

HARSHIT YADAV

Department of Mathematics
University of Alberta
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PERSONAL INFORMATION

Date of birth: Nov 13, 1995
Citizenship: India

RESEARCH INTERESTS

Representation theory and quantum algebra: tensor categories, fusion categories, Hopf algebras, vertex operator algebras, and algebraic aspects of 2D conformal field theory.

EMPLOYMENT

Postdoc, Max Planck Institute for Mathematics, Bonn, Sep 2026–Aug 2027

Postdoc, University of Alberta, July - Sept 2026

Max-Wyman Assistant Professor (non tenure-track), University of Alberta, Aug 2023–Jun 2026

Postdoctoral Researcher, University of Alberta, Jul 2026–Dec 2026

VISITING POSITIONS

Research member, Quantum Symmetries reunion, Simons Laufer Mathematical Sciences Institute (SLMath/MSRI), Jun–Jul 2024

Program Associate, Quantum Symmetries program, SLMATH/MSRI, Jan–Mar 2020

EDUCATION

Ph.D. in Mathematics, Rice University, Jul 2020–May 2023

Advisor: Chelsea Walton

M.S./Ph.D. in Mathematics (transferred to Rice), University of Illinois at Urbana-Champaign, Aug 2017–Jul 2020

Bachelor of Science, Mathematics, Indian Institute of Technology, Kanpur, May 2017

GRANTS AND FELLOWSHIPS

NSERC Discovery Grant RES0065383, National Sciences and Engineering Research Council, Canada, 2024–2029 (\$142,500 CAD)

Nettie S. Autrey Fellowship, Rice University, 2022 (awarded once per year college wide)

PREPRINTS

- (4) A Galois connection between subalgebras and tensor subcategories (with K. Shimizu),
[arXiv:2609.04073](https://arxiv.org/abs/2609.04073), (2026)

- (3) Transparent subalgebras and local module categories (with K. Shimizu),
arXiv:2608.19153, (2026)
- (2) Ribbon categories from ind-exact algebras: simple current case (with K. Shimizu),
arXiv:2603.28215, (2026)
- (1) Pivotal Brauer-Picard groupoids and graded extensions (with A. Czenky, D. Jaklitsch,
D. Nikshych, J. Plavnik, D. Reutter and S. Sanford),
arXiv:2511.04482, (2025)

PUBLICATIONS

- (10) Commutative exact algebras and modular tensor categories (with K. Shimizu),
Selecta Mathematica, 32, no. 4, 78 (2026).
- (9) $\otimes$ -Frobenius functors and exact module categories (with D. Jaklitsch),
International Mathematics Research Notices, 2026, no. 8, rnag065.
- (8) Commutative algebras in Grothendieck-Verdier categories, rigidity, and vertex operator algebras
(with T. Creutzig, R. McRae and K. Shimizu),
Communications in Contemporary Mathematics, 2550091 (2025).
- (7) Nondegenerate module categories (with C. Walton),
Mathematische Zeitschrift, 310, no. 2 (2025).
- (6) On unimodular module categories,
Advances in Mathematics, 432, 109264 (2023).
- (5) Frobenius monoidal functors from (co)Hopf adjunctions,
Proceedings of the AMS, 152, no. 2, 471–487 (2024).
- (4) On non-counital Frobenius algebras (with A. Hernandez and C. Walton),
Journal of Algebra and Its Applications, 2550018 (2023).
- (3) Filtered Frobenius algebras in monoidal categories (with C. Walton),
International Mathematics Research Notices, rnac314 (2022).
- (2) The ABCDs of Schubert calculus (with C. Robichaux and A. Yong),
Séminaire Lotharingien de Combinatoire, B85a (2020).
- (1) Equivariant cohomology, Schubert calculus, and edge labeled tableaux (with C. Robichaux and
A. Yong),
Facets of Algebraic Geometry: A Volume in Honour of William Fulton's 80th Birthday, LMS
Lecture Note Series, Vol. 2 (2022), Cambridge University Press, 284–335.
- (0) Autoequivariant Network Search via Group Decomposition (with S. Basu, A. Magesh and
L. R. Varshney),
arXiv:2104.04848, presented at SIAM Conference on Mathematics of Data Science (MDS24),
Atlanta, GA, 21–25 Oct 2024.

MENTORING

Jin-Cheng Guu (Postdoctoral researcher, University of Alberta), Jul 2024–Jul 2026
Co-mentored with Terry Gannon; partially supported through my NSERC Discovery Grant

Ian Parrish (Undergrad, University of Alberta), summer 2025
Topic: Knot invariants
Obtained an NSERC USRA for the project

Andrii Smutchak, Sofia Breslavets, 2023–2024

High school students, MIT Yulia’s dream program

Topic: Double groupoids and weak Hopf algebras [final report]

Amanda Hernandez (Undergrad, Rice University), 2021–2022

Co-supervised with Chelsea Walton

Topic: (Weak) Hopf algebras and (quasi) Frobenius algebras [arXiv:2204.14182]

TEACHING

University of Alberta, Instructor of record

- Math 228, Introduction to Ring Theory Winter, Spring, Fall 2024
- Math 214, Calculus III (multivariable calculus) Spring, Fall 2025

Rice University

- Math 302, Elements of Analysis; *Teaching Assistant (recitation)* Spring 2021
- Math 356, Abstract Algebra I; *Grader* Fall 2020, Fall 2021
- Math 357, Abstract Algebra II; *Grader* Spring 2022

