

Brenda Johnson
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Department of Mathematics
Union College
Schenectady, NY 12308

Education

BROWN UNIVERSITY Ph.D. 1991, Sc.M. 1987
GRINNELL COLLEGE B.A., 1985

Professional Experience

UNION COLLEGE:

2004 - present Professor
2004 - 2007 Chair, Department of Mathematics
1998 - 2004 Associate Professor
1991 - 1998 Assistant Professor

VISITING POSITIONS AND RESEARCH VISITS:

May-June, 2010 Visitor, Ecole Polytechnique Fédérale de Lausanne
January, March, 2006 Visitor, Institut Mittag-Leffler
Fall, 2002 Visiting Associate Professor, Johns Hopkins University
1991 - 1992 Visiting Assistant Professor, Northwestern University

Teaching Experience

COURSES TAUGHT AT UNION COLLEGE: Calculus I, II, III, and IV, Linear Algebra, Differential Equations, Integrated Math/Physics I and II, Mathematical Political Science, Logic and Set Theory, Geometry, Abstract Algebra, Number Theory, Topology, Knot Theory, Galois Theory

COURSES TAUGHT AT JOHNS HOPKINS UNIVERSITY: Calculus I

COURSES TAUGHT AT NORTHWESTERN UNIVERSITY: Calculus I and II, Differential Equations, Calculus of Homotopy Functors (graduate seminar)

THESES AND INDEPENDENT STUDIES: directed 28 undergraduate thesis projects, 2 undergraduate research projects, and 1 masters thesis on topics in knot theory, topology, algebraic topology, dynamical systems, cryptography, number theory, Galois theory, and combinatorics

Publications

REFEREED ARTICLES AND BOOK CHAPTERS:

- The derivatives of homotopy theory*, Trans. Amer. Math. Soc. 347 (1995), 1295-1321
(with Randy McCarthy) *Linearization, Dold-Puppe stabilization, and Mac Lane's Q-construction*, Trans. Amer. Math. Soc. 350 (1998), 1555-1593
(with Randy McCarthy) *Taylor towers for functors of additive categories*, J. Pure Appl. Algebra 137 (1999), 253-284
(with Michael Frame and Jim Sauerberg) *Fixed points and Fermat: a dynamical systems approach to number theory*, Amer. Math. Monthly 107 (2000), no. 5, 422-428
(with William Johnson) *On the size of links in $K_{n,n}$, $K_{n,n,1}$ and K_n* , J. Knot Theory 11 (2002), no. 2, 145-152
(with Randy McCarthy) *A classification of degree n functors, I*, Cah. Topol. Géom. Différ. Catég. 44 (2003), no. 1, 2-38
(with Randy McCarthy) *A classification of degree n functors, II*, Cah. Topol. Géom. Différ. Catég. 44 (2003), no. 3, 163-216
(with Randy McCarthy) *Deriving calculus with cotriples*, Trans. Amer. Math. Soc. 356 (2004), 757-803
(with Randy McCarthy), *Taylor towers of symmetric and exterior powers*, Fund. Math. 201 (2008), 197-216
(with Michele Intermont and Randy McCarthy), *The rank filtration and Robinson's complex*, J. Pure Appl. Algebra 212 (2008), 735-752
(with Mark Kidwell and T.S. Michael), *Intrinsically knotted graphs have at least 21 edges*, J. Knot Theory 19 (2010), 1423-1429
(with Kristin Fox, Kimberley Frederick, and Catherine Berheide) *Adapting Mentoring Programs to the Liberal Arts College Environment in Mentoring Strategies To Facilitate the Advancement of Women Faculty*, ACS Publications Symposium Series 1057, 2010
(with Michael Frame and Kathleen Meloney) *Generating Euclidean structures using IFS with memory*, in *Classification and Application of Fractals*, NOVA Publishers, 2011
(with Kristine Bauer and Randy McCarthy) *Cross effects and calculus in an unbased setting*, to appear in Trans. Amer. Math. Soc.
(with Maria Basterra, Kristine Bauer, Agnès Beaudry, Rosona Eldred, Mona Merling, and Sarah Yeakel), *Unbased calculus for functors to chain complexes*, to appear in *Women in topology: collaborations in homotopy theory*, *Contemp. Math.* (2015)
- ### EDITED VOLUMES:
- Christian Ausoni, Kathryn Hess, Brenda Johnson, Wolfgang Lück, and Jérôme Scherer, editors, *An alpine expedition through algebraic topology*, *Contemp. Math.* 617, American Mathematical Society (2014)
- Maria Basterra, Kristine Bauer, Kathryn Hess, and Brenda Johnson, editors, *Women in topology: collaborations in homotopy theory*, to appear in *Contemp. Math.* (2015)

