Prasit Bhattacharya

Department of Mathematical Science
Science Hall 249
New Mexico State University
Las Cruces NM 88003

Email: prasit@nmsu.edu
Homepage: sites.google.com/view/prasit0605/

Research Interests

algebraic topology, homotopy theory, classical geometry, chromatic homotopy theory, stable homotopy theory, equivariant stable homotopy theory, algebraic K-theory, motivic homotopy theory

Education

PhD in Mathematics, Indiana University at Bloomington, 2015. Advisor Michael A. Mandell.

Master in Mathematics, Indian Statistical Institute at Bengaluru, 2009.

Bachelor in Mathematics, Indian Statistical Institute at Bengaluru, 2007.

Employment

Visiting scholar, University of Michigan, June 2024 – January 2025

Assistant Professor, New Mexico State University August 2022 – current.

Visiting Assistant Research Professor, University of Notre Dame, June 2020 – May 2022.

Whyburn Instructor, University of Virginia, July 2017 – May 2020.

Visiting Assistant Professor, University of Notre Dame, July 2015 – June 2017.

Program Associate, Algebraic topology program, M.S.R.I. Berkeley, January 2013 – May 2013.

Awards and grants

NSF Research Grant, DMS 2305016 (2023 – 2026)
Generalized Steenrod operations and equivariant geometry

NSF Conference Grants (co-PI) DMS 2305016 (2023 – 2024)
South Central Topology Conference III

NMSU College of Art & Science Travel Grant (Summer 2023)

James P. Williams memorial Award, 2010
Outstanding first year graduate student at Indiana University

M.Math honors fellowship, 2007 – 2009
Indian Statistical Institute, Bengaluru

B.Math honors fellowship, 2004 – 2007
Indian Statistical Institute, Bengaluru

Preprints and publications

1. *On the periodic v_2–self-map of A_1*, Prasit Bhattacharya, Philip Egger and Mark E. Mahowald.
Algebraic & Geometric Topology 17 (2017), no. 2, 657 – 692.

2. *A class of* 2*-local finite spectra which admits v_2^1 -self-map*, Prasit Bhattacharya and Philip Egger.
Advances in Mathematics 360 (2020), 106895, 40.

3. *On the E_2-term of the bo Adams spectral sequence*, Agnes Beaudry, Mark Behrens, Prasit Bhattacharya, Dominic Culver and Zhouli Xu.
Journal of Topology 13 (2020) 356– 415.

4. *Towards the K(2)-local homotopy groups of Z*, Prasit Bhattacharya and Philip Egger.
Algebraic & Geometric Topology 20 (2020), no. 3, 1235–1277.

5. *The P_2^1-Margolis homology of connective topological modular form*, Prasit Bhattacharya, Irina Bobkova and Brian Thomas.
Homology, Homotopy and Applications, Vol. 23 (2021), No 2, 379–402.

6. *The telescope conjecture at the height 2 and the tmf resolution,* Agnes Beaudry, Mark Behrens, Prasit Bhattacharya, Dominic Culver and Zhouli Xu.
Journal of Topology 14 (2021) no. 4, 1243-1320.

7. *The stable Adams conjecture and higher associative structures of Moore spectra*, Prasit Bhattacharya and Nitu Kitchloo.
Annals of Mathematics, 195 (2022), no. 2, 375–420.

8. *Higher associativity of Moore spectra*, Prasit Bhattacharya.
Advances in Mathematics, 402 (2022), 108319.

9. *An $\mathbb{R}$-motivic v_1–self-map of periodicity 1*, Prasit Bhattacharya, Bertrand Guillou and Ang Li.
Homology, Homotopy and Applications Vol 24 (2022), No 1, 299–324.

10. *On realizations of the subalgebra $A^{\mathbb{R}}(1)$ of the $\mathbb{R}$-motivic Steenrod algebra*, Prasit Bhattacharya, Bertrand Guillou and Ang Li.
Transactions of the American Mathematical Society (Series B) 9 (2022), 700–732.

11. *On the* EO*-orientability of vector bundles*, Prasit Bhattacharya and Hood Chatham
Journal of Topology 15 (2022) no. 4, 2017-2044

12. *Equivariant orientations and Thom class for disconnected base spaces*, Prasit Bhattacharya and Foling Zou.
Proceedings of the London Mathematical Society Vol.129 (2024) Issue 5.

13. *On the Steenrod module structure of $\mathbb{R}$-motivic Spanier Whitehead duals*, Prasit Bhattacharya, Bertrand Guillou and Ang Li.
Proceedings of the American Mathematical Society (Series B) 11 (2024), 555–569.

