

Patrick K. McFaddin

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Education

Ph.D., Mathematics

University of Georgia

May 2016

Athens, GA

- Advisor: Daniel Krashen
- Dissertation: K -Cohomology of Generalized Severi-Brauer Varieties

M.A., Mathematics

University of Georgia

August 2011

Athens, GA

- Advisor: Robert Varley

B.A., with Honors in Mathematics

University of Southern California

May 2010

Los Angeles, CA

Employment

University of South Carolina

Visiting Research Assistant Professor

Aug. 2016 - Present

University of Georgia

Graduate Research and Teaching Assistant

June 2010- May 2016

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.

Last updated February 10, 2019

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

Physics and Astronomy Research

7. (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.
8. (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. Kernels for Grassmann Flops.
(with M. Ballard, N. Chidambaram, D. Favero, and R. Vandermolen)
3. Patching over fields and étale K -theory.
4. The Chen-Gibney-Krashen moduli spaces revisited.
(with P. Gallardo, N. Giansiracusa, and X. Wu).
5. 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 <i>American Mathematical Society and the Simons Foundation</i>	July 2018 - June 2020
Great Lakes National Scholarship <i>Great Lakes Educational Loan Services</i>	Aug. 2015
Outstanding Teaching Assistant <i>University of Georgia</i>	March 2015
VIGRE Graduate Fellowship <i>National Science Foundation</i>	Aug. 2011 - July 2012

Selected Talks

Toric varieties and their derived categories <i>Mathematics Department Colloquium, Georgia Southern University</i>	Feb. 2019
Geometric study of subfields of some non-commutative algebras <i>Carolina Math Seminar, University of South Carolina</i>	Nov. 2018

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

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
<i>Recitation Instructor</i>	
· Math 2200- Analytic Geometry and Calculus	Spring 2011
	Fall 2010
Mental Health and International Students	Nov. 2018
<i>International Accelerator Program, University of South Carolina</i>	
FLIP (Focus on Learning, Innovation and Pedagogy) Participant	Fall 2017
<i>Center for Teaching Excellence, University of South Carolina</i>	
Observer of first-time graduate instructors	Spring 2015
<i>University of Georgia, supervised by Lisa Townsley</i>	
UGA graduate student teacher training	2010- 2014
<i>Courses with Robert Rumley, Jon Hanke, Matt Mastin, and Lisa Townsley</i>	

Professional Activities

New Beginnings Life Skills Program Volunteer	Fall 2018- Present
<i>South Carolina Department of Juvenile Justice</i>	
Magellan Explorer Project Advisor	Spring 2017- Spring 2018
<i>for Danielle Wood, University of South Carolina</i>	
Top Scholar Review Committee Member and Interviewer	Fall 2017-Spring 2018
<i>University of South Carolina</i>	
Motives at South Carolina	Spring 2018
<i>Seminar Organizer</i>	
Comprehensive Exam Committee Member	Spring 2017-Fall 2018
<i>University of South Carolina</i>	
· Candace Bethea	
· Tracy Huggins	
· Alicia Lamarche	
· Robert Vandermolen	
Referee	2017-2018
<i>Pacific Journal of Mathematics</i>	
South Carolina 4 Square Club (SC4SC)	Fall 2017
<i>Club Advisor</i>	
USC Graduate Student Seminar	Sept. 2017
<i>Job Market Panelist</i>	
UGA conference on algebraic and analytic aspects of quadratic forms	July 2017
<i>Co-organizer with D. Krashen, P. Clark, and K. Thompson</i>	

University of South Carolina High School Math Competition	Feb. 2017
<i>Volunteer Judge and Proctor</i>	Feb. 2018
UGA Graduate Student Bootcamp	June 2016
<i>Job Market Panelist/Speaker on “How to give a good math talk”</i>	
University of Georgia Math Camp	June 2016
<i>Graduate Instructor</i>	July 2014
Project REFOCUS	Spring 2016
<i>21st Century Skills Program Volunteer</i>	Fall 2015
University of Georgia High School Math Tournament	Nov. 2014
<i>Volunteer</i>	Nov. 2013
A Place Called Home Non-Profit Youth Center	Spring 2008
<i>Volunteer Tutor, K-12, all subjects</i>	
Member of the American Mathematical Society	

