

# 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

## SELECTED HONORS

- USAMO (USA Math Olympiad) ('22 '25); Gold award ('25)
- MAA's Math Olympiad Program, 'Blue' MOP ('25)
- USAPhO (USA Physics Olympiad) Gold Medal & US Physics Team ('24)
- USAMTS (USA Math Talent Search) Gold medal ('23, '25)
- AIME, 6-time qualifier. 13/15 ('25); 11/15 ('22,'24)
- 85th Annual Putnam Competition. Honorable mention ('24)
- S.-T. Yau Science Award. USA Bronze medal in Mathematics ('24)
- Spirit of Ramanujan \$2k Fellowship ('23)
- WSS, World Science Scholar ('24)
- 2025 Global Child Prodigy Award. Recipient ('25)

## RESEARCH HIGHLIGHTS

**MIT PRIMES-USA** (Combinatorics, Representation Theory, Commutative Algebra)

- Twisted Yangians in Complex Rank (with A.S. Kannan) [arXiv] Submitted to *Journal of Algebra* (2025)
- Mixed Tensor Products ... and Newton's Formula for  $\mathfrak{gl}(m|n)$  (with S. Erat, A.S. Kannan) [arXiv] *Transform. Groups*. (2025)
- The Length Finite Factorization Property. (with H. Jiang, H. Kim) [arXiv] *Commun. Korean Math. Soc.* **39** (2024), no. 2, 313–329. (2024)

**San José State University (SJSU)** (Number Theory)

- On Product Formulas of Guillerá and Sondow (with J. Schettler) [arXiv] Submitted to *Amer. Math. Monthly* (2024)

## ADVANCED COURSEWORK

San José State University (Graduate courses shown in color)

|    |   |                  |              |
|----|---|------------------|--------------|
| A  | MATH 221A Higher Algebra I                | Edgar Bering     | ..... '25 F  |
| A+ | MATH 226 Theory of Numbers                | Jordan Schettler | ..... '24 Sp |
| A+ | MATH 285M Elliptic Curves & Modular Forms | J Schettler      | ..... '25 F  |
| A+ | MATH 229 Advanced Matrix Theory           | Wasin So         | ..... '24 F  |
| A+ | MATH 285M Nonnegative Matrices            | Wasin So         | ..... '25 Sp |
| A+ | MATH 275A Topology                        | Yan Zhang        | ..... '25 F  |
| A+ | MATH 279A Graph Theory                    | Yan Zhang        | ..... '24 F  |
| A+ | MATH 231A Real Analysis                   | Slobodan Simic   | ..... '24 F  |
| A+ | MATH 231B Functional Analysis             | Slobodan Simic   | ..... '25 Sp |
| A+ | MATH 233A Applied Mathematics I           | Daniel Brinkmann | ..... '25 Sp |
| A+ | MATH 234 Advanced Dynamical Systems       | Liam Stanton     | ..... '24 Sp |
| A  | MATH 285A Stochastic Methods              | Liam Stanton     | ..... '25 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 |
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## EXPOSITORY PAPERS

- David Gale's Subset Takeaway Game, Combinatorial Game Theory ('24)
- Space-Filling Curves, Real Analysis ('24)
- The Hahn-Banach Theorem and Applications, Functional Analysis ('25)
- Sobolev Spaces and Applications to PDEs, Theory of PDEs ('25)
- The Stochastic Gradient Descent Method, Stochastic Methods ('25)
- 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)

## CAMPS & PROGRAMS

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

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

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