14. *The structure of the v_2-local algebraic tmf resolution*, Mark Behrens, P. Bhattacharya and D. Culver
Mathematische Zeitschrift Volume 310, article number 17, (2025).

15. *New infinite families in stable homotopy groups of spheres*, Prasit Bhattacharya, Irina Bobkova, and JD Quigley.
`https://arxiv.org/abs/2404.10062` (Submitted).

16. *Equivariant Weiss Calculus*, Prasit Bhattacharya and Yang Hu.
`https://arxiv.org/abs/2410.12087` (Submitted).

17. *The stable Picard group of $A(2)$*, Prasit Bhattacharya and Nicolas Ricka.
`https://arxiv.org/abs/1702.01493`

18. *Equivariant Steenrod operations*, Prasit Bhattacharya, Alex Waugh, Mingcong Zeng, and Foling Zou.
Preprint (2024).

19. *Orientation number and chromatic defects*, Prasit Bhattacharya, Christian Carrick, and Yang Hu.
Preprint (2024).

20. *Equivariant Dyer Lashof operations*, Prasit Bhattacharya and Alex Waugh
Preprint (2024).

21. *The Atiyah Real Adams conjecture*, Prasit Bhattacharya and Hood Chatham.
Preprint (2024).

Outside Algebraic topology

20. *Fractal Sets as Final Coalgebras Obtained by Completing an Initial Algebra*, Prasit Bhattacharya, Lawrence S. Moss, Jayampati Ratnayake and Robert Rose, **Horizons of mind: A tribute to Prakash Panangaden, Lecture notes in computer science**, volume 8448, 2014, pp.146-167.

21. *The p-adic integers as final coalgebra*, Prasit Bhattacharya, **Logic, Language, Information, and Computation, Lecture Notes in computer science**, volume 9160, 2015, pp.189-199

Invited Talks

Conference, workshop and colloquium talks

NAU Colloquium October 2025
Northern Arizona University
Title *Topology, symmetry, and the Frobenius endomorphism*

NMSU Colloquium October 2025
New Mexico State University
Title *Topology, symmetry, and the Frobenius endomorphism*

International Workshop on Algebraic Topology (IWoAT) July 2024
Fudan University at Shanghai, China
Title *Equivariant Weiss Calculus*

Algebraic Structures in Topology June 2024
San Juan, Puerto Rico
Title *Equivariant Weiss Calculus*

Midwest Topology Seminar July 2023
University of Illinois at Urbana Champaigne
Title *Equivariant Steenrod Operations*

International Workshop on Algebraic Topology (IWoAT) July 2023
Beijing International Center of Mathematical Research
Peking University
Title *Equivariant Steenrod Operations*

South Central Topology Conference–San Marcos February 2023
Texas State University
Title: *Equivariant Steenrod Operations*

Colloquium talk–Mumbai, India January 2023
Tata Institute of Fundamental Research
Title: *Equivariant Steenrod Operations*

Colloquium talk–Kolkata, India January 2023
Indian Statistical Institute
Title: *Equivariant Steenrod Operations*

Colloquium talk –Las Cruces September 2022
New Mexico State University
Title: *Rabbit holes of spheres*

Electronic Computational Homotopy theory February 2022
https://s.wayne.edu/echt/
Title: *Equivariant Steenrod Operations*

Colloquium talk –College Station October 2021
Texas A&M University
Title: *The Atiyah Real stable Adams conjecture*

Workshop on Homotopy theory and group theory
Centre de Recerca Matematica, Barcelona July 2021
Title: *Equivariant cohomology operations*

Spring Southeastern Sectional Meeting
University of Virginia, Charlottesville March 2020
Title: *On the* EO*-orientations of vector bundles*

Joint math meetings – Denver January 2020
Colorado Convention Center
Title: *Revising Higher associativity of Moore spectra*

Colloquium talk – Mumbai December 2019
Tata Institute of Fundamental Research
Title: *On the stable Adams Conjecture*

Colloquium talk – Hawaii December 2019
University of Hawaii
Title: *Stable homotopy groups of spheres, finite CW-complexes and periodic self-maps*

Electronic Computational Homotopy theory January 2019
https://s.wayne.edu/echt/
Title: *On the* EO*-orientations of vector bundles*

Chromatic homotopy theory- Journey to the frontier May 2018
University of Colorado
Title: *On beyond Zebras*

Electronic Computational Homotopy theory October 2017
https://s.wayne.edu/echt/
Title: *The $K(2)$-local homotopy of a type 2 complex Z*

AMS Sectional April 2017
Vanderbilt University
Title: *The P^1_2-Margolis homology of tmf*

AMS Sectional April 2017
Indiana University
Title: *A very nice type 2 spectrum*

Graduate Student Topology and Geometry Conference April 2013
University of Notre Dame
Title: *Higher Associativity of Moore spectra*

