Daniel Krashen **Curriculum Vitæ** February 20, 2019

CONTACT

Department of Mathematics, Rutgers University
Hill Center for the Mathematical Sciences
110 Frelinghuysen Rd.
Piscataway, NJ 08854-8019

daniel.krashen@gmail.com

WEBSITE

http://dkrashen.org

PHD THESIS

Birational Isomorphisms between Severi-Brauer Varieties
University of Texas at Austin, under the direction of David J. Saltman

APPOINTMENTS

Professor, 2018-, Rutgers University

Professor, 2017-2018, University of Georgia

Associate Professor, 2012-2017, University of Georgia

Assistant Professor, 2008-2012, University of Georgia

Visiting Scholar, 2007-2008, University of Pennsylvania

Member, Fall 2006, Institute for Advanced Study, Princeton

Member, 2004-2005, Institute for Advanced Study, Princeton

Gibbs Assistant Professor, 2003-2007, Yale University

Visiting Scholar, 2002-2003, University of Michigan, Ann Arbor

VIGRE Assistant Professor, 2001-2003, University of California, Los Angeles

Graduate Instructor, 1997-2001, University of Texas at Austin

AWARDS AND HONORS

Associate editor, Notices of the American Mathematical Society (2018-)

Fellow of the American Mathematical Society (2017)

Presidential Early Career Award for Scientists and Engineers (PECASE) (2016)

University of Georgia Outstanding Professor Award (2016)

Associate editor, American Mathematical Monthly (2014-)

Faculty Early Career Development (CAREER) (2012)

University of Georgia Creative Research Medal (2012)

Graduate Research Assistantship, UT Austin (1998-2000)

Edward and Louise Dodd Teaching Excellence Award, UT Austin (2000)

Continuing Fellowship, UT Austin (1998-1999)

David Bruton Jr. Fellowship, UT Austin (1996)

National Science Foundation Graduate Fellowship (1994-1997)

Rebecca Cary Orr Memorial Prize in Mathematics, Oberlin College (1994)

ADMINISTRATION

Co-organizer of UGA MathCamp (2013, 2014, 2016, 2018)
MathCamp is a week long outreach program for local high school students, involving UGA Math faculty, graduate students, and undergraduate majors.

NSF Research and Training Grant (Algebraic Geometry, Algebra and Number Theory) academic year coordinator (2016-2017)

Research Manuscripts

1. *Local-Global Principles for Zero-Cycles on Homogeneous Spaces over Arithmetic Function Fields*, with Jean-Louis Colliot-Thélène, David Harbater, Julia Hartmann, R. Parimala and V. Suresh. *Preprint.* http://arxiv.org/abs/1710.03173.

2. *Schubert cycles and subvarieties of generalized Severi-Brauer varieties*, with Caroline Junkins and Nicole Lemire. *Preprint.* http://arxiv.org/abs/1704.08687.

3. *The Clifford algebra of a finite morphism*, with Max Lieblich. *Preprint.* http://arxiv.org/abs/1509.07195.

4. *Local-global Galois theory of arithmetic function fields*, with David Harbater, Julia Hartmann, R. Parimala and V. Suresh. To appear in the Israel Journal of Mathematics. *Preprint.* http://arxiv.org/abs/1710.03635.

5. *Period-index bounds for arithmetic threefolds*, with Benjamin Antieau, Asher Auel, Colin Ingalls and Max Lieblich, to appear in Inventiones Mathematicae. http://arxiv.org/abs/1704.05489.

6. *Derived categories for torsors for Abelian schemes*, with Benjamin Antieau and Matthew Ward, Advances in Mathematics, 306 (2017), 1-23. http://arxiv.org/abs/1409.2580.

7. *Period and index, symbol lengths, and generic splittings in Galois cohomology*, Bulletin of the London Mathematical Society, 48 (2016), no. 6, 985-1000. http://arxiv.org/abs/1305.5217.

8. *Local-global principles for torsors over arithmetic curves*, with David Harbater and Julia Hartmann, American Journal of Mathematics, 137 (2015), no. 6, 1559–1612. http://arxiv.org/abs/1108.3323.

9. *Diophantine and cohomological dimensions*, with Eliyahu Matzri, Proceedings of the AMS, 143 (2015), no. 7, 2779–2788. http://arxiv.org/abs/1305.5295.

