

## CURRICULUM VITAE: TIAN YANG

### Current Appointment

Associate Professor, Texas A&M University, 2022-present.

### Past Appointment

Assistant Professor, Texas A&M University, 2017-2022.

Szegö Assistant Professor, Stanford University, 2013–2017.

### Contact Information

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### Education

Zhejiang University, China, Bachelor, 2005. (Mentor: Shiuchun Wong.)

University of Regina, Canada, Master of Science, 2007. (Supervisor: Donald Stanley.)

Rutgers University, Ph.D. in Mathematics, 2013. (Supervisor: Feng Luo.)

### Awards

NSF Conference Grant DMS-2350250, 2024-2025, Principal Investigator.

NSF Grant DMS-2203334, 2022-2025, Principal Investigator.

NSF Grant DMS-1812008, 2018-2023, Principal Investigator.

NSF Grant DMS-1405066, 2014-2017, Principal Investigator.

Silver Medal of Doctor thesis, New World Mathematics Awards 2014.

Best Paper Award, International Congress of Chinese Mathematicians of 2019.

### Service to Mathematical Community

Co-organized the Conference: Quantum Topology, Quantum Information and connections to Mathematical Physics, May 27-31, 2024.

Serviced on NSF review panels for the Division of Mathematics.

Co-organized the AIM workshop Quantum invariants and low-dimensional topology, August 14-18, 2023.

Co-organized the Third GEAR Junior Retreat, July 30 - August 5, 2017.

## Publications

*Adjoint twisted Reidemeister torsion and Gram matrices*, Advances in Mathematics 438 (2024), Paper No. 109470. Joint with Ka Ho Wong.

*A relative version of the Turaev-Viro invariants and the volume of hyperbolic polyhedral 3-manifolds*, Journal of Topology, 16 (2023), no.2, 650-678.

*Relative Reshetikhin-Turaev invariants, hyperbolic cone metrics and discrete Fourier transforms I*, Communications in Mathematical Physics, 400 (2023) 1019-1070. Joint with Ka Ho Wong.

*Growth of quantum  $6j$ -symbols and applications to the volume conjecture*, Journal of Differential Geometry, 120 (2022) 199-229. Joint with Giulio Belletti, Renaud Detcherry and Effie Kalfagianni.

*On Type-preserving representations of thrice punctured projective plane group*, Journal of Differential Geometry, 119 (2021) 421-457. Joint with Sara Maloni and Frédéric Palesi.

*Turaev-Viro invariants for knots and the colored Jones polynomials*, Quantum Topology, 9 (2018), no. 4, 775-813. Joint with Renaud Detcherry and Effie Kalfagianni.

*Volume conjectures for the Reshetikhin-Turaev and the Turaev-Viro invariants*, Quantum Topology, 9(2018) no. 3, 419-140. Joint with Qingtao Chen.

*Volume and rigidity of hyperbolic polyhedral 3-manifolds*, Journal of Topology, 11(2018) no.1, 1-29. Joint with Feng Luo.

*On type-preserving representations of the four-punctured sphere group*, Geometry & Topology, 20 (2016), no. 2, 1213–1255.

*The skein algebra of arcs and links and the decorated Teichmüller space*, Journal of Differential Geometry, 96 (2014) no.1, 95–140. Joint with Julien Roger.

*Thurston's spinning construction and solutions to the hyperbolic gluing equations for closed hyperbolic 3-manifolds*, Proceedings of the American Mathematical Society, 141 (2013), 335–350. Joint with Feng Luo and Stephan Tillman.

*A Batalin-Vilkovisky algebra structure on the Hochschild cohomology of truncated polynomials*, Topology and its Applications, 160 (2013), no. 13, 1633–1651.

*A deformation of Penner's simplicial coordinate*, Journal of Differential Geometry, 89 (2011) no.3, 529–551.

## Preprints

*Asymptotics of quantum  $6j$ -symbols and generalized hyperbolic tetrahedra*, arXiv: 2308.13864. Joint with Giulio Belletti.

*Asymptotics of quantum invariants of surface diffeomorphisms III: the one-puncture torus*, in preparation. Joint with Francis Bonahon and Helen Wong.

*Asymptotics of quantum invariants of surface diffeomorphisms II: the figure-eight knot complement*, arXiv:2203.05730. Joint with Francis Bonahon and Helen Wong.

*Asymptotics of quantum invariants of surface diffeomorphisms I: conjecture and algebraic computations*, arXiv:2112.12852. Joint with Francis Bonahon and Helen Wong.

