Yufei Shan

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[my website]

Academic Interests

My research interests: geometric analysis, conformal geometry, CR-geometry, symmetric spaces, microlocal analysis, semiclassical microlocal analysis, representations of Lie groups and Lie algebras, etc.

Education

University of California, Santa Cruz

- Ph.D. in Mathematics (09/2017 - 06/2023).

- Dissertation: Asymptotically Symmetric Metrics and Ricci Flows

- Advisor: Jie Qing.

University of Science and Technology of China

- M.Sc. in Mathematics (09/2015 - 06/2017).

- Thesis: The Upper Bound for the Eigenvalue of the Laplace-Beltrami Operator on $\mathbf{S}^2$

- Advisor: Zuoqin Wang

Sichuan University

- B.S. in Mathematics and Applied Mathematics (09/2011 - 06/2015)

Employment

Shanghai Jiao Tong University

- Postdoctor in Mathematics (09/2023 - 09/2025).

- Research area: Symmetric spaces of noncompact type, Volume comparison theorems, Noncompact Kahler manifolds

- Advisor: Fang Wang

Publications and Preprints

2. **Comparison of total σ_k-curvature,** (joint with Jiaqi Chen, Yinghui Ye). submitted to Journal of Geometric Analysis. arXiv:2505.23440 [math.DG], 2025

1. **The volume comparison of symmetric spaces of noncompact type of rank 1,** (joint with Jiaqi Chen, Yinghui Ye). submitted to Science China Mathematics. arXiv: 2508.08674 [math.DG], 2025

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[1]Updated September 5, 2025

CURRENT RESEARCHES

3. **The Volume Comparison Theorems for Noncompact Kahler Manifolds** (joint with Jiaqi Chen). (in prep).

2. **The Heat Kernel Estimate on Asymptotically Hyperbolic Manifolds and the Stability of the Asymptotically Hyperbolic Einstein Manifolds on Ricci Flows** (joint with Jie Qing). (in prep).

1. **The Perturbation Existence and the Stability of Conformally Compact Einstein Manifolds under Ricci flows** (joint with Jie Qing). (in prep).

INVITED TALKS

4. *05/17/2025.* 2025 XJTLU Geometric Analysis Conference, Xi'an Jiaotong-Liverpool University, The volume comparison of symmetric spaces of non-compact type of rank 1, The link for slices.

3. *05/09/2025.* The Geometric Analysis Conference of Nanjing University and Shanghai Jiao Tong University, Nanjing University, The volume comparison of symmetric spaces of non-compact type of rank 1, The link for slices.

2. *05/13/2021.* Mathematical Colloquium, UC Santa Cruz, The heat kernel estimate on asymptotically hyperbolic manifolds and the stability of asymptotically hyperbolic Einstein manifolds, The link for slices.

1. *08/08/2019.* Geometric Analysis and Mathematical General Relativity Seminar, Peking University, Asymptotically symmetric spaces and Ricci flows, The link for slices.

TEACHING EXPERIENCE

Shanghai Jiao Tong University

- **Instructor:**
  - **Math1209** Medical Calculus (2024 Fall)

University of California, Santa Cruz

- **Instructor:**
  - **Math121A** Differential Geometry (2019 Spring)
- **Teaching Assistant:**
  - **Math11A** Calculus with Applications (2023 Spring)
  - **Math11B** Calculus with Applications (2019 Winter)
  - **Math19A** Calculus for Science, Engineering, and Mathematics (2017 Fall*, 2018 Summer*, 2019 Fall)
  - **Math19B** Calculus for Science, Engineering, and Mathematics (2018 Summer*, 2018 Winter*, 2020 Winter*)
  - **Math22** Introduction to Calculus of Several Variables (2019 Summer)
  - **Math23A** Calculus for Science, Engineering, and Mathematics (2018 Spring*, 2018 Summer*, 2020 Summer, 2021 Spring*, 2021 Winter*, 2022 Summer*, 2023 Winter*, 2023 Summer*)
  - **Math23B** Calculus for Science, Engineering, and Mathematics (2021 Fall*, 2022 Spring)
  - **Math21** Linear Algebra (2018 Fall)

- **Math107** Partial Differential Equations (2020 Spring)
- **Math100** Introduction to Proof and Problem Solving (2020 Summer)
- **Math115** Graph Theory (2020 Fall)
- **Math124** Introduction to Topology (2022 Fall)
- **Math145** Introductory Chaos Theory (2022 Winter)

AWARDS

- 09/2016: The First-Class Graduate Student Scholarship of University of Science and Technology of China

- 11/2014: The Second-Class Single Scholarship of Sichuan University

- 11/2013: The First Prize of the 5th Chinese Mathematics Competitions (CMC) (Sichuan Division) .

SKILLS

- Proficiency in Java, Python, Latex, Git and so on.

- Read, write and speak English fluently.