# Curriculum Vitae

## Ben Webster


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|---|---|---|---|
| Address: | Department of Pure Mathematics | Email: | ben.webster@uwaterloo.ca |
| | University of Waterloo | Website: | https://uwaterloo.ca/scholar/b2webste |
| | Waterloo, ON, Canada | Citizenships: | Canadian, US |


### Employment/Education:

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|---|---|
| 2017 – | **Associate Professor**, University of Waterloo. |
| 2017 – | **Associate Faculty**, Perimeter Institute. |
| 2016 – 2017 | **Associate Professor**, University of Virginia. |
| 2013 – 2016 | **Assistant Professor**, University of Virginia. |
| 2011 – 2013 | **Assistant Professor**, Northeastern University. |
| 2010 – 2011 | **Assistant Professor**, University of Oregon. |
| 2008 – 2010 | **C.L.E. Moore Instructor** and **NSF Postdoctoral Fellow**, M.I.T.<br>Sponsoring Scientist: R. Bezrukavnikov. |
| 2007 – 2008 | **Member** and **NSF Postdoctoral Fellow**, Institute for Advanced Study. |
| 2002 – 2007 | **Ph.D. in Mathematics**, University of California, Berkeley.<br>Supervisor: N. Reshetikhin.<br>Thesis: "Algebraic Poisson Geometry in Representation Theory and Combinatorics." |
| 1998 – 2002 | **B.A. in Mathematics**, Simon's Rock College.<br>Supervisor: W. Dunbar |
| *As visitor* | |
| 2014 Spring | **Junior Chair**, Université Denis Diderot–Paris VII,<br>sponsored by Fondation Sciences Mathématiques de Paris. |
| 2006 Fall | Center for the Topology and Quantization of Moduli Spaces (Århus, Denmark). |
| 2001 Spring | Budapest Semesters in Mathematics (Budapest, Hungary). |

### Scientific/Academic Honors and Grants:

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| 2024 – 2029 | (pending) NSERC Discovery Grant |
| 2023 | SMRI International Visitor Program ($5k for research visit to Australia) |
| 2019 | Golden Jubilee Research Excellence Award (UW Faculty of Math) |
| 2018 – 2024 | NSERC Discovery Grant ($28k per year) |
| 2016 | Cory Family Teaching Award (recognizes excellence in lower division teaching;<br>one awarded for all STEM fields at UVA per year) |
| 2015 | Kavli Fellow, National Academy of Sciences |
| 2015 | International Researcher Collaboration Award from Sydney University |
| 2014 – 2016 | Sloan Research Fellowship ($50,000) |
| 2012 – 2017 | NSF CAREER grant: "Representation theory of symplectic singularities" ($416,905) |
| 2013 | NSF conference grant "Algebra, Combinatorics, and Representation Theory." ($40,000) |
| 2010 – 2012 | NSA Young Investigator Grant ($30,000) |
| 2007 – 2011 | NSF Postdoctoral Research Fellowship |
| 2007 June | Clay Liftoff Fellowship |
| 2003 – 2007 | NSF Graduate Research Fellowship |

### Research Interests:

Connections of representation theory and topology with quantum field theory.

**Publications:** available at https://uwaterloo.ca/scholar/b2webste/publications

2024 1. *Gelfand-Tsetlin modules: canonicity and calculations* (with Turner Silverthorne). Algebras and Representation Theory **27**, no. 2, 1405–1455. arXiv:2011.06029

2. *Gelfand-Tsetlin modules in the Coulomb context.* arXiv:1904.05415; to appear in Annals of Representation Theory.

3. *RoCK blocks for affine categorical representations.* to appear in Journal of Combinatorial Algebra. arXiv:2301.01613

4. *Homological mirror symmetry for hypertoric varieties I.* (with Michael McBreen). Geometry and Topology. **28** (2024), no. 3, 1005–1063 arXiv:1804.10646

5. *Lie algebra actions on module categories for truncated shifted Yangians.* (with J. Kamnitzer, A. Weekes and O. Yacobi). Forum of Mathematics, Sigma **12** (2024). arXiv:2203.12429

6. *The nil-Brauer category.* (with Jon Brundan and Weiqiang Wang) Annals of Representation Theory, Volume 1 (2024) no. 1, pp. 21-58. arXiv:2305.03876

