

# Patrick K. McFaddin

LeConte College 300E  
Department of Mathematics  
University of South Carolina

pkmcfaddin@gmail.com  
mcfaddin.github.io

## 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 geometry.

## Publications

1. 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.
2. (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.
3. (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.

4. (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.

### Submitted articles and preprints

5. (with M. Ballard and A. Duncan) The toric Frobenius morphism and a conjecture of Orlov. arXiv:1709.07128, submitted, 2017.
6. Zero-cycles with coefficients for the second generalized symplectic involution variety of an algebra of degree 4, arXiv:1703.03826, submitted, 2017.
7. (with M. Ballard and A. Duncan) On derived categories of arithmetic toric varieties. arXiv:1709.03574, submitted, 2018.

### Work in Progress

1. Exceptional collections for generalized del Pezzo varieties via windows (with M. Ballard and A. Duncan)
2. Twisted Milnor  $K$ -theory (with M. Nguyen)
3. Kernels for Grassmann flops (with M. Ballard and R. Vandermolen)
4. Patching over fields and étale  $K$ -theory.
5. The Chen-Gibney-Krashen moduli spaces revisited. (with P. Gallardo, N. Giansiracusa, and X. Wu).
6. 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).

### Selected Talks

<b>Groups of Loops: They're Fundamental!</b> <i>PME and Gamecock Math Club</i>	Feb. 2018
<b>Twisted Linear Algebra</b> <i>Graduate Colloquium, University of South Carolina</i>	Feb. 2018
<b>Exceptional Collections on Toric Varieties</b> <i>Algebraic Geometry Seminar, University of South Carolina</i>	Nov. 2017
<b>Lectures on noncommutative motives</b> <i><math>K</math>-theory and related fields, Hausdorff Institute</i>	May-June 2017
<b>Chow groups with coefficients for some twisted homogeneous varieties</b> <i>Algebraic Geometry Seminar, Courant Institute of Mathematical Sciences</i>	March 2017
<b><math>K_1</math>-zero-cycles for some homogeneous varieties of type <math>A_n</math> and <math>C_n</math></b> <i>Algebra Seminar, University of Alberta</i>	March 2017

<b>Zero-cycles with coefficients for some twisted homogeneous varieties</b> <i>Georgia Algebraic Geometry Symposium, University of Georgia</i>	March 2017
<b><math>K_1</math>-zero-cycles on twisted Grassmannians</b> <i>Topological Approaches to Arithmetic and Algebraic Geometry, University of Georgia</i>	Sept. 2016
<b>Subfields of central simple algebras</b> <i>Math Department Colloquium, California State University Sacramento</i>	Feb. 2016
<b>Chow groups with coefficients and generalized Severi-Brauer varieties</b> <i>Algebra and Number Theory Seminar, Emory University</i>	Feb. 2016

## Teaching and Training

### University of South Carolina

*Instructor of Record*

· 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

### FLIP (Focus on Learning, Innovation and Pedagogy) Participant

*Center for Teaching Excellence, University of South Carolina*

Fall 2017

### Observer of first-time graduate instructors

*University of Georgia, supervised by Lisa Townsley*

Spring 2015

### UGA graduate student teacher training

*Courses with Robert Rumley, Jon Hanke, Matt Mastin, and Lisa Townsley*

2010- 2014

## Professional Activities

### Magellan Explorer Project Advisor

*for Danielle Wood, University of South Carolina*

Spring 2017- Present

### Top Scholar Review Committee Member and Interviewer

*University of South Carolina*

Fall 2017-Spring 2018

### Motives at South Carolina

*Seminar Organizer*

Spring 2018

<b>Comprehensive Exam Committee Member</b> <i>University of South Carolina</i>	Spring-Fall 2017
· Candace Bethea · Alicia Lamarche · Robert Vandermolen	
<b>Referee</b> <i>Pacific Journal of Mathematics</i>	2017-2018
<b>South Carolina 4 Square Club (SC4SC)</b> <i>Club Advisor</i>	Fall 2017
<b>USC Graduate Student Seminar</b> <i>Job Market Panelist</i>	Sept. 2017
<b>UGA conference on algebraic and analytic aspects of quadratic forms</b> <i>Co-organizer with D. Krashen, P. Clark, and K. Thompson</i>	July 2017
<b>University of South Carolina High School Math Competition</b> <i>Volunteer Judge and Proctor</i>	Feb. 2017 Feb. 2018
<b>UGA Graduate Student Bootcamp</b> <i>Job Market Panelist/Speaker on “How to give a good math talk”</i>	June 2016
<b>University of Georgia Math Camp</b> <i>Graduate Instructor</i>	June 2016 July 2014
<b>Project REFOCUS</b> <i>21st Century Skills Program Volunteer</i>	Spring 2016 Fall 2015
<b>University of Georgia High School Math Tournament</b> <i>Volunteer</i>	Nov. 2014 Nov. 2013
<b>A Place Called Home Non-Profit Youth Center</b> <i>Volunteer Tutor, K-12, all subjects</i>	Spring 2008
<b>Member of the American Mathematical Society</b>	

## Skills

### Technology

Self-instructed coding in Python, HTML, website building, Mathematica, Sage, Git, L<sup>A</sup>T<sub>E</sub>X, MyMathLab, WebAssign, WebWork, BlackBoard, experience with Windows, Mac, Linux (via Ubuntu) operating systems.

