



# Xingting Wang

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## Research Interests

Quantum Group and Topological Quantum Computation. Areas of special interest to me are tensor categories, hopf algebras, Poisson algebras, cohomology theory, and representation theory.

## Academic Degrees

- **Ph.D. Mathematics**, University of Washington. Advisor: James Zhang. Aug. 2014  
Dissertation: “Classification of connected Hopf algebras up to prime-cube dimension.”
- **B.S. Mathematics**, Fudan University (China). July 2007

## Appointments

- **Assistant Professor**, Howard University. August, 2018-present
- **Research Assistant Professor**, Temple University. July, 2015-June, 2018
- **Teaching Visitor**, University of California at San Diego. Sept., 2014-March, 2015

## Publications

- (33) The Zariski cancellation problem for Poisson algebras, (with J. Gaddis), to appear *J. Lond. Math. Soc.*.
- (32) A note on generic Clifford algebras of binary cubic forms, (with L. Wang), to appear *Algebr. Represent. Theory*.
- (31) Nonsplit module extensions over the one-sided inverse of  $k[x]$ , (with Z.-P. Lu and L. Wang), *Involve, a journal of mathematics* 12 (2019), no. 8, 1369–1377.
- (30) Gelfand-Kirillov dimension of cosemisimple Hopf algebras, (with A. Chirvasitu and C. Walton), *Proc. Amer. Math. Soc.*, 147 (2019), 4665–4672.
- (29) PBW-basis for universal enveloping algebras of differential graded Poisson algebras, (with X.-G. Hu and J.-F. Lü), *Bull. Malays. Math. Sci. Soc.* 42 (2019), no. 6, 3343–3377.
- (28) Primitive deformations of quantum  $p$ -groups, (with V. Nguyen and L. Wang), *Algebr. Represent. Theory* 22 (2019), no.4, 837–865.
- (27) The Dixmier-Moeglin equivalence, Morita equivalence, and homeomorphism of spectra, (with J. Bell and D. Yee), *J. Algebra* 534 (2019), 228–244.
- (26) On  $q$ -commutative power and Laurent series rings at roots of unity, (with E. S. Letzter and L. Wang), *Comm. Algebra* 47 (2019), no. 5, 2149–2156.
- (25) Hopf algebras of prime dimension in positive characteristic, (with S.-H. Ng), *Bull. Lond. Math. Soc.* 51 (2019), no. 3, 459–465.
- (24) A note on Masuoka’s theorem for semisimple irreducible Hopf algebras, *Arch. Math. (Basel)* 113 (2019), no. 1, 11–20.
- (23) Poisson geometry of PI three-dimensional Sklyanin algebras, (with C. Walton and M. Yakimov), *Proc. Lond. Math. Soc.* (3) 118 (2019), no. 6, 1471–1500.
- (22) On quantum groups associated to a pair of preregular forms, (with A. Chirvasitu and C. Walton), *J. Noncommut. Geom.* 13 (2019), no. 1, 115–159.
- (21) On the structure and cohomology ring of connected Hopf algebras, (with K. Erdmann and Ø. Solberg), *J. Algebra* 527 (2019), 366–398.
- (20) DG Poisson adjoint action and its application, (with X.-J. Li, X.-G. Hu, J.-F. Lü), *Eur. J. Pure Appl. Math.* 12 (2019), no.1, 14–24.
- (19) Finite generation of some cohomology rings via twisted tensor product and Anick resolutions, (with V. Nguyen and S. Witherspoon), *J. Pure Appl. Algebra* 223 (2019), no. 1, 316–339.
- (18) Indicators of pointed Hopf algebras of dimension  $pq$  over characteristic  $p$ , (with S. Chen, T. Liu, and L. Wang), *Missouri J. Math. Sci.* 30 (2018), no. 2, 176–184.