2023 7. *The degenerate Heisenberg category and its Grothendieck ring.* (with Jonathan Brundan and Alistair Savage). Annales Scientifiques de l'École Normale Supérieure **56** (2023) no. 5, pp. 1517–1563. arXiv:1812.03255

8. *Rational Cherednik algebras of $G(\ell, p, n)$ from the Coulomb perspective* (with Elise LePage) Advances in Mathematics 433 (2023), Paper No. 109295, 49 pp. arXiv:1912.00046

9. *3-dimensional mirror symmetry* (with Philsang Yoo). Notices of the American Mathematical Society **70** (2023), no. 9, 1395–1406 arXiv:2308.06191

2022 10. *Quantum Frobenius Heisenberg categorification* (with Jonathan Brundan and Alistair Savage). J. Pure Appl. Algebra 226 (2022), no. 1, Paper No. 106792, 50 pp. arXiv:2009.06690

2021 11. *Foundations of Frobenius Heisenberg categories* (with Jonathan Brundan and Alistair Savage). J. Algebra 578 (2021), 115–185. arXiv:2007.01642

2020 12. *Heisenberg and Kac-Moody categorification* (with Jonathan Brundan and Alistair Savage). Selecta Math. (N.S.) 26 (2020), no. 5, 74. arXiv:1907.11988

13. *On the definition of quantum Heisenberg category.* (with Jonathan Brundan and Alistair Savage). Algebra and Number Theory **14** (2020), no. 2, 275-321. arXiv:1812.04779

14. *A quantum Mirković–Vybornov isomorphism.* (with A. Weekes and O. Yacobi). Representation Theory 24 (2020), 38-84. arXiv:1706.03841

15. *On graded presentations of Hecke algebras and their generalizations.* Algebraic Combinatorics, Volume 3 (2020) no. 1, pp. 1-38. arXiv:1305.0599

2019 16. *Representation theory of the cyclotomic Cherednik algebra via the Dunkl-Opdam subalgebra.* New York J. Math. 25 (2019), 1017–1047 arXiv:1605.03780

17. *Weighted Khovanov-Lauda-Rouquier algebras.* to appear in Documenta Mathematica. Doc. Math. 24 (2019), 209–250. arXiv:1209.2463

18. *On category $\mathcal{O}$ for affine Grassmannian slices and categorified tensor products.* (with J. Kamnitzer, P. Tingley, A. Weekes and O. Yacobi). Proc. Lond. Math. Soc. (3) 119 (2019), no. 5, 1179–1233. arXiv:1806.07519

19. *Highest weights for truncated shifted Yangians and product monomial crystals* (with J. Kamnitzer, P. Tingley, A. Weekes and O. Yacobi). J. Comb. Algebra 3 (2019), no. 3, 237–303. arXiv:1511.09131

20. *A categorical action on quantized quiver varieties.* Mathematische Zeitschrift, **292** Issue 1-2 (2019), 611–639.

21. Appendix to *Coulomb branches of* $3d$ $\mathcal{N}=4$ *quiver gauge theories and slices in the affine Grassmannian.* (with A. Braverman, M. Finkelberg, J. Kamnitzer, R. Kodera, H. Nakajima, and A. Weekes). Adv. Theor. Math. Phys. 23 (2019), no. 1, 75–166. arXiv:1604.03625

2018 22. *Categorified skew Howe duality and comparison of knot homologies* (with Marco Mackaay). Advances in Math **330** (2018), 876–945. arXiv:1502.06011

23. *Categorification of quantum symmetric pairs I.* (with H. Bao, P. Shan and W. Wang). Quantum Topology, **9**, Issue 4 (2018) pp. 643–714. arXiv:1605.03780

2017 24. *Rouquier's conjecture and diagrammatic algebra.* Forum of Mathematics Sigma **5** (2017), e27, 71 pp. arXiv:1306.0074

25. *A geometric construction of colored HOMFLYPT homology* (with G. Williamson). Geometry & Topology **21-5** (2017), 2557–2600. arXiv:0905.0486

26. *On generalized category* $\mathcal{O}$ *for a quiver variety.* Mathematische Annalen **368** (2017), no. 1–2, 483–536. arXiv:1409.4461

27. *Geometry and categorification.* "Categorification in Geometry, Topology and Physics," 1–22, Contemp. Math., **680**, AMS, 2017. arXiv:1602.05992

28. *Comparison of canonical bases for Schur and universal enveloping algebras.* Transformation Groups, **22(3)**, 869–883. arXiv:1503.08734

