Curriculum Vitae

Hongdi Huang

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Employment

G.C. Evans Instructor (Postdoctoral Fellow), Rice University, July 2020–Present.

Education

2015–2020   **Ph.D., Pure Mathematics**, *University of Waterloo, Waterloo, ON, Canada, Thesis: On Hopf Ore Extensions and Zariski Cancellation Problems*, Advisor: Prof. Jason Bell

2019–2019   **Visiting Ph.D. Student (Sept.–Dec.), Mathematics Department**, *University of Illinois at Urbana-Champaign, Champaign, IL, U.S.*, Advisor: Prof. Chelsea Walton

2013–2015   **M.S., Mathematics**, *Brock University, St. Catharines, ON, Canada, Thesis: Some Combinatorial Problems in Group Theory*, Advisor: Prof. Yuanlin Li

2007–2011   **B.S., Mathematics**, *Nanning Normal University*, Nanning, Guangxi, China

Research

Research Interest

○ Representation theory and invariant theory of noncommutative algebras

○ Quantum symmetries including the (co)actions of quantum groups and (weak) Hopf algebras

○ Poisson algebras and their invariant theory

Submitted Preprints

16. H. Huang, X. Tang, X. Wang and J.J. Zhang, Valuation method for Nambu-Possion algebras, submitted, arXiv:2312.00958

15. H. Huang, and K. Vashaw, Group actions on monoidal triangulated categories and Balmer spectra, submitted, arXiv:2311.18638.

14. H. Huang, X. Tang, X. Wang and J.J. Zhang, Poisson valuations, submitted, arXiv:2309.05511.

13. H. Huang, X. Tang, X. Wang and J.J. Zhang, Weighted Poisson polynomial rings in dimension three, submitted, arXiv:2309.00714.

12. F. Calderón, H. Huang, E. Wicks and R. Won, Symmetries captured by actions of weak Hopf algebras, submitted, arXiv:2209.11903.

Published/Accepted

11. H. Huang, V. Nguyen, C. Ure, K. Vashaw, P. Veerapen and X. Wang, Twisting of Manin's universal quantum groups and comodule algebras, to appear in *Adv. Math.*, arXiv:2209.11621.

10. H. Huang, X. Tang and X. Wang, A survey on Zariski cancellation problems for noncommutative and Poisson algebras, to appear in *Contemp. Math.,* arXiv:2304.05914.

9. H. Huang, V. Nguyen, C. Ure, K. Vashaw, P. Veerapen and X. Wang, A cogroupoid associated to preregular forms, to appear in *J. Noncommutative Geom.,* arxiv:2112.09098.

8. H. Huang, V. Nguyen, C. Ure, K. Vashaw, P. Veerapen and X. Wang, Twisting of graded quantum groups and solutions to the quantum Yang-Baxter equation, to appear in *Transform. Groups,* arxiv:2109.11585.

7. H. Huang, C. Walton, R. Won and E. Wicks, Universal quantum semigroupoids, *J. Pure Appl. Algebra* 227 (2023), no. 2, 107193.

6. J. Bell, M. Hamidizadeh, H. Huang and H. Venegas, Noncommutative analogues of a cancellation theorem of Abhyankar, Eakin and Heinzer, *Beitr. Algebra Geom.* 62 (2021), no. 2, 295–315.

5. H. Huang, Hopf Ore Extensions, *Algebr. Represent. Theory* 23 (2020), no. 4, 1477–1486.

4. H. Huang, Y. Li and G. Tang, On ∗-clean non-commutative group rings, *J. Algebra Appl.* 15 (2016), no. 8, 1650150.

3. H. Huang, Y. Li and P. Yuan, On ∗-clean group rings II, *Comm. Algebra* 44 (2016), no. 7, 3171–3181.

2. H. Huang and Y. Li, On $B(5, 18)$-groups, *Comm. Algebra* 44 (2016), no. 2, 568–590.

1. H. Huang and Y. Li, On $B(4, 14)$ non-2 groups, *J. Algebra Appl.* 14 (2015), no. 8, 1550118.

Invited Talks

Conference Talks

○ Joint Mathematics Meetings, Special AMS Special Session on Homological Techniques in Noncommutative Algebra, San Francisco, January 4, 2024

○ AMS Fall Southeastern Sectional Meeting, Special Session on New Directions in Noncommutative Algebras and Representation Theory, Mobile, AL, October 14, 2023.

- Canadian Discrete and Algorithmic Mathematics, Special Session on Many Perspectives on Hopf algebras in Combinatorics, Winnipeg, MB, Canada, June 7, 2023.

- CMS Summer Meeting, Special Session on Noncommutative Algebra and Noncommutative Geometry, Ottawa, ON, Canada, June 4, 2023.

- AMS Spring Western Sectional Meeting, Special Session on Artin–Schelter Regular Algebras and Related Topics, Fresno, CA, May 6, 2023.

- AMS Spring Central Sectional Meeting, Special Session on Interactions between Noncommutative Ring Theory and Algebraic Geometry, Cincinnati, OH, April 15, 2023.

- Seattle Noncommutative Algebra Day at University of Washington, Seattle, WA, March 17-18, 2023.

- AMS Fall Western Sectional Meeting, Special Session on Quantum Qroups, Hopf Algebras and Applications, in honor of Professor Earl J. Taft, Salt Lake City, UT, October 2022.

- BIRS Workshop on Noncommutative Geometry and Noncommutative Invariant Theory, Banff, AB, Canada, September 2022.

- Recent Advances and New Directions in the Interplay of Noncommutative Algebra and Geometry, in honor of Professor S. Paul Smith on the occasion of his 65th Birthday, University of Washington, Seattle, WA, June 2022.

