

# Ruben Carpenter

203-606-0045 | ruben.carpenter@yale.edu | Nationality: German and British | Residency: Spain

## EDUCATION

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**Yale University** 2023–2027

*M.S. in Mathematics, B.S. In Mathematics. GPA: 4.0/4.0. Elected to Phi Beta Kappa in junior year.*

- *Mathematics Graduate Coursework:* Algebra, Complex Analysis, Measure Theory, Functional Analysis, Combinatorics, Algebraic Topology, Representation Theory, Ergodic Theory, Complex AG.
- *Other Quantitative Coursework:* Statistical Inference, Probabilistic ML, Game Theory, Randomized Algorithms, Combinatorial Optimization, High Dimensional Probability, Scientific ML, Intermediate ML.

**Aula European School, Barcelona (Spain)** 2021–2023

*International Baccalaureate Diploma Score: 44/45. Spanish High School GPA: 9.91/10.*

- Full academic scholarship from the Cellex Foundation. Named first of 24 scholars in Catalonia.

## PAPERS AND PREPRINTS

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[1] *Sets with few Subset Sums.* R. Carpenter, C. Defant, and N. Kravitz, 2026.

[2] *On the Number of Permutation-Twisted Dot Products.* R. Carpenter, C. Defant, and N. Kravitz, 2026. arXiv:2601.15276. Invited to present at the LIMDA Seminar at the UPC, Barcelona.

[3] *Taming Irrationality: An Invariance Principle for the Random Billiard Walk.* R. Carpenter, 2025. Submitted. Preprint: arXiv:2508.12849. Presented at the 2026 Joint Mathematics Meeting.

## RESEARCH EXPERIENCE

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**The D.E. Shaw Group:** Quantitative Research Intern NY, Summer 2026

**Duluth REU (Research Experience for Undergraduates):** Summer 2025

- I was invited to return for a second summer (the last time a student returned was 2017).

**Research Science Institute (RSI):** MIT Mathematics Department Summer 2022

- I researched the stability of chaotic pilot wave dynamics.

## OLYMPIAD EXPERIENCE

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**International Mathematical Olympiad (IMO):** Silver Medal (rank 55 of 612) 2023

- Best score of a member of the Spanish team in 41 years (one point from Gold medal).
- Gold medal in the Spanish Math Olympiad in 2021, 2022, 2023.

**Iberoamerican Mathematical Olympiad:** Gold Medal 2023

**International Physics Olympiad (IPhO):** Bronze Medal 2023

- National winner of the 2023 Spanish Physics Olympiad, 1st member of Team Spain.

**International Collegiate Programming Contest (ICPC):** Greater NY region winner 2025

- Represented Yale at NAC with teammates Andrei Onut and Jiakang Chen.

**Intercollegiate Math Tournament:** First Place Team (\$8,000 prize) 2026

- With teammates Jordan Lefkowitz, Krishna Pothapragada, and Pichayut Saengrungkongka.

**Putnam Competition:** Honorable Mention and best score at Yale ( $\times 3$ ) 2023, 2024, 2025

## OTHER AWARDS

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<b>Heidelberg Laureate Forum:</b> Invited as Young Researcher	2026
<b>Benjamin F. Barge Prize (Yale Math Department):</b> First place ( $\times 2$ )	2024, 2025
<b>Anthony D. Stanley memorial Prize (Yale Math Department):</b>	2026
• Awarded to a member of the junior class of Yale College for excellence in mathematics.	
<b>ORLO Prize (Yale English Department):</b> The best writing of ENGL 1020	2026

## TEACHING EXPERIENCE

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<b>Undergraduate TA.</b> <i>Yale University</i>	
CPSC 5630: <i>Algorithms Via Convex Optimization</i>	Spring 2026
S&DS 6030: <i>Advanced Stochastic Processes</i>	Fall 2025
CPSC 5860: <i>Probabilistic Machine Learning</i>	Spring 2025
MATH 3100: <i>Complex Analysis</i>	Fall 2024
<b>Math Olympiad Program (MOP) TA.</b> <i>Mathematical Association of America.</i>	Summer 2024
• I co-taught classes to the Blue and Black Groups (including the US IMO team).	
• I also organized social activities for participants as contracted staff member.	

## SERVICE AND LEADERSHIP

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<b>Head Engineering Tour Guide.</b> <i>Yale Undergraduate Admissions Office.</i>	2024–Present
• I manage a team of $\sim 20$ guides, and am in charge of hiring, training, and updating the script.	
<b>Problem Setter and Reviewer for US IMO Team Selection Tests</b>	2024–Present
• I'm the author of several competition problems: TST 2025/3, TSTST 2025/9, TST 2026/4, 5.	