29. *Current algebras and categorified quantum groups* (with A. Beliakova, K. Habiro and A. Lauda). Journal of the London Mathematical Society, **95**, 248–276 arXiv:1412.1417

30. *Knot invariants and higher representation theory.* Memoirs of the American Mathematical Society **250**, no. 1191, pp. 133. arXiv:1309.3796

2016 31. *Quantizations of conical symplectic resolutions II: category* $\mathcal{O}$ *and symplectic duality.* (with T. Braden, A. Licata and N. Proudfoot). Astérisque No. 384, 75–179. arXiv:1407.0964

32. *Quantizations of conical symplectic resolutions I: local and global structure* (with T. Braden and N. Proudfoot). Astérisque No. 384, 1–73. arXiv:1208.3863

33. *Tensor product algebras, Grassmannians and Khovanov homology.* "Physics and mathematics of link homology," 23–58, Contemp. Math., **680**, AMS, 2016. arXiv:1312.7357

34. *Cyclicity for categorified quantum groups* (with A. Beliakova, K. Habiro and A. Lauda). Journal of Algebra **452**, 118–132. arXiv:1506.04671

35. *Mirković-Vilonen polytopes and Khovanov-Lauda-Rouquier algebras* (with Peter Tingley). Compositio Mathematica **152**, no. 8, 1648–1696. arXiv:1210.6921

36. *Tensor product categorifications and the super Kazhdan-Lusztig conjecture* (with Jonathan Brundan and Ivan Losev). International Mathematics Research Notices, Volume 2017, Issue 20, Pages 6329–6410. arXiv:1310.0349

2015 37. Appendix to *Indecomposable Soergel bimodules for universal Coxeter groups* (by Ben Elias and Nicolas Libedinsky). to appear in Transactions of the AMS. arXiv:1401.2467

38. *On uniqueness of tensor products of irreducible categorifications* (with Ivan Losev). Selecta Math. (N.S.) **21**, no. 2, 345–377. arXiv:1303.1336

39. *Canonical bases and higher representation theory.* Compositio Mathematica **151**, no. 1, 121–166. arXiv:1209.0051

2014 40. *Yangians and quantizations of slices in the affine Grassmannian* (with J. Kamnitzer, A. Weekes and O. Yacobi). Journal of Algebra and Number Theory **8** (2014), no. 4, 857–893. arXiv:1209.0349

2012 41. *An introduction to categorifying quantum knot invariants.* "The FreedmanFest," Geometry and Topology Monographs, **18**, Mathematical Sciences Publishers, Berkeley

42. *2-block Springer fibers: convolution algebras and coherent sheaves* (with C. Stroppel). Commentarii Mathematici Helvetici **87** (2012), no. 2, 477–520. arXiv:0802.1943
43. *Hypertoric category $\mathcal{O}$* (with T. Braden, A. Licata, and N. Proudfoot). Advances in Mathematics. **231** (2012), no. 3-4, 1487–1545. arXiv:1010.2001
44. *Schur-Weyl-type duality for $\mathfrak{gl}(1|1)$, the Burau representation of braid groups, and invariants of tangled graphs* (with N. Reshetikhin and C. Stroppel). "Perspectives in analysis, geometry, and topology," 389–401, Progress in Mathematics, **296**, Birkhäuser/Springer, New York, 2012.

2011 45. *Localization algebras and deformations of Koszul algebras* (with T. Braden, A. Licata, C. Phan and N. Proudfoot). Selecta Mathematica, **17** (2011) 533–572. arXiv:0905.1335
46. *The geometry of Markov traces* (with G. Williamson). Duke Mathematics Journal, **160** (2011) 401–419. arXiv:0911.4494
47. *Singular blocks of parabolic category $\mathcal{O}$ and finite W-algebras.* Journal of Pure and Applied Algebra **215** (2011), no. 12, 2797–2804. arXiv:0909.1860

2010 48. *Gale duality and Koszul duality* (with T. Braden, A. Licata, and N. Proudfoot). Advances in Mathematics, **225** (2010) 2002–2049. arXiv:0806.3256

2008 49. *A geometric model for the Hochschild homology of Soergel bimodules* (with G. Williamson). Geometry and Topology, **12** (2008) 1243–1263. arXiv:0707.2003.
50. *Cramped subgroups and generalized Harish-Chandra modules.* Proceedings of the AMS, **136** (2008), 3809–3814. arXiv:math.RT/0609846.

