

Curriculum Vitae

Xin Jin

Contact Information

- Department of Mathematics
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Employment

- Associate Professor, Boston College, starting from August 2025
- Assistant Professor, Boston College, July 2018 (hired in 2017)–August 2025
- Boas Assistant Professor, Northwestern University, Sep. 2015–July 2018

Short-term visits

- The Chinese University of Hong Kong, Nov. 27–Dec. 9, 2024

Education

- Ph.D., University of California, Berkeley, 2015.
Thesis title: *Symplectic approaches in geometric representation theory*
Advisor: David Nadler
- M.S., Northwestern University, 2010
- B.S., Peking University, 2008.

Research Interests

- Primary: microlocal sheaves, symplectic topology, geometric representation theory, homological mirror symmetry, algebraic topology.
- I'm also broadly interested in areas that have direct or indirect connections with symplectic geometry and representation theory. For example, some of my work is in integrable and chaotic billiards.

Publications and Preprints

- (1) Holomorphic Lagrangian branes correspond to perverse sheaves. *Geom. Topol.* 19 (2015), 1685–1735.
- (2) Symplectomorphism group of $T^*(G/B)$ and the braid group I: A homotopy equivalence for $G = SL_3(\mathbb{C})$. *J. Symplectic Geom.* 17 (2) (2019), 337–380.
- (3) Representing the big tilting sheaves as holomorphic Morse branes. *Adv. Math.* 345 (2019), 845–860.
- (4) Brane structures in microlocal sheaf theory. Joint with D. Treumann. *J. Topology* 17 (1) (2024), e12325, 68 pages.
- (5) A Hamiltonian $\coprod_n BO(n)$ -action, stratified Morse theory and the J -homomorphism. *Compositio Math.* 160 (9) (2024), 2005–2099.
- (6) Hyperbolicity of asymmetric lemon billiards. Joint with P. Zhang, *Nonlinearity* 34 (1) (2021), 92–117.
- (7) Microlocal sheaf categories and the J -homomorphism. <https://arxiv.org/abs/2004.14270>. *Submitted*, 55 pages.
- (8) Homological mirror symmetry for the universal centralizers I: the adjoint group case. <https://arxiv.org/abs/2107.13395> (this is now part of item (11)).
- (9) Birkhoff normal form and twist coefficients of periodic orbits of billiards. Joint with P. Zhang. *Nonlinearity* 35 (8) (2022), 3907–3943.
- (10) Homoclinic and heteroclinic intersections for lemon billiards. Joint with P. Zhang. *Adv. Math.* 442 (2024), 109588, 67 pages.
- (11) Homological mirror symmetry for the universal centralizers. <https://arxiv.org/abs/2206.09035>, 119 pages.
- (12) Cohomology of the universal centralizers I: the adjoint group case. <https://arxiv.org/abs/2411.09041>, 9 pages.
- (13) Mirror symmetry for the affine Toda systems. Joint with Z. Yun. *In preparation*.
- (14) Multiplicative universal centralizers: cluster structure and mirror symmetry. Joint with B. Webster. *In preparation*.
- (15) Cohomology of the universal centralizers II: the semisimple group case. *In preparation*.

Invited Talks

- Conference Talks

- Plenary lecture at the 2024 International Congress of Chinese Mathematicians (ICCM), Shanghai, China, January 3-6, 2025.
- “Ramification in geometric Langlands and non-abelian Hodge theory”, Heidelberg, Germany, September 9-13, 2024.
- The 10th annual Goe Fishing conference on “Poisson geometry and representation theory”, Northwestern University, April 11-14, 2024
- New England Algebraic Topology and Mathematical Physics Seminar (NEAT MAPS), March 16-17, 2024
- Nearby cycles and derived geometry, Universitat Regensburg, Feb. 26-March 1, 2024
- Fall Southeastern Sectional Meeting, University of South Alabama, Oct. 13-15, 2023
- AMS Joint Mathematics Meeting, special session on Resolutions of singularities and cohomology in geometry and representation theory, Hynes Convention Center in Boston, Massachusetts, January 4-5, 2023
- Floer homotopical methods in low dimensional and symplectic topology, MSRI, November 14-18, 2022
- AMS Fall Eastern Sectional Meeting, Special session on Lagrangian and Legendrian submanifolds, U. Mass Amherst, October 1-2, 2022
- Connections Workshop: Floer Homotopy Theory, MSRI, September 8-9, 2022
- Geometric and Categorical Aspects of Representation Theory and Related Topics, AWM Research Symposium, U. Minnesoda, June 16-19, 2022
- AMS Special Session on Categorical and Combinatorial Methods in Representation Theory, and Related Topics, May 1-2, 2021
- Structural aspects of Fukaya categories, Harvard University, May 12-15, 2020 (postponed)
- (∞, n) -categories, factorization homology and algebraic K-theory, MSRI, Berkeley, March 23-27, 2020

