

Yongyu (Frank) Qiang

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🐙 [yqiang7](https://github.com/yqiang7)

Education

- 08/2026–present **Duke University**, Durham, NC
Ph.D. in Mathematics
- 01/2026–05/2026 **Georgia Institute of Technology**, Atlanta, GA
M.S. in Computer Science
GPA: 4.00/4.00
- 08/2022–12/2025 **Georgia Institute of Technology**, Atlanta, GA
B.S. in Computer Science, B.S. in Mathematics
GPA: 4.00/4.00

Research Interests

Number theory, automorphic forms, Langlands program, harmonic analysis, ergodic theory.

Research Experience

- Summer 2025 **Cryptography and Coding Theory REU**, *University of South Florida*, Tampa, FL
Worked on cubic rational functions over finite fields using function field theory.
Advisor: Xiang-dong Hou
Poster: <https://www.overleaf.com/read/fqmfbssmpykgv#85de5e>
- Summer 2024 **Mathematics REU**, *Georgia Institute of Technology*, Atlanta, GA
Worked on scattering theory of the cubic Schrödinger equation using Fourier analysis.
Advisor: Gong Chen
Poster: <https://math.gatech.edu/sites/default/files/images/petersen-qiang.pdf>
- 01/2024–05/2026 **Undergraduate Research**, *Georgia Institute of Technology*, Atlanta, GA
Background reading in Fourier analysis, continuation of Summer 2024 REU project.
Advisor: Gong Chen
- 08/2023–05/2025 **Vertically Integrated Project**, *Georgia Institute of Technology*, Atlanta, GA
Secure Hardware group, applied finite fields and group theory to study symmetric cryptography.
Advisor: Vincent Mooney III

Teaching Experience

- 01/2026–05/2026 **Graduate Teaching Assistant**, *Georgia Institute of Technology*, Atlanta, GA
CS 4510: Automata and Complexity Theory (Spring 2026)
- 01/2024–12/2025 **Undergraduate Teaching Assistant**, *Georgia Institute of Technology*, Atlanta, GA
CS 3510: Design and Analysis of Algorithms (Spring 2024, Fall 2024, Fall 2025)
CS 3451: Computer Graphics (Spring 2025)

Publications

Published:

- [1] D. Gordon, A. Allahverdi, S. Abrelat, A. Hemingway, A. Farooq, I. Smith, N. Arora, A. Chang, **Y. Qiang**, and V. Mooney III. *Scalable nonlinear sequence generation using composite Mersenne product registers*. IACR Communications in Cryptology, vol. 1, no. 4, 2025. doi: 10.62056/a3tx11zn4
- [2] A. Allahverdi, A. Farooq, A. Pullen, **Y. Qiang**, V. Mooney III, and S. Grijalva. *CASH: Lightweight keyed hash function design for reconfigurable hardware*. 2026 IEEE International Symposium on Hardware Oriented Security and Trust (HOST), 2026. doi: 10.1109/HOST68814.2026.11604990

Preprints:

- [3] X. Hou, S. Peng, **Y. Qiang**, and S. Zhao. *A study of rational functions of degree three over finite fields*. arXiv preprint, 2026. arXiv:2604.18954 [math.NT]
- [4] G. Chen and **Y. Qiang**. *On the final-state problem for the 1D cubic NLS*. arXiv preprint, 2026. arXiv:2605.23063 [math.AP]

Talks

01/2026 “A study of rational functions of degree three over finite fields.” Joint Mathematics (accepted) Meetings (Washington, D.C.).

Service and Volunteering

03/2026 Volunteer for High School Math Day 2026 at Georgia Tech
 11/2025 Volunteer for ICPC (International Collegiate Programming Contest) Southeast USA Regionals 2025, Georgia Tech site
 06/2025 Volunteer for USF CodeBreakHERS Cybersecurity Summer Camp
 03/2025 Volunteer for High School Math Day 2025 at Georgia Tech
 03/2024 Volunteer for High School Math Day 2024 at Georgia Tech
 06/2023–07/2023 Volunteer for summer math team practices at Vestavia Hills High School

Awards

2025 AMS Undergraduate Travel Grant for Joint Mathematics Meetings 2026 (\$1000)
 2025 Georgia Tech Outstanding Graduating Mathematics Major Award (\$100 stipend)
 2025 Bloomberg Bpuzzled Global Finals 2025 3rd Place (teams of 4)

Programming Skills

C++, Python, $\text{\LaTeX}$ (typesetting), C, Java, C#, GLSL, JavaScript/TypeScript

Coursework

University of Alabama, Birmingham (as a transient student in Summer 2023):

- MA 445: Complex Analysis
- MA 637: Graph Theory and Combinatorics

Georgia Tech (MATH 6XXX–8XXX denotes graduate-level coursework):

- MATH 3406: Second Course on Linear Algebra

- MATH 3235: Probability Theory
- MATH 4107: Abstract Algebra I
- MATH 4108: Abstract Algebra II
- MATH 4150: Introduction to Number Theory
- MATH 4317: Analysis I
- MATH 4318: Analysis II
- MATH 4431: Introduction to Topology
- MATH 6122: Algebraic Number Theory
- MATH 6321: Complex Analysis
- MATH 6421: Algebraic Geometry I
- MATH 6422: Algebraic Geometry II
- MATH 6441: Algebraic Topology
- MATH 6455: Differential Geometry
- MATH 7337: Harmonic Analysis
- MATH 8803: Nonlinear Dispersive Equations
- MATH 8803: Representation Theory I
- MATH 8803: Representation Theory II

Reading courses:

- Fourier Analysis (Spring 2024, Advisor: Gong Chen)
Books: Stein-Shakarchi, *Fourier Analysis*; Muscalu-Schlag, *Classical and Multilinear Harmonic Analysis*
- Measure Theory (Fall 2024, Advisor: Gong Chen)
Books: Heil, *Introduction to Real Analysis*; Wheeden-Zygmund, *Measure and Integral*