- (17) Enveloping algebras of double Poisson-Ore extensions, (with J.-F. Lü, S.-Q. Oh, and X. Yu), *Comm. Algebra* 46 (2018), no. 11, 4891–4904.
- (16) Indicators of Hopf algebras in positive characteristic, (with L. Wang), *Arch. Math. (Basel)* 111 (2018), no. 5, 485–491.
- (15) A note on the bijectivity of antipode of a Hopf algebra and its applications, (with J.-F. Lü, S.-Q. Oh, and X. Yu), *Proc. Amer. Math. Soc.* 146 (2018), no. 11, 4619–4631.
- (14) Pointed  $p^3$ -dimensional Hopf algebras in positive characteristic, (with V. Nguyen), *Algebra Colloq.* 25, no. 3 (2018), pp. 399–436.
- (13) The structures on the universal enveloping algebras of differential graded Poisson Hopf algebras, (with M. Guo, X. Hu, and J.-F. Lü), *Comm. Algebra* 46, no. 6 (2018), pp. 2714–2729.
- (12) Computing indicators of Radford algebras, (with H. Hu, X. Hu, and L. Wang), *Involve, a journal of mathematics* 11 (2018), no. 2, 325–334.
- (11) Homological unimodularity and Calabi-Yau condition for Poisson algebras, (with J.-F. Lü and G. Zhuang), *Lett. Math. Phys.* 107 (2017), no. 9, 1715–1740.
- (10) Calabi-Yau property under monoidal Morita-Takeuchi equivalence, (with X. Yu and Y. Zhang), *Pacific J. Math.* 290 (2017), no. 2, 481–510.
- (9) On quantum groups associated to non-noetherian regular algebras of dimension 2, (with C. Walton), *Math. Z.* 284 (2016), no. 1, 543–574.
- (8) DG Poisson algebra and its universal enveloping algebra, (with J.-F. Lü and G. Zhuang), *Sci. China Math.* 59 (2016), no. 5, 849–860.
- (7) Universal enveloping algebras of Poisson-Ore extensions, (with J.-F. Lü and G. Zhuang), *Proc. Amer. Math. Soc.* 143 (2015), no. 11, 4633–4645.
- (6) Isomorphism classes of finite dimensional connected Hopf algebras in positive characteristic, *Adv. Math.* 281 (2015), 594–623.
- (5) Universal enveloping algebras of Poisson Hopf algebras, (with J.-F. Lü and G. Zhuang), *J. Algebra* 426 (2015), 92–136.
- (4) Classification of connected Hopf algebras of dimension  $p^3$  I, (with V. Nguyen and L. Wang), *J. Algebra* 424 (2015), 473–505.
- (2) Classification of pointed Hopf algebras of dimension  $p^2$  over any algebraically closed field, (with L. Wang), *Algebr. Represent. Theory* 17 (2014), no. 4, 1267–1276.
- (3) Local criteria for cocommutative Hopf algebras, *Comm. Algebra* 42 (2014), no. 12, 5180–5191.
- (1) Connected Hopf algebras of dimension  $p^2$ , *J. Algebra* 391 (2013), 93–113.

### Grants & Awards

- Summer Faculty Research Fellowship at Howard University. 2019
- AMS-Simons Travel Grants. 2016-2018
- Excellence in Teaching by a Postdoctoral Fellow, Temple University. 2015-2016
- Microsoft Scholar Award, University of Washington. 2007-2011
- 2<sup>nd</sup> Prize in National Math Contest in Modeling for Undergraduates. 2006
- University Scholarship, Fudan University. 2004-2007
- 1<sup>st</sup> Prizes in National Middle School Math and Physics Olympiads. 2001-2002

### Undergraduate Research Projects Supervised

The following projects are co-supervised with Linhong Wang at University of Pittsburgh.

- Nonsplit module extensions over the one-sided inverse of  $k[x]$ , participants: Zheping Lu, 2018-2019. A research paper was published in *Involve. A Journal of Mathematics* and the result was presented by Zheping Lu at MAA Allegheny Mountain Section’s Spring Meeting at Shepherd University, March 2019.
- Pointed Hopf algebras of dimension  $pq$ , participants: Tiantian Liu and Si Chen, 2017-2018. A research paper was published in *Missouri J. Math. Sci.* and the result was presented by Tiantian Liu and Si Chen at MAA Allegheny Mountain Section’s Spring Meeting at Penn State Behrend, April 2018.

