GUANGBO XU

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Research Interest: Symplectic Geometry

POSITIONS

Associate Professor	**Rutgers Unviersity**	*2025–Now*
Visiting Scholar (visiting position)	**Princeton University**	*2024 Fall*
Assistant Professor	**Rutgers University**	*2023–2025*
Member (visiting position)	**Institute for Advanced Study**	*2022 Fall*
Assistant Professor	**Texas A&M University**	*2019–2023*
Postdoctoral Associate	**Simons Center for Geometry and Physics**	*2018–2019*
Associate Research Scholar	**Princeton University**	*2015–2018*
Lecturer	**Princeton University**	*2015–2018*
Visiting Assistant Professor	**University of California, Irvine**	*2013–2015*

EDUCATION

PhD, **Princeton University** *2013*
Advisor: Gang Tian
MA, **Chern Institute of Mathematics, Nankai University** *2008*
Advisor: Weiping Zhang
BA, **Nankai University** *2006*

GRANTS AND AWARDS

Travel Support for Mathematicians	**Simons Foundation**	*2025–2029*
NSF Award DMS-2506403	**NSF**	*2025–2028*
NSF Conference Award		
Rutgers Symplectic Summer School 2025	**NSF**	*2025*
NSF Conference Award		
South Central Topology Conference II	**NSF**	*2023*
NSF Award DMS-2345030	**NSF**	*2022–2025*
NSF Conference Award		
South Central Topology Conference	**NSF**	*2021*
Early Career Researcher Award (declined)	**Australian Research Concil**	*2018*
AMS-Simons Travel Grant	**Simons Foundation**	*2014–2016*
Qiu Shi Fellowship (declined)	**Qiu Shi Foundation**	*2006–2011*
Jiang Li-Fu Award	**Nankai University**	*2005*

PAPERS

1. (with H. Feng and W. Zhang) *Real embedding, η-invariant and Chern–Simons current*, **Pure Appl. Math. Q.**, 26 (2009), no.3, Special Issue: In honor of Friedrich Hirzebruch, Part 2, 1113–1137.
2. *Moduli space of twisted holomorphic maps with Lagrangian boundary condition: compactness*, **Adv. Math.** 242 (2013) 1–49.
3. (with S. Schecter) *Morse theory for Lagrange multipliers and adiabatic limits*, **J. Differential Equations** 257 (2014) 4277–4318.
4. *Classification of $U(1)$-vortices with target $\mathbb{C}^N$*, **International J. Math.** 26 (2015), no.13, 1550109, 20pp.
5. *Gauged Hamiltonian Floer homology I: definition of the Floer homology groups*, **Trans. Amer. Math. Soc.** 368 (2016), 2967–3015.
6. (with G. Tian) *Correlation functions of gauged linear σ-model*, **Science China Math.** 59 (2016), 823–838.
7. (with G. Tian) *The symplectic approach of gauged linear σ-model* **Proceedings of the Gökova Geometry-Topology Conference 2016**, 86–111.
8. (with D. Wang) *Compactness of disk vortices in adiabatic limit*, **Math. Z.**, 287 (2017), 405–459.
9. (with S. Venugopalan) *Local model of affine vortices*, **International J. Math.**, 29 (2018), no. 3 1850020 (54 pages)
10. (with G. Tian) *Analysis of gauged Witten equation*, **J. Reine Angew. Math.**, 740 (2018), 187–274.
11. (with W. Wu) *Gauged Floer homology and spectral invariants*, **Int. Math. Res. Not. IMRN**, 2018, no. 13, 3959–4021.
12. (with G. Tian) *A wall-crossing formula and the invariance of GLSM correlation functions* **Peking Mathematical Journal**, 3 (2020), 235–291.
13. (with G. Tian) *Virtual cycles of gauged Witten equation*, **J. Reine Angew. Math.** 771 (2021), 1–64
14. (with G. Tian) *Gauged Witten equations and adiabatic limit*, **Symp. Pure App. Math.** 103 (2021) 503–514
15. *A compactness theorem for $SO(3)$ anti-self-dual equation with translation symmetry*, **Adv. Math.**, 408B (2022) 108576, 95pp.
16. *Gluing affine vortices*, **Acta Mathematica Sinica, English Series**, 40 (2024) 250–312
17. *Symplectic aspects of gauged (non)linear sigma model*, **Int. J. Mod. Phys. A**, 39, no. 33, 2446017 (2024), Special Issue on Thirty Years of Gauged Linear Sigma Models
18. (with G. Tian) *Gauged linear sigma model in geometric phases*, To appear on **Selecta Mathematica**