2007 51. *Small linearly equivalent G-sets and a construction of Beaulieu.* Journal of Algebra, **317** (2007), no. 1, 306–323. arXiv:math.GR/0610205.
52. *Khovanov-Rozansky homology via a canopolis formalism.* Algebraic and Geometric Topology, **7** (2007), 673–699. arXiv:math.GT/0610650.
53. *A Deodhar type stratification of the double flag variety* (with M. Yakimov). Transformation Groups, **12** (2007), no. 4, 769–785. arXiv:math.SG/0607374.
54. *Intersection cohomology of hypertoric varieties* (with N. Proudfoot). Journal of Algebraic Geometry **16** (2007), 39–63. arXiv:math.AG/0411350.

2006 55. *Stabilization phenomena in Kac-Moody algebras and quiver varieties.* arXiv:math.RT/0505619. International Mathematics Research Notices, vol. 2006, Article ID 36856.

**Preprints:**

1. *A tilting generator for $T^*\mathrm{Gr}(2,4)$ as a Coulomb branch.* (with Aiden Suter) arXiv:2409.01379
2. *Bubbles in the affine Brauer and Kauffman categories.* (with Alistair Savage) arXiv:2408.07000
3. *Degenerate twisted traces on quantized Kleinian singularities of type A* (with Zev Friedman) arXiv:2406.07708
4. *Twisted traces on abelian quantum Higgs and Coulomb branches.* (with Davide Gaiotto, ) Justin Hilburn, Jaime Redondo-Yuste, and Zheng Zhou. arXiv:2307.10406
5. *On the representation theory of Schur algebras in type B.* (with Dinushi Munasinghe) arXiv:2307.10406
6. *Nil-Brauer categorifies the split $\imath$-quantum group of rank one.* (with Jon Brundan and Weiqiang Wang) arXiv:2305.05877

7. *Coherent sheaves and quantum Coulomb branches II: quiver gauge theories and knot homology.* arXiv:2211.02099
8. *Three perspectives on categorical symmetric Howe duality* arXiv:2001.07584
9. *Coherent sheaves and quantum Coulomb branches I: tilting bundles from integrable systems.* arXiv:1905.04623
10. *Homological mirror symmetry for hypertoric varieties II.* (with Benjamin Gammage and Michael McBreen). arXiv:1903.07928; submitted to Geometry and Topology
11. *Koszul duality between Higgs and Coulomb categories $\mathcal{O}$.* arXiv:1611.06541
12. *Unfurling Khovanov-Lauda-Rouquier algebras.* arXiv:1603.06311
13. *Centers of KLR algebras and cohomology rings of quiver varieties.* arXiv:1504.04401
14. *Quiver Schur algebras and q-Fock space* (with C. Stroppel). arXiv:1110.1115

**Students & postdocs supervised:**

| | |
|---|---|
| 2016 – 2019 | Chris Leonard (PhD, Virginia; joint with Weiqiang Wang) |
| 2017 – 2019 | Alex Weekes (postdoc, Perimeter) |
| 2017 – 2020 | Qiao Zhou (postdoc, Perimeter) |
| 2018 – | Aiden Sutter (MSc, PSI; PhD, Perimeter/Waterloo) |
| 2019 | Amanda Garcia (MMath, Waterloo) |
| 2019 | Edward Poon (MMath, Waterloo) |
| 2019 | Elise LePage (MSc, PSI) |
| 2019 – 2020 | Turner Silverthorne (undergrad, Waterloo) |
| 2019 | Jerry Guan (undergrad, Waterloo) |
| 2019 – | Justin Hilburn (postdoc, Perimeter) |
| 2019 – 2020 | Mark Penney (postdoc, Perimeter) |
| 2020 – 2022 | Dene Lepine (PhD, Waterloo) |
| 2020 – | Dinushi Munasinghe (PhD, Toronto) |
| 2020 | Baorui Zhou (undergrad, Waterloo) |
| 2021 | Jeremy Peters (MSc, PSI) |
| 2021 | Shannon Jeffries (undergrad, Waterloo) |
| 2021 – 2023 | Ethan Kowalenko (postdoc, Waterloo) |
| 2021 – | Keke Zhang (PhD, Perimeter/Waterloo) |
| 2023 | Zev Friedman (undergrad, Waterloo) |
| 2023 – | Nikita Grygoryev (PhD, co-supervision with Gaiotto and Costello, Perimeter/Waterloo) |