*Asymptotic expansion of relative quantum invariants*, arXiv:2103.15056. Joint with Ka Ho Wong.

*Relative Reshetikhin-Turaev invariants, hyperbolic cone metrics and discrete Fourier transforms II*, arXiv: 2009.07046. Joint with Ka Ho Wong.

*Discrete Fourier transforms, quantum 6j-symbols and deeply truncated tetrahedra*, arXiv: 2009.03684. Joint with Giulio Belletti.

*On the Volume Conjecture for hyperbolic Dehn-filled 3-manifolds along the figure-eight knot*, arXiv: 2003.10053. Joint with Ka Ho Wong.

## **Selected Talks**

Knots in Washington L, George Washington University, Washington DC. April 26-28, 2024. Invited speaker.

Symplectic Geometry, Low Dimensional Topology, and Quantum Fields, Clay Mathematics Institute, Oxford, UK. September 25-29, 2023. Invited speaker.

The Eighteenth East Asian Conference on Geometric Topology, Soochow University, February 6-9, 2023. Plenary speaker.

Colloquium, Center of Mathematical Sciences and Applications, Harvard University, September 15, 2021.

On Topological Quantum Computing, Shenzhen, China, December 16-20, 2019.

Texas Geometry and Topology Conference 2019, Texas A&M University, College Station, TX. November 8-10, 2019.

In and around Topological Physics, Beijing International Center for Mathematical Research, Beijing, China. July 16-20, 2019.

45-Minute Lecture. The 8th International Congress of Chinese Mathematicians of 2019, YMSC, Tsinghua University, Beijing, China. June 9-14, 2019.

Quantum Topology and Hyperbolic Geometry, Da Nang, Vietnam. May 27-31, 2019.

Intelligence of Low-dimensional Topology 2019, RIMS, Kyoto University, Kyoto, Japan. May 22-24, 2019.

Classical and quantum three-manifold topology, Monash University, Clayton campus, Melbourne, Australia. December 17-21, 2018.

Teichmüller Theory and Related Topics, Tsinghua University, Beijing, China. August 24-26, 2018.

Geometry, Quantum Topology and Asymptotics 2018, Sandbjerg Estate, Sønderborg, Denmark. July 9-13, 2018.

Modular Forms and Quantum Knot Invariants, Banff International Research Station, Banff, Canada. March 11-16, 2018.

Geometric Structures and Representation Varieties (GEAR Network), Third GEAR Retreat, Stanford University, Stanford, CA. August 6-12, 2017.

The Joint Los Angeles Topology Seminar, University of Southern California, Los Angeles, CA. October 31, 2016.

Knots in Hellas 2016, International Olympic Academy, Ancient Olympia, Greece. July 17-23, 2016.

Workshop on Grothendieck-Teichmüller Theories, Chern Institute of Mathematics, Nankai University, Tianjin, China. July 24–30, 2016.

2016 International Conference on Low-dimensional Topology, Southwest Jiaotong University, Chengdu, China. June 13-15, 2016.

Advances in Quantum and Low-Dimensional Topology 2016, University of Iowa, Iowa City, IA. March 11-13, 2016.

Colloquium talk, Mathematics Colloquium, University of Iowa, Iowa City, IA. March 10, 2016.

Tsinghua Sanya International Mathematics Forum, Teichmüller Theory and Low Dimensional Topology, Yau Mathematical Sciences Center, Tsinghua University, Sanya, China. January 11-15, 2016.

Invariants in Low Dimensional Geometry. Gazi University in Ankara, Turkey. August 10-14, 2015.

First Encounter to Quantum Topology. Center for Mathematical Challenges (CMC), KIAS. July 15-22, 2015.

The Tenth East Asian School of Knots and Related Topics, East China Normal University, January 26-29, 2015. Plenary speaker.

China-Russia Workshop on Knot Theory and Related Topics, Beijing International Center for Mathematical Research, August 28-31, 2014.

Workshop on Minimal Surfaces, 3-Manifold Topology and Related Topics, Massachusetts Institute of Technology, April 26-28, 2013.

GEometric structures And Representation varieties (GEAR Network), Junior Retreat 2012, University of Illinois in Urbana-Champaign, July 23-August 3.

2012 Lehigh University Geometry and Topology Conference, Lehigh University, May 25-27, 2012.

Knots in Washington XXXIII, George Washington University, December 2-4, 2011. Distinguished graduate student speaker.

The Triennial Ahlfors-Bers Colloquium, Rice University, March 24-27, 2011.

Graduate Student and Post-Doc Workshop on Low Dimensional Topology and Geometry,  
Princeton University, March 14-16, 2011.