19. (with S. Venugopalan and C. Woodward) *Fukaya categories of blowups*,
J. Inst. Math. Jussieu

20. (with S. Bai) *An integral Euler cycle in normally complex orbifolds and $\mathbb{Z}$-valued Gromov–Witten type invariants*,
Submitted, https://arxiv.org/abs/2201.02688.

21. (with C. Woodward) *Partly-local domain-dependent almost complex structures*,
https://arxiv.org/abs/1903.05557.

22. (with G. Tian) *Counting pointlike instantons virtually without gluing*,
preprint, https://arxiv.org/abs/2110.15379.

23. (with C. Woodward) *An open quantum Kirwan map*,
https://arxiv.org/abs/1806.06717.

24. (with S. Bai) *Arnold conjecture over integers*,
submitted, https://arxiv.org/abs/2209.08599.

25. (with S. Bai) *Franks' dichotomy for toric manifolds, Hofer–Zehnder conjecture, and gauged linear sigma model*,
submitted, https://arxiv.org/abs/2309.07991.

26. *Quantum Kirwan map and quantum Steenrod operation*,
Preprint, https://arxiv.org/abs/2405.12902.

27. (with S. Bai and D. Pomerleano) *Cohomological splitting over rationally connected bases*
Submitted, https://arxiv.org/abs/2406.00931.

28. *Reduced Gromov–Witten invariants without ghost bubble censorship*
preprint, https://arxiv.org/abs/2604.13209

29. (with S. Bai) *Integral Hamiltonian Floer homology: foundations*,
Upcoming Soon

30. (with S. Bai, E. Shelukhin, and N. Wilkins) *New Applications of Floer theory in Hamiltonian dynamics*,
Upcoming Soon

RESEARCH TALKS

- *Reduced Gromov–Witten invariants without ghost bubble censorship*, **Differential geometry and symplectic topology seminar**, University of Minnesota, 04/21/2026.
- *Integral Floer homology and new applications in Hamiltonian dynamics*, **AMS Joint Mathematical Meeting**, Washington DC, 01/04/2026
- *Two refinements of Gromov–Witten invariants*, **Algebraic Geometry Seminar**, KIAS, 12/31/2025
- *Introduction to gauged linear sigma model*, **Gauge Theory Seminar**, Rutgers University, 12/09/2025
- *Transversality on orbifolds and counting holomorphic curves*, **Topology Seminar**, University of Barcelona, 06/26/2025
- *Transversality on Orbifolds*, **Geometry and Topology Seminar**, UW-Madison, 03/14/2025
- *Integral Floer homology theory*, **Symplectic Geometry Seminar**, IAS, 03/11/2025
- *Integer-valued Gromov–Witten invariants*, **Recent developments in higher genus curve counting**, Simons Center for Geometry and Physics, 02/13/2025.
- *Transversality on orbifolds and counting holomorphic curves*, **Symplectic geometry seminar**, Stanford University, 12/2024.

