

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, Zariski cancellation problem in characteristic 0, Algebra and geometry of link homology, Springer theory, microlocal sheaves and mirror symmetry, quantization of character varieties and Skein modules, Langlands duality for 3-manifolds.

Publications/Preprints

- Cell decomposition of Deligne-Lusztig varieties, (*in preparation*).
- Mirror $P=W$ phenomena for (wild) character varieties, (*in preparation*).
- A note on the HLRV conjecture, (*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 revision for Advances in Mathematics)
- 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 Xuetao 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.