Workshop on motivic homotopy theory March 2013
M.S.R.I.
Title: *Etale cohmology and Fundamental groups*

Seminar Talks

Topology seminar – **University of Washington** at Seattle
Title: *Equivariant Weiss Calculus* June 2025

Geometry & Topology seminar – **New Mexico State University** at Las Cruces
Title: *Orientation with respect to extra-ordinary cohomology theory* May 2025

Topology seminar – **University of Virginia** at Charlottesville
Title: *Eulerian sequences and equivariant Steenrod operations* March 2025

Topology seminar – **University of Michigan** at Ann Arbor
Title: *Eulerian sequences and equivariant Steenrod operations* March 2025

Topology seminar – **New Mexico State University** at Las Cruces
Title: *Eulerian sequences and Steenrod operations* February 2025

Topology seminar – **Utrecht Geometry Center** at Utrecht, Netherlands
Title: *New infinite families in stable homotopy groups of spheres* November 2024

Geometry & Topology seminar – **New Mexico State University** at Las Cruces
Title: *New infinite families in stable homotopy groups of spheres* September 2024

Topology seminar – **Indian Statistical Institute** at Kolkata, India
Title: *Equivariant Weiss Calculus* July 2024

Online graduate lecture – **NISER** at Bhubaneswar, India
Title: *Spheres and their homotopy groups* March 2024

Topology seminar – **University of Washington** at Seattle
Title: *New infinite families in stable homotopy groups of spheres* February 2024

Topology seminar – **Wayne State University** at Detroit
Title: *New infinite families in stable homotopy groups of spheres* February 2024

Geometry & Topology seminar – **New Mexico State University** at Las Cruces
Title: *Equivariant orientation theory for disconnected base spaces* August 2023

Topology seminar – **Indian Statistical Institute** at Kolkata
Title: *Atiyah Real Adams Conjecture* July 2023

Topology seminar – **University of Oregon** at Eugene
Title: *Equivariant Steenrod Operations* May 2023

Geometry, topology & dynamic seminar – **University of Michigan** at Ann Arbor
Title: *Equivariant Steenrod Operations* March 2023

Geometry & Topology seminar – **New Mexico State University**
Title: *Higher homotopy associativity or $\mathbb{A}_n$-structures* November 2022

Topology seminar – **University of Virginia**
Title: *Equivariant orientation and Thom class for disconnected base space* October 2022

Topology seminar – **University of California Los Angeles**
Title: *Equivariant Steenrod Operations* June 2022

Topology seminar – **Southern University of Science and Technology, China**
Title: *Equivariant Steenrod Operations* November 2021

Geometry seminar – **Texas A&M University**
Title: *Equivariant Steenrod Operations* October 2021

Topology seminar – **University of Notre Dame** September 2021
Title: *Equivariant Steenrod Operations*

Chicagoland algebraic topology seminar – **Univ of Chicago/Northwestern Univ** January 2021
Title: *The stable Adams conjecture*

Topology seminar – **Texas A&M University** September 2020
Title: *The stable Adams conjecture*

Topology seminar – **University of Chicago** January 2020
Title: *Revisiting stable Adams conjecture*

Topology seminar – **Northwestern University** January 2020
Title: *Revisiting stable Adams conjecture*

Topology seminar – **Johns Hopkins University** October 2019
Title: *A* 2*-local finite spectrum that admit* 1*-periodic v_2–self-map*

Topology seminar – **University of Kentucky** September 2019
Title: *Revisiting higher associativity of Moore spectra*

Topology seminar – **University of Colorado** December 2018
Title: *P^1_2-Margolis homology of tmf*

Topology seminar – **Massachusetts Institute of Technology** October 2018
Title: *A* 2*-local type* 3 *spectrum, its periodic v_3-self-map, and its $K(3)$-local homotopy groups*

Topology seminar – **Princeton University** April 2018
Title: *Stable Adams conjecture and higher associative structure on Moore spectra*

Algebraic topology seminar – **University of Chicago** January 2017
Title: *A very nice type* 2 *spectrum*

Topology seminar – **University of Rochester** September 2016
Title: *A very nice type* 2 *spectra*

Topology seminar – **University of Virginia** September 2016
Title: *A very nice type* 2 *spectra*

Topology seminar – **Ohio State University** April 2016
Title: *A finite spectra admitting* 1*-periodic* v_2*-self-map*

Topology seminar – **Wayne State University** March 2016
Title: *A finite spectra admitting* 1*-periodic* v_2*-self-map*

Topology seminar – **University of Notre Dame** October 2015
Title: *Higher associativity of Moore spectra*

Topology seminar – **Purdue University** April 2016
Title: *Higher associativity of Moore spectra*

