

Junrong Yan

Curriculum Vitae

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Education

2013–2017 **B.S in Mathematics**, *School of Mathematical Sciences*, Nankai University.

2017–2022 **Ph.D.**, *Department of Mathematics*, University Of California, Santa Barbara.

Advisor: Xianzhe Dai

Employment

2022–present **Postdoc**, *Beijing International Center for Mathematical Research*, Peking University.

Mentor: Xiaobo Liu

Awards and Grants

2018 Wilder Award at UCSB

2022 Boya Postdoctoral Fellowship at PKU

2023 General Program in China Postdoctoral Science Foundation

Research Interests

Geometric Analysis The analysis of PDEs on noncompact manifolds; spectral theory of Dirac operators; gluing formula of global spectral invariants; index theorem; comparison geometry of submanifolds

Papers

Published [1] Xianzhe Dai and Junrong Yan. *Witten Deformation for Noncompact Manifolds with Bounded Geometry*, *Journal of the Institute of Mathematics of Jussieu*, 38 pages

[2] Xianzhe Dai and Junrong Yan. *Witten Deformation on Non-compact Manifold: Heat Kernel Expansion and Local Index Theorem*, *Math. Z.*, 28 pages

Preprint [1] Xinxing Tang and Junrong Yan. *Calabi-Yau/Landau-Ginzburg Correspondence for Weil-Peterson Metrics and tt^* Structures*, arXiv:2205.05791, 34 pages

[2] Junrong Yan. *Witten deformation for non-Morse Functions and gluing formula for analytic torsions*, arxiv: 2301.01990, 39 pages

[3] Junrong Yan. *A new analytic proof of gluing formula for analytic torsion forms*, arXiv:2301.02591, 40 pages

[4] Fagui Li and Junrong Yan. *A first eigenvalue estimate for embedded hypersurfaces in positive Ricci curvature manifolds*. arXiv:2308.02803, 10 pages

Academic Activities

Referee for SIGMA (Symmetry, Integrability and Geometry: Methods and Applications)

Referee for Journal für die reine und angewandte Mathematik
Reviewer for zbmath

Undergraduate mentoring (2021 UCSB Directed reading program)

Jiasheng Lin Morse theory and Floer homology
Kai Yan & Xinzhe Li Gauge theory, TQFT and knot theory

Talks and Presentations

- Mar. 2023 **Witten Deformation for Non-Morse Functions and Gluing formulas**, *Chern Institute of Mathematics, Nankai University, Tianjin*
- Sept. 2022 **Calabi-Yau/Landau-Ginzburg Correspondence for tt^* Structures**, *Peking University, Beijing*
- Jun. 2022 **Calabi-Yau/Landau-Ginzburg Correspondence for tt^* Structures**, *The Chinese University of Hong Kong, Hongkong*
- Jan. 2022 **Analytic torsion on noncompact manifolds**, *AMS Special Session on Intersections of geometric analysis and mathematical physics, Seattle*
- Jan. 2021 **Heat kernel expansion and local index theorem on noncompact manifolds**, *Peking University*
- Dec. 2020 **Heat kernel expansion and local index theorem on noncompact manifolds**, *Chern Institute of Mathematics, Nankai University*
- Nov. 2020 **Heat kernel expansion and local index theorem on noncompact manifolds**, *East China Normal University*
- Nov. 2020 **Witten deformation on noncompact manifolds: heat kernel expansion and local index theorem**, *UCSB Differential Geometry Seminar*
- Apr. 2020 **Witten deformation on noncompact manifolds and Mirror Symmetry for Landau-Ginzburg model**, *UCSB Differential Geometry Seminar*
- Jan. 2020 **Witten deformation on noncompact manifolds**, *AMS Special Session on Differential Geometry and Global Analysis, I Honoring the Memory of Tadashi Nagano, Colorado Convention Center, Denver*
- Nov. 2019 **Witten deformation on noncompact manifolds**, *AMS Special Session on Topics in Global Geometric Analysis, UC Riverside*
- May 2019 **Witten Deformation on noncompact manifolds**, *UCSB Differential Geometry Seminar*
- Nov. 2018 **Positive scalar curvature and index theorem**, *UCSB Differential Geometry Seminar*

Teaching Activities

Instructor *Math 3B: Calculus with Applications, Summer 2021*

Teaching Assistant *Math 8: Transitions to Higher Mathematics, Spring 2018*
Math 8: Transitions to Higher Mathematics, Fall 2018
Math 6B: Vector Calculus, Winter 2019
Math 34B: Calculus for Social and Life Sciences, Spring 2019
Math 6A: Vector Calculus, Fall 2019

Math 6A: Vector Calculus, Winter 2020

Math 6A: Vector Calculus, Summer 2020

Math 8: Transitions to Higher Mathematics, Fall 2020

Math 6A: Vector Calculus, Winter 2021

Math 6A: Vector Calculus, Spring 2021

Reader *Math 117: Methods of Analysis, Fall 2017*

Math 108B: Introduction to Linear Algebra, Winter 2018

Math 117: Methods of Analysis, Fall 2019