

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

Fordham University

Assistant Professor (tenure-track)

Aug. 2019 - Present

University of South Carolina

Visiting Research Assistant Professor

Aug. 2016 - June 2019

University of Georgia

Graduate Research and Teaching Assistant

June 2010- May 2016

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.

Last updated June 15, 2020

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, submitted.
7. (with M. Ballard and A. Duncan) Derived categories of centrally-symmetric smooth toric Fano varieties. arXiv:1812.09392, submitted.
8. (with M. Ballard, A. Duncan, A. Lamarche) Separable algebras and coflasque resolutions. arXiv:2006.06876, 2020.
9. (with M. Ballard, A. Duncan, A. Lamarche) Consequences of the existence of exceptional collections in arithmetic and rationality. In preparation, 2020.

Physics and Astronomy Research

10. (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.
11. (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

American Mathematical Society and the Simons Foundation

July 2018 - June 2021

Great Lakes National Scholarship

Great Lakes Educational Loan Services

Aug. 2015

Outstanding Teaching Assistant

University of Georgia

March 2015

VIGRE Graduate Fellowship

National Science Foundation

Aug. 2011 - July 2012

Selected Talks

Algebraic groups, torsors, and twisted forms

Lincoln Center Math Seminar, Fordham University

Jan. 2020

Twisted forms of toric varieties, their derived categories, and rationality

Brauer Groups, Derived Categories and Birational Geometry, BIRS

Nov. 2019

Arithmetic and geometry of algebraic cycles

Lincoln Center Math Seminar, Fordham University

Oct. 2019

Resolutions of tori and derived categories of toric varieties

Emerging Research in Alg. Groups, Motives, and K-Theory, St. Petersburg, Russia

Sept. 2019

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
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

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

MoMath Math Gym Host (via Zoom)

May 2020

National Museum of Mathematics, New York, NY

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 <i>Pac. J. Math and J. Eur. Math. Soc.</i>	2017-2020
South Carolina 4 Square Club (SC4SC) <i>Club Advisor</i>	Fall 2017- Spring 2019
USC Graduate Student Seminar <i>Job Market Panelist</i>	April 2019 Sept. 2017
UGA conference on algebraic and analytic aspects of quadratic forms <i>Co-organizer with D. Krashen, P. Clark, and K. Thompson</i>	July 2017
University of South Carolina High School Math Competition <i>Volunteer Judge and Proctor</i>	Feb. 2017 Feb. 2018
UGA Graduate Student Bootcamp <i>Job Market Panelist/Speaker on "How to give a good math talk"</i>	June 2016
University of Georgia Math Camp <i>Graduate Instructor</i>	June 2016 July 2014
Project REFOCUS <i>21st Century Skills Program Volunteer</i>	Spring 2016 Fall 2015
University of Georgia High School Math Tournament <i>Volunteer</i>	Nov. 2014 Nov. 2013
A Place Called Home Non-Profit Youth Center <i>Volunteer Tutor, K-12, all subjects</i>	Spring 2008
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

Electronic Algebraic K-Theory Seminar <i>Organizers: B. Antieau, E. Elmanto, A. Mathew, M. Yakerson</i>	June 2020
Quadratic forms, linear algebraic groups and beyond <i>Organizers: P. Gille, Z. Reichstein, K. Zainoulline</i>	May-June 2020
Teaching as a legitimate application of college mathematics <i>META Math Webinar, Mathematical Association of America</i>	May 2020

Brauer Groups, Derived Categories and Birational Geometry <i>Banff International Research Station, Banff, AB, Canada</i>	Nov. 2019
Emerging Research in Algebraic Groups, Motives, and K-Theory <i>Euler International Mathematical Institute, St. Petersburg, Russia</i>	Sept. 2019
Rationality problems in algebraic geometry <i>American Institute of Mathematics, San Jose, CA</i>	July 2019
Derived algebraic geometry and its applications <i>Mathematical Sciences Research Institute, Berkeley, CA</i>	March 2019
Joint Mathematics Meetings <i>Baltimore, MD</i>	Jan. 2019
Carolina Math Seminar <i>University of South Carolina</i>	Nov. 2018
K-theory Conference Workshop (ICM Satellite) <i>Universidad de Buenos Aires, Argentina</i>	July 2018
K-theory Conference School (ICM Satellite) <i>Universidad Nacional de La Plata, Argentina</i>	July 2018
The 13th Brauer Group Conference <i>Colorado State Mountain Campus, Pingree Park, CO</i>	June 2018
Discover USC <i>Mentor for Danielle Wood, University of South Carolina</i>	April 2018
A Day of Algebraic Geometry in Savannah <i>Georgia Southern University</i>	March 2018
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
CAATQuaFs (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