10. *Refinements to patching and applications to field invariants*, with David Harbater and Julia Hartmann, International Math. Research Notices, doi: 10.1093/imrn/rnu278 (2015). http://arxiv.org/abs/1404.4349.

11. *Local-global principles for Galois cohomology*, with David Harbater and Julia Hartmann, Comment. Math. Helv., 89 (2014), no. 1, 215–253. http://arxiv.org/abs/1208.6359.

12. *Weierstrass preparation and algebraic invariants*, with David Harbater and Julia Hartmann, Math. Ann., 356 (2013), no. 4, 1405–1424. http://arxiv.org/abs/1109.6362.

13. *Relative Brauer groups of genus 1 curves*, with Mirela Ciperiani, Israel J. Math., 192 (2012), no. 2, 921–949. http://arxiv.org/abs/math/0701614.

14. *Appendix to: Period and index in the Brauer group of an arithmetic surface*, J. Reine Angew. Math., 659 (2011), 1–41. http://arxiv.org/abs/math/0702240.

15. *Patching subfields of division algebras*, with David Harbater and Julia Hartmann, Trans. Amer. Math. Soc., 363 (2011), no. 6, 3335–3349. http://arxiv.org/abs/0904.1594.

16. *Distinguishing division algebras by finite splitting fields*, with Kelly McKinnie, Manuscripta Math., 134 (2011), no. 1-2, 171–182. http://arxiv.org/abs/1001.3685.

17. *Field patching, factorization, and local-global principles*, Quadratic forms, linear algebraic groups, and cohomology, 57–82, Dev. Math., 18, Springer, New York, 2010. http://arxiv.org/abs/0909.3115.

18. *Corestrictions of algebras and splitting fields*, Trans. Amer. Math. Soc., 362 (2010), no. 9, 4781–4792. http://arxiv.org/abs/0704.3443.

19. *Zero cycles on homogeneous varieties*, Adv. Math., 223 (2010), no. 6, 2022–2048. http://arxiv.org/abs/math/0501399.

20. *Applications of patching to quadratic forms and central simple algebras*, with David Harbater and Julia Hartmann, Inventiones Mathematicae, 178 (2010), no. 2, 231–263. http://arxiv.org/abs/0809.4481.

21. *Pointed trees of projective spaces.*, with Linda Chen and Angela Gibney, J. Algebraic Geom., 18 (2009), no. 3, 477–509. http://arxiv.org/abs/math/0505296.

22. *Index reduction for Brauer classes via stable sheaves*, with Max Lieblich, Int. Math. Res. Not. IMRN, no. 8 (2008), Art. ID rnn010, 31 pp. http://arxiv.org/abs/0706.1072.

23. *Birational maps between generalized Severi-Brauer varieties*, J. Pure Appl. Algebra, 212 (2008), no. 4, 689–703. http://arxiv.org/abs/math/0203117.

24. *Motives of unitary and orthogonal homogeneous varieties*, J. Algebra, 318 (2007), no. 1, 135–139. http://arxiv.org/abs/math/0603389.

25. *Severi-Brauer varieties and symmetric powers*, with David J. Saltman, Algebraic transformation groups and algebraic varieties, 59–70, Encyclopaedia Math. Sci., 132, Springer, Berlin, 2004.

26. *Severi-Brauer varieties of semidirect product algebras*, Doc. Math., 8 (2003), 527–546 (electronic). http://arxiv.org/abs/math/0206154.

Grants

Active Grants

1. *The 13th Brauer Group Meeting, National Science Foundation (3/1/2018-2/28/2019),* PI: Kelly McKinnie, coPIs: Daniel Krashen.
2. *FRG: Collaborative Research: Obstructions to Local-Global Principles and Applications to Algebraic Structures, National Science Foundation (07/01/15-06/31/18),* PI: Daniel Krashen (in collaboration with D. Harbater, J. Hartmann, R. Parimala, V. Suresh).
3. *Collaborative Research: Georgia Algebraic Geometry Symposium, National Science Foundation (06/15/15-05/31/18),* PI: Valery Alexeev, coPIs: Valery Alexeev, Noah Giansiracusa, Daniel Krashen, Angela Gibney, Dino Lorenzini.
4. *RTG: Algebra, Algebraic Geometry, and Number Theory, National Science Foundation (DMS-1344994 , 05/01/14-04/30/19)* PI: Dino Lorenzini, coPIs: Valery Alexeev, Pete L. Clark, Daniel Krashen, Angela Gibney.
   http://agant.torsor.org
5. *CAREER: The Arithmetic of Fields and the Complexity of Algebraic Structures, National Science Foundation (DMS-1151252 , 07/01/12-06/30/17)* PI: Daniel Krashen.

