

REBECCA E. FIELD

Associate Professor
Department of Mathematics and Statistics
James Madison University
Harrisonburg, VA 22802

fieldre@jmu.edu
<http://educ.jmu.edu/~fieldre>

EMPLOYMENT

Visiting Scholar, University of Virginia, Charlottesville, VA 2017-2018
Associate Professor, James Madison University, Harrisonburg, VA, 2013-
Assistant Professor, James Madison University, Harrisonburg, VA, 2008-2013
Visiting Scholar, DPMMS, Center for Mathematical Sciences, Cambridge University, Cambridge,
UK, 2007-2008
Visiting Scholar, Reed College, Portland, Oregon, 2007-2008
Visiting Assistant Professor, Bowdoin College, 2005-2007
Visiting Assistant Professor, University of California-Santa Cruz, 2003-2005
VIGRE-Van Vleck Visiting Assistant Professor, University of Wisconsin-Madison, 2000-2003

EDUCATION

PhD. in Mathematics, University of Chicago, August 2000,
advisors: Burt Totaro, Peter May.
M.S. in Mathematics, University of Chicago, August 1995.
B.A. in Mathematics and Studio Art, Bowdoin College, May 1994,
with high honors in Studio Art.

RESEARCH INTERESTS

Algebraic topology, algebraic geometry, and their interactions.
Classifying spaces of reductive groups, and equivariant geometry.
String theory (dynamics of semi-classical strings on non-trivial geometry).
Hash algorithms and coding theory.
Mathematics of games and puzzles.
3D printing and prosthetics

PUBLICATIONS

The Chow ring of the symmetric space $Gl(2n, \mathbf{C})/SO(2n, \mathbf{C})$, *Journal of Algebra*, Volume 249,
Issue 1, 1 January, 2012.
The Chow ring of the classifying space $BSO(2n, \mathbf{C})$, *Journal of Algebra*, Volume 350, Issue 1,
15 January, 2012.
 MU^*BG_2, CH^*BG_2 and descent, joint with I.Grojnowski, preprint, to be submitted to *Journal
of Algebra*.
 $BSO(2n)$ as an extension of $BO(2n)$ by $BSp(2n)$, joint with I.Grojnowski, preprint.
Dynamics on asymptotically conical geometries, joint with I.Melnikov and B.Weaver, 2017 preprint,
arXiv:1710.00404 [hep-th]
Minimal complete Shidoku symmetry groups, joint with B.Arnold, S.Lucas, and L.Taalman,
Journal of Combinatorial Mathematics and Combinatorial Computing, Volume 87, Nov
2013.
Using truncated addition to analyze add-rotate-xor hash algorithms, joint with B.Jones, *Journal
of Mathematical Cryptology* 7 (2) (2013) 97-110.
Nest graphs and minimal complete symmetry groups for magic Sudoku variants, joint with
E.Arnold, J.Lorch, S.Lucas, and L.Taalman, *Rocky Mountain Journal of Mathematics*
Volume 45, Number 3 (2015), 887-901.
Permutations, pattern avoidance, and the Catalan triangle, joint with B.Jones, D.DeSantis,
W.Hough, R.Meissen and J.Ziefle, *Missouri Journal of Mathematics* Vol 24, No. 2, Fall,
2012.

The Igusa local zeta function for $x^n + y^m$, joint with V.Gargeya, M.Robinson F.Schoenberg, and R.Scott, 1992 preprint, arXiv:1207.2474 [math.NT].

Physical properties of hyperbolic space in relation to the history of clothing and armor, in preparation, to be submitted to a popular science journal.

Hash algorithms over \mathbf{Z} , preprint, available on request.

Harrisonburg, VA bus survey report, joint with Transportation for the Public/Transporte para el Publico, presented to Harrisonburg Department of Public Transportation, September 2011.

PRESENTATIONS

Introduction to group cohomology and a surprise appearance of ZFC, Colloquium, JMU, 2018

Finite generation of group cohomology, WINR Conference, UVA, September, 2018.

Matrix groups as twisted products of spheres, Undergraduate Math Club, UVA, 2018

Line bundles and complex cobordism II, Faculty Research Seminar, JMU, 2016

Line bundles and complex cobordism, Faculty Research Seminar, JMU, 2016

Why do we care about complex cobordism?, Faculty Research Seminar, JMU, 2016

Stumbling towards a pattern: how to make pants, Joint Math Meetings, 2014

BG_2 and descent, Topology Seminar, University of Virginia, 2013

MU^*BG_2, CH^*BG_2 and descent, Joint Math Meetings, 2012

Minimal complete Shidoku symmetry groups, Joint Math Meetings, 2012

BSO_{2n} as an extension of BO_{2n} by BSp_{2n} , Algebra Seminar at Cambridge University, UK, 2011

BSO_{2n} as an extension of BO_{2n} by BSp_{2n} , Topology Seminar, University of Virginia, 2010

The decent spectral sequence for SL_2 and PSL_2 , Joint Mathematics Meetings, 2010

Physical properties of hyperbolic space in relation to the history of clothing and armor, Joint Math Meetings, 2010

Algebra seminar, University of California-Davis, 2005.

Colloquium, University of California-Santa Cruz, 2004.

Colloquium, Wayne State University, 2002.

Fifth joint meeting AMS-SMM, Morelia, Mexico, contributing talk, Morelia Mexico, May 23-26, 2001.

Third Annual Midwest Algebraic Geometry Conference, contributing talk, Columbia, MO, 1999.

