

# Shihan Kanungo

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## EDUCATION

**Henry M Gunn High School** GPA 3.96/4.46W | **San José State University (SJSU)** GPA 4.0 ..... 2022–2026

## MATHEMATICS RESEARCH (PUBLICATIONS/PREPRINTS)

**MIT PRIMES-USA** (2025 Combinatorics; '24 Representation Theory; '23 Commutative Algebra) ..... Cambridge, MA · 2023–25

- Representation Theory of the Twisted Yangians in Complex Rank (with A.S. Kannan) [[arXiv](#)] (2025)  
*Journal of Algebra*. Submitted May 14, 2025. Reference: Dr. Arun S Kannan
- Mixed Tensor Products, Capelli Berezinians, and Newton's Formula for  $\mathfrak{gl}(m|n)$  (with S. Erat, A.S. Kannan) [[arXiv](#)] (2024)  
*Transform. Groups*. Published Mar 24, 2025. Won USA Bronze medal in Mathematics at S.-T. Yau HS Science Award. Presented at JMM25 PME Contributed Session for Research by Undergraduates. Reference: Dr. Arun S Kannan (MIT)
- A weaker notion of the finite factorization property. (with H. Jiang, H. Kim) [[arXiv](#)] (2023)  
*Commun. Korean Math. Soc.* **39** (2024), no. 2, 313–329. Presented at JMM24 AMS-PME, MAA MathFest. Reference: Dr. Felix Gotti (MIT)

**San José State University (SJSU)** (Number Theory, 2024) ..... San José, CA · 2024

- On Product Formulas of Guillera and Sondow (with J. Schettler) [[arXiv](#)] (2024)  
*American Mathematical Monthly*. Submitted. Reference: Dr. J. Schettler (SJSU)

## EXPOSITORY PAPERS

- David Gale's Subset Takeaway Game, Combinatorial Game Theory ('24)
- Space-Filling Curves, Real Analysis ('24)
- Chromatic Polynomials, Graph Theory ('24)
- Lagrangian and Hamiltonian Mechanics, Dynamical Systems ('24).
- Large Gaps Between Primes, Analytic Number Theory ('24)
- Dynamical Billiards, Ergodic Theory ('24)
- Arithmetic Dynamics, Number Theory ('23)
- Minimal surfaces, Differential Geometry ('22)
- Herbert Wilf's snake-oil method, Generating Functions ('21)
- Mixing-time estimates for riffle shuffle, Markov chains ('20)
- Classifying groups of certain orders, Algebra ('20)

## HONORS & AWARDS

- USAMO (USA Math Olympiad) ('22 '25); Gold award ('25)
- MAA's Math Olympiad Program, 'Blue' MOP ('25)
- USAPhO Gold Medal & US Physics Team (top 20) ('24)
- 85th Annual Putnam Competition. Honorable mention ('24)
- S.-T. Yau Science Award. USA Bronze medal in Mathematics ('24)
- WSS, World Science Scholar ('24)
- Spirit of Ramanujan \$2k Fellowship ('23)
- USAMTS Gold Medal and highest scorer ('23, '25)
- AIME, 6-time qualifier. 13/15 ('25); 11/15 ('22, '24)
- Math Kangaroo (Level 12) USA rank 4 ('22)

## CAMPS & PROGRAMS

- MOP (Math Olympiad Program), IMSA, IL. (Jun '25)
- USAPhO Team Training Camp, Univ. of Maryland. (Jun '24)
- The Special Lectures. Kharkiv-Vienna International Science School. Invitee. (Aug 2023)

**Technical Skills:** Python, Java, MATLAB,  $\text{\LaTeX}$ , Asymptote.

**Languages:** English (native) & French (beginner).

## MATH COURSES

**San José State University** (Graduate courses shown in color)

- A+ MATH 231A Real Analysis Slobodan Simic ..... '24 F
- MATH 231B Functional Analysis Slobodan Simic ..... '25 Sp
- MATH 233A Applied Mathematics I Daniel Brinkmann ..... '25 Sp
- A+ MATH 234 Advanced Dynamical Systems Liam Stanton ..... '24 Sp
- MATH 285A Stochastic Methods Liam Stanton ..... '25 Sp
- A+ MATH 229 Advanced Matrix Theory Wasin So ..... '24 F
- MATH 285M Nonnegative Matrices Wasin So ..... '25 Sp
- A+ MATH 279A Graph Theory Yan Zhang ..... '24 F
- A+ MATH 226 Theory of Numbers Jordan Schettler ..... '24 Sp
- A MATH 39 Linear Algebra I Dashiell Fryer ..... '23 F
- A+ MATH 129B Linear Algebra II Wasin So ..... '24 Sp
- A+ MATH 131A Introduction to Analysis Tim Hsu ..... '24 Sp
- A+ MATH 131B Introduction to Real Variables Tim Hsu ..... '24 F
- A+ MATH 138 Complex Variables Liam Stanton ..... '23 F
- A+ MATH 179 Introduction to Graph Theory Sogol Jahanbekam . . '24 F

**Euler Circle** (Grades not assigned)

Combinatorial Game Theory ..... 2024–'25  
Analytic Number Theory, Ergodic Theory, Number Theory . . 2023–'24  
Differential Geometry, Generating Functions ..... 2021–'22  
Markov Chains, Abstract Algebra, Real Analysis ..... 2020–'21

**Art of Problem Solving (AoPS)**

Group Theory (A+), Calculus (A+) ..... 2020–23

## MUSIC

- Stanford Jazz Workshop (2024)  
Duke Ellington award; Outstanding Musicianship award
- Northern California Young Talents Competition (2023)  
First place, solo violin classical performance
- Golden State Youth Orchestra (GSYO)
  - Assistant concertmaster. Camilla Kolchinsky Orchestra (2023)
  - Concertmaster. Camerata & Chamber Players Orch. ('20–'22)