

# Lực Đinh-Khuong Ta

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## EDUCATION

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### University of Pittsburgh

Mathematics Ph.D. student, Kenneth P. Dietrich School of Arts and Sciences

Pittsburgh, PA

Aug 2025 – present

- **Selected coursework:** Algebraic Groups (in progress), Introduction to Langlands (in progress)

### Yale University

B.A. Mathematics (intensive track) & Ethnicity, Race, and Migration; GPA: 3.82

New Haven, CT

Aug 2021 – May 2025

- **Graduate coursework:** Representation Theory, Flavors of Hyperbolicity in Geometric Group Theory, Commutative Algebra and Category Theory, Algebraic Topology, Quantum Invariants of Knots and 3-Manifolds
- Conducted bachelor's thesis research advised by Prof. Sam Raskin; see [6]

### Budapest Semesters in Mathematics

Study abroad; GPA: 4.0

Budapest, Hungary

Jun 2023 – Aug 2023

## PUBLICATIONS

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### PREPRINTS

- [1] *Distinguishing power of 4-Legendrian permutation racks*, with Peyton Phinehas Wood. [arXiv:2510.26619](https://arxiv.org/abs/2510.26619), 2025. 13 pages.
- [2] *Groups versus quandle-like invariants of 3-manifolds*. [arXiv:2509.24098](https://arxiv.org/abs/2509.24098), 2025. 11 pages. Submitted.
- [3] *Good involutions of twisted conjugation subquandles and Alexander quandles*. [arXiv:2508.16772](https://arxiv.org/abs/2508.16772), 2025. 18 pages. Submitted.
- [4] *Good involutions of conjugation subquandles*. [arXiv:2505.08090](https://arxiv.org/abs/2505.08090), 2025. 32 pages. Submitted.
- [5] *Graph quandles: Generalized Cayley graphs of racks and right quasigroups*. [arXiv:2506.04437](https://arxiv.org/abs/2506.04437), 2025. 19 pages.
- [6] *Classification and structure of generalized Legendrian racks*. [arXiv:2504.12671](https://arxiv.org/abs/2504.12671), 2025. 29 pages. Submitted.

### PEER-REVIEWED ARTICLE

- [7] *Constructions of and bounds on the toric mosaic number*, with Kendall Heiney, Margaret Kipe, Samantha Pezzimenti, and Kaelyn Pontes. *Topology Appl.* **377** (2026), Paper No. 109657, [doi:10.1016/j.topol.2025.109657](https://doi.org/10.1016/j.topol.2025.109657). MR4981983. 17 pages. (Preprint available on [arXiv](https://arxiv.org/abs/2510.26619).)
- [8] *Enumeration of virtual quandles up to isomorphism*. *J. Integer Seq.* **28** (2025), no. 8, Article 25.8.4, <https://cs.uwaterloo.ca/journals/JIS/VOL28/Ta/ta3.html>. 11 pages. (Preprint available on [arXiv](https://arxiv.org/abs/2505.08090).)
- [9] *Bounds on the mosaic number of Legendrian knots*, with Margaret Kipe, Samantha Pezzimenti, Leif Schaumann, and Tony W. H. Wong. *J. Knot Theory Ramifications* **34** (2025), no. 12, Paper No. 2550055, [doi:10.1142/S0218216525500555](https://doi.org/10.1142/S0218216525500555). 52 pages. MR4966653. (Preprint available on [arXiv](https://arxiv.org/abs/2504.12671).)

### EDITOR-REVIEWED PUBLICATIONS

- [10] Integer sequences [A383144](#)–[A383146](#), [A383828](#)–[A383831](#), [A385040](#)–[A385041](#), [A386231](#)–[A386234](#), and [A387317](#) related to various topics in group theory and nonassociative algebra (see [3–6]) and [A375353](#)–[A375357](#), [A375392](#), [A375619](#), and [A376155](#) related to combinatorics. *On-Line Encyclopedia of Integer Sequences (OEIS)*, 2025.
- [11] Integer sequences [A374939](#), [A374942](#)–[A374947](#), and [A375354](#) related to Legendrian knot mosaics (see [9]), with Margaret Kipe, Samantha Pezzimenti, Leif Schaumann, and Wing Hong Tony Wong. *On-Line Encyclopedia of Integer Sequences (OEIS)*, 2024.

## PRESENTATIONS

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<b>Legendrian Knots and Rack-Theoretic Coloring Invariants</b> SIAM Conference PD25, Contributed Presentation Session 9	Pittsburgh, PA Apr 2025
<b>From Groups to Nonassociative Knot Invariants</b> Graduate Student Seminar University of Pittsburgh	Pittsburgh, PA Sep 2025
<b>Why Knot? Algebraic Coloring Invariants of Legendrian Knots</b> Mellon Forum (general audience), Grace Hopper College, Yale University	New Haven, CT Apr 2025
<b>Generalized Legendrian Racks: Knot Coloring Invariants &amp; Algebraic Classification</b> Hudson River Undergraduate Mathematics Conference, Union College	Schenectady, NY Apr 2025
<b>Computing the Mosaic Numbers of Legendrian Knots</b> Joint Mathematical Meetings, Spectra Special Session on Research by LGBTQ+ Mathematicians	Seattle, WA Jan 2025
<b>Thrown for a Loop: A Survey of Knot Theory</b> (half expository, half research talk) Pizza Seminar Series, Yale Undergraduate Mathematics Society, Yale University	New Haven, CT Sep 2024
<b>Toric Knot Mosaics</b> (with Kendall Heiney) UnKnot V Conference, Seattle University, Department of Mathematics	Seattle, WA Jul 2024
<b>Legendrian Knot Mosaics</b> (with Margaret Kipe and Leif Schaumann) REU Symposium, Gettysburg College, Department of Mathematics	Gettysburg, PA Jun 2024

