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; gluing formula of global invariants; index theorem

Mathematics Physics: Renormalization theory in QFT and string theory

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 noncomapct 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 noncomapct 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