attended

Brauer Groups, Derived Categories and Birational Geometry — Nov. 2019
Banff International Research Station, Banff, AB, Canada

Emerging Research in Algebraic Groups, Motives, and K-Theory — Sept. 2019
Euler International Mathematical Institute, St. Petersburg, Russia

Rationality problems in algebraic geometry — July 2019
American Institute of Mathematics, San Jose, CA

Derived algebraic geometry and its applications — March 2019
Mathematical Sciences Research Institute, Berkeley, CA

Joint Mathematics Meetings — Jan. 2019
Baltimore, MD

Carolina Math Seminar — Nov. 2018
University of South Carolina

K-theory Conference Workshop (ICM Satellite) — July 2018
Universidad de Buenos Aires, Argentina

K-theory Conference School (ICM Satellite)   July 2018
Universidad Nacional de La Plata, Argentina

The 13$^{\text{th}}$ Brauer Group Conference   June 2018
Colorado State Mountain Campus, Pingree Park, CO

Discover USC   April 2018
Mentor for Danielle Wood, University of South Carolina

A Day of Algebraic Geometry in Savannah   March 2018
Georgia Southern University

Georgia Algebraic Geometry Symposium   Feb. 2018
Georgia Institute of Technology

Joint Mathematics Meetings   Jan. 2018
San Diego, CA

Stacks Project Workshop   July-Aug. 2017
University of Michigan

CAAATQuaFs (Conference on Quadratic Forms)   July 2017
University of Georgia

K-theory and Related Fields Trimester Program   May-June 2017
Hausdorff Research Institute for Mathematics

Georgia Algebraic Geometry Symposium   March 2017
University of Georgia

Lectures in Arithmetic Geometry at Rice   Feb. 2017
Rice University

Topological Approaches to Arithmetic and Algebraic Geometry   Sept. 2016
University of Georgia

Arithmetic Algebraic Geometry   Aug. 2016
Courant Institute of Mathematical Sciences

Joint Mathematics Meetings   Jan. 2016
Seattle, WA

Georgia Algebraic Geometry Symposium   Oct. 2015
Emory University

Local-Global Principles and Their Obstructions   Oct. 2015
University of Pennsylvania

Grad Student Bootcamp for the Alg. Geom. Research Institute   July 2015
University of Utah

The 12$^{\text{th}}$ Brauer Group Conference   June 2015
Colorado State Mountain Campus, Pingree Park, CO

Arizona Winter School: Arithmetic and Higher-Dimensional Varieties   March 2015
University of Arizona

Georgia Algebraic Geometry Symposium   Oct. 2014
University of Georgia

Representation Theory and K-Theory   May 2014
University of Southern California

Southeastern Lie Theory Workshop   May 2014
University of Georgia

Georgia Algebraic Geometry Symposium	Oct. 2013
University of Georgia	
Torsors, Nonassociative Algebras, and Cohomological Invariants	June 2013
Fields Institute	
Homotopical Methods in Algebraic Geometry	May 2013
University of Southern California	
Workshop on Torsors, Motives, and Cohomological Invariants	May 2013
Fields Institute	
Oberwolfach Seminar on Algebraic Groups and Patching	Oct. 2012
Mathematisches Forschungsinstitut Oberwolfach	
Georgia Algebraic Geometry Symposium	May 2012
University of Georgia	
VIGRE Summer School Program in Algebraic Geometry	May 2012
University of Georgia	
Arizona Winter School: Ramification and Geometry	March 2012
University of Arizona	
Algebraic Geometry Northeastern Series Workshop	Oct. 2011
Stony Brook University	
A Celebration of Algebraic Geometry	Aug. 2011
Harvard University	
K-Theory and Motives	March 2011
University of California, Los Angeles	
Compact Moduli and Vector Bundles	May 2010
University of Georgia	

References

Matthew Ballard
  Department of Mathematics
  University of South Carolina

Vladimir Chernousov
  Department of Mathematical and
    Statistical Sciences
  University of Alberta

Daniel Krashen
  Department of Mathematics
  Rutgers University

Andrew Kustin (Teaching)
  Department of Mathematics
  University of South Carolina

Alexander Merkurjev
  Department of Mathematics
  University of California, Los Angeles

Lisa Townsley (Teaching)
  Department of Mathematics
  University of Georgia