Peter Bonventre, Ph.D.

Contact Information

University of Kentucky
Department of Mathematics
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Research Interests

Algebraic topology and equivariant stable homotopy theory, in particular equivariant operads, dendroidal sets, model categories, and structured ring spectra.

Additional Skills

Project design, technical writing and communication, collaboration, teaching
Programming: Python, git, LaTeX, Macaulay2

Academic Appointments

Postdoctoral Scholar August 2017 – June 2020
University of Kentucky, Lexington, KY

Education

University of Virginia, Charlottesville, VA May 2017
Ph.D., Mathematics. Thesis: *Comparison of Models for Equivariant Operads*
Advisor: Michael Hill

Union College, Schenectady, NY June 2011
B.S. in Mathematics and Physics, *summa cum laude*

Publications

The genuine operadic nerve
Theory and Application of Categories, **34** (2019), 736–780. arXiv:`1904.01465`

Equivariant dendroidal Segal spaces and G-∞-operads (with L. Pereira)
To appear in *Algebraic & Geometric Topology*. arXiv:`1801.02110`

Estimating Energy Expenditure during Level, Uphill, and Downhill Walking
D. Looney, W. Santee, E. Hansen, **P. Bonventre**, C. Chalmers, A. Potter
Medicine & Science in Sports & Exercise, 2019, Vol.51(9), pp. 1954–1960

Nonfreezing Interfacial Layers of Cyclohexane in Nanoporous Silica
S. Amanuel, H. Bauer, **P. Bonventre**, D. Lasher.
Journal of Physical Chemistry C, 2009, 113(44), 18983–18986

Preprints

Rigidification of dendroidal infinity-operads (with L. Pereira)
arXiv:`2004.12296`, submitted

On the homotopy theory of equivariant colored operads (with L. Pereira)
arXiv:`2004.01352`, submitted

Additive power operations in equivariant cohomology (with B. Guillou and N. Stapleton), arXiv:`2001.11078`, submitted

Equivariant dendroidal sets and simplicial operads (with L. Pereira)
arXiv:`1911.06399`, submitted

Homotopy theory of equivariant operads with fixed colors (with L. Pereira)
arXiv:`1908.05440`, submitted

Genuine equivariant operads (with L. Pereira)
arXiv:1707.02226, submitted

Grants

Learning Technologies Incubator grant, "An Experiment in Flipped-Classroom Calculus Instruction," University of Virginia, 2016-2017
Travel support for Young Topologists Meeting, 2016
Dean's Dissertation Completion Fellowship, University of Virginia, 2015–2017
Travel support for GSTGC, 2016

Awards

Outstanding GTA, Honorable Mention, University of Virginia, 2017
Outstanding Mathematics GTA, University of Virginia, 2016
COMAP Mathematical Contest in Modeling, Meritorious Designation, 2009,2010,2011
Martin Terry Resch Prize, Mathematics Department, Union College, 2011
Barry M. Goldwater Scholarship, 2010

Mentorship Roles

Group leader, University of Kentucky MathLab, *3D Visualization*, 2019–present
Math Club Faculty Advisor, University of Kentucky, 2017–present
Math Outreach Ambassador, University of Virginia, 2014–2016
Graduate Teaching Mentor, University of Virginia, 2014–2016

Service

Referee for several mathematics journals
Co-organizer, Midwest Topology Conference, University of Kentucky, Fall 2018
Co-organizer, Student Seminar in Homotopy Theory, University of Virginia, Fall 2015
Academic Opportunities Program Tutor, Union College, 2007–2008

Invited Talks

Additive power operations in equivariant cohomology, Vanderbilt University, Topology Seminar, March 2020 (cancelled, COVID-19)

Additive power operations in equivariant cohomology, AMS Sectional Meeting, Special Session on Homotopy Theory, University of Virginia, March 2020 (cancelled, COVID-19)

Power operations and transfers in equivariant cohomology theory, Joint Mathematics Meetings, Special Session on Categorical and Computational Methods in Homotopy Theory, January 2020

Equivariant symmetric monoidal categories and K-theory, UIUC, Topology Seminar, November 2019

Equivariant trees and equivariant higher algebra, AMS Section Meeting, Special Session on Homotopy Theory, University of Wisconson-Madison, September 2019

G-trees and equivariant higher algebra, UCLA, Algebraic Topology Seminar, May 2019

Generalizing composition of functions and operads, Union College, Student Seminar, February 2019

Symmetric monoidal Mackey functors, SUNY Albany, Algebra/Topology Seminar, February 2019

Models for equivariant operads, AMS, Special Session on Recent Progress and New Directions in Homotopy Theory, April 2018

Genuine equivariant operads, Indiana University, Topology Seminar, November 2017

Genuine equivariant operads, Vanderbilt University, Topology Seminar, October 2017

Genuine equivariant operads, Johns Hopkins University, Topology Seminar, April 2017

Equivariant trees and G-dendroidal sets, 31st Summer Conference on Topology and its Applications, Algebraic Topology Special Session; Leicester, England, August 2016

Select Other Talks

Generalizing composition of functions and operads, University of Kentucky, Undergraduate Math Club, February 2020

