

William Balderrama

Contact information

Address: Department of Mathematics
University of Virginia
141 Cabell Drive, Kerchof Hall
P.O. Box 400137
Charlottesville, VA 22904
Office: 301 Kerchof Hall
Email: eqr8nm@virginia.edu
Website: <https://williamb.info>

Research interests

Homotopy theory, category theory, and related topics.

Employment

University of Virginia 2021–present
RTG Research Associate and Lecturer

Education

University of Illinois at Urbana-Champaign
Ph.D. in Mathematics 2015–2021
Advisor: Charles Rezk
Thesis title: *Deformations of homotopy theories via algebraic theories*

University of California, Los Angeles
B.S. in Mathematics 2013–2015

Papers and preprints

An elementary proof of the chromatic Smith fixed point theorem 2023
With Nick Kuhn
<https://arxiv.org/abs/2303.02022>

The Real-oriented cohomology of infinite stunted projective spaces 2022
<https://arxiv.org/abs/2207.06934>

Total power operations in spectral sequences 2022
<https://arxiv.org/abs/2205.07409>

K-theory equivariant with respect to an elementary abelian 2-group 2022
<https://nyjm.albany.edu/j/2022/28-67.html>

The motivic lambda algebra and motivic Hopf invariant one problem 2021
With Dominic Leon Culver and J. D. Quigley
<https://arxiv.org/abs/2112.07479>

Algebraic theories of power operations 2021
<https://arxiv.org/abs/2108.06802>

Deformations of homotopy theories via algebraic theories 2021
<https://arxiv.org/abs/2108.06801>

The C_2 -equivariant $K(1)$ -local sphere 2021
<https://arxiv.org/abs/2103.13895>

Definability and decidability in expansions by generalized Cantor sets 2017
 With Philipp Hieronymi
<https://arxiv.org/abs/1701.08426>

Teaching
experience

University of Virginia

Instructor Math 3351 Elementary Linear Algebra Fall 2022
Instructor Math 3354 Survey of Algebra Spring 2022
Instructor Math 3000 Transition to Higher Mathematics Fall 2021

University of Illinois at Urbana-Champaign

Teaching assistant Math 220 Calculus I Spring 2020
Grader Math 570 Mathematical Logic Fall 2020
Grader Math 225 Introductory Matrix Theory Fall 2020
Grader Math 125 Elementary Linear Algebra Fall 2020
Teaching assistant Math 231 Calculus II Spring 2020
Teaching assistant Math 221 Calculus I Fall 2019
Teaching assistant Math 231 Calculus II Spring 2019
Head TA Math 221 Calculus I Fall 2018
Teaching assistant Math 221 Calculus I Fall 2017
Teaching assistant Math 221 Calculus I Fall 2016
Grader Math 213 Discrete mathematics Fall 2015
Grader Math 241H Honors Calculus III Fall 2015

Miscellaneous

University of Virginia Topology REU Summer 2022
 Mentored a group of four undergraduates in a project on equivariant persistence.

eCHT Online Research Community Spring 2022
Co-organizer for online reading seminar on synthetic homotopy theory
s.wayne.edu/echt/echt-synthetic-spectra-reading-seminar-winter-2022

Illinois Geometry Lab 2019, 2020
Graduate team leader
 Helped lead a group of five undergraduates in a project about operads.

Honors / awards **The Philippe Tondeur Dissertation Prize (UIUC)** 2021

On the List of Teachers Ranked as Excellent (UIUC) 2019, 2020
GAANN Fellowship recipient (UIUC) 2015, 2017, 2018
Sloan Scholar, Alfred P. Sloan Foundation's Minority Ph.D. Program 2015

Invited talks

UCSD Topology seminar March 2023
James-type periodicities in equivariant stable homotopy theory

MIT Topology Seminar February 2023
Equivariant chromatic localizations

AMS 2022 Fall Western Sectional October 2022
The Real-oriented cohomology of stunted projective spaces

Johns Hopkins Topology Seminar October 2022
The Real-oriented cohomology of stunted projective spaces

University of Regina Topology Seminar March 2022
The motivic lambda algebra and Hopf invariant one problem
Recording available at <https://youtu.be/fdiL5NPMRDc>

Electronic Computational Homotopy Theory Seminar February 2022
Some chromatic equivariant homotopy theory

**Special Session on Homotopy Theory, AMS Sectional Meeting,
University of Virginia (cancelled)** March 2022

Texas A&M University Topology Seminar September 2021

University of Virginia Topology Seminar October 2020
Approximating higher algebra by derived algebra

Chicagoland Topology seminar September 2020

Hopkins Topology Seminar, John Hopkins University September 2020

University of Kentucky Topology Seminar September 2020
From power operations to E-infinity maps

**The Transatlantic Transchromatic Homotopy Theory Conference II
Warm-up conference** August 2020