- Homological Algebra, Microlocal Analysis and Symplectic Geometry, Centre de Recherches Mathématiques (CRM - Montreal, Canada), June 2-28, 2019
- Modern Trends in Non-Commutative Geometry, Northwestern University, May 20-24, 2019
- *Fukaya categories of holomorphic symplectic manifolds and applications*, International Conference on Geometric Representation Theory and Symplectic Varieties, University of Notre Dame, June 25 - 29, 2018
- *Lagrangians and constructible sheaves*, Sixth Midwest Women in Mathematics Symposium, Purdue University, April 7 2018
- *Brane structures in microlocal sheaf theory*, Floer homology and homotopy theory, UCLA, July 17-21 2017
- *Brane structures from the perspective of microlocal sheaf theory*, Homological mirror symmetry: emerging developments and applications, IAS, March 13-17, 2017
- *Holomorphic Lagrangian branes and perverse sheaves*, Workshop on Symplectic Varieties and Geometric Representation Theory, University of North Carolina at Chapel Hill, October 28-30, 2016
- *Nadler-Zaslow correspondence without Floer theory*, The 12th William Rowan Hamilton Geometry and Topology Workshop on Low-dimensional topology, complex and symplectic geometry, Trinity College Dublin, August 22-26, 2016
- *Holomorphic branes correspond to perverse sheaves*, Graduate Student Topology & Geometry Conference, UT Austin, April 5-6, 2014

• Seminar Talks

- Topology Seminar, Johns Hopkins, Apr. 28, 2025
- BU Geometry&Physics Seminar, BU, Apr. 16, 2025
- MIT Lie Group Seminar, MIT, Mar. 12, 2025
- Geometry Seminar, the Chinese University of Hong Kong, Dec. 4, 2024
- Number Theory/Representation Theory Seminar, Boston College, Nov. 7, 2024

- Geometry, Physics, and Representation Theory Seminar, Northeastern, Apr. 18, 2024
- Dynamics seminar, Tufts, Nov. 14, 2023
- Geometry/Physics seminar, Northwestern, May 4, 2023
- UChicago Algebraic topology seminar, UChicago, May 2, 2023
- USC Topology seminar, USC, April 10, 2023
- Institute of Geometry and Physics, GT series, USTC, China (remote), March 16, 2023
- BC Number theory/Representation theory seminar, BC, March 2, 2023
- MIT symplectic seminar, MIT, November 3, 2022
- Geometry, symmetry and physics seminar, Yale University, October 24, 2022
- Geometric Representation Theory Seminar, UC Berkeley, March 30, 2022
- Freemath Seminar, September 21, 2021
- Geometry, Physics, and Representation Theory (GPRT) Seminar, Northeastern University, September 9, 2021
- Math Physics seminar, Perimeter Institute, November 5, 2020
- Symplectic Geometry and Mathematical Physics Seminar at BICMR, Peking University, September 24, 2020
- Higher invariants AG-seminar, Universitat Regensburg, July 16, 2020
- Western Hemisphere Virtual Symplectic seminar, July 10, 2020
- Geometry and Physics seminar, Northwestern University, June 4, 2020
- Columbia Symplectic Geometry, Gauge Theory, and Categorification Seminar, Columbia University, March 7, 2020
- Geometry and Physics seminar, Boston University, December 4, 2019
- University of Massachusetts at Boston, October 30, 2019