Additive power operations in equivariant cohomology, University of Kentucky, Topology Seminar, February 2020

Equivariant trees and equivariant higher algebra, University of Kentucky, Topology Seminar, September 2019

Equivariant power operations and the transfer, University of Kentucky, Topology Seminar, January 2019

Symmetric monoidal Mackey functors, University of Kentucky, Topology Seminar, September 2018

Equivariant dendroidal Segal spaces and categorical homotopy theory, University of Kentucky, Topology Seminar, January 2018

Operads and exotic multiplications, University of Kentucky, Topology Seminar, September 2017

Genuine equivariant operads, Joint Mathematics Meetings, January 2017

Genuine equivariant operads, University of Virginia, Topology Seminar, October 2016

Equivariant trees and G-dendroidal sets, Bell Talk, BIRS Operations in Highly Structured Homology Theories; Banff, Canada, May 2016

Presenting Equivariant Operads, Graduate Student Topology and Geometry Conference; Bloomington, Indiana, April 2016

Models for Equivariant Infinite Loop Spaces, University of Virginia, Graduate Student Seminar, November 2015

Presenting Equivariant Operads, University of Virginia, Topology Seminar, Oct. 2015

G-spectra and duality, University of Virginia, Equivariant Homotopy Theory Seminar, September 2015

Flexibly Planar and Flexibly Flat Graphs, MathFest 2010, with Lydia Garcia, Alex Murray, and Sarah Rasco, August 2010

Teaching Experience

Instructor of Record, University of Kentucky
Number Theory (inquiry-based learning), MA 261, Spring 2020
Elementary Calculus and its Applications (large lecture), MA 123, Spring 2020
Elementary Calculus and its Applications (large lecture), MA 123, Fall 2019
Topology II, MA 352, Spring 2019
Independent Study in Category Theory, Spring 2019
Topology I, MA 351, Fall 2018
Calculus III (large lecture), MA 213, Fall 2018
Calculus III (large lecture), MA 213, Spring 2018
Calculus III (large lecture), MA 213, Fall 2017
Number Theory (inquiry-based learning), MA 261, Fall 2017

Course Development Collaborator, University of Virginia, Fall 2016
Redesigned Calculus I with a focus on active- and cooperative-learning.
Supported by a Learning Technologies Incubator grant, "An Experiment in Flipped-Classroom Calculus Instruction," from the University of Virginia.

Instructor of Record, University of Virginia

Flipped-Classroom Calculus I (inquiry-based learning), MATH 1310, Spring 2017
Calculus I, MATH 1310, Fall 2016
Applied Calculus II, MATH 1220, Fall 2015
Applied Calculus II, MATH 1220, Fall 2014
Applied Calculus II, MATH 1220, Spring 2014
Applied Calculus I, MATH 1210, Fall 2013
Applied Calculus II, MATH 1220, Spring 2013
Applied Calculus I, MATH 1220, Fall 2012

Graduate Teaching Assistant, University of Virginia
Differential Equations, MATH 3250, Spring 2012
Calculus II, MATH 1320, Spring 2012
Calculus I, MATH 1310, Fall 2011

Select conferences and workshops attended

BIRS Equivariant Stable Homotopy Theory and p-adic Hodge Theory, Banff, Canada, March 2020

Midwest Topology Seminar, University of Chicago, October 2019

Midwest Topology Seminar, Michigan State University, May 2019

Midwest Topology Seminar, UIUC, February 2019

Upstate New York Topology Seminar, SUNY Albany, November 2018

Co-organized Midwest Topology Seminar, University of Kentucky, September 2018

Chromatic Homotopy Theory, Journey to the Frontier, University of Colorado Boulder, May 2018

Midwest Topology Seminar, University of Indiana, April 2018

Midwest Topology Seminar, Northwestern University, March 2018,

Homotopy Theory Summer, Equivariant homotopy theory and K-theory, Freie Universität Berlin, Germany, June 2018

Speaker at 31st Summer Conference on Topology and its Applications, University of Leicester, England, August 2016

Invertibility and Duality in DAG and Homotopy Theory, University of Regensburg, Germany, April 2017

Young Topologists Meeting, University of Copenhagen, Denmark, July 2016

BIRS Operations in Highly Structured Homology Theories, Banff, Canada, May 2016

Speaker at Graduate Student Topology and Geometry Conference, University of Indiana, April 2016

Mid-Atlantic Topology Conference, Johns Hopkins University, March 2016

BIRS Equivariant Derived Algebraic Geometry, Banff, Canada, Feb. 2016

Introductory School to Homotopy theory, manifolds, and field theories, Hausdorff Institute for Mathematics, Germany, May 2015

Mid-Atlantic Topology Conference, University of Virginia, April 2015

Re-imagining the Foundations of Algebraic Topology, MSRI, April 2014

Mathfest, Pittsburg, Pennsylvania, August 2010

References

Michael Hill
UCLA, Professor
mikehill@math.ucla.edu
(310) 825-2229

Andrew Blumberg
University of Texas at Austin, Professor
blumberg@math.utexas.edu
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Erica Whitaker (teaching)
University of Kentucky, Lecturer
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