- The 4th Canada-Mexico-USA Conference in Representation Theory, Noncommutative Algebra and Categorification, Northeastern University, Boston, MA, June 2022.

- AMS Spring Sectional Meeting, Special Session on Hopf Algebras, Tensor Categories and Related Homological Methods, March 2021, online.

- AMS–MAA Joint Mathematics Meetings, Special Session on Interactions between Noncommutative Algebra and Noncommutative Algebraic Geometry, January 2021, online.

- The Joint International Meeting of CMS-AMS, Fudan University, Shanghai, China, June 2018.

- Recent Developments in Noncommutative Algebra and Related Areas, University of Washington, Seattle, March 2018.

- International Conference on Groups, Rings and Group Rings, Brock University, St. Catharines, ON, Canada, July 2014.

Seminar Talks

- Algebra and Number Theory Seminar, Louisiana State University, LA, US, Nov. 2023.

- Rocky Mountain Representation Theory Seminar, University of Colorado, CO, US, October 2023.

- Algebra and Combinatorics Seminar, Texas A&M University, College Station, TX, US, March 2023.

- Algebra Seminar, Sun Yat-Sen university, Zhuhai, Guangdong, China, September 2022, online.

- Algebra Seminar, Hangzhou Normal University, Hangzhou, Zhejiang, China, September 2022, online.

- Long Feng Science Forum, CUHK-Shenzhen, Shenzhen, China, August 2022, online.

- Hodge Seminar, University of Edinburgh, Edinburgh, UK, December 2021, online.

- Northeastern Representation Theory and Related Topics Seminar, Northeastern University, MA, November 2021, online.

- Representation Theory Seminar, University of California at Riverside, Riverside, CA, November 2021, online.

- Algebra Seminar, University of Illinois at Urbana-Champaign, Champaign, IL, September 2019.

- Algebra Seminar, Nanning Normal University, Nanning, Guangxi, China, May 2015.

- Algebra Seminar, Brock University, St. Catharines, ON, Canada, March 2014.

Workshop Participation

- Summer Research in Mathematics Program grant, SLMath, joint with Van Nguyen, Kent Vashaw, Padmini Veerapen, and Xingting Wang, 2024.

- SQuaRE grant, American Institute of Mathematics, (one week-long program focused collaborative research with Van Nguyen, Charlotte Ure, Kent Vashaw, Padmini Veerapen and Xingting Wang per year), 2022–2024.

- The Physical Mathematics of Quantum Field Theory School, University of Massachusetts Amherst, Amherst, MA, July 17-21, 2023.

- Quantum Symmetries: Tensor categories, Topological Quantum Field Theories, Vertex Algebras, Centre of Researches Mathematics, University of Montreal, Montreal, QC, Canada, October 16-21, 2022.

- BIRS Workshop on Noncommutative Geometry and Noncommutative Invariant Theory, Banff, AB, Canada, September 2022.

Teaching, Mentoring and Committee Service

Teaching

- Instructor, Calculus II (Math 102), Rice University, Spring 2021, Fall 2021, Fall 2022, Fall 2023.

- Instructor, Abstract Algebra I (Math 356), Rice University, Fall 2020, Fall 2023.

- Instructor, Abstract Algebra II (Math 357), Rice University, Spring 2022, Spring 2023.

- Instructor, Elementary Number Theory (PMath 340), University of Waterloo, Fall 2018.

- Teaching Assistant, University of Waterloo, 2015–2020.

- Teaching Assistant, Brock University, 2013-2015.

Mentoring

- January 2022–Present: I have been guiding Mariam Fatima in reading an abstract algebra textbook, *Abstract Algebra: An Inquiry-Based Approach* by Hodge, Jonathan K.; Schlicker, Steven; Sundstrom, Ted. She was a high school student when we started working together and became a freshman at the University of Texas at Austin in Fall 2023. We have already covered the fundamentals of group theory and ring theory, and we are currently engaged in a research project focused on classifying low-dimensional Frobenius algebras.

- Summer 2022: During a one-semester directed reading program at Rice University, I guided Jimmy Huang and Darius Huang in reading the book *An Introduction to Groups, Groupoids, and Their Representations* by Alberto Ibort and Miguel A. Rodriguez.

- Spring 2021: During a one-semester directed reading program at Rice University, I guided Evan Huang in reading *Representation Theory of Finite Groups* by Benjamin Steinberg.

Seminar Committee

- Colloquium Committee at Math Department of Rice University, 2021–2023.

- Co-organizing AGNT Seminar at Math Department of Rice University, 2020–2023.

Academic Service

Conference Organization

- Co-organizing with Zheng Hua, Brent Pym, Xiaolan Yu and James Zhang, Poisson Geometry and Artin-Schelter Regular Algebras at the Banff International Research Station in October 2024.

Referee

- Referee for "Communications in Algebra" and "Algebras and Representation Theory"

- Reviewer for Mathematical Reviews/MathSciNet

Scholarships and Awards

○ **Cotton Family Women in Mathematics Graduate Scholarship**, University of Waterloo, ON, Canada, 2016.

○ **Barbara Hayes-Roth Award for Women in Math and Computer Science**, University of Waterloo, ON, Canada, 2015.

○ **The Second Prize for CUMCM (Contemporary Undergraduate Mathematical Contest in Modeling)**, Nanning Normal University, Guangxi, China, 2009.

○ **China National Scholarship**, Nanning Normal University, Guangxi, China, 2009.

Professional Memberships

○ Member of the Association for Women in Mathematics

○ Member of the American Mathematical Society