**Selected Lectures (since 2017):**

2025 Apr. **Yale** (Geometry and Symmetry Seminar): *Geometry of Coulomb branches*
Apr. **Harvard CMSA** (Colloquium): *3d mirror symmetry*
Apr. **Stony Brook** (Symplectic Singularities, Supersymmetric QFT, and Geometric Representation Theory): *Geometry of Coulomb branches*
Feb. **Toronto** (Mathematical Physics Seminar): *Geometry of Coulomb branches*
Jan. **Zoom** (Imperial Mathematical Physics Seminar): *Gluing constructions for Coulomb branches*
2024 Oct. **Virginia** (Algebra Seminar): *Coulomb branches and representation theory*
Oct. **Virginia** (Colloquium): *Representation theory and a little bit of quantum field theory*
Oct. **NCSU** (Quantum Groups and Representation Theory): *Coulomb branches and representation theory*

Sep. **Les Diablerets** (Quantization in Representation Theory, Derived Algebraic Geometry, and Gauge Theory): *3d mirror symmetry*
Apr. **Berkeley** (String-Math Seminar):
*The cotangent bundle of the Grassmannian as a Coulomb branch*
Mar. **Zoom** (Quivers meeting): *Twisted traces and symplectic singularities*
Jan. **Ottawa** (Algebra Seminar): *Gelfand-Tsetlin modules and other fun with Coulomb branches*
Jan. **Ottawa** (Colloquium): *Representation theory and a little bit of quantum field theory*
2023 Sep. **Pollica** (Supersymmetric Quantum Field Theory and Mathematics): *3d mirror symmetry*
Aug. **Edinburgh** (Geometric Representation Theory and W-algebras):
*Finite W-algebras as Coulomb branches*
Jun. **MIT** (Summer School in Geometric Representation Theory):
lead speaker at 1 week summer school
Mar. **Imperial** (Mathematical Physics Seminar): *Noncommutative resolutions and Coulomb branches*
Feb. **Sydney** (Categorification in representation theory):
*Categorical $\mathfrak{sl}_2$ actions and RoCK blocks*
*Categorical $\mathfrak{sl}_2$ representations and modular representation theory* (expository 4 lecture series)
Jan. **Melbourne** (Representation Theory Seminar):
*Noncommutative resolutions and Coulomb branches*
Jan. **Singapore** (Workshop on interactions between representation theory, combinatorics, and geometry): *The noncommutative Springer resolution of type A and KLRW algebras*
2022 Dec. **AIM** (Floer theory of symmetric products and Hilbert schemes):
*Fun with Coulomb branches*
Sep. **Oberwolfach** (Character Theory and Categorification):
*Heisenberg and Kac-Moody categorification*
Jun. **Northeastern** (Canada-Mexico-USA Conference in Representation Theory, Noncommutative Algebra, and Categorification): *Coulomb branches and KLRW algebras*
May **McMaster** (Colloquium): *Representation theory and a little bit of quantum field theory*
Apr. **Northeastern** (GASC Seminar): *Representation theory and a little bit of quantum field theory*
Apr. **Boston U.** (geometry seminar): *Mirror symmetry for hypertoric varieties*
Feb. **Queens** (Colloquium): *Representation theory and a little bit of quantum field theory*
Jan. **Zoom** (Geometry and Physics Seminar, Zhejiang University): *3d mirror symmetry and symplectic singularities*
2021 Oct. **Zoom** (Berkeley String-Math Seminar):
*Noncommutative resolutions of Coulomb branches*
Jun. **Zoom** (NSF-FRG workshop on Categorical braid group actions and categorical representation theory): *Knot homology from coherent sheaves on Coulomb branches*
May **Zoom** (BIRS Workshop on Perspectives on Knot Homology):
*Knot homology from coherent sheaves on Coulomb branches*
April **Zoom** (Kansas State M-Seminar):
*Knot homology from coherent sheaves on Coulomb branches*
2020 Nov. **Zoom** (Yale Geometry, Symmetry and Physics Seminar):
*Knot homology and coherent sheaves on Coulomb branches*
Nov. **Zoom** (Northwestern Geometry and Physics Seminar): *Hypertoric mirror symmetry*
Sep. **Zoom** (Learning Seminar on Categorification): *Coulomb branches and cylindrical KLRW algebras [2 talks]*
Aug. **Zoom** (Quantum groups, Representation theory, Superalgebras, and Tensor categories):
*Tensor products and categorification*