## TEACHING

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<b>Lie Groups, Lie Algebras, and Representation Theory</b> Mentor, Directed Reading Program	University of Pittsburgh Sep 2025 – present
– Hold weekly one-on-one meetings to mentor an undergraduate student studying Lie theory, culminating in an end-of-term project and colloquium presentation	
– Developed an original syllabus using the book <i>Lie Groups, Lie Algebras, and Representations</i> by Brian Hall	
<b>Preparation for Scientific Calculus</b> Substitute Teaching Assistant	University of Pittsburgh Sep 2025
– Led semiweekly practice sessions and administered exams for 30 precalculus students	
<b>Fields and Galois Theory</b> Undergraduate Learning Assistant	Yale University Jan 2025 – May 2025
– Served as one of two TAs for 22 students; held regular office hours, small group tutoring sessions, and review sessions; designed original exam review materials; held regular one-on-one tutoring sessions; graded assignments	
<b>Introduction to Abstract Algebra</b> Undergraduate Learning Assistant	Yale University Aug 2024 – Dec 2024
– Served as one of two TAs for 41 students; held regular office hours and interactive exam review sessions; designed original exam review materials	
<b>Analysis II: Lebesgue Integration and Complex Fourier Series</b> Undergraduate Learning Assistant	Yale University Jan 2024 – May 2024
– Created and distributed original exam review materials; designed and conducted multiple interactive exam review sessions and collected student feedback throughout the term; held regular office hours	
– Served as the only on-campus ULA for all 40 students; wrote and provided solution sets to assist the off-campus ULA	
<b>Real Analysis</b> Undergraduate Learning Assistant	Yale University Aug 2023 – Dec 2023
– Designed and led weekly proof-writing workshops to introduce 44 students to set-theoretic concepts, proof techniques, and mathematical writing; conducted interactive midterm and final exam review sessions; held regular office hours	

**Introduction to Functions and Calculus I-II**  
Undergraduate Learning Assistant and Peer Tutor

Yale University  
Aug 2022 – May 2023

- Designed and led semiweekly interactive practice workshops; organized and conducted weekly small-group review sessions; created original practice problems for all 88 students and solution sets for other ULA's to consult during workshops

## EMPLOYMENT

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**Web Developer**  
Yale University Bands

New Haven, CT  
Aug 2023 – May 2025

- Applied HTML, CSS, and JavaScript to oversee web development for Yale's concert, jazz, and marching bands

**Undergraduate Learning Assistant**  
Yale University, Department of Mathematics

New Haven, CT  
Aug 2022 – May 2025

- Hired after a highly selective interview and teaching evaluation process with mathematics faculty
- For further information, please refer to the “Teaching” section above.

**Mathematics Tutor**  
Self-employed

New Haven, CT and remote  
Aug 2021 – present

- Work one-on-one with students of all ages to develop and reinforce mathematical confidence, review material for courses and standardized testing, and nurture mathematical curiosity by exploring connections to higher mathematics

**Event Assistant**  
“Crossroads of Algebra, Geometry, and Physics” Conference at Yale University

New Haven, CT  
May 2022

- Worked alongside mathematics faculty and staff to facilitate and usher for a Yale mathematics conference
- Took advantage of the opportunity to attend presentations and explore algebraic geometry as a future research interest

## SERVICE

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**Co-Secretary, Graduate Student Organization**  
University of Pittsburgh, Department of Mathematics

Pittsburgh, PA  
Sep 2025 – present

- Elected to take notes at meetings, share meeting minutes with the department, and maintain student resources for graduate students

**Organizer, Scheme Theory Reading Group**  
University of Pittsburgh, Department of Mathematics

Pittsburgh, PA  
Sep 2025 – present

- Organize weekly meetings to discuss the algebraic geometry book *The Rising Sea* by Ravi Vakil (currently on Ch. 9), advised by Prof. Roman Fedorov

**Reviewer**  
zbMATH Open

Remote  
Dec 2025 – present

**Session Chair**  
SIAM Conference PD25

Pittsburgh, PA  
Nov 2025

- Selected to serve as chair for Contributed Presentation Session 9

**Delegate, Student Advisory Committee**  
Yale University, Department of Mathematics

New Haven, CT  
Feb 2024 – Apr 2025

- Elected by students across mathematics-related majors to bridge the gap between students and faculty
- Advocated in particular for the needs of first-generation and marginalized students at biweekly meetings