Skills

Technology

Self-instructed coding in Python, HTML, website building, Mathematica, Sage, Git, L^AT_EX, 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

Joint Mathematics Meetings	Jan. 2019
<i>Baltimore, MD</i>	
Carolina Math Seminar	Nov. 2018
<i>University of South Carolina</i>	
K-theory Conference Workshop (ICM Satellite)	July 2018
<i>Universidad de Buenos Aires, Argentina</i>	
K-theory Conference School (ICM Satellite)	July 2018
<i>Universidad Nacional de La Plata, Argentina</i>	
The 13th Brauer Group Conference	June 2018
<i>Colorado State Mountain Campus, Pingree Park, CO</i>	
Discover USC	April 2018
<i>Mentor for Danielle Wood, University of South Carolina</i>	
A Day of Algebraic Geometry in Savannah	March 2018
<i>Georgia Southern University</i>	

Georgia Algebraic Geometry Symposium <i>Georgia Institute of Technology</i>	Feb. 2018
Joint Mathematics Meetings <i>San Diego, CA</i>	Jan. 2018
Stacks Project Workshop <i>University of Michigan</i>	July-Aug. 2017
CAAATQuaFs (Conference on Quadratic Forms) <i>University of Georgia</i>	July 2017
K-theory and Related Fields Trimester Program <i>Hausdorff Research Institute for Mathematics</i>	May-June 2017
Georgia Algebraic Geometry Symposium <i>University of Georgia</i>	March 2017
Lectures in Arithmetic Geometry at Rice <i>Rice University</i>	Feb. 2017
Topological Approaches to Arithmetic and Algebraic Geometry <i>University of Georgia</i>	Sept. 2016
Arithmetic Algebraic Geometry <i>Courant Institute of Mathematical Sciences</i>	Aug. 2016
Joint Mathematics Meetings <i>Seattle, WA</i>	Jan. 2016
Georgia Algebraic Geometry Symposium <i>Emory University</i>	Oct. 2015
Local-Global Principles and Their Obstructions <i>University of Pennsylvania</i>	Oct. 2015
Grad Student Bootcamp for the Alg. Geom. Research Institute <i>University of Utah</i>	July 2015
The 12th Brauer Group Conference <i>Colorado State Mountain Campus, Pingree Park, CO</i>	June 2015
Arizona Winter School: Arithmetic and Higher-Dimensional Varieties <i>University of Arizona</i>	March 2015
Georgia Algebraic Geometry Symposium <i>University of Georgia</i>	Oct. 2014
Representation Theory and K-Theory <i>University of Southern California</i>	May 2014
Southeastern Lie Theory Workshop <i>University of Georgia</i>	May 2014
Georgia Algebraic Geometry Symposium <i>University of Georgia</i>	Oct. 2013
Torsors, Nonassociative Algebras, and Cohomological Invariants <i>Fields Institute</i>	June 2013
Homotopical Methods in Algebraic Geometry <i>University of Southern California</i>	May 2013
Workshop on Torsors, Motives, and Cohomological Invariants <i>Fields Institute</i>	May 2013

Oberwolfach Seminar on Algebraic Groups and Patching <i>Mathematisches Forschungsinstitut Oberwolfach</i>	Oct. 2012
Georgia Algebraic Geometry Symposium <i>University of Georgia</i>	May 2012
VIGRE Summer School Program in Algebraic Geometry <i>University of Georgia</i>	May 2012
Arizona Winter School: Ramification and Geometry <i>University of Arizona</i>	March 2012
Algebraic Geometry Northeastern Series Workshop <i>Stony Brook University</i>	Oct. 2011
A Celebration of Algebraic Geometry <i>Harvard University</i>	Aug. 2011
K-Theory and Motives <i>University of California, Los Angeles</i>	March 2011
Compact Moduli and Vector Bundles <i>University of Georgia</i>	May 2010

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