- *Quantum Kirwan map and quantum Steenrod operation*, **Differential geometry, topology, and special structures seminar**, CUNY Graduate Center, 11/2024.
- *Transversality on orbifolds and counting holomorphic curves*, **Geometry Seminar**, Lehigh University, 10/07/2024
- *Quantum Kirwan map and quantum Steenrod operation*, **Geometry and Topology Seminar**, MIT, 09/26/2024
- *Arnold conjecture over integers*, **Colloquium**, Chern Institute for Mathematics, Nankai University, 06/2024.
- *Arnold conjecture over integers*, **Colloquium**, Beijing International Center for Mathematical Research, 06/2024.
- *Integral Hamiltonian Floer homology*, **Frontiers of Geometric Analysis**, Santa Cruz, California, 06/2024.
- *Fukaya category for point blowups*, **Workshop on birational geometry and quantum invariants**, Simons Center for Geometry and Physics, 10/2023.
- *Hofer–Zehnder conjecture for toric manifolds*, **Differential Geometry Seminar**, University of Minnesota, 10/05/2023.
- *Hofer–Zehnder conjecture for toric manifolds*, **Conference on geometry and topology**, Princeton University, 07/20/2023.
- *Integer-valued Gromov–Witten invariants*, **Western Hemisphere Colloquium on Geometry and Physics**, Zoom, 04/10/2023.
- *Arnold conjecture over integers*, **Special Colloquium**, Rutgers University, 12/20/2022.
- *Arnold conjecture over integers*, **Mathematical Physics Seminar**, University of Pennsylvania, 12/06/2022.
- *Integral count of pseudoholomorphic curves*, **Annual meeting of Simons Collaboration Program on homological mirror symmetry**, Simons Foundation, 11/04/2022.
- *Arnold conjecture over integers*, **Series Talks**, Institute for Advanced Study, 10/2022.
- *Arnold conjecture over integers*, **Symplectic Geometry Seminar**, Princeton University/IAS, 10/03/2022.
- *Integer-valued Gromov–Witten invariants*, **Symplectic Zoominar**, Zoom, 06/03/2022.
- *Integer-valued Gromov–Witten invariants in symplectic geometry*, **Topics in Enumerative Geometry**, University of Oregon, 05/22/2022.
- *Gromov compactness without boundary estimate*, **Recent developments in Lagrangian Floer theory**, Simons Center for Geometry and Physics, Stony Brook University, 03/15/2022.
- *Integral Gromov–Witten invariants*, **Geometry, Symmetry, and Physics Seminar**, Rutgers University, Zoom, 03/07/2022.
- *Integral Gromov–Witten invariants*, **Geometry Seminar**, University of Georgia, Zoom, 02/04/2022.
- *Closed and open string theories of gauged linear sigma model*, **Differential Geometry and Symplectic Topology Seminar**, University of Minnesota, Zoom, 12/02/2021.
- *Counting pointlike instantons virtually without gluing*, **Symplectic geometry, topology, and gauge theory seminar**, Simons Center for Geometry and Physics, Stony Brook University, 10/07/2021
- *Compactness results in $SO(3)$ Atiyah–Floer conjecture*, **Mathematical Institute Geometry and Analysis Seminar, Oxford University**, Zoom, 05/03/2021
- *Compactness of instantons and the Atiyah–Floer conjecture*, **Boston University Geometry Seminar**, Zoom, 10/07/2020
- *Compactness of instantons and the Atiyah–Floer conjecture*, **University of Iowa Differential Geometry Seminar**, Zoom, 10/06/2020
- *Adiabatic limit of the gauged Witten equation*, **Mirror Symmetry, gauged linear sigma model, matrix factorization, and related topics**, CMSA, Harvard University, 03/04/2020
- *Lectures on Gauged linear sigma model and gauged Witten equation*, **Simons Center Series Talks**, 01/21/2020–01/24/2020
- *Adiabatic limit of the gauged Witten equation*, **Simons Center workshop on "Novel Vistas on Vortices"**, 11/15/2019
- *Adiabatic limit of the gauged Witten equation*, **The 3rd IBS–BICMR Joint Symplectic Geometry Workshop**, Pohang, Korea, 09/25/2019
- *Anti-Self-Dual equation over certain noncompact 4-manifolds and the $SO(3)$ Atiyah–Floer conjecture*, **Columbia Symplectic Geometry, Gauge Theory, and Categorification Seminar**, September 6, 2019
- *An open quantum Kirwan map*, Symplectic Geometry and Topology Seminar, **Simons Center for Geometry and Physics and Department of Mathematics of Stony Brook University**, March 2019
- *Gauged linear sigma model in geometric phases*, Symplectic Geometry Seminar, **IAS**, 01/28/19
- *Mirror Symmetry and Gauged Linear Sigma Model*, Mathematics Colloquim, **Rutgers University at Newark**, 11/28/18

