

**Contact  
information**

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**Employment**

**University of Bonn** 2024–present  
Hausdorff Postdoc

**University of Virginia** 2021–2024  
RTG Research Associate and Lecturer

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**Education**

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

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

**Los Medanos College** 2011–2013  
Transferred to UCLA

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**Papers**

*Equivariant  $v_{1,\bar{0}}$ -self maps*  
With Yueshi Hou and Shangjie Zhang.  
*Bull. Lond. Math. Soc.* 58: e70288 (2026).  
<https://doi.org/10.1112/blms.70288>

*The  $C_2$ -equivariant  $K(1)$ -local sphere*  
*Math. Z.* 312, 52 (2026).  
<https://doi.org/10.1007/s00209-025-03925-1>.

*Deformations of homotopy theories via algebraic theories*  
*Adv. Math.* 480 B, 110496 (2025).  
<https://doi.org/10.1016/j.aim.2025.110496>.

*Type 2 complexes constructed from Brown–Gitler spectra*  
With Justin Barhite, Nick Kuhn, and Donald Larson.  
*Math. Z.* 311, 72 (2025).  
<https://doi.org/10.1007/s00209-025-03869-6>.

*A motivic analogue of the  $K(1)$ -local sphere spectrum*  
With Kyle Ormsby and J.D. Quigley  
*J. Eur. Math. Soc.* (2025).  
<https://doi.org/10.4171/jems/1641>.

*The motivic lambda algebra and motivic Hopf invariant one problem*  
With Dominic Leon Culver and J.D. Quigley  
*Geom. Topol.* 29, 1489-1570 (2025).  
<https://doi.org/10.2140/gt.2025.29.1489>.

*The Real-oriented cohomology of infinite stunted projective spaces*  
*Algebr. Geom. Topol.* 24, 4061–4084 (2024).  
<https://doi.org/10.2140/agt.2024.24.4061>.

*Total power operations in spectral sequences*  
*Trans. Amer. Math. Soc.* 377, 4779-4823 (2024).  
<https://doi.org/10.1090/tran/9073>.

*An elementary proof of the chromatic Smith fixed point theorem*  
With Nick Kuhn  
*Homology Homotopy Appl.* 26(1), 131-140 (2024).  
<https://doi.org/10.4310/HHA.2024.v26.n1.a8>.

*Algebraic theories of power operations*  
*J. Topol.* 16(4), 1543-1640 (2023).  
<https://doi.org/10.1112/topo.12318>.

*$K$ -theory equivariant with respect to an elementary abelian 2-group*  
*New York J. Math.* 28, 1531-1553 (2022).  
<https://nyjm.albany.edu/j/2022/28-67.html>.

## Preprints

*Unstable synthetic deformations II: Infinitesimal extensions*  
With Piotr Pstrągowski  
Preprint available at <https://arxiv.org/abs/2601.08812>

*Unstable synthetic deformations I: Malcev theories*  
With Piotr Pstrągowski  
Preprint available at <https://arxiv.org/abs/2601.08802>

*Affineness and reconstruction in complex-periodic geometry*  
With Jack Morgan Davies and Sil Linskens.  
Submitted. Preprint available at <https://arxiv.org/abs/2510.26711>.

*$C_p^n$ -equivariant Mahowald invariants*  
With Yueshi Hou and Shangjie Zhang.  
Submitted. Preprint available at <https://arxiv.org/abs/2411.00421>.

*Equivalences of the form  $\Sigma^V X \simeq \Sigma^W X$  in equivariant stable homotopy theory*  
Submitted. Preprint available at <https://arxiv.org/abs/2306.11000>.

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

Teaching  
experience

University of Virginia

<b>Instructor</b>	Math 3354 Survey of Algebra	Spring 2024
<b>Instructor</b>	Math 3354 Survey of Algebra	Fall 2023
<b>Instructor</b>	Math 3350 Applied Linear Algebra	Spring 2023
<b>Instructor</b>	Math 3351 Elementary Linear Algebra	Fall 2022
<b>Instructor</b>	Math 3354 Survey of Algebra	Spring 2022
<b>Instructor</b>	Math 3000 Transition to Higher Mathematics	Fall 2021

University of Illinois Urbana-Champaign

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

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Advising

<b>Francis Baer</b>	2023–present
PhD student at Wayne State, coadvised with Dan Isaksen	
<b>Tilman Grunwald</b>	2025–present
Masters student at Bonn	

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Mentoring  
and misc.