PREPRINT:

(with Kristine Bauer, Rosona Eldred, and Randy McCarthy), *Combinatorial models for Taylor polynomials of functors*

Funding

NSF Research Opportunity Award, 2003-2006

NSF Advance PAID, PI, Skidmore Union Network, 2008-2012

NSF Conference Grant, PI, Fourth Arolla Conference on Algebraic Topology, 2012

AWM Travel Grant, 2012

Clay Mathematics Institute Enhancement and Partnership Program, Manifolds, K -theory, and Related Topics, 2014

NSF Conference Grant, PI, Manifolds, K -theory, and Related Topics, 2014

Invited Presentations (since 2000):

Yale University Topology Seminar, October 19, 2000

SUNY-Albany Graduate Student Seminar, November 8, 2000

Johns Hopkins University Topology Seminar, March 13, 2001

Johns Hopkins University Topology Seminar, April 15, 2002

Franklin and Marshall College/ Millersville University Mathematics Colloquium, October 31, 2002

Special Session on Homotopy Theory, AMS-MAA Joint Meetings, Baltimore, MD, January 18, 2003

Grinnell College Mathematics Colloquium, February 14, 2003

Purdue University Topology Seminar, April 1, 2003

Special Session on Algebraic Topology, AMS Central Sectional Meeting, Bloomington, IN, April 5, 2003

Knots in Washington XVI, University of Maryland, College Park, MD, May 6, 2003

Special Session on Knots, Links, and Embedded Graphs, AMS Southeast Sectional Meeting, Chapel Hill, NC, October 25, 2003

University of Calgary Discrete Mathematics Seminar, March 26, 2004

Special Session on Homotopy Theory, AMS Northeast Sectional Meeting, Lawrenceville, NJ, April 18, 2004

M.I.T. Topology Seminar, December 5, 2005

Northeastern University Representation Theory Seminar, February 10, 2006

Johns Hopkins University Topology Seminar, April 17, 2006

Pi Mu Epsilon Induction, Skidmore College, March 26, 2007

Special Session on Homotopy Theory, CMS Winter Meeting, London, Ontario, December 8, 2007

Siena College Mathematics Colloquium, February 6, 2008

Special Session on Algebraic Topology, AMS Fall Eastern Section Meeting, Middletown, CT, October 12, 2008

Homotopy Theory Mini Conference, Altoona, PA, October 23, 2009

Indiana University Topology Seminar, Bloomington, IN, November 18, 2009

University of British Columbia Topology Seminar, Vancouver, BC, April 7, 2010

KTH Algebra and Geometry Seminar, Stockholm, Sweden, May 30, 2010

EPFL Topology Seminar, Lausanne, Switzerland, May 17 - June 3, 2010 (four lectures)

Utilizing NSF ADVANCE to Promote the Success of Women Faculty in Mathematics, panel at Joint Mathematics Meetings, New Orleans, LA, January 8, 2011

Functor Calculus and Operads, Banff International Research Station, Banff, Alberta, March 17, 2011

Special Session on Geometric and Algebraic Topology, AMS Northeast Sectional Meeting, Ithaca, NY, September 11, 2011

Special Session on Calculus of Functors, AMS-MAA Joint Meetings, Boston, MA, January 6, 2012

Special Session on Homotopy Theory, Canadian Mathematical Society Summer Meeting, Regina, Saskatchewan, June 4, 2012

SUNY-Albany Algebra and Topology Seminar, University at Albany, March 27, 2014

Conferences and Seminars Co-organized:

AWM Workshop on Homotopy Theory, Joint Mathematics Meetings, San Antonio, January 13, 2015

Manifolds, K-theory, and Related Topics, Dubrovnik, Croatia, June 23-27, 2014

WIT: Women in Topology, Banff International Research Station, August 18-23, 2013

Fourth Arolla Conference on Algebraic Topology, Arolla, Switzerland, August 20-26, 2012

Hudson River Undergraduate Mathematics Conference, 1998-2012

Union College Mathematics Conference, 1994, 2001, 2003, 2005, 2011, 2013

Johns Hopkins University Topology Seminar, 2002-2003