- Hopf algebras and Frobenius-Schur higher indicators, participants: Hao Hu and Xinyi Hu, 2016-2017. A research paper was published in *Involve. A Journal of Mathematics* and the result was presented by Hao Hu at MAA Allegheny Mountain Section's Spring Meeting at Duquesne University, April 2017.

## Teaching Experience

### **Howard University (2018-present)**

- Math198/209 Introduction to Modern Algebra II (instructor). Spring 2020
- Math158 Calculus III (instructor),  
Math197/208 Introduction to Modern Algebra I (instructor). Fall 2019
- Math210 Algebra II (instructor). Spring 2019
- Math6 College Algebra I (instructor),  
Math158 Calculus III (instructor). Fall 2018

### **Temple University (2015-2018)**

- Math3051 Theoretical Linear Algebra (instructor for 16 math majors). Spring 2018
- Math3003 Theory of Numbers (instructor for 8 ugrads). Fall 2017
- Math2043 Calculus III (instructor). Spring 2017
- Math2043 Calculus III (instructor). Fall 2016
- Math3051 Theoretical Linear Algebra (instructor for 14 math majors),  
Math2043 Calculus III (instructor). Spring 2016
- Math2043 Calculus III (instructor). Fall 2015

### **University of California at San Diego (2014-2015)**

- Math20A Calculus I (instructor for 400+ ugrads),  
Math20C Calculus III ((instructor for 400+ ugrads). Winter 2015
- Math20A Calculus I (instructor for 400+ ugrads),  
Math20C Calculus III (instructor for 400+ ugrads). Fall 2014

### **University of Washington (2007-2014)**

- Math124 Calculus I (instructor). Summer 2014
- Math120 Pre-Calculus (teaching assistant). Spring 2014
- Math125 Calculus II (instructor). Summer 2013
- Math407 Linear Optimization (grader for senior applied math majors). Fall 2012
- Math120 Pre-Calculus (instructor). Summer 2012
- Math125 Calculus II (teaching assistant). Winter 2012
- Math120 Pre-Calculus (teaching assistant). Fall 2010
- Math125 Calculus II (instructor). Summer 2010
- Math120 Pre-Calculus (teaching assistant). Fall 2009
- Math126 Calculus III (instructor). Summer 2009
- Math126 Calculus III (teaching assistant). Spring 2009
- Math125 Calculus II (teaching assistant). Winter 2008
- Math125 Calculus II (teaching assistant). Spring 2008
- Math504 Modern Algebra (grader for math graduates). Fall 2007

## Invited Talks

### **2019**

- "Topological criterion for Poisson Dixmier-Moeglin equivalence", Noncommutative Algebraic Geometry Shanghai Workshop, Shanghai Center for Mathematical Sciences, Shanghai, China, November.
- "Noncommutative algebra from a geometric point of view", Algebra Seminar, University of Illinois at Urbana Champaign, October.
- "Zariski cancellation problem for Poisson algebras", AMS Special Session on Connections between Noncommutative Algebra and Algebraic Geometry, University of Wisconsin at Madison, September.

- “Noncommutative algebra from a geometric point of view”, International Conference on Representation Theory VIII, Harbin China, July.
- “Finite generation of cohomology rings in positive characteristic”, COAS Junior Faculty Research Workshop, Howard University, March.
- “Noncommutative algebra from a geometric point of view”, Colloquium, Miami University, March.
- “Connected Hopf algebras and related homological properties”, Mini-Workshop: Cohomology of Hopf Algebras and Tensor Categories, Mathematisches Forschungsinstitut, Oberwolfach, Germany, March.
- “Gourmet’s Guide to Noncommutative Algebraic Geometry”, Geometry & Topology Seminar, Howard University, March.
- “Quantum Invariant Theory”, Geometry & Topology Seminar, Howard University, February.
- “Introduction to noncommutative algebraic geometry”, Geometry & Topology Seminar, Howard University, January.

