

Bangzheng (Benjamin) Li

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INTRODUCTION

I am a senior at MIT majoring in mathematics. My current interests are in algebra and number theory.

EDUCATION

- | | |
|---|---------------------------------|
| • Massachusetts Institute of Technology
<i>Undergraduate</i>
◦ GPA: 5.0/5.0. | 2022 - Present
Cambridge, MA |
| • Christian Heritage School
<i>High School</i> | 2018 - 2022
Trumbull, CT |

AWARDS

- | | |
|---|-----------------------|
| • Hartley Rogers Jr. Prize
<i>MIT</i> | August 2024
[link] |
|---|-----------------------|
- Awarded for the best paper in the Summer Program in Undergraduate Research (SPUR).

ACTIVITIES

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|--|-----------------------------------|
| • Undergraduate Research Opportunities Program Plus (UROP+)
<i>MIT</i> | June 2025 - August 2025
[link] |
| • Undergraduate Research Opportunities Program (UROP)
<i>MIT</i> | 2025
[link] |
| • PRIMES-USA (mentor)
<i>MIT</i> | 2024
[link] |
| • Summer Program in Undergraduate Research (SPUR)
<i>MIT</i> | June 2024 - August 2024
[link] |
| • Directed Reading Program (DRP)
<i>MIT</i> | January 2024
[link] |
| • Joint Mathematics Meetings
<i>San Francisco</i>
◦ Presenter. | January 2024
[link] |
| • Conference on Rings and Factorizations
<i>University of Graz</i>
◦ Presenter. | July 2023
[link] |
| • PRIMES-USA (mentee)
<i>MIT</i> | 2021
[link] |

PUBLICATIONS

- [5] Gotti, F., Li, B. (2025). *Arithmetic properties encoded in undermonoids*. Semigr. Forum.
doi.org/10.1007/s00233-025-10578-3
- [4] Ajran, K., Bringas, J., Li, B., Singer, E., Tirador, M. (2023). *Factorization in additive monoids of evaluation polynomial semirings*. Commun. Algebra, 51(10), 4347–4362. doi.org/10.1080/00927872.2023.2208672
- [3] Gotti, F., Li, B. (2023). *Atomic semigroup rings and the ascending chain condition on principal ideals*. Proc. Amer. Math. Soc., 151, 2291-2302. doi.org/10.1090/proc/16295
- [2] Jiang, N., Li, B., Zhu, S. (2023). *On the primality and elasticity of algebraic valuations of cyclic free semirings*. Int. J. Algebra Comput., 33:02, 197-210. doi.org/10.1142/S021819672350011X
- [1] Gotti, F., Li, B. (2021). *Divisibility in rings of integer-valued polynomials*. New York J. Math. 28, 117-139.

PREPRINTS

- [6] Kac, V., Li, B. (2025). *The Quiver Problem is NP Complete*. [arXiv:2508.02975](https://arxiv.org/abs/2508.02975)
- [5] Li, B., Xiao, Y. (2025). *Commutative Quantale and Localization*. [arXiv:2508.02991](https://arxiv.org/abs/2508.02991)
- [4] Dani, J., Gotti, F., Hong, L., Li, B., Schlessinger, S. (2025). *On finitary power monoids of linearly orderable monoids*. [arXiv:2501.03407](https://arxiv.org/abs/2501.03407)
- [3] Bu, A., Gotti, F., Li, B., Zhao, A. (2024). *One-dimensional monoid algebras and ascending chains of principal ideals*. [arXiv:2409.00580](https://arxiv.org/abs/2409.00580)
- [2] Li, B., Ma, N., Wang, Z. (2024). *Rewarded Region Replay (R3) for Policy Learning with Discrete Action Space*. [arXiv:2405.16383](https://arxiv.org/abs/2405.16383)
- [1] Gotti, F., Li, B. (2022). *Divisibility and a weak ascending chain condition on principal ideals*. [arXiv:2212.06213](https://arxiv.org/abs/2212.06213)

MATH COURSES TAKEN

F=FALL TERM, S=SPRING TERM

All courses taken after 2022 Fall (inclusive) are at MIT.

- 2025 F: 18.155 Differential Analysis I
- 2025 F: 18.965 Geometry of Manifolds I
- 2025 S: 18.102 Intro to Functional Analysis
- 2025 S: 18.737 Algebraic Groups
- 2025 S: 18.821 Project Lab in Mathematics
- 2024 F: 18.745 Lie Groups and Lie Algebras I
- 2024 F: 18.785 Number Theory I
- 2024 S: 18.786 Number Theory II
- 2024 S: 18.906 Algebraic Topology II
- 2023 F: 18.101 Analysis and Manifold
- 2023 F: 18.783 Elliptic Curves
- 2023 F: 18.905 Algebraic Topology I
- 2023 S: 18.152 Intro: Partial Differential Equations
- 2023 S: 18.726 Algebraic Geometry II
- 2023 S: 18.901 Introduction to Topology
- 2022 F: 18.112 Functions of Complex Variable
- 2022 F: 18.725 Algebraic Geometry I
- 2022 S: MATH603 Introductory Topics in Representation Theory, Professor Ivan Loseu, at Yale
- 2021 F: Reading Group, *Commutative Algebra with a View Toward Algebraic Geometry* by David Eisenbud, at Yale
- 2021 S: MATH353 Introduction to Representation Theory, Professor Congling Qiu, at Yale
- 2020 F: MATH380 Modern Algebra I, Professor Ivan Loseu, at Yale

BOOKS READ (FULLY OR PARTIALLY)

- *Basic Topology*, M.A. Armstrong
- *Algebra*, Michael Artin
- *Linear Algebra Done Right*, Sheldon Axler
- *The Calculus Lifesaver*, Adrian Banner
- *Primes of the Form $x^2 + ny^2$* , David A. Cox
- *Commutative Algebra with a View Toward Algebraic Geometry*, David Eisenbud
- *Algebraic Curves*, William Fulton
- *Surreal Numbers*, Donald Knuth
- *Thirty-three Miniatures: Mathematical and Algorithmic Applications of Linear Algebra*, Jiri Matousek
- (Note) *Algebraic Geometry*, J.S. Milne
- (Note) *Algebraic Number Theory*, J.S. Milne
- (Note) *Field and