

# Ethan Lu

ethanlu@andrew.cmu.edu | <https://elu00.github.io>

## EDUCATION

AUG 2022-MAY 2027	PhD in Mathematics, <b>Stanford University</b>
AUG 2020-MAY 2022	Master of Science in Mathematics, <b>Carnegie Mellon University</b> Thesis: <i>A Probabilistic Analysis of Enhanced Dissipation</i> Advised by Gautam Iyer
AUG 2018-MAY 2022	Bachelor of Science, <b>Carnegie Mellon University</b> Major in Mathematical Sciences, Minor in Computer Science   <a href="#">Courses</a> GPA: 4.0/4

## AWARDS AND SCHOLARSHIPS

APR 2022	NSF GRFP
MAR 2021-MAR 2022	2021 Goldwater Scholar
SEP 2021	Andrew Carnegie Society Scholar
MAY 2021	Roger N. Pedersen Award (CMU)
MAY 2020	Richard A. Moore Award (CMU)
DEC 2019, 2021	Putnam Exam Top 500

## WORK AND RESEARCH EXPERIENCE

AUG 2021-MAY 2022	Teaching Assistant, DEPT. OF MATHEMATICS AT CMU Teaching assistant for 21-237/238: Mathematical Studies Algebra I/II (honors). Taught weekly recitations to showcase interesting results/problems outside of those from class.
JUN 2021-AUG 2021	Quantitative Trading Intern, SUSQUEHANNA INTERNATIONAL GROUP (SIG) Intern under equity options desk.
JAN 2021-JUN 2021	Teaching Assistant, DEPT. OF COMPUTER SCIENCE AT CMU Grading and curriculum design for 15-458: Discrete Differential Geometry.
APR 2020-AUG 2020	Summer Undergrad Research Fellow, DEPT. OF MATHEMATICS AT CMU Research in partial differential equations and fluid dynamics under the supervision of Professor Ian Tice, studying surfactant dynamics from the Arnold perspective. Supported by NSF Grant 1653161.
APR 2019-JUN 2021	Research Assistant at <a href="#">THE GEOMETRY COLLECTIVE</a> (CMU CSD). Research in computer graphics and geometry processing under the supervision of Professor Keenan Crane, developing algorithms and optimization techniques for intrinsic geometry processing. Supported by NSF Grant 1717320.
JUN 2017 & 2018	Summer Mathematics Research Training Camp at TEXAS A&M High school research camp led by Professors Kuchment, Zelenko, and Shatalov. 2017: Galois theory, finite fields, Reed-Solomon error correcting codes 2018: Application of the Fourier and Radon Transforms to Medical Imaging
SEP 2016-JAN 2018	Tutor at UNIVERSITY OF NEVADA, RENO MATH CENTER Hired to tutor UNR students in all available undergraduate math, statistics, and physics courses. Organized, created, and led comprehensive review sessions for midterms/finals.
JUL-AUG 2017	Math Faculty at A-STAR MATH CAMPS, Santa Clara, CA Created, developed, and taught intensive 4-block 3-week curriculum to promote problem solving and competition skills. Revised and rewrote existing Number Theory curriculum.

## PUBLICATIONS AND TALKS

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1. *Surfactant Dynamics from the Arnold Perspective*.  
Ethan Lu, J. Jenkins, C. Lee, Y. Liu, D. Reed.  
*SIAM Undergraduate Research Online*, vol. 14, Society for Industrial & Applied Mathematics (SIAM), 2021. Crossref, [doi:10.1137/20s1378144](https://doi.org/10.1137/20s1378144).
2. *Central Limit Theorems for Compound Paths on the 2-Dimensional Lattice*  
E. Fang, J. Jenkins, Z. Lee, D. Li, Ethan Lu, S. Miller, D. Salgado, J. Siktir  
*Fibonacci Quart.* vol 58 (2020), no. 3, pp. 208-225.  
<https://arxiv.org/abs/1906.10645>
3. *Circular Arc Triangulations*  
Ethan Lu, Keenan Crane. *In preparation*.
4. *Invited talk* at **New Connections in Math 2021** (Duke, October 2021).
5. *Invited talk* at the **19th International Conference on Fibonacci Numbers** (July 2020).
6. CMU Undergraduate Poster Competition (May 2021).

## PROJECTS

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CURRENT	CATOpt <a href="https://github.com/elu00/CATOpt">https://github.com/elu00/CATOpt</a> Research codebase for optimization and processing of circular arc triangle (CAT) meshes.
JUN 2020	Probase <a href="https://github.com/CMU-Math/probase">https://github.com/CMU-Math/probase</a> Implemented test export/rendering functionality for CMIMC problem database.
SEP 2018	HACKCMU 2018: viz.ml <a href="https://github.com/TheNumbat/viz.ml">https://github.com/TheNumbat/viz.ml</a> Implemented Barnes-Hut TSNE algorithm for use in 3D dataset visualization.
NOV 2018	HACKPRINCETON 2018: styledev.rt <a href="https://github.com/elu00/styledev.rt">https://github.com/elu00/styledev.rt</a> Real-time style transfer through video games. Machine learning category finalist.

## INTERESTS AND ACTIVITIES

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### Mathematics

- Volunteer at the CMIMC (CMU), PUMaC (Princeton), and HMMT (Harvard/MIT) competitions.
- Volunteer for the PA Regional Science Bowl

### Programming

- Languages: C/C++, Python, C#, R,  $\LaTeX$ .
- Software: Cinema 4D, Vegas Pro, Adobe After Effects/Premier, Mathematica.

## LANGUAGES

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ENGLISH: Native Speaker  
CHINESE: Fluent

# Bachelor/Master of Science in MATHEMATICS

## Grades

COURSE CODE	COURSE TITLE	GRADE	CREDIT HRS
21-732	Partial Differential Equations 1	A	12
21-723	Advanced Real Analysis	A	12
21-721	Probability (Graduate)	A	12
21-720	Measure and Integration	A	12
21-640	Functional Analysis	A	12
21-623	Complex Analysis	A	12
21-238	Mathematical Studies Algebra II	A	12
21-237	Mathematical Studies Algebra I	A	12
21-236	Mathematical Studies Analysis II	A	12
21-235	Mathematical Studies Analysis I	A	12
21-269	Vector Analysis	A	10
21-499	Research in Number Theory and Probability	A	9
21-375	Mathematical Paradoxes	A	9
21-329	Set Theory	A	9
21-295	Putnam Seminar	A	3
21-242	Matrix Theory	A	10
21-228	Discrete Math	A	9
21-128	Math Concepts and Proofs	A	12
15-458	Discrete Differential Geometry	A	12
15-451	Algorithm Design and Analysis	A	12
15-295	Competitive Programming	A	5
15-251	Great Ideas in Theoretical Computer Science	A	12
15-210	Parallel and Sequential Data Structures and Algorithms	A	12
15-150	Principles of Functional Programming	A	10
15-122	Principles of Imperative Computing	A	12
15-112	Fundamentals of Programming and CS	A	12
GPA		4.0/4.0	