## 2018

- “Finite generation of cohomology rings of some pointed Hopf algebras in positive characteristic”, AMS Special Session on Homological Aspects of Noncommutative Algebra and Geometry, San Francisco State University, October.
- “Irreducible representations of the 4-dimensional Sklyanin algebra at points of finite order”, AMS Special Session on Cluster Algebra, Poisson Geometry, and Related Topics, University of Michigan, October.
- “Noncommutative algebra from a geometric point of view”, Colloquium, Howard University, September.
- “Representations of 4-dimensional Sklyanin algebras through Poisson geometry”, Algebra Seminar, Louisiana State University, May.
- “Noncommutative algebra from a geometric point of view”, Algebra and Combinatorics Seminar, Texas A&M University, April.
- “Cohomology of some Hopf algebras in positive characteristic”, AMS Special Session on Hopf Algebras, Tensor Categories, and Homological Algebra, Northeastern University, April.
- “Representations of 4-dimensional Sklyanin algebras through Poisson geometry”, AMS Special Session on Noncommutative Algebra and Representation Theory, Northeastern University, April.
- “Irreducible representations of the 4-dimensional Sklyanin algebra at points of finite order”, AMS Special Session on Noncommutative Algebraic Geometry and Related Topics, Portland State University, April.
- “Irreducible representations of the 4-dimensional Sklyanin algebra at points of finite order”, AMS Special Session on Noncommutative Algebra and Noncommutative Algebraic Geometry, Ohio State University, March.
- “Noncommutative algebra from a geometric point of view”, Algebra Seminar, University of Buffalo, Buffalo, NY, February.
- “Noncommutative algebra from a geometric point of view”, Colloquium, George Mason University, February.
- “Noncommutative algebra from a geometric point of view”, Colloquium, Embry-Riddle Aeronautical University, February.
- “Finite generation of cohomology rings of some pointed Hopf algebras in positive characteristic”, AMS Special Session on Noncommutative Algebras and Noncommutative Invariant Theory, San Diego, CA, January.

## 2017

- “Pizza and rabbit”, SASE-Talk, Temple University, November.
- “Calabi-Yau property under monoidal Morita-Takeuchi equivalence”, AMS Special Session on Noncommutative and Homological Algebra, University of North Texas, September.
- “Universal enveloping algebras of double Poisson-Ore extensions”, AMS Special Session on Topics Related to the Interplay of Noncommutative Algebra and Geometry, University of North Texas, September.
- “Calabi-Yau property under monoidal Morita-Takeuchi equivalence”, Algebra Extravaganza—a conference in honor of Ellen Kirkman and Martin Lorenz, Temple University, July.

- “The Poisson geometry of the 3-dimensional Sklyanin algebras”, AMS Special Session on Noncommutative Algebraic Geometry and Related Topics, Washington State University, April.
- “Poisson geometry in noncommutative algebras”, Algebra, Combinatorics and Geometry Graduate Student Research Seminar, University of Pittsburgh, March.
- “Poisson geometry of 3-dimensional Sklyanin algebras”, Fudan–Guanghua International Forum for Young Scholars in Mathematics, Fudan University, China, March.
- “Quantum symmetry in noncommutative algebra”, Colloquium, University of Denver, January.
- “Non-noetherian Hopf algebras versus Noetherian Hopf algebras”, AMS Special Session on New Developments in Noncommutative Algebra & Representation Theory, Atlanta, GA, January.
- “Quantum groups associated to a pair of preregular forms”, AMS Special Session on Hopf Algebras and Their Actions, Atlanta, GA, January.

## 2016

- “The relation between unimodularity and Calabi-Yau property for Poisson algebras II”, Algebra Seminar, Temple University, November.
- “The relation between unimodularity and Calabi-Yau property for Poisson algebras I”, Algebra Seminar, Temple University, November.
- “Quantum groups associated to a pair of preregular forms”, Algebra Seminar, Louisiana State University, October.
- “Homological unimodularity and Calabi-Yau condition for Poisson algebras”, AMS Special Session on Quantum Algebra, University of Denver, October.
- “Homological unimodularity and Calabi-Yau condition for Poisson algebras”, AMS Special Session on Noncommutative Ring Theory and Noncommutative Algebra, Bowdoin College, September.
- “Poisson geometry and noncommutative algebras”, Poisson Algebra Workshop, Zhejiang Normal University, China, July.
- “Poisson geometry in noncommutative projective algebraic geometry”, Algebra Seminar, University of Science and Technology of China, June.
- “Quantum symmetry in noncommutative projective algebraic geometry”, Algebra Seminar, Anhui University, China, June.
- “Noncommutative symmetric groups in noncommutative projective algebraic geometry”, Algebra Seminar, Suzhou University, China, June.
- “Primitive deformation and classification of Hopf algebras up to prime-cube dimension”, Algebra Seminar, Zhejiang University, China, June.
- “Quantum groups associated to a pair of preregular forms”, Hopf Algebra and Actions Workshop Part II, University of Washington, April.
- “Noncommutative symmetric groups in noncommutative projective algebraic geometry”, Algebra Seminar, University of Pittsburgh, March.
- “Noncommutative symmetric groups in noncommutative projective algebraic geometry”, Algebra Seminar, Northeastern University, February.
- “Primitive deformations of quantum p-groups II”, Algebra Seminar, Temple University, April.
- “Primitive deformations of quantum p-groups I”, Algebra Seminar, Temple University, March.
- “Universal enveloping algebras of Poisson-Ore extensions”, Joint Mathematics Meeting, Seattle, WA, January.

