

Curriculum Vitae of You Qi

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| CONTACT INFORMATION | Department of Mathematics, University of Virginia 141 Cabell Drive, Kerchof Hall Charlottesville, VA 22904, USA Webpage: https://you-qi2121.github.io/mypage/ | <i>Tel:</i> +1(434)924-4936 <i>Email:</i> yq2dw@virginia.edu |
| RESEARCH INTERESTS | Categorification, representation theory, algebraic geometry, homological algebra, applications to low dimensional topology. | |
| CURRENT POSITION | Assistant Professor , University of Virginia. August 2019 – present. | |
| PAST EMPLOYMENT | Sherman Fairchild Research Assistant Professor , California Institute of Technology. July 2017 – August 2019. | |
| | Gibbs Assistant Professor , Yale University. July 2014 – June 2017. | |
| | Morrey Visiting Assistant Professor , University of California, Berkeley. July 2013 – June 2014. | |
| EDUCATION | Columbia University , New York, USA PhD in Mathematics, Sept 2008 – May 2013. <ul style="list-style-type: none">• Advisor: Mikhail Khovanov• Thesis: “Hopfological algebra” Hong Kong University of Science and Technology , Clear Water Bay, Hong Kong MPhil. in Mathematics, Sept 2006 - July 2008. <ul style="list-style-type: none">• Advisor: Guowu Meng• Thesis: “An Algebraic Proof of a Quadratic Relation in MICZ-Kepler Problem” Tsinghua University , Beijing, P. R. China BS., Academic Talent Program, Sept 2002 – July 2006. | |
| PUBLICATIONS | <ul style="list-style-type: none">[1] Hopfological algebra, <i>Compositio Mathematica</i> 150(01): 1–45, 2014. arXiv:1205.1814.[2] An approach to categorification of some small quantum groups, joint with Mikhail Khovanov, <i>Quantum Topology</i> 6(2): 185–311, 2015. arXiv:1208.0616.[3] An approach to categorification of some small quantum groups II, joint with Ben Elias, <i>Advances in Mathematics</i> 288: 81–151, 2016. arXiv:1302.5478.[4] A categorification of the Burau representation at a prime root of unity, joint with Joshua Sussan, <i>Selecta Mathematica</i> 22(3): 1157–1193, 2016. arXiv:1312.7692.[5] A categorification of quantum $\mathfrak{sl}(2)$ at prime roots of unity, joint with Ben Elias, <i>Advances in Mathematics</i> 299: 863–930, 2016. arXiv:1503.05114.[6] The differential graded odd nilHecke algebra, joint with Alexander P. Ellis, <i>Communications in Mathematical Physics</i>, 344(1): 275–331, 2016. arXiv:1504.01712. | |

- [7] Categorification at prime roots of unity and hopfological finiteness, joint with Joshua Sussan, *Categorification and Higher Representation Theory, AMS Contemporary Mathematics*, **683**: 261–286, 2017. arXiv:1509.00438.
- [8] The center of small quantum groups I: the principal block in type A, joint with Anna Lachowska, *International Mathematics Research Notices IMRN*, **2018**(20): 6349–6405, 2018. arXiv:1604.07380.
- [9] A categorification of a quantum Frobenius map, *Journal of the Institute of Mathematics of Jussieu*, 2017, DOI:10.1017/S1474748017000275. arXiv:1607.02117.
- [10] The center of small quantum groups II: singular blocks, joint with Anna Lachowska, the *Proceedings of the London Mathematical Society*, **118**(3):513–544, 2019. arXiv:1703.02457.
- [11] Morphism spaces in stable categories of Frobenius algebras, *Communications in Algebra*, **47**(8): 3239–3249, 2019. arXiv:1801.07838.
- [12] A faithful braid group action on the stable category of tricomplexes, joint with Mikhail Khovanov, *SIGMA* **16** (2020), 019, 32 pages, arXiv:1911.02503.
- [13] Evaluating thin flat surfaces, joint with Mikhail Khovanov and Lev Rozansky, *Communications in Mathematical Physics*, DOI: 10.1007/s00220-021-04011-3, 2021. arXiv:2009.01384.

BOOK CHAPTERS

- [1] Connections to Link Invariants, joint with Johannes Flake, (2020). In *Introduction to Soergel bimodules*, edited by Ben Elias, Shotaro Makisumi, Ulrich Thiel and Geordie Williamson. RSME Springer Series **5**:421–440, Springer, Cham.

