Patrick K. McFaddin

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Department of Mathematics

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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

University of South Carolina   Aug. 2016 - Present

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, K-cohomology, algebraic cycles, motives and motivic cohomology, central simple algebras, algebraic groups, homogeneous and toric varieties, derived categories.

Publications

1. (with M. Ballard and A. Duncan) On derived categories of arithmetic toric varieties. arXiv:1709.03574, to appear in Annals of K-Theory.

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, European Journal of Mathematics (2018), DOI.

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.

Work in Progress

1. Twisted Milnor K-theory.
   (with M. Nguyen)

2. Patching over fields and étale K-theory.

3. The Chen-Gibney-Krashen moduli spaces revisited.
   (with P. Gallardo, N. Giansiracusa, and X. Wu).

4. A cocycle-free proof of a theorem of Uematsu on the Brauer group of affine diagonal quadrics.
   (with R. Gordon-Sarney, D. Adams, D. Litt, S. Mathur).

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

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

Twisted linear algebra   Feb. 2018
Graduate Colloquium, 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

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

New Beginnings Life Skills Program Volunteer — Fall 2018- Present
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- Present
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
Volunteer Judge and Proctor Feb. 2018

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
Graduate Instructor July 2014

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

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

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

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