## 2015

- “Quantum p-groups and their classification in low dimensions”, Algebra Seminar, Louisiana State University, November.
- “Noncommutative symmetric groups in noncommutative projective algebraic geometry”, Algebra Seminar, Temple University, October.
- “On quantum groups associated to non-noetherian regular algebras of dimension 2”, Seattle Noncommutative Algebra Day, University of Washington, August.
- “On quantum groups associated to non-noetherian regular algebras of dimension 2”, Hopf Algebra and Tensor Category Mini-Meeting, University of Southern California, May.

- “On quantum groups associated to non-noetherian regular algebras of dimension 2”, Hopf Algebra Seminar, University of Southern California, April.
- “Universal enveloping algebras of Poisson algebras”, Algebra Seminar, University of California at San Diego, February.
- “Classification of connected Hopf algebras up to prime-cube dimension”, Joint Mathematics Meeting, San Antonio, TX, January.

#### 2014

- “Isomorphism classes of Hopf algebras in positive characteristic”, Algebra Seminar, University of California at San Diego, September.
- “Small unipotent quantum groups arising from primitive control deformation, Hopf Algebra Seminar”, University of Southern California, September.
- “Classification of small unipotent quantum groups in positive characteristic and its applications”, Algebra Seminar, University of Southern California, September.

#### 2013

- “Connected Hopf algebras in positive characteristic”, Algebra Seminar, University of Pittsburgh, November.
- “Finite-dimensional connected Hopf algebras”, AMS Special Session on Recent Developments in Noncommutative Algebra, Temple University, October.

### Selected Conferences & Workshops

- Noncommutative Algebraic Geometry Shanghai Workshop, Shanghai Center for Mathematical Sciences, Shanghai, China, Nov. 11-15, 2019
- International Conference on Representation Theory VIII, Harbin China, July 8-12, 2019.
- Research Week, Howard University, Washington, DC, April 8-12, 2019.
- Oberwolfach Mini-Workshop: Cohomology of Hopf Algebras and Tensor Categories, Oberwolfach, Germany, Mar. 3-9, 2019.
- MRC (Mathematics Research Communities) Summer Conference: Quantum Symmetries: Subfactors and Fusion Categories, Whispering Pines Conference Center, West Greenwich, RI, June 10-16, 2018.
- GAP XV (Geometry and Physics-Séminaire itinérant), Pennsylvania State University, College Station, PA, July 31-Aug. 4, 2017.
- Summer 2017 NSF West Coast Lie Theory Workshop, University of California at San Diego, CA, June 3-4, 2017.
- Regularity and Rigidity of Noncommutative Algebras Workshop, University of Washington, Seattle, WA, Mar. 21-23, 2014.
- BIRS Workshop: New Trends in Noncommutative Algebra and Algebraic Geometry, Banff International Research Station, Banff, Canada, Oct. 28-Nov. 2, 2012.
- Noncommutative Invariant Theory Workshop, University of Washington, Seattle, WA, May 26-27, 2012.
- New Trends in Noncommutative Algebra, University of Washington, Seattle, WA, Aug. 9-13, 2010.
- Summer School on Noncommutative Algebra/Geometry, Fudan University, Shanghai, China, Aug. 5-18, 2007.