- *Mirror Symmetry and Gauged Linear Sigma Model*, Geometry Seminar, **University of Rochester**, 11/12/18
- *Mirror Symmetry and Gauged Linear Sigma Model*, Geometry and Topology Seminar, **North Carolina State University**, 10/30/18
- *Bershadsky–Cecotti–Ooguri–Vafa torsion for Landau–Ginzburg models*, Geometric Analysis Seminar, **University of Oregon**, 10/23/18
- *Bershadsky–Cecotti–Ooguri–Vafa torsion for Landau–Ginzburg models*, Differential Geometry Seminar, **UC Santa Barbara**, 10/12/18
- *Bershadsky–Cecotti–Ooguri–Vafa torsion for Landau–Ginzburg models*, Joint UCI–UCSD–UCR Differential Geometry Seminar, **UC Irvine**, 10/09/18
- *Bershadsky–Cecotti–Ooguri–Vafa torsion for Landau–Ginzburg models*, Geometry seminar, **Texas A & M**, 10/01/18
- Geometry and Topology Seminar, **University of Virginia**, 09/25/18
- *Gauged linear sigma model in geometric phases*, Geometry and Topology Seminar, **MIT**, 09/17/18
- *Gauged linear sigma model in geometric phases*, New Postdoc Talks, **Stony Brook University**, 08/30/18
- *Vortex equation and gauged linear sigma model*, **University of Georgia**, Georgia Topology Conference 2018, 06/08/18
- *Bershadsky–Cecotti–Ooguri–Vafa torsion for Landau–Ginzburg models*, Geometry and Topology Seminar, **Simons Center for Geometry and Physics**, Stony Brook University, 04/09/18
- *Open quantum Kirwan map*, **IAS/Princeton** Symplectic Geometry Seminar, 03/26/18
- *Open quantum Kirwan map and bulk deformations*, Geometry and Physics Seminar, **Boston University**, 03/21/18
- *Open quantum Kirwan map*, Mirror Symmetry Seminar, **Harvard University**, 03/09/18
- Conference in honour of Professor Gang Tian for his 60th birthday, **University of Sydney**, 02/01/18
- *Vortices, Gauged Sigma Model, and Kirwan Map*, Geometry and Physics Seminar, **Rutgers University**, 11/09/17
- *Open Quantum Kirwan Map*, Geometry seminar, **University of Georgia**, 10/06/17
- *Gauged linear sigma model and geometric phases*, Conference on "Holomorphic curves & symplectic topology", **Institut Mittag-Leffler**, 08/09/17
- *Gauged linear sigma model and adiabatic limits*, The 7th International Workshop on Differential Geometry, **Karatsu, Japan**, 03/24/17
- *Open Quantum Kirwan Map*, Workshop on Global Mirror Symmetry, **Nankai University**, 06/10/16
- *Open Quantum Kirwan Map*, Workshop on Symplectic Geometry and Mathematical Physics, **Beijing International Center for Mathematical Research**, 05/27/16
- *Correlation Functions of Gauged Linear σ-Model*, Joint "Geometric Analysis" and "Geometry, Physics and Symmetry" Seminar, **Rutgers University**, 04/16
- *Gauged Witten Equation and Gauged Linear σ-Model*, Differential Geometry Seminar, **UC Riverside**, 05/15
- *Gauged Witten Equation and Gauged Linear σ-Model*, Differential Geometry Seminar, **UC Irvine**, 05/15
- *Gauged Witten Equation and Gauged Linear σ-Model*, **IAS/Princeton** Symplectic Geometry Seminar, 12/05/14
- Workshop on gauged sigma-model in two dimensions, **Simons Center for Geometry and Physics**, Stony Brook, 11/05/14
- *Compactness of gauged Witten equation*, **Center of Geometry and Physics, Pohang, Korea**, 06/16
- *Compactness of gauged Witten equation*, **University of Minnesota**, 05/14
- *Compactness of gauged Witten equation*, Workshop on equivariant Gromov-Witten theory and applications, **Simons Center for Geometry and Physics**, Stony Brook, 05/14/14
- *Morse theory for Lagrange multipliers*, *Adiabatic limits and Hamiltonian Floer homology*, **Caltech** Geometry and Topology Seminar, 01/17/14
- *Gauged Floer homology for Hamiltonian isotopies*, **AMS special session on geometric analysis**, 11/02/13
- *Adiabatic limits of vortex equation in gauged linear sigma-model*, **UC Irvine** Differential Geometry Seminar, 10/01/13
- *Gauged linear σ-model and its adiabatic limits*, UMD-JHU joint complex geometry seminar, 04/02/13

OTHER TALKS

- *How to count? Hairy Ball with Symmetries and Symplectic Geometry*, Glimpse talk for beginning graduate students, Rutgers, 08/29/2024
- *What are differential forms?*, Undergraduate Math Circle, 11/2013.