University of Illinois at Urbana-Champaign, Teaching Assistant (recitation)

- Math 241, Calculus III (multivariable calculus) Fall 2017, Fall 2018, Spring 2019, Fall 2019
- Math 231, Calculus II (integral calculus) Spring 2018

CONFERENCES AND WORKSHOPS CO-ORGANIZED

- **Geometric & Categorical approaches to Conformal Field Theory**, Banff International Research Station, Chennai, India, Jan 2026
- **RIMS Satellite Seminar**, Research Institute in Mathematical Sciences (RIMS), Kyoto, Japan, Dec 2025
- **Mini-workshop on VOAs**, University of Alberta, Canada, Feb–Mar 2024

SEMINARS CO-ORGANIZED

- Geometry-Algebra-Physics Seminar, University of Alberta, Canada, Fall 2024
- Aspects of Mathematical Physics Seminar, University of Alberta, Canada, Winter 2024
- Algebra-Geometry-Combinatorics Seminar, University of Illinois at Urbana-Champaign, 2018–2019

INVITED AND CONTRIBUTED TALKS

Rigidity and modularity of infinite VOA extensions

- Dalhousie University, Halifax Feb 2026
- Tata Institute of Fundamental Research, Mumbai Jan 2026
- International Centre for Theoretical Sciences, Bangalore Jan 2026
- Institute for Mathematical Sciences, Chennai Dec 2025

Tensor functors with isomorphic left and right adjoints

- Hopf algebras and related topics, Bonne Bay station Aug 2025

Tensor category results and their applications to VOAs

- Indian Statistical Institute, Kolkata Mar 2026
- Indian Institute of Technology, Palakkad Mar 2026

• Indian Institute of Technology, Delhi	Mar 2026
• University of Hamburg, Hamburg (virtual)	Jun 2025
• Indian Institute of Technology, Kanpur	Apr 2025
• Tata Institute of Fundamental Research, Mumbai	Mar 2025
• Indian Institute of Technology, Mumbai	Mar 2025
Rigidity of the category of local modules	
• TQFT Club (virtual)	Aug 2025
• Mathematical Physics Seminar, University of Hamburg (virtual)	Jan 2025
Rigidity of VOAs and Hopf extensions	
• AMS sectional meeting, San Antonio	Sep 2024
• Mini-workshop, Shanghai Jiao Tong University	Jun 2024
Rigidity of extensions	
• Rocky Mountain representation theory Seminar (virtual)	Oct 2024
• SLMath, Quantum Symmetries Seminar	Jul 2024
• VOA, tensor categories and related topics, Shanghai	Jun 2024
• CMS summer meeting, University of Saskatchewan	May 2024
• Fields Institute, Toronto	Mar 2024
On unimodular module categories	
• BIRS, Banff	Dec 2023
• Rocky Mountain representation theory Seminar	Oct 2023
• Mathematical Physics Seminar, Perimeter Institute	Sep 2023
• Mathematical Physics Seminar, University of Hamburg	Jun 2023
• Shibaura Algebra Seminar, SIT, Japan	May 2023
• AMS sectional meeting, University of Cincinnati	Apr 2023
• Seattle Noncommutative Algebra Day	Mar 2023
• Quantum symmetries program, CRM Montreal	Oct 2022
• AMS fall sectional meeting, University of Utah	Oct 2022
On non-counital Frobenius algebras	
• Categories and Companions Symposium	Sep 2022
• Hopf algebras, monoidal categories and related topics	Jul 2022
• Graduate Algebra Symposium, UT Arlington	Apr 2022
• Seattle Noncommutative Algebra Day (virtual)	Mar 2022
Filtered Frobenius algebras in monoidal categories	
• Quantum Groups Seminar (virtual)	Jul 2022
• Algebra Seminar, Indiana University	Apr 2022
• Algebra Seminar, Texas A&M University	Mar 2022
• Quantum Algebra Seminar, Ohio State University	Mar 2022
• Seattle Noncommutative Algebra Day (virtual)	May 2021
• AMS Spring sectional meeting (virtual)	Mar 2021

EXPOSITORY TALKS

Hopf algebras and Quantum Symmetries

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| • Seminar at Google X | Nov 2021 |
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Introduction to Topological Quantum Field Theories

- Current Mathematics Seminar, Rice University

Oct 2021

Various reading group talks at Rice, UIUC, 2019–2022

SERVICE

Referee work

Selecta Mathematica, Communications in Mathematical Physics, Communications of the American Mathematical Society, Mathematische Zeitschrift, Journal of Pure and Applied Algebra, Canadian Journal of Mathematics, Quantum Topology

Thesis committee member

Zach Goldthorpe, University of Alberta, May 2024

Graduate Student Panelist, Gulf Coast Undergraduate Research Symposium, Rice University, Oct 2021

Student guide, Counseling service, Indian Institute of Technology, Kanpur, 2014–2015

REFEREES

Chelsea Walton, Rice University

Email: notlaw@rice.edu

Relationship: Ph.D. advisor

Terry Gannon, University of Alberta

Email: tjgannon@ualberta.ca

Relationship: postdoctoral mentor

Christoph Schweigert, University of Hamburg

Email: christoph.schweigert@uni-hamburg.de

Relationship: external referee

Last updated on September 4, 2026.