Aug. **Zoom** (QUACKS): *Howe to translate Gelfand-Tsetlin*
Aug. **Zoom** (Western Hemisphere Colloquium on Geometry and Physics): *3d mirror symmetry and its discontents*
May **Zoom** (Gone Fishin'): *Coulomb branches in math and physics*
Apr. **Zoom** (UC Davis Coulomb seminar): *Tilting bundles from positive characteristic* [2 talks]
Feb. **Fields Institute** (Geometric Representation Theory Seminar): *S(ymplectic) duality: where do we stand?*
2019 Nov. **Fields Institute** (Workshop on Higher Structures in Geometry and Physics): *Line defects and tilting bundles*
Sep. **KSU** [remote] (Kansas State M-Seminar): Tilting bundles and 3-dimensional field theory
Aug. **CRM Montreal** (Workshop on quiver varieties and representation theory): *Quiver varieties as Coulomb branches*
Jul. **Warsaw** (Symposium on Integrable Systems): *Representation theory, topology and quantum field theory*
Apr. **Berkeley** (String-Math seminar): *Mathematical hints of 3-d mirror symmetry*
Apr. **Luminy** (Symplectic representation theory): *Gelfand-Tsetlin theory and Coulomb branches*
Jan. **VUB** (Aspects of Higher Representation Theory): *Heisenberg v. Kac-Moody*
2018 Nov. **Oberwolfach** (Enveloping Algebras and Geometric Representation Theory): *The classification of Gelfand-Tsetlin modules and the Braverman-Finkelberg-Nakajima construction*
Oct. **U. Virginia** (Representation theory, Combinatorics, and Geometry): *Coherent sheaves on Hilbert schemes through the Coulomb lens*
Aug. **SUNY Buffalo** (Algebra Seminar): *Representation theory of symplectic singularities*
Jul. **ECNU, Shanghai** (Workshop on Lie Theory and Representation Theory): *Coulomb branches and Cherednik algebras*
Jul. **ECNU, Shanghai** (Summer School on Lie Theory and Representation Theory): *Categorification: Heisenberg and Kac-Moody* (8 talk series)
Jun. **Notre Dame** (Thematic Program in Geometric Representation Theory): *Coulomb branches and applications* (4 talk series)
Jun. **Oberwolfach** (Interactions between Algebraic Geometry and Noncommutative Algebra): *Coulomb branches and KLR algebras*
2017 Dec. **Macquarie** (AustMS Representation Theory Keynote): *Representation theory of symplectic singularities*
Dec. **Sydney** (Future Directions in Representation Theory): *Symplectic duality and KLR algebras*
Oct. **Northeastern** (GASC Seminar): *Coherent sheaves and Coulomb branches*
Oct. **U. Toronto** (Geometric Representation Theory Seminar): *The extended BFN category and shifted Yangians*
Sep. **Perimeter Institute** (Mathematical Physics Seminar): *An extended category for the BFN construction*
Sep. **U. Buffalo** (AMS Sectional): *Representation theory and the Coulomb branch*
Aug. **U. of Oregon** (WARTHOG): *Symplectic duality (the abelian case)* (five day workshop)
Jun. **Newton Institute** (Quantum topology and categorified representation theory): *Representation theory and the Coulomb branch*
Apr. **GWU** (Knots in Washington): *Knot invariants via quantizations of Hecke modifications*
Mar. **UCLA** (Gauge Theory and Categorification): *Knot invariants via quantizations of Hecke modifications*
Mar. **Perimeter Institute**: *3-dimensional mirror symmetry: a mathematical perspective*
Jan. **Texas** (Colloquium): *Representation theory of symplectic singularities*
Jan. **Rice** (Colloquium): *Representation theory of symplectic singularities*

**Professional Activities:**

- Member of Editorial Board of *Representation Theory*
- Journals refereed:

  Annals of Math
  Selecta Mathematica
  American Journal of Mathematics
  Advances in Mathematics
  Representation Theory
  Transactions of the AMS
  Banach Center Publications
  Nagoya Math Journal
  Compositio Mathematica
  Proceedings of the LMS
  Journal of Algebra
  SIGMA
  Fundamenta Mathematicae
  Math Annalen
  Birkhäuser Festschriften
  Algebra and Number Theory
  Journal of the EMS
  Moscow Mathematical Journal
  Algebraic & Geometric Topology
  Quantum Topology
  International Mathematics Research Notices
  Duke Mathematics Journal
  Mathematische Zeitschrift
  International Journal of Mathematics & Mathematical Sciences
  Journal of the AMS
  Inventiones Mathematicae
  Acta Mathematica
  Journal of the LMS