Previous Grants Awarded

6. *The 12th Brauer Group Meeting, National Science Foundation (04/01/15-03/31/16),* PI: Kelly McKinnie, coPIs: Daniel Krashen, Eric Brussel.
   Description: *For a conference which was held summer 2015 at Pingree Park Colorado on the study of the Brauer group.*
   http://torsor.github.io/brauer/index2015/.
7. *The structure of invariants in algebra and geometry, National Science Foundation (DMS-1007462 , 09/01/10-08/31/13)* PI: Daniel Krashen.
8. *The 10th Brauer Group Meeting, National Science Foundation (DMS-1214939 , 06/01/12-05/31/13)* PI: Kelly McKinnie, coPIs: Daniel Krashen, Eric Brussel.
9. *Young Investigator's Grant, National Security Agency (2009-2010),* PI: Daniel Krashen.
10. *University of Georgia Foreign travel grant, University of Georgia (2009),* PI: Daniel Krashen.
11. *Young Investigator's Grant, National Security Agency (H98230-08-1-0109 , 2008-2009)* PI: Daniel Krashen.
12. *Young Investigator's Grant, National Security Agency (H98230-06-1-0032 , 2006-2007)* PI: Daniel Krashen.

Workshops

1. Topological Approaches to Algebra and Arithmetic Geometry (co-organizer), 2016.
2. Local-Global Principles and Their Obstructions, University of Pennsylvania (co-organizer, presenter), 2015.
3. Algebraic Geometry in Seattle: New connections for recent PhDs (mentor), 2014.
4. Brauer groups and obstruction problems: moduli spaces and arithmetic, American Institute of Mathematics (participant), 2013.
5. Oberwolfach Seminar: Algebraic Groups and Patching (co-organizer, presenter), 2012.
6. Deformation theory, patching, quadratic forms, and the Brauer group, American Institute of Mathematics (co-organizer, participant), 2011.
7. Rational curves and $\mathbb{A}^1$-homotopy theory, American Institute of Mathematics (participant), 2009.

Conference Organization

1. AGNES: Algebraic Geometry Northeast Series, at Rutgers, co-organized with Lev Borisov, Anders Busch, Angela Gibney, 2018.
   http://www.agneshome.org/rutgers-2018
2. ECHORaP: Emory Conference on Higher Obstructions to Rational Points, co-organized with D. Harbater, J. Hartmann, R. Parimala, V. Suresh, 2017.
   https://sites.google.com/site/echorap2017/
3. The Georgia Algebraic Geometry Symposium at the University of Georgia, co-organized with V. Alexeev, A. Gibney, D. Lorenzini, 2017.
   https://sites.google.com/site/galgeoms2017/
4. The Georgia Algebraic Geometry Symposium at Emory, co-organized with A. Gibney, R. Parimala, V. Suresh, D. Zurich-Brown, 2015.
   https://sites.google.com/site/galgeoms2015/
5. Workshop: Local-Global Principles and Their Obstructions, co-organized with D. Harbater, J. Hartmann, R. Parimala, V. Suresh, 2015.
   https://www.math.upenn.edu/~hartmann/sha/
6. The 12th Brauer Group Meeting at Pingree Park, co-organized with Eric Brussel and Kelly McKinnie, 2015.
   http://torsor.github.io/brauer/index2015/
7. The Georgia Algebraic Geometry Symposium, co-organized with Valery Alexeev, Noah Giansiracusa and Angela Gibney, 2014.
   http://gags.torsor.org/conf2014/

