

Yu-Wei Fan

<https://ywfan-math.github.io/> \diamond ywfan@mail.tsinghua.edu.cn

Education

Harvard University

Ph.D., Mathematics, 2014-2019

Advisor: Shing-Tung Yau

Thesis: Mirror Symmetry, Autoequivalences, and Bridgeland Stability Conditions

National Taiwan University

B.S., Mathematics, 2008-2012

Employment

Tsinghua University

Assistant Professor (tenure track), 2021.12-present

University of California, Berkeley

Morrey Visiting Assistant Professor, 2019.08-2021.11

Awards

- AMS-Simons Travel Grant, 2019-2021
- Kao Fellowship, Harvard University, 2018-2019
- TUSA Scholarship, Harvard University, 2014-2017

Research Interests

Algebraic geometry, dynamical systems, symplectic geometry, and mathematical physics

Publications and Preprints

- Systolic inequalities for K3 surfaces via stability conditions. *Mathematische Zeitschrift*, Vol. 300 (2022), pp. 301–323.
- On pseudo-Anosov autoequivalences (with S. Filip, F. Haiden, L. Katzarkov, and Y. Liu). *Advances in Mathematics*, Vol. 384 (2021), 107732.
- Categorical polynomial entropy (with L. Fu and G. Ouchi). *Advances in Mathematics*, Vol. 383 (2021), 107655.
- Weil–Petersson geometry on the space of Bridgeland stability conditions (with A. Kanazawa and S.-T. Yau). *Communications in Analysis and Geometry*, Vol. 29, No. 3 (2021), pp. 681–706.
- Mirror of Atiyah flop in symplectic geometry and stability conditions (with H. Hong, S.-C. Lau, and S.-T. Yau). *Advances in Theoretical and Mathematical Physics*, Vol. 22, No. 5 (2018), pp. 1149–1207.
- Entropy of an autoequivalence on Calabi–Yau manifolds. *Mathematical Research Letters*, Vol. 25, No. 2 (2018), pp. 509–519.

- Stokes matrices, character varieties, and braids. *Proceedings of 2020 ICCM Annual Meeting*.
- Counting special Lagrangian classes and semistable Mukai vectors for K3 surfaces (with J. S. Athreya and H. Lee). arXiv:2109.13824
- Attractor mechanisms of moduli spaces of Calabi-Yau 3-folds (with A. Kanazawa). arXiv:2108.07262
- Surfaces, braids, Stokes matrices, and points on spheres (with J. P. Whang). arXiv:2009.07104
- Asymptotic shifting numbers in triangulated categories (with S. Filip). arXiv:2008.06159
- New rational cubic fourfolds arising from Cremona transformations (with K-W. Lai). arXiv:2003.00366
- Contractibility of space of stability conditions on the projective plane via global dimension function (with C. Li, W. Liu, and Y. Qiu). arXiv:2001.11984
- On entropy of P-twists. arXiv:1801.10485

Conference/Workshop Talks

- AMS Spring Eastern Sectional Meeting (Special Session on Mirror Symmetry and Enumerative Geometry), Brown University, March 2021
- ICCM annual meeting, University of Science and Technology of China, December 2020
- Hodge Theory and Rationality, Institute of the Mathematical Sciences of the Americas, Miami, October 2020
- Workshop on Birational Geometry, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, June 2020 (*canceled due to COVID-19*)
- Moduli on Chestnut Hill, Boston College, March 2020
- Homological Mirror Symmetry and Topological Recursion, Miami, January 2020
- Homological Mirror Symmetry and Self Organized Criticalities, Institute of the Mathematical Sciences of the Americas, Miami, September 2019
- Aspects of Mirror Symmetry, Chiba University, July 2019
- PIMS Postdoctoral Training School on Stochastic Dynamics and Hodge Theory, University of Alberta, March 2019
- Holomorphic Differentials in Mathematics and Physics, Simons Center, February 2019
- AMS Grad Student Conference in geometry and topology, Brown University, April 2018
- BU-Keio Workshop, Boston University, June 2017
- RTG/FRG Mirror Symmetry Conference for Young Researchers, University of Michigan, May 2017

Invited Talks

- Capital Normal University, April 2022
- New Directions in Group Theory and Triangulated Categories, November 2021
- Geometric Group Theory in East Asia Webinar, October 2021
- IBS Center for Geometry and Physics, Symplectic Monday, June 2021
- University of British Columbia, Algebra and Algebraic Geometry seminar, February 2021

- Algebraic Geometry in East Asia Seminar, December 2020
- Symplectic Zoominar (CRM-Montreal, Princeton/IAS, Tel Aviv, Paris), November 2020
- UC Irvine, Differential Geometry Seminar, October 2020
- Rutgers University–Newark, Colloquium, October 2020
- National University of Singapore, Topology and Geometry Seminar, September 2020
- ICCM Math Physics Seminar, July 2020
- UC Santa Barbara, Seminar on Geometry and Arithmetic, May 2020
- Harvard University, CMSA Mathematical Physics Seminar, April 2020
- Kyoto University, Algebraic Geometry Seminar, January 2020
- Southeast University, Nanjing, China, December 2019
- UC Berkeley, Northern California Symplectic Geometry Seminar, November 2019
- MSRI, Learning seminar on stability conditions, November 2019
- National Taiwan University, NCTS Seminar in Algebraic Geometry, June 2019
- UMass Amherst, Valley Geometry Seminar, April 2019
- Harvard University, Differential Geometry Seminar, April 2019
- Boston College, NT & AG Seminar, January 2019
- Harvard University, Student/Postdoc Symplectic Geometry Seminar, October 2018
- Columbia University, Symplectic Geometry, Gauge Theory, and Categorification Seminar, September 2018
- Tsinghua University, Beijing, Geometric Representation Seminar, June 2018
- Kavli IPMU, Mathematics-String Seminar, May 2018
- TIMS, Taiwan, Algebraic Geometry Seminar, May 2018
- Brown University, Algebra and Algebraic Geometry Seminar, May 2018
- Kansas State University, M-seminar, April 2018
- Harvard University, Mirror Symmetry Seminar, March 2018
- Boston University, Geometry and Physics Seminar, February 2018
- University of Missouri, Geometry and Topology Seminar, November 2017
- Harvard University, CMSA Algebraic Geometry Seminar, September 2017
- Harvard University, CMSA Mathematical Physics Seminar, September 2017
- IHES, Séminaire Mathjeunes, June 2017
- University of Vienna, June 2017

Teaching

- At Tsinghua University, Beijing:
 - Instructor, *Categories and dynamical systems* (topic course), Spring 2022
 - Instructor, *Introduction to Bridgeland stability conditions* (topic course), Summer 2018
- At UC Berkeley:

- Instructor, *Honors Linear Algebra and Differential Equations* (undergraduate course), Fall 2019, Fall 2020, Fall 2021
- Instructor, *Introduction to Analysis* (undergraduate course), Fall 2019, Spring 2020, Spring 2021
- Instructor, *Introduction to Complex Analysis* (undergraduate course), Spring 2021
- At Harvard University:
 - Instructor, *Multivariable Calculus* (undergraduate course), Fall 2017
 - Coach, *Multivariable Calculus* (undergraduate course), Fall 2016
 - Course assistant, *Theoretical multivariable calculus and real analysis* (undergraduate course), Spring 2019
 - Course assistant, *Symplectic Manifolds and Lagrangian Submanifolds* (topic course), Fall 2018

Service

- *Reviewing:*
 - Reviewer for Duke Mathematical Journal, Journal of Differential Geometry, Advances in Mathematics, Mathematical Research Letters, Journal of the Mathematical Society of Japan, manuscripta mathematica
- *Conferences co-organized:*
 - Workshop on Mirror Symmetry and Stability, Harvard University, March 2019
- *Seminars co-organized:*
 - Harvard University, Yau’s student seminar, 2016-2017
 - Harvard University, Trivial Notions Seminar, 2015-2016

(Last updated: April 2022.)