- *Math Reviews* reviewer.
- Departmental committees served:

  DACA (UW)
  Graduate/admissions committees (UW, UVA)
  Assessment committee (UVA)
  Postdoctoral search committee (NU & PI)
  Niven and Moursund Lectures committee (UO)
  PhD Thesis Chair Pool (UW)
  Library committee (PI)
  Undergraduate advisor (UVA)
  Graduate Open House committee (NU)

- External committees served:

  AMS Web Editorial Group (2014–2016)
  AMS Committee on Publications (2015–2018)

- Reviewed grants for:

  NSA Mathematics
  NSF Mathematics
  European Research Council
  BIRS workshops
  EPSRC
  Portuguese Foundation for Science and Technology
  France Berkeley Fund
  Swiss National Science Foundation
  National Fund for Scientific Research (Belgium)

- Expository talks given:

  Waterloo PMC
  Simon's Rock College Math Club
  Northeastern incoming math majors
  LSU graduate colloquium
  UVA Math Club
  Boston Math Circle
  Western Albemarle High School
  Waterloo EMACS

- Conferences co-organized:
  - "The geometry of double affine Hecke algebras and Coulomb branches" conference at ICMS in Edinburgh (2023)
  - "QFT for Mathematicians II" summer school at Perimeter Institute (2022)
  - "Perspectives on knot homology" planned for Banff; held online (2021)
  - "Geometric Representation Theory" planned for Perimeter Institute and MPIM Bonn; held online (2020)

- "Algebraic and Geometric Categorification" at CMO in Oaxaca (2019)
- "QFT for Mathematicians" summer school at Perimeter Institute (2019)
- "Representation theory, mathematical physics and integrable systems" in Luminy (2018)
- "Virginia Topology Conference 2016" in Charlottesville (2016)
- "Algebraic Groups, Quantum Groups and Geometry" in Charlottesville (2016)
- "Categorification and Geometric Representation Theory" in Montréal (2014)
- "Workshop on Quiver Representations and Geometric Representation Theory" in Paris (2014)
- "Algebra, Combinatorics and Representation Theory: an international conference in memory of Andrei Zelevinsky" in Boston (2013)
- "Representation Theory and Geometry" in Berkeley (2005)

**Teaching Activities:**

*At Waterloo:*

| | | |
|---|---|---|
| 2024 | Winter | Taught "Representation Theory of Finite Groups" (MATH 445) |
| 2023 | Fall | Taught "Commutative Algebra" (MATH 446) |
| 2022 | Winter | Taught "Algebraic Geometry" (MATH 464) |
| 2021 | Fall | Taught "Topics in Algebra: Category $\mathcal{O}$" (MATH 945) |
| 2021 | Winter | Taught "Topics in Geometry: Symplectic Geometry" (MATH 965) |
| 2020 | Fall | Taught "Linear Algebra 2 for Honours Mathematics" (MATH 235) |
| 2020 | Spring | Taught "Euclidean Geometry" (MATH 320) |
| 2020 | Winter | Taught "Calculus 1 for Honours Mathematics" (MATH 128) |
| 2019 | Fall | Taught "Linear Algebra 2 for Honours Mathematics" (MATH 235) |
| 2019 | Winter | Taught "Linear Algebra 1 for Honours Mathematics" (MATH 136) |
| 2018 | Fall | Taught "Representation Theory of Finite Groups" (PMATH 4/745) |
| 2018 | Winter | Taught "Combinatorial Representation Theory" (PMATH 945) |
| 2017 | Fall | Taught "Representation Theory of Finite Groups" (PMATH 4/745) |

*At UVA, NU, UO and MIT:*

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|---|---|
| undergrad: | Calculus (single and multivariable), Differential Equations with Linear Algebra, Transition to Higher Mathematics, Number Theory, Project Lab in Mathematics, Representations of Finite Groups |
| graduate: | Algebra, Measure Theory, Lie Groups, Homological, Algebraic Topology, Symplectic Geometry, Quiver Representations, reading courses on categorification, geometric representation theory and quiver varieties. |