Topology seminar – **University of Chicago** October 2014
Title: *Higher associativity of Moore spectra*

Topology seminar – **Northwestern University** October 2014
Title: *Higher associativity of Moore spectra*

Topology seminar – **Johns Hopkins University** October 2014
Title: *Higher associativity of Moore spectra*

Topology seminar – **Indiana University** September 2014
Title: *Higher associativity of Moore spectra*

Teaching experience

New Mexico State University

Calculus I & Applied Linear Algebra Spring 2025

Algebraic Topology II Spring 2024

Calculus & Analytic Geometry I Fall 2023

Calculus III Fall 2023

Topology I Spring 2023

Calculus & Analytic Geometry I Fall 2022

Algebraic topology II Fall 2022

University of Virginia

Calculus of Manifolds	Spring 2020
Linear Algebra	Spring 2020
Algebraic topology II	Fall 2019
Chromatic Homotopy Theory (topic course)	Spring 2019
Calculus III (2 sections)	Fall 2018
Calculus III (2 sections)	Spring 2018
Linear algebra	Fall 2017

University of Notre Dame

Linear algebra & Differential Equations (2 sections)	Spring 2017
Calculus III (2 sections)	Fall 2016
Calculus for Business major	Spring 2016
Finite Mathematics	Spring 2016
Calculus III	Fall 2015
Calculus I	Fall 2015

Indiana University Bloomington

Finite Mathematics	Summer 2015
Finite Mathematics	Fall 2014
Finite Mathematics (2 sections)	Fall 2012
Finite Mathematics (2 sections)	Spring 2012
Pre-calculus (2 sections)	Fall 2011
Finite Mathematics (1 sections)	Summer 2011

Mentorship

Postdoctorate

Yang Hu	Fall 2023 – Spring 2025

Graduate students

Alexander Waugh	Fall 2023 –
Aaron Stewart	Spring 2023 –
Mason Adams	Spring 2023 –

Undergraduate students

Soumya Dasgupta	Summer, 2023
Connor Malin	REU 2019
Trent Lucas	REU 2019
Edith Zhang	REU 2019
Yifan (Jasmine) Zao	2017 – 2018
Shirley (Qianshu) Liu	2017 – 2018

High school students

Hans Riess	2011 – 2013

Professional services

Committee member

Social committee, New Mexico State University	Fall 2023 – present
NMSU Math Problem of the Week	Fall 2022 – present
Majors and Minors committee, New Mexico State University	Fall 2022 – Spring 2024
Scholarships, New Mexico State University	Fall 2022 – Spring 2024

Refereed for Journals

Proceedings of American Mathematical Society

Journal of American Mathematical Society

Algebraic & Geometric Topology –(2)

New York Journal of Math

Proceedings of the Edinburgh Mathematical Society

Journal of Topology

Geometry & Topology

Mathematische Zeitschrift

Arkiv för Matematik

Reviewed papers (mathscinet) – 10

Co-organized

South Central Topology Conference IV, College Station	March 2025
Mid-Atlantic Topology Conference, Virginia	March 2025
Reading seminar in algebraic K-theory (NMSU)	Spring 2024 – Summer 2024
South Central Topology Conference III, Las Cruces	October 2023
Special session in homotopy theory AMS Sectional, Omaha	October 2023
NMSU math problem of the week, New Mexico State University	Fall 2022 – current
NMSU Geometry & Topology seminar, New Mexico State University	Fall 2022 – current
Topology seminar, University of Notre Dame	Fall 2019 – Spring 2022
Arf-Kervaire invariant one problem (international reading course), eCHT	Fall 2020
Stable Equivariant Homotopy Theory (reading seminar), University of Virginia	Fall 2018
Computations in Stable homotopy theory (reading seminar), University of Virginia	Spring 2018
Topology seminar, University of Virginia	Fall 2017 – Fall 2020
Topology seminar, University of Notre Dame	Fall 2015 – Fall 2017
Equivariant Homotopy Theory (reading seminar), University of Notre Dame	Summer 2014
Graduate Student Topology Conference (G.S.T.C.), Indiana University	April 2012
Exotic spheres (reading seminar), Indiana University	Summer 2013
Student Topology Seminar, Indiana University	March 2010 - April 2013

Outreach and Volunteerism

Math inspiration lecture series: *Mathematics and being a math major* at Centennial High School, Las Cruces High School, Organ Mountain High School	Summer 2024
NMSU-MÁS (Mejorando las Aulas en STEM/Improving STEM Classrooms)	Fall 2023 – current
Centennial Math Day, Centennial High School at Las Cruces	March 4, 2023
Trivial Loops – departmental social hiking event	Fall 2022 – present