- Geometric Representation Theory seminar, Fields Institute, September 13, 2019
- Geometry and Topology seminar, Massachusetts Institute of Technology, April 1, 2019
- *Symplectic geometry, microlocal sheaves and representation theory*, Symplectic geometry and Mathematical Physics seminar, Peking University, September 8, 2017
- *Dehn twists and symplectomorphism group of the cotangent bundle of flag varieties*, Symplectic geometry and Mathematical Physics seminar, Peking University, September 7, 2017
- *Holomorphic Lagrangian branes and perverse sheaves*, Felix Klein seminar, University of Notre Dame, April 20, 2017
- *Sheaf quantizations and the J -homomorphism*, Geometry and Physics seminar, Northwestern University, November 17, 2016
- *Nadler-Zaslow correspondence without Floer theory*, Columbia Symplectic Geometry, Gauge Theory, and Categorification Seminar, Columbia University, April 29, 2016
- *Holomorphic Lagrangian branes, perverse sheaves and tilting sheaves*, Algebraic Geometry Seminar, UIUC, March 1, 2016
- *Holomorphic branes correspond to perverse sheaves*, GRASP seminar, UC Berkeley, February 27, 2015
- *Symplectomorphism group of $T^*(G/B)$ and the braid group*, University of Alberta, January 15, 2015
- Mini-courses given
 - *On the geometry of polarizations*, in Symplectic Paradise, Translating manifold topology to a symplectic setting, Paradise Valley, Montana, August 16-20, 2023
 - *Microlocal sheaf theory of nearby Lagrangians*, in Symplectic Topology from the K-Theoretic Viewpoint, Woods Hole, MA, May 19-23, 2025
- Outreach
 - Mirror symmetry at the interface of symplectic geometry and representation theory, TADM-REU program, East Texas A&M University, Commerce TX, July 8, 2025 (Remote)

- Expository Talks

- *Complex K-theory*, Zoom reading seminar for 2020 summer, July 28, 2020
- *Adjoint quotients*, Geometric Representation Theory Seminar, UC Berkeley, April 21, 2015
- *Knot contact homology I, II*, Contact Homology Seminar, UC Berkeley, April 13 and 20, 2015
- *Legendrian knot contact homology*, Contact Homology Seminar, UC Berkeley, April 6, 2015
- *What is a blowup in symplectic geometry?*, Geometric Representation Theory Seminar, UC Berkeley, April 24, 2014
- *Constructible sheaves and the Fukaya category*, Seminar on Symplectic Convolutions, UC Berkeley, April 2, 9, 2014
- *Spaces of almost complex structures on symplectic manifolds*, Pseudoholomorphic disks – from analysis to algebra, UC Berkeley, Oct. 24, 2013
- *Dehn twists*, Geometric Representation Theory Seminar, UC Berkeley, Sep. 26, 2013
- *From special Lagrangians to Hermitian-Yang-Mills connections via Fourier-Mukai transforms*, Mirror Symmetry Seminar, UC Berkeley, Sep. 17, 2014
- *Homological mirror symmetry for a pair of pants*, Mirror Symmetry Seminar, UC Berkeley, April, 2013
- *Examples of the Decomposition Theorem*, Geometric Representation Theory Seminar, UC Berkeley, Nov. 27, 2012
- *Introduction to semisimple perverse sheaves*, Geometric Representation Theory Seminar, UC Berkeley, Nov. 20, 2012

Activities (co-)organized

- Special Session at 2025 AWM Research Symposium in May 16-May 18, 2025, University of Wisconsin, Madison, WI
- Special Session at 2023 AWM Research Symposium in September 30-October 2, 2023, Clark Atlanta University, Atlanta, GA
- *Symplectic Paradise, Translating manifold topology to a symplectic setting*, Paradise Valley, Montana, August 16-20, 2023
- *Mini-conference on Representation Theory, Integrable Systems and Quantum Fields*, Northwestern University, April 23-24, 2016
- Math reading seminar, Northwestern University, Fall 2015 and Spring 2016

Academic Activities

- Inaugural conference of the Simons Collaboration on Homological Mirror Symmetry, University of Pennsylvania, November 5-8, 2015
- Workshop on Springer Theory and Related Topics, University of Massachusetts, Amherst, October 9–11, 2015
- PCMI Summer School, Geometry of moduli spaces and representation theory, June 28-July 18, 2015

