

JungTao (Ronnie) Cheng

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EDUCATION

Stanford University

2023–present

Ph.D. in Mathematics, in progress. Advisor: Ravi Vakil.

National Taiwan University

2018–2023

B.S. in Mathematics, with a double major in Computer Science.

RESEARCH INTERESTS

Applications of algebraic geometry to matroids, particularly through wonderful compactifications. Broader interests in combinatorics and algorithms.

PUBLICATIONS AND PREPRINTS

Publication

1. **On the tangent bundle and the divisor theory of a general matroid.**
International Mathematics Research Notices **2026**, no. 17, rnag188.
doi:10.1093/imrn/rnag188 | arXiv:2510.06609.

Preprints

2. **Kazhdan–Lusztig polynomials of matroids need not be unimodal.**
With Shurui Liu.
2026. arXiv:2607.24186.
3. **Tangent classes for matroid building sets.**
2026. arXiv:2606.22650.
4. **Inequalities for Chow polynomials and Chern numbers of matroids.**
With Wangyang Lin.
2026. arXiv:2603.21680.

AI FOR MATHEMATICS

A1. **Danus: Orchestrating Mathematical Reasoning Agents with Fact-Graph Memory.**

With Jihao Liu, Guoxiong Gao, Zeming Sun, Bin Wu, Shurui Liu, Jiedong Jiang, Haocheng Ju, Leheng Chen, Xiping Zhang, and Bin Dong.

Preprint, 2026. arXiv:2607.06447.

Related experiment documentation: Tangent classes of matroids and wonderful compactifications, with Shurui Liu and Guoxiong Gao (2026), arXiv:2607.05835. Record of Danus-generated mathematical output; not intended for journal publication.

RESEARCH TALKS AND PRESENTATIONS

University of California, Berkeley Commutative Algebra and Algebraic Geometry Seminar. <i>Forthcoming</i> .	November 2026
University of California, Berkeley Combinatorics Seminar. <i>Forthcoming</i> .	October 2026
Joint Mathematics Meetings Special Session on Combinatorial Algebraic Geometry, Washington, D.C.	January 2026
Western Algebraic Geometry Symposium (WAGS) University of Oregon. Five-minute lightning talk.	2025

SELECTED HONORS AND FELLOWSHIPS

Olympiad Scholarship for Study Abroad Ministry of Education, Taiwan.	2023–2027
Dean’s Award, College of Science National Taiwan University; recognition of overall undergraduate achievement.	
ICPC World Finals — three-time finalist National Taiwan University (18th and 27th); Stanford University (46th).	2021, 2022, 2024
International Mathematical Olympiad Gold medals in 2016 and 2018; silver medal in 2017. Best result: 6th place (2018).	2016–2018

TEACHING

Stanford University. TA: Teaching Assistant; CA: Course Assistant.

Winter 2026	Math 51: Linear Algebra, Multivariable Calculus, and Modern Applications	TA
Fall 2025	Math 110: Number Theory for Cryptography	TA
Spring 2025	Math 120: Modern Algebra	TA
Fall 2024	Math 107: Graph Theory	CA
Spring 2024	Math 115: Functions of a Real Variable	CA
Fall 2023	Math 104: Applied Matrix Theory	CA

MENTORING AND OUTREACH

Mentor, Directed Reading Program, Stanford University Introduction to algebraic geometry; Fall 2023, Winter 2024, and Spring 2024. Olympiad mathematics instructor, Taiwan: IMO training camps and the High School Cultivate Math Talents Project.	2023–2024
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