TEACHING

MATH 534 Selected Topics in Geometry I: Floer homology in symplectic geometry	**Rutgers University**	Fall 2025
MATH 533 Differential Geometry II	**Rutgers University**	Spring 2025
MATH 251 Multivariable Calculus	**Rutgers University**	Spring 2024
MATH 510 Topics in Analysis: Atiayh–Singer Index Theorem	**Rutgers University**	Fall 2023
MATH 304 Linear Algebra	**Texas A&M University**	Spring 2023
MATH 689 Topic: Atiyah–Singer Index Theorem	**Texas A&M University**	Spring 2023
MATH 423 Linear Algebra II	**Texas A&M University**	Spring 2022
MATH 689 Topic: Morse Theory	**Texas A&M University**	Spring 2022
MATH 622 Differential Geometry I	**Texas A&M University**	Spring 2021
MATH 323 Linear Algebra (Honor Section)	**Texas A&M University**	Spring 2021
MATH 308 Differential Equations (2 Sections)	**Texas A&M University**	Fall 2019
Linear Algebra (2 Sections)	**Princeton University**	Spring 2018
Multivariable Calculus (2 Sections)	**Princeton University**	Fall 2016
Introduction to Engineering, Mathematics, and Physics (2 Sections)	**Princeton University**	Fall 2015
Linear Algebra (2 Sections)	**UC Irvine**	Spring 2015
Differential Geometry	**UC Irvine**	Winter 2015
Linear Algebra	**UC Irvine**	Winter 2015
Linear Algebra	**UC Irvine**	Spring 2014
Differential Geometry	**UC Irvine**	Winter 2014
Modern Geometry	**UC Irvine**	Winter 2014
Linear Algebra	**UC Irvine**	Fall 2013
Elementary Analysis	**UC Irvine**	Fall 2013
Analysis in Several Variables (Honor Course, with Professor Robert Gunning)	**Princeton University**	Fall 2012
Linear Algebra	**Princeton University**	Spring 2011

STUDENT ADVISEE

1. Hussein Hijazi, Master, Rutgers, 2024, Reading course
2. Alexandros Kazantzidis, PhD, TAMU, 2022, Reading course
3. Jose Lopez Garcia, PhD, TAMU, 2021, Reading course
4. Alexander Adams, Undergraduate, TAMU, 2022 Spring

SERVICES

- Reviewer for AMS MathReview (20 MathReview articles)
- Journal/Book Referee: Geometry & Topology, Journal of Differential Geometry, Journal of Symplectic Geometry, Advances in Mathematics, Journal of Geometry and Physics, Frontiers in

Mathematics of China, Science China Mathematics, Calculus of Variation and Partial Differential Equations, SIAM Journal of Applied Dynamical Systems, Mathematical Survey and Monographs, Peking Mathematical Journal

- Organizer of Rutgers Symplectic Summer School 2024
- Organizer of Rutgers Symplectic Geometry Seminar
- Co-organizer of the second South Central Topology Conference (2023)
- Co-organizer of the first South Central Topology Conference (2021)
- Organizer of Stony Brook Symplectic Geometry and Topology Seminar (2018–2019)
- Organizer of Princeton/IAS Symplectic Geometry Seminar (2016–2018)
- Minicourse on Hodge Theorem at TAMU (6 hours, 2021)
- Volunteer for MathCount (2014, 2015)
- Instructor for TAMU Math Circle (2019–Now) (Weekly problem solving session for the group of 5th–6th graders)
- Organizer of TAMU Geometry Seminar (2019–Now) (invited 3 speakers)
- Organizer of TAMU Topology Seminar (2020–Now) (invited 16 speakers)
- Maintainer of TAMU Geometry and Topology Research Page (2020–Now)