<b>University of Virginia Directed Reading Program</b>	2023–2024
Mentored undergraduate reading in topology and in category theory. <a href="https://math.virginia.edu/drp">https://math.virginia.edu/drp</a>	
<b>University of Virginia Topology REU</b>	Summer 2022
Mentored a group of four undergraduates in a project on equivariant persistence. <a href="https://uva.theopenscholar.com/reu/program">https://uva.theopenscholar.com/reu/program</a>	
<b>eCHT Online Research Community</b>	Spring 2022
Co-organized an online reading seminar on synthetic homotopy theory. <a href="https://s.wayne.edu/echt/echt-synthetic-spectra-reading-seminar-winter-2022">s.wayne.edu/echt/echt-synthetic-spectra-reading-seminar-winter-2022</a>	
<b>Illinois Geometry Lab</b>	2019, 2020
<i>Graduate team leader</i> Helped lead a group of five undergraduates in a project about operads. <a href="https://math.illinois.edu/research/igl">https://math.illinois.edu/research/igl</a>	

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**Awards /  
Fellowships**

<b>The Philippe Tondeur Dissertation Prize (UIUC)</b>	2021
<b>On the List of Teachers Ranked as Excellent (UIUC)</b>	2019, 2020
<b>GAANN Fellowship recipient (UIUC)</b>	2015, 2017, 2018
<b>Illinois Sloan Scholar (UIUC)</b> Alfred P. Sloan Foundation's Minority Ph.D. Program	2015

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**Invited talks**

<b>School and Workshop on Algebraic Topology</b> Vietnam Institute for Advanced Study in Mathematics (online talk)	December 2025
<b>Topology Intercity Seminar (TopICS)</b> Utrecht University	November 2025
<b>Computations in stable homotopy theory</b> American Institute of Mathematics	October 2025
<b>Motives and Higher Categories</b> Johannes Gutenberg University of Mainz	October 2025
<b>Princeton Algebraic Topology Seminar</b>	October 2025
<b>Electronic Computational Homotopy Theory Seminar</b>	April 2025
<b>Workshop on "Unstable Homotopy Theory"</b> Max Planck Institute for Mathematics	November 2024
<b>Betti numbers in commutative algebra and equivariant homotopy theory</b> Bielefeld University	September 2024
<b>Chicago Topology Seminar</b>	March 2024
<b>Joint Mathematics Meetings 2024</b> AMS Special Session on Homotopy Theory	January 2024
<b>Bonn Research Seminar Homotopy Theory</b>	November 2023
<b>University of Washington Topology Seminar</b>	November 2023
<b>AMS 2023 Fall Central Sectional</b> Special Session on Homotopy Theory Creighton University	October 2023
<b>Wayne State Topology Seminar</b>	September 2023
<b>IU Bloomington Topology Seminar</b>	August 2023
<b>International Workshop on Algebraic Topology</b> Peking University	July 2023
<b>UCSD Topology Seminar</b>	March 2023
<b>MIT Topology Seminar</b>	February 2023

<b>AMS 2022 Fall Western Sectional</b> Special Session on Higher Topological and Algebraic K-Theories University of Utah	October 2022
<b>Johns Hopkins Topology Seminar</b>	October 2022
<b>University of Regina Topology Seminar</b>	March 2022
<b>Electronic Computational Homotopy Theory Seminar</b>	February 2022
<b>AMS Sectional Meeting, University of Virginia (cancelled)</b> Special Session on Homotopy Theory	March 2022
<b>Texas A&amp;M University Topology Seminar</b>	September 2021
<b>University of Virginia Topology Seminar</b>	October 2020
<b>Chicagoland Topology Seminar</b>	September 2020
<b>John Hopkins Topology Seminar</b>	September 2020
<b>University of Kentucky Topology Seminar</b>	September 2020
<b>The Transatlantic Transchromatic Homotopy Theory Conference II</b> Warm-up conference	August 2020

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**Contributed  
talks**

<b>Young Homotopy-Theorist Meeting</b> International Centre for Mathematical Sciences, Edinburgh	October 2025
<b>Midwest Topology Seminar</b> University of Illinois at Urbana-Champaign	September 2023
<b>The Transatlantic Transchromatic Homotopy Theory Conference II</b> University of Regensburg	August 2023