Yaxiong Liu

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🌐 https://yaxiongliu23.github.io/
Citizenship: China, Sex: Male, Date of birth: February 28, 1995.

Research Interests

Kähler geometry, Algebraic geometry, especially K-stability of polarized varieties, Several complex variables and complex geometry.

Education

Tsinghua University – Beijing, China   **September 2020 – June 2023**
PhD in Mathematics
Supervisor: Professor Akito Futaki.

Institute of Mathematics, Academy of Mathematics and
Systems Science, Chinese Academy of Sciences – Beijing, China **September 2017 – June 2020**
M.S. in Mathematics
Supervisors: Professor Weidong Ruan, Professor Jiayu Li.

Lanzhou University – Lanzhou, China   **September 2013 – June 2017**
B.S. in Mathematics and Applied Mathematics
Supervisor: Professor Wei zhang.

Employment

University of Maryland – College Park, US   **August 2023 – Present**
Novikov Postdoc in Mathematics
Mentor: Professor Tamás Darvas.

Honors and Scholarships

2022

- National Scholarship for Graduate Student (China)
- Excellent Postgraduate Award (Yau Mathematical Sciences Center in Tsinghua University)

2021

- Excellent Postgraduate Award (Yau Mathematical Sciences Center in Tsinghua University)
  The scholarship is supported by Professor Yau, the so-called Ruolin graduate Award, named by his mother.
- Comprehensive Scholarship (Tsinghua University)

Publications and Preprints

- With J. Han, $\mathbb{G}$-*uniform weighted K-stability for models on klt varieties*, arXiv:2506.18039.
- With Z. Liu and Hui Yang, *An asymptotic formula for the Segre classes*, **J. Geom. Anal.** 35 (2025), no 3, 101.
- With J. Han, *On the existence of weighted-cscK metrics*, **Adv. Math.** 463 (2025), Paper No. 110125.
- With J. Chu and N. McCleerey, *The eigenvalue problem for the complex hessian operator on m-pseudoconvex manifolds*, **J. Funct. Anal.** 290(3) (2026), Paper No. 111256.
- With Zhuo Liu, Hui Yang, and Xiangyu Zhou, *A Le Potier-type isomorphism twisted with multiplier submodule sheaves*, **J. Math. Pures Appl.** 202 (2025), Page No. 103760.
- Y. Liu, *Openness of uniformly valuative stability on the Kähler cone of projective manifolds*, **Math. Z.** 303 (2023), no 2, 52.
- Y. Liu, *Uniform K-stability and conformally Kähler, Einstein-Maxwell geometry on toric manifolds*, **Tohoku Math. J.** (2) 74 (2022), no 1, 1-21.

Teaching and TA Experiences

Teaching

- Department of Mathematics, University of Maryland
  - Math-436: *Differential geometry of curves and surfaces I*, Fall, 2025
  - Math-401: *Applications of Linear Algebra*, Fall, 2025
  - Math-401: *Applications of Linear Algebra*, Spring, 2025
  - Math-121: *Elementary Calculus II*, Fall, 2024
  - Math-140H: *Calculus I*, Fall, 2024
  - Math-401: *Applications of Linear Algebra*, Spring, 2024
  - Math-436: *Differential geometry of curves and surfaces I*, Fall, 2023

TA

- School of Mathematical Sciences, Tsinghua University
  - *Complex Geometry*, Spring, 2023.
  - *Topics in Complex Geometry*, Fall, 2022.
  - *Differential geometry III–Complex Geometry*, Spring, 2022.
  - *Differential geometry III–Complex Geometry*, Spring, 2021.
- School of Mathematical Sciences, University of Chinese Academy of Sciences
  - *Differential geometry*, Fall, 2018.
  - *Calculas III*, Fall, 2017.

Academic Visits

- July 2025, Mathematical Science Research Center, Chongqing University of Technology.
- July 2024, Westlake University, visiting Prof. Jiyuan Han.
- May 2024, Rutgers University, visiting Prof. Jian Song for one week.
- June 2023, Westlake University, visiting Prof. Jiyuan Han for one week.
- February 2017–June 2017, Enhanced Program for Graduate Study, Beijing International Center For Mathematical Research.

Invited Talks

- 7 2025, Existence of weighted cscK metrics, at Chongqing University of Technology.
- 7 2025, Existence of weighted cscK metrics, Workshop on Geometric Analysis 2025 at Qingdao
- 6 2024, The eigenvalue problem for the complex hessian operator on m-pseudoconvex manifolds, ITS seminar, Westlake University
- 6 2024, The existence of weighted cscK metrics and G-coercivity of weighted Mabuchi functional, Beijing Normal University
- 6 2024, The eigenvalue problem for the complex hessian operator on m-pseudoconvex manifolds, Geometry & Topology seminar at Chongqing University of Technology
- 6 2024, The eigenvalue problem for the complex hessian operator on m-pseudoconvex manifolds, 2024 Geometry & Topology conference at Qingtian
- 5 2024, A Le Potier-Type Isomorphism Twisted with Multiplier Submodule Sheaves, Geometric Analysis Seminar, Peking
- 3 2024, The eigenvalue problem of complex Hessian operators, Differential Geometry Seminar, Tsinghua
- 10 2023, A Le Potier-type Isomorphism with Multiplier Submodule Sheaves, Geometry and Geometric Analysis seminar in Purdue
- 10 2023, The eigenvalue problem of complex Hessian operators, IGA seminar, UMD
- 6 2023, Recent progress on the valuative stability of polarized varieties, ITS seminar, Westlake University
- 1 2023, Uniformly valuative stability of polarized varieties and applications, Complex Analysis and Geometry Seminar, Rutgers
- 12 2022, Uniformly valuative stability of polarized varieties and applications, IGA seminar, Maryland University
- 11 2022, Uniformly valuative stability of polarized varieties and applications, Tsinghua University
- 12 2020, Uniform K-stability and cKEM geometry on toric manifolds, Chinese Academy of Sciences.
- 12 2020, Geodesic rays and stability in the cscK problem, Beijing Geometric Analysis Day in Xiangshan.

- 10 2020, Uniform K-stability and cKEM geometry on toric manifolds, Peking University.