CONFERENCE ORGANIZATION

Topology session, Women's Intellectual Network Research Symposium, UVA, September, 2018.

THESIS

On the Chow ring of the classifying space $BSO(2n, \mathbf{C})$.

AWARDS AND FELLOWSHIPS

Educational Leave Support, JMU September 2017-May 2018

Institute for Computational and Experimental Research in Mathematics Topical Workshop on Illustrating Mathematics, June 2016, workshop participant with full funding.

Institute for Advanced Study/Park City Mathematics Institute Summer Session on Math and Materials, Undergraduate Faculty Program, accepted with full funding, but was unable attend due to traumatic brain injury.

DC/MD/VA Sectional Project NeXT Fellow, 2008-2010.

Faculty Research Grant, Bowdoin College, 2006-2007.

VIGRE Grant, University of Wisconsin-Madison, 2000-2003.

Booth Prize for the four best University of Chicago graduate student instructors, based on student nominations, May 1999.

Graves Memorial Lectureship Teaching Prize, given to Lecturers in Mathematics for effective and responsible undergraduate teaching by their second year of teaching, May 1998.

Nominated for Physical Sciences Division Graduate Student Teaching Prize, based on student

nominations, May 1998.
Honorable mention, AWM Alice T. Schafer Prize , August 1993
Smyth Prize, Bowdoin College, April 1993.

TEACHING EXPERIENCE

James Madison University

Advanced Linear Algebra, current
Independent Study in Differential Geometry (with Dr. Duncan), Oct 2018- current
Calculus with functions II, Jan - May 2009, 2015, and current, Sept - Dec 2013
Linear Algebra, September - December 2018
Introduction to 3D Printing and Design, Sept - Dec 2014-2017, 2018 Jan - May 2015-2016
Representation Theory, January -May 2017
Calculus with functions I, Sept - Dec 2008-2009, 2014, 2016, Jan - May 2017
Introduction to Topology, September - December 2010 and current
Putnam Problem Seminar, Sept - Dec, 2010-2013, 2015 (with Dr. Jones), and current (solo)
Advanced Calculus II (Real Analysis), January - May 2016
Advanced Calculus (Real Analysis), January - May and September - December 2015
Independent Study in Differential Geometry of Curves and Surfaces, January - May 2014
Differential Geometry with Applications to General Relativity, January - May 2014
Differential Geometry, September - December 2012
Abstract Algebra II, January - May 2012
Abstract Algebra, January - May 2011, September - December 2011
Linear Algebra with Differential Equations, January - May 2013
Supplemental Course in Group Theory, January - May 2012
JMU NSF Supported REU in Algebraic Combinatorics, June - July 2011
Independent Study in Summer Research, June - July 2011
Independent Study, Topology 2, January - May 2011
Independent Study, Topology, January - May 2013
Independent Study, Abstract Algebra Assistant, September - December 2012
Calculus I, January - May 2011, September - December 2012
Calculus II, January - May 2010, September - December 2010 and January - May 2016
Nature of Mathematics, January - May 2012

Reed College

Topology Learning Seminar, February - May 2008

Bowdoin College

Independent Study in Linear Algebra (from a theoretical prospective), January - May 2006
Linear Algebra (an applied math class), January - May 2006
Introduction to Mathematical Analysis, September - December 2006
Independent Study in Algebraic Geometry, January - May 2006
Introduction to Mathematical Reasoning, January - May 2006
Multivariate Calculus, September - December 2005,
September - December 2006
Integral Calculus, September - December 2005,
January - May 2006
Differential Calculus, January - May 2007

University of California-Santa Cruz

Calculus for Science, Engineering, and Mathematics II, March - June 2005
Introduction to Proof and Problem Solving, January - March 2005
Introduction to Topology, September - December 2004
Calculus with Applications II, September - December 2004
Abstract Algebra, September 2003 - March 2004

Precalculus, January - March 2004
 Linear Algebra, September - December 2003
 University of Wisconsin-Madison
 Topics in Algebraic Geometry, January - May 2003
 Introduction to Modern Algebra, September - December 2002
 College Geometry I, Euclidean and non-Euclidean geometry, January - May 2001.
 Arithmetical Problem Solving, for elementary education majors, September - December 2000,
 September - December 2001
 Geometrical Inference and Reasoning, for elementary education majors, January - May 2002
 University of Chicago
 Lecturer for Fundamental Mathematics, pre-calculus, October 1998 - March 1999,
 October 1999 - March 2000
 Lecturer for Calculus 152-3, intermediate level calculus, October 1997 - March 1998.
 Lecturer for Elementary Functions and Calculus 131-2-3, October 1996 - June 1997
 Teaching Assistant for Abstract Algebra 254-5-6, October 1995 - June 1996
 Outreach for the Chicago Public School System
 Teaching Assistant for Summer Institute for the Development of Mathematics Teachers in
 Chicago High Schools, June - July 2000
 Teaching Assistant for supplementary training for CPS middle and high school teachers,
 September 1998 - May 1999, January 1999 - May 2000

LETTERS OF RECOMMENDATION FROM

Ian Grojnowski, University of Cambridge, Cambridge, England	groj@dpmms.cam.ac.uk
Allen Knutson, Cornell University	allenk@math.ucsd.edu
J. Peter May, University of Chicago	may@math.uchicago.edu
Dave Carothers, James Madison University	carothdc@jmu.edu
Jennifer Taback (teaching letter), Bowdoin College	jtaback@bowdoin.edu