

Tao Su

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<https://tao-su-math.github.io/>



Employment

- Sep.2022- **Visiting Postdoc**, *IMS, CUHK*, Hong Kong.
Sep.2023
- Jan.2021- **Postdoc**, *YMSC*, Beijing.
Jul.2022 supported by the International Postdoctoral Exchange Fellowship (Talent-Introduction)
- Sep.2018- **Postdoc**, *École Normale Supérieure*, Paris.
Aug.2020 supported by the ANR Microlocal Project

Education

- 2018 **PhD in math**, *UC Berkeley*.
Advisors: Vivek Shende, and Richard E. Borcherds
- 2012 **B.S. in math and physics**, *Tsinghua University*.
Fellowship in the Tsinghua Xuetang Talents Program

Academic visits

- Oct.30, 2023- Academy of Mathematics and Systems Science, CAS, China
present
- Oct.7- YMSC, Beijing, China
Oct.17, 2023
- Sep.01- IHES, Paris, France
Nov.25, 2020
- Jul.28- IBS-CGP, South Korea
Aug.04, 2019
- Jun.08- CRM, Montreal, Canada
Jun.30, 2019
- Nov.25- RIMS, Kyoto, Japan
Dec.09, 2018
- Oct.04- Fourier Institute, Grenoble, France
Oct.06, 2018

Research interests

- Microlocal/Symplectic geometry, Algebraic geometry and Mathematical physics.
- Specific topics of interest include: Legendrian knots and constructible sheaves, Hodge theory of character varieties and various $P=W$ conjectures, character sheaves, Springer theory, Hilbert schemes of points, microlocal sheaves and mirror symmetry.

Publications/Preprints

- Mirror $P=W$ phenomena for (wild) character varieties, (*in preparation*).
- Cell decomposition, dual boundary complexes and motives of character varieties, arXiv:2307.16657.
(*The main result of this paper proves the weak geometric $P=W$ conjecture of Katzarkov-Noll-Pandit-Simpson for very generic character varieties*)
- Dual boundary complexes of Betti moduli spaces over the two-sphere with one irregular singularity, arXiv:2109.01645. (Under review w/ positive feedback)
- Augmentations are sheaves for Legendrian graphs, with Byung Hee An, Youngjin Bae, Journal of Symplectic Geometry, 20 (2022), pp.259-416.
- Augmentations and ruling polynomials for Legendrian graphs, with Byung Hee An, Youngjin Bae, Algebraic & Geometric Topology, 22 (2022), pp.2079-2185.
- A Hodge-theoretic study of augmentation varieties associated to Legendrian knots/tangles, Ph.D thesis, ProQuest 2018.
- Ruling polynomials and augmentations for Legendrian tangles, arXiv:1707.04948.

Research talks

- Nov.13,2023 CAS seminar, AMSS, CAS, Beijing
- Oct.8- Oct.16,2023 5 lectures on dual boundary complexes of character varieties, YMSC, Beijing
- Aug.2,2023 MIST workshop, IMS, CUHK, Hong Kong
- Jan.7,2023 MIST workshop, IMS, CUHK, Hong Kong
- May 25,2022 Zoom seminar, Zhejiang University.
- Apr.21,2022 Algebraic Geometry/Number theory seminar (zoom), Boston College.
- Dec.17,2021 Tsinghua Algebraic Geometry workshop, YMSC, Beijing.
- Dec.14,2021 Symplectic Geometry and Mathematical Physics seminar, BICMR, Beijing.
- Nov.29,2021 GeoTop seminar, YMSC, Beijing.
- Nov.10,2021 Geometry and Topology seminar, AMSS, Chinese Academy of Sciences, Beijing.
- Oct.13,2021 Geometry and Topology seminar, Chern Institute of Mathematics, Tianjin.
- Oct.12,2021 Geometry and Topology seminar, Chern Institute of Mathematics, Tianjin.
- Sep.24,2021 Geometric representation seminar, YMSC, Beijing.
- Mar.24,2021 Moscow-Beijing topology seminar, Zoom talk.
- Jul.31,2019 Director's seminar, IBS-CGP, South Korea.
- Jun.27,2019 Conference on Homological algebra, Microlocal analysis, and Symplectic geometry, CRM, Montreal.
- Jan.19,2019 Conference on Number theory, Algebra, Combinatorics, IAS of HIT, Haerbin, China.
- Nov.30,2018 Symplectic seminar, RIMS, Kyoto.
- Nov.9,2018 Symplectic seminar, ENS, Paris.
- Oct.5,2018 Topology seminar, Fourier Institute, Grenoble.
- May 24,2018 Student geometry/topology seminar, UC Davis.
- Mar.6,2018 EGN postdoc and student seminar, MSRI.
- Dec.5,2017 3-manifold Seminar, UC Berkeley.

Jun.28,2017 AIM square meeting “Sheaf theory and Legendrian knots”, San Jose.

Honors and Awards

- 2021 International Postdoctoral Exchange Fellowship, China Postdoc Science Foundation
- 2017 Graduate Division Summer Grant, UC Berkeley
- 2015 Graduate Division Summer Grant, UC Berkeley
- 2009-2012 Fellowship in the Tsinghua Xuetaang Talents Program, Tsinghua University
- 2011 S.-T. Yau College Students Mathematics Contests:
 - (All-around Competition) Bronze medal ○ (Geometry and Topology) Bronze medal
 - (Algebra, Number Theory, and Combinatorics) Bronze medal ○ (Group competition) Silver medal

Services

- Tutored Friend scholar for Qiuzhen college, Tsinghua university, Apr. 2021-Jun.2022.
- Organized Derived Algebraic Geometry learning seminar, YMSC, Spring 2021.
- Referee for Symmetry, Integrality and Geometry: Methods and Applications.

Teaching experience

- Fall 2021 TA for Geometric Representation Theory II, Tsinghua university.
- Spring 2018 TA for Math 113, Introduction to Abstract Algebra, UC Berkeley.
- Fall 2017 GSI for Math 16B, Analytic Geometry and Calculus, UC Berkeley.
- Fall 2016 GSI for Math 16B, Analytic Geometry and Calculus, UC Berkeley.
- Spring 2016 GSI for Math 16B, Analytic Geometry and Calculus, UC Berkeley.
- Fall 2015 GSI for Math 16B, Analytic Geometry and Calculus, UC Berkeley.
- Spring 2015 GSI for Math 54, Linear Algebra and Differential Equations, UC Berkeley.
- Fall 2014 GSI for Math 54, Linear Algebra and Differential Equations, UC Berkeley.
- Spring 2014 GSI for Math 16B, Analytic Geometry and Calculus, UC Berkeley.
- Fall 2013 GSI for Math 1B, Calculus, UC Berkeley.