**Undergraduate Peer Mentor**  
Yale Undergraduate Mathematics Society

New Haven, CT  
Aug 2023 – Apr 2025

- Mentor first-year students interested in studying mathematics, especially other first-generation students
- Engage with Yale's broader mathematics community through various events, seminars, and presentations

<b>Mathematics Advisor, Academic Fair</b> Yale University, Department of Mathematics	New Haven, CT Aug 2023, Aug 2024, Apr 2025
– Introduced incoming students to Yale's mathematics department, answering questions about courses and the major	

<b>Cofounder and Vice Chair</b> Yale Students for Ranked-Choice Voting	New Haven, CT Aug 2022 – May 2025
– Mentored students interested in statistical and combinatorial research on ranked-choice voting in New Haven	

## ADDITIONAL ACADEMIC EXPERIENCE

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<b>REU: Research Challenges of Computational Methods in Discrete Mathematics</b> Moravian University, Department of Mathematics	Bethlehem, PA May 2024 – Jul 2024
– <b>Supervisors:</b> Profs. Samantha Pezzimenti (Widener University) and Wing Hong Tony Wong (Kutztown University)	

<b>Independent Study of Lie Theory and Representation Theory</b> Yale University, Department of Mathematics	New Haven, CT Jan 2023 – May 2023
– <b>Advisor:</b> Prof. Andrew Neitzke	

<b>Directed Project on Commutative Algebra</b> Polymath, Jr. Undergraduate Research Program	Remote Jun 2022 – Aug 2022
– <b>Advisor:</b> Prof. Ananthnarayanan Hariharan (Indian Institute of Technology, Bombay)	

<b>Science, Technology, and Research Scholars (STARS) Program</b> Yale University, Science and Quantitative Reasoning Center	New Haven, CT Aug 2021 – May 2022
– <b>Advisor:</b> Prof. Ananthnarayanan Hariharan (Indian Institute of Technology, Bombay)	

## WORKSHOPS

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<b>Mathematics REU Panel</b> (Invited panelist) Yale Undergraduate Mathematics Society, Yale University	New Haven, CT Jan 2024
– Held discussions at two session open for all students to provide feedback for the department, especially regarding its climate and potential structural reforms	

<b>Departmental Town Halls</b> (Organized and led) Yale University, Department of Mathematics	New Haven, CT Apr 2024 and Dec 2024
– Compiled a report of students' experiences and critiques to share with the Dean of Undergraduate Studies in Mathematics	

<b>Mathematics Career Panel</b> (Organized and led) Yale University, Department of Mathematics	New Haven, CT Nov 2024
– Held discussions at two session open for all students to provide feedback for the department, especially regarding its climate and potential structural reforms	

<b>Mathematics Graduate School Panel</b> (Organized) Yale University, Department of Mathematics	New Haven, CT Apr 2024
– Held discussions at two session open for all students to provide feedback for the department, especially regarding its climate and potential structural reforms	

<b>Mathematics Course Scheduling and Major Planning Workshop</b> (Organized and hosted) Yale University, Department of Mathematics	New Haven, CT Apr 2024
– Held discussions at two session open for all students to provide feedback for the department, especially regarding its climate and potential structural reforms	

## HONORS & GRANTS

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<b>SREB-State Doctoral Scholar</b> Southern Regional Education Board	Sep 2025
– Received funding for my doctoral studies at Yale University.	

<b>K. Leroy Irvis Fellowship</b> University of Pittsburgh, Office of the Provost	Aug 2025
– Received funding for my doctoral studies at Yale University.	

<b>Prospective Ph.D. Preview Program Scholar</b> (6% acceptance rate) Princeton University, Graduate School Deans and Administration	Aug 2024
– Received funding for my doctoral studies at Yale University.	

<b>Delta Alpha Pi Honor Society</b> (Founding member of Yale chapter) Yale University	Jan 2023 – May 2025
<b>Richter Summer Fellowship</b> Paul K. Richter and Evalyn E. Cook Richter Memorial Fund	Jun 2023
<b>International Study Award</b> Yale University	Jun 2023
<b>Summer Experience Award</b> Yale University	May 2022
<b>Winston T. Townsend Prize for Excellence in English Composition</b> Yale University, Department of English	May 2022

## PROFESSIONAL MEMBERSHIPS & AFFILIATIONS

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- American Mathematical Society (AMS)
- Center for Minorities in the Mathematical Sciences (CMMS)
- Out in Science, Technology, Engineering, and Mathematics (oSTEM)
- Sines of Disability
- Spectra, the Association for LGBTQ+ Mathematicians

## SKILLS

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- **Programming languages:** Python, Java, R, HTML, CSS, JavaScript, Wolfram Language
- **Other software:** L<sup>A</sup>T<sub>E</sub>X, PGF/TikZ, GAP, Mathematica, Singular, KnotPlot, Jupyter Notebook, Git, Logger Pro, Adobe Creative Cloud
- **Human languages:** American Sign Language (advanced), Spanish (intermediate), Vietnamese (conversational), Italian (reading only)