8. AMS special session: Galois Cohomology and the Brauer Group, Knoxville, TN, co-organized with Ben Antieau and V. Suresh, 2014.
   http://www.ams.org/meetings/sectional/2216_special.html
9. The Georgia Algebraic Geometry Symposium, co-organized with Valery Alexeev and Angela Gibney, 2013.
   http://gags.torsor.org/conf2013/
10. Algebraic Groups and Patching, Oberwolfach Mathematical Research Institute, Oberwolfach, Germany, co-organized with Karim Becher, David Harbater and Julia Hartmann, 2012.
11. The 10th Brauer Group Meeting at Pingree Park, co-organized with Eric Brussel and Kelly McKinnie, 2012.
12. The Georgia Algebraic Geometry Symposium and Summer School Program, University of Georgia, co-organized with Valery Alexeev, Angela Gibney and Elham Izadi, 2012.
13. Ramification in Algebra and Geometry at Emory, co-organized with Asher Auel, Eric Brussel, Skip Garibaldi and R. Parimala, 2011.
14. Deformation theory, patching, quadratic forms, and the Brauer group, American Institute of Mathematics, co-organized with Max Lieblich, 2011.
15. Local-global principles for étale cohomology, Banff International Research Station, Research in Teams program, co-organized with David Harbater and Julia Hartmann, 2010.
16. The Brauer group in Israel, Kibbutz Ketura, Israel, co-organized with Skip Garibaldi, Louis Rowen, David Saltman, Jack Sonn and Uziel Vishne, 2010.
17. Conference on the Brauer group at Pingree Park, co-organized with Skip Garibaldi and Kelly McKinnie, 2008.

PhD students

Current PhD students

1. Riley Ellis
   Topic: Ulrich bundles and Clifford algebras.
2. Saurabh Gosavi
   Topic: Splitting behavior of quadratic forms.
3. Ernest Guico
   Topic: Admissible groups over semiglobal fields.

Former PhD students

4. Patrick McFaddin,
   Visiting Research Assistant Professor at the University of South Carolina,
   Thesis: *K-Cohomology of Generalized Severi-Brauer Varieties, 2016.*
5. Maren Turbow,
   Statistical Modeler at LexisNexis Risk Solutions,
   Thesis: *The Structure Theory of Graded Central Simple Algebras, 2016.*

6. Kate Thompson (coadvised with Jonathan Hanke),
   Assistant Professor DePaul University/ Shelly Visiting Assistant Professor at Carnegie Mellon University,
   Thesis: *Explicit Representation Results of Quadratic Forms over* $\mathbb{Q}$ *and* $\mathbb{Q}\sqrt{5}$ *by Analytic Methods, 2014.*

7. Stacy Musgrave,
   Assistant Professor of Mathematics at Cal Poly Pomona,
   Thesis: *Structure and Representation of Alternative Clifford Algebras of Quadratic Forms, 2013.*

Courses taught

Fall 2018 (Rutgers University)	*Homological Algebra* (MATH 560), Course website: http://dkrashen.github.io/homological-algebra/
Spring 2018 (University of Georgia)	*Graduate Seminar in Computational Mathematics* (MATH 8850), Course website: http://compvrg.github.io/compvrg-spring-2018/
Spring 2017 (University of Georgia)	*Field Arithmetic* (MATH 8430), Course website: http://dkrashen.github.io/fa/ *Calculus I - two sections* (MATH 2250), Course website: http://dkrashen.github.io/calc1/
Fall 2016 (University of Georgia)	*Combinatorics* (MATH 4670/6670), Course website: http://dkrashen.github.io/combinatorics/
Previous Graduate Courses at UGA	*Central Simple Algebras* (MATH 8330) *Algebraic Stacks* (MATH 8330) *Algebraic Geometry: Cohomology* (MATH 8315) *Reading course on Etale Cohomology* *Reading course on Algebraic Geometry* *Quadratic Forms* (MATH 8030) *Graduate Algebra* (MATH 8000) *Spectral Sequences* (MATH 8900) *Algebraic Geometry: Schemes* (MATH 8310)

Previous Undergraduate Courses at UGA	*Graph Theory* (MATH/CS 4690/6690)
	Calculus I (MATH 2250)
	Calculus II (MATH 2260)
	Graph Theory (MATH/CS 4690/6690)
	Linear Algebra (MATH 3000)

Selected courses taught at other institutions	Numerical Analysis I and II (UCLA), Algebraic K-theory (Yale), Intersection Theory (Yale), Galois Theory (Yale), Partial Differential Equations (UPenn).