### Language

- French, limited working proficiency
- Spanish, elementary proficiency

## Awards

<b>Great Lakes National Scholarship</b> <i>Great Lakes Educational Loan Services</i>	Aug. 2015
<b>Outstanding Teaching Assistant</b> <i>University of Georgia</i>	March 2015
<b>VIGRE Graduate Fellowship</b>	Aug. 2011 - July 2012

## Conferences and Workshops Attended

<b>Discover USC</b> <i>Mentor for Danielle Wood, University of South Carolina</i>	April 2018
<b>A Day of Algebraic Geometry in Savannah</b> <i>Georgia Southern University</i>	March 2018
<b>Georgia Algebraic Geometry Symposium</b> <i>Georgia Institute of Technology</i>	Feb. 2018
<b>Joint Mathematics Meetings</b> <i>San Diego, CA</i>	Jan. 2018
<b>Stacks Project Workshop</b> <i>University of Michigan</i>	July-Aug. 2017
<b>CAAATQuaFs (Conference on Quadratic Forms)</b> <i>University of Georgia</i>	July 2017
<b>K-theory and Related Fields Trimester Program</b> <i>Hausdorff Research Institute for Mathematics</i>	May-June 2017
<b>Georgia Algebraic Geometry Symposium</b> <i>University of Georgia</i>	March 2017
<b>Lectures in Arithmetic Geometry at Rice</b> <i>Rice University</i>	Feb. 2017
<b>Topological Approaches to Arithmetic and Algebraic Geometry</b> <i>University of Georgia</i>	Sept. 2016
<b>Arithmetic Algebraic Geometry</b> <i>Courant Institute of Mathematical Sciences</i>	Aug. 2016
<b>Joint Mathematics Meetings</b> <i>Seattle, WA</i>	Jan. 2016
<b>Georgia Algebraic Geometry Symposium</b> <i>Emory University</i>	Oct. 2015
<b>Local-Global Principles and Their Obstructions</b> <i>University of Pennsylvania</i>	Oct. 2015
<b>Grad Student Bootcamp for the Alg. Geom. Research Institute</b> <i>University of Utah</i>	July 2015
<b>The 12th Brauer Group Conference</b> <i>Pingree Park, CO</i>	June 2015

<b>Arizona Winter School: Arithmetic and Higher-Dimensional Varieties</b> <i>University of Arizona</i>	March 2015
<b>Georgia Algebraic Geometry Symposium</b> <i>University of Georgia</i>	Oct. 2014
<b>Representation Theory and <math>K</math>-Theory</b> <i>University of Southern California</i>	May 2014
<b>Southeastern Lie Theory Workshop</b> <i>University of Georgia</i>	May 2014
<b>Georgia Algebraic Geometry Symposium</b> <i>University of Georgia</i>	Oct. 2013
<b>Torsors, Nonassociative Algebras, and Cohomological Invariants</b> <i>Fields Institute</i>	June 2013
<b>Homotopical Methods in Algebraic Geometry</b> <i>University of Southern California</i>	May 2013
<b>Workshop on Torsors, Motives, and Cohomological Invariants</b> <i>Fields Institute</i>	May 2013
<b>Oberwolfach Seminar on Algebraic Groups and Patching</b> <i>Mathematisches Forschungsinstitut Oberwolfach</i>	Oct. 2012
<b>Georgia Algebraic Geometry Symposium</b> <i>University of Georgia</i>	May 2012
<b>VIGRE Summer School Program in Algebraic Geometry</b> <i>University of Georgia</i>	May 2012
<b>Arizona Winter School: Ramification and Geometry</b> <i>University of Arizona</i>	March 2012
<b>Algebraic Geometry Northeastern Series Workshop</b> <i>Stony Brook University</i>	Oct. 2011
<b>A Celebration of Algebraic Geometry</b> <i>Harvard University</i>	Aug. 2011
<b><math>K</math>-Theory and Motives</b> <i>University of California, Los Angeles</i>	March 2011
<b>Compact Moduli and Vector Bundles</b> <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

**Alexander Duncan**

Department of Mathematics  
University of South Carolina

**Daniel Krashen**

Department of Mathematics  
University of Georgia

**Andrew Kustin** (Teaching)

Department of Mathematics  
University of South Carolina

**Lisa Townsley** (Teaching)

Department of Mathematics  
University of Georgia