PREPRINTS

- [1] p -DG cyclotomic nilHecke algebras, joint with Mikhail Khovanov and Joshua Sussan, 2017, arXiv:1711.07159.
- [2] A categorification of cyclotomic integers, joint with Robert Laugwitz, 2018, arXiv:1804.01478.
- [3] p -DG cyclotomic nilHecke algebras II, joint with Joshua Sussan, 2018, arXiv:1811.04372.
- [4] Remarks on the derived center of small quantum groups, joint with Anna Lachowska, 2019, arXiv:1912.08783.
- [5] Categorifying Hecke algebras at prime roots of unity, part I, joint with Ben Elias, 2020, arXiv:2005.03128.
- [6] On some p -differential graded link homologies, joint with Joshua Sussan, 2020, arXiv:2009.06498.
- [7] A braid group action on a p -DG homotopy category, joint with Joshua Sussan and Yasuyoshi Yonezawa, 2020, arXiv:2012.15181.
- [8] Actions of $\mathrm{sl}(2)$ on algebras appearing in categorification, joint with Ben Elias, 2021, arXiv:2103.00048.

PROJECTS IN PROGRESS

- [1] On some p -differential graded link homologies, part II, joint with Joshua Sussan, in preparation.
- [2] A categorification of type- A Hecke algebra at prime roots of unity, part II, joint with Ben Elias and Peter McNamara, in preparation.
- [3] Hopfological quotients of hopfological categories, in preparation.

AWARDS AND GRANTS

- NSF Research Grant: “Categorification at Roots of Unity,” DMS-1763328, 2017–2021.
- Carl B. Boyer Memorial Fellowship, Columbia University, 2012–2013.
- Faculty Fellowship, Columbia University, 2008–2012.
- Epsilon Fund Award, Department of Mathematics, HKUST, 2008.
- Academic Excellence Scholarship, Tsinghua University, 2005–2006.

INVITED PRESENTATIONS

- (1) A mini-course on categorification at prime roots of unity, QUACKS conference, online meeting due to Covid19, information (lecture videos and notes) available at <https://pages.uoregon.edu/belias/QUACKS/index.html>. Aug., 2020.
- (2) A talk on tensor product categorification at prime roots of unity, Columbia Symplectic Geometry, Gauge Theory, and Categorification Seminar, New York, September 2019.
- (3) A 4-lecture series on categorification at prime roots of unity, workshop on quiver Hecke algebra and its applications to topology, Nagoya, Japan, July 2019.

- (4) An invited 45-minute address on categorification at prime roots of unity, the 8th International Congress of Chinese Mathematicians, Beijing, China, June 2019.
- (5) Two lectures on categorification at prime roots of unity, Summer School and Workshop on Categorification of Quantum 3-Manifold Invariants, University of Southern California, Jul., 2018.
- (6) A talk on categorification of cyclotomic rings, Categorification and Higher Representation Theory Conference, Mittag-Leffler Institute, Stockholm, Sweden, Jul., 2018.
- (7) A talk on the center of small quantum groups, Colloquium, CUNY Medgar Evers College, May, 2018.
- (8) A talk on the center of small quantum groups, Lie Theory Seminar, UC Riverside, Apr., 2018.
- (9) A talk on the center of small quantum groups, Winter Young Algebraic Geometer Workshop, Southern University of Science and Technology, Shenzhen, Dec., 2017.
- (10) A talk on categorification at prime roots of unity at Guanghai Forum, Fudan University, Shanghai, Dec., 2017.
- (11) A talk on the center of small quantum groups, Special Session on Recent Advancements in Representation Theory, AMS Sectional Meeting at the State University of New York at Buffalo, Sep. 2017.
- (12) A talk on categorification at prime roots of unity, Lie Groups and Quantum Math Seminar, Rutgers University, New Brunswick, Mar., 2017.
- (13) A colloquium talk on categorification at prime roots of unity, University of California, Santa Cruz, Feb. 2017.
- (14) A colloquium talk on categorification at prime roots of unity, Hong Kong University of Science and Technology, Jan., 2017.
- (15) A talk on Categorification at prime roots of unity, Hausdorff Institute, University of Bonn, Dec., 2016
- (16) A talk on the center of small quantum groups, Algebra Seminar, University of Virginia, Sep., 2016.
- (17) A talk on the center of small quantum groups, Geometric Methods in Representation Theory Seminar, University of North Carolina, Chapel Hill, Sep., 2016.
- (18) Three lectures on categorification at prime roots of unity, Workshop: Categorification, Mathematical Institute, University of Bonn, Germany, May, 2016.
- (19) A talk on categorification of small quantum $\mathfrak{sl}(2)$, Informal Mathematical Physics Seminar, Columbia, Apr., 2016.
- (20) A talk on the center of small quantum groups, Yau Mathematical Sciences Center, Tsinghua University, Sanya, China, Mar., 2016.
- (21) Two talks on categorification at prime roots of unity, Kyoto University and RIMS, Kyoto, Japan, Feb., 2016.
- (22) A talk on categorification at prime roots of unity, a conference on “Geometric and Categorical Representation Theory,” Mooloolaba, Australia, Dec., 2015.
- (23) Five lectures on categorification at prime roots of unity, IMPJ, Paris, France, Nov., 2015.
- (24) A talk on categorification of small quantum groups, Colloquium, CUNY Medgar Evers College, Oct., 2015.
- (25) A talk on “A New Year’s Resolution”, Joint Meeting of AMS-EMS-SPM, Porto, Portugal, Jun., 2015.
- (26) A talk on categorification of small quantum groups given at the algebra seminar at University of Oregon, Mar., 2015.

- (27) A talk on “A New Year’s Resolution,” Spring Eastern AMS Sectional Meeting at Georgetown University, Mar., 2015.
- (28) A talk on categorification of small quantum groups given at the representation theory seminar at CUNY graduate center, Sep., 2014.
- (29) A talk on categorification of small quantum groups given at the CBMS conference at North Carolina State University, Jul., 2014.
- (30) A talk on categorification of small quantum $\mathfrak{sl}(2)$ given at CRM (Canada), a workshop on “Categorification and geometric representation theory,” Jun., 2014.
- (31) A talk on categorification of small quantum groups given at HKUST (Hong Kong), Mar., 2014.
- (32) A talk on categorification of small quantum groups given at UC Davis, Mar., 2014.
- (33) A talk on categorification of small quantum groups in the workshop “Lie Theory Workshop on Quantum Groups,” Stanford, Feb, 2014.
- (34) A talk on categorification of small quantum groups in the conference “Hecke algebras in number theory and categorification,” Columbia, May, 2013.
- (35) A talk on categorification of small quantum groups, MIT, Oct., 2012.
- (36) A talk on categorification of small quantum groups, Yale, Sep., 2012.
- (37) Two talks on categorification of small quantum groups, USC, Sep., 2012.
- (38) Three lectures on Khovanov homology, Chern Institute, Nankai, China, Jun., 2012.

TEACHING EXPERIENCE

California Institute of Technology

- Instructor for the course Math 151b, Algebraic and Differential Topology II, Winter term, 2018.
- Instructor for the course Math 191a, Introduction to Categorification, Fall term, 2017.

Yale University

- Instructor for the course Math 560, Geometric Representation Theory, Spring 2017.
- Instructor for the course Math 235, Reflection Groups, Spring 2017.
- Advisor of Andrew Salmon on his undergraduate senior thesis *Topics in Lie Theory*. Summer 2017.
- Instructor for the course Math 225 Linear Algebra and Matrix Theory, Fall, 2016.
- Advisor of Alexandros Mousatov on his undergraduate senior thesis *An Introduction to Quantum Invariants*. Fall 2015–Spring 2016.
- Instructor for the course Math 225 Linear Algebra and Matrix Theory, Spring, 2016.
- Instructor for the course Math 381/501, Modern Algebra II, Spring, 2016.
- Instructor for the course Math 225, Linear Algebra and Matrix Theory, Spring, 2016.
- Instructor for the course Math 650, Introduction to Categorification, Fall, 2015.
- Instructor for the course Math 120, Multivariable Calculus, Spring, 2015.
- Instructor for the course Math 225, Linear Algebra and Matrix Theory, Fall, 2014.

University of California, Berkeley

- Instructor for the course Math 185, Introduction to Complex Analysis, Spring, 2014.
- Instructor for the course Math H1b, Honors Calculus, Fall, 2013.
- Instructor for the course Math 113, Introduction to Abstract Algebra, Fall 2013.

CONFERENCES
ATTENDED

- (1) Summer School and Workshop on Categorification of Quantum 3-Manifold Invariants, University of Southern California, Jul., 2018.
- (2) Categorification and Higher Representation Theory Conference, Mittag-Leffler Institute, Stockholm, Sweden, Jul., 2018.
- (3) Winter Young Algebraic Geometer Workshop, Southern University of Science and Technology, Shenzhen, Dec., 2017.
- (4) Workshop: Categorification, Mathematical Institute, University of Bonn, Germany, May, 2016.
- (5) Joint AMS-EMS-SPM meeting, Porto, Portugal, Jun. 10–13, 2015.
- (6) A conference on “Representation Theory and Geometry of Symplectic Resolutions,” Boston, USA, May 18–21, 2015.
- (7) Spring Eastern AMS Sectional Meeting at Georgetown University, Washington, DC, USA, Mar. 7–8, 2015.
- (8) CBMS conference on Categorification at North Carolina State University, Raleigh, USA, Jul. 5–10, 2014.
- (9) A workshop on “Categorification and geometric representation theory,” CRM, Montreal, Canada, Jun. 9–13, 2014.
- (10) A workshop on “Yangians and Quantum Loop Algebras,” Austin, USA, May 5–9, 2014.
- (11) A workshop on “Quantum and Affine Schubert Calculus,” University of Oregon, Eugene, USA, Aug. 5–9, 2013.
- (12) A summer school on “Cluster Algebras and Commutative Algebras,” MSRI, Berkeley, USA, Aug. 27–Sep. 7, 2012.
- (13) A workshop on “Categorical Representation Theory,” University of Oregon, Eugene, USA, Aug. 13–17, 2012.
- (14) A workshop on “Super-Symmetry and Invariants,” Chern Institute, Nankai, P. R. China, Jun. 18–24, 2012.
- (15) A workshop on “Cluster Algebras and Lusztig’s Semicanonical Basis,” University of Oregon, Eugene, USA, Jun. 13–17 2011.
- (16) A conference on “Derived categories,” Newton Institute, Cambridge, United Kingdom, Apr. 11–15, 2011.
- (17) An international conference on representation theory, Tokyo, Japan, Aug. 5th–15, 2010.
- (18) A winter school on “Homology Theory of Knots and Links,” MSRI, Berkeley, USA, Jan. 25–29, 2010.

PROFESSIONAL
SERVICES

- Co-organizer with Joshua Sussan and Liron Speyer of American Mathematical Society Spring Sectional Meeting, “Special Session on Categorical Representation Theory and Beyond”. March 14–15, 2020, Charlottesville, VA.
- Referee for the journals and book series *Compositio Mathematica*, *Selecta Mathematica*, *Quantum Topology*, *Finite Fields and their Applications*, *Algebraic and Geometric Topology*, *Proceedings of the London Mathematical Society*, *Algebra and Representation Theory*, *Journal of Combinatorial Theory, Series A*, *Fundamenta Mathematicae*, *Journal of Combinatorial Algebra*, *Contemporary Mathematics*, *Journal of Knot Theory and Ramifications*, *Advances in Mathematics*, *Journal für die reine und angewandte Mathematik*, *Journal of the London Mathematical Society*.
- Coorganizer with Lei Chen of the “Geometry and Topology Seminar” at Caltech, Fall 2018–Spring 2019.
- Coorganizer with Tom Graber, Daxin Xu and Sasha Yom Din of the “Algebra and Geometry Seminar” at Caltech, Fall 2017–present.
- Coorganizer with Igor Frenkel, Gregg Zuckerman of the “Geometry, Symmetry and Physics Seminar” at Yale, Fall 2014–Spring 2017.

- Coorganizer with Atoshi Chowdhury of the UC Berkeley “Representation Theory, Geometry and Combinatorics Seminar”, Fall 2013-Spring 2014.
- Coorganizer with Mikhail Khovanov and Alexander Ellis of the informal categorification and representation theory seminar, 2011-present.
- Discussion session leader, homology theory of knots and links, MSRI, Berkeley, 2010.
- Coorganizer with A. Johan de Jong of the summer graduate student seminar on intersection theory and Grothendieck-Riemann-Roch theorem.

LANGUAGES

- Native Language: (Chinese) Mandarin.
- Foreign Languages: English, French.