- Representation theory and geometry of symplectic resolutions, Northeastern University, May 18-21, 2015
- Conference on Homological Mirror Symmetry, University of Miami, January 26-31, 2015
- Graduate Student Topology & Geometry Conference, UT Austin, April 5-6, 2014
- Conference on Homological Mirror Symmetry, University of Miami, January 27-February 1, 2014
- Conference on Homological Mirror Symmetry, University of Miami, January 28-February 1, 2013
- Noncommutative Algebraic Geometry, MSRI, Berkeley, Jun 18-29, 2012.
- Spring School on Algebraic Microlocal Analysis, Northwestern University, May 14-26, 2012
- Geometry of derived categories and representation theory, Northeastern University, April 30-May 4, 2012.
- PCMI Summer School, Moduli Spaces of Riemann Surfaces, Park City, Utah, July 3- July 23, 2011
- Workshop on Mirror Symmetry and Related Topics, University of Miami, January 24-29, 2011.

Awards and Honors

- NSF Grant DMS-1854232 (previously DMS-1710481), July 1, 2017-January 31, 2022
- Coleman Fellowship in Mathematics, Spring 2014
- Honorable Mention in the Mathematical Contest in Modeling, 2008
- PetroChina Fellowship, Spring 2007

Professional Services

- Referee for *Astérisque*, *Compositio*, *Inventiones*, *JDG*, *J. Topology* and others
- Reviewer for Math Reviews, zbMATH
- Served twice as an NSF panelist
- Panelist for the event “Floer homotopy theory”, Western Hemisphere Virtual Symplectic seminar, Dec. 3rd, 2021
- Mentor for the Kylerec workshop (a workshop for graduate students in symplectic topology), 2019
- Defense Committee member of Rebecca Wei, PhD of Northwestern University 2017

Postdoctoral Advisees: Andrei Ionov

Department Services

- Postdoc Search committee, Boston College, Fall 2021-Spring 2022
- Graduate admissions committee, Boston College, Fall 2020-Spring 2021

Teaching

Instructor at Boston College:

- Fall 2025: Math 2202, Multivariable Calculus (2 sections)
- Spring 2025: Math 2202, Multivariable Calculus (2 sections)
- Fall 2024: Math 8820, Introduction to Representation Theory
- Spring 2024: Math 4410 Differential Equations (2 sections)
- Fall 2023: Math 8808, Geometry/Topology I
- Spring 2023: Math 3312, Algebra II
- Fall 2022: Math 3311, Algebra I;
Math 8820, Introduction to Representation Theory
- Spring 2022: Math 8865, Topics in Algebraic Geometry
- Fall 2021: Math 4410, Differential Equations (2 sections)
- Spring 2021: Math 8822, Number Theory II
- Fall 2020: Math 4410, Differential Equations (2 sections)
- Spring 2020: Math 2210, Linear Algebra (2 sections)
- Spring 2019: Math 2210, Linear Algebra
- Fall 2018: Math 8820, Introduction to Representation Theory

Supervised Reading Courses:

- Winter 2017 at Northwestern: Geometry of Legendrian knots (student: Nilay Kumar)

Instructor at Northwestern University:

- Spring 2018: Math 240, Linear Algebra (2 sections)
- Fall 2017: Math 230, Differential Calculus of Multivariable Functions (2 sections)
- Spring 2017: Math 405, Riemann surfaces;
Math 230, Differential Calculus of Multivariable Functions
- Fall 2016: Math 230, Differential Calculus of Multivariable Functions (2 sections)
- Winter 2016: Math 224, Integral Calculus of One Variable Functions (2 sections)
- Fall 2015: Math 220, Differential Calculus of One Variable Functions (2 sections)

Graduate student instructor at UC Berkeley:

- Spring 2015: Math 16B Analytic Geometry and Calculus (2 sections)
- Fall 2014: Math54 Linear Algebra and Differential Equations (2 sections)
- Fall 2013: Math54 Linear Algebra and Differential Equations (2 sections)
- Spring 2013: Math54 Linear Algebra and Differential Equations (2 sections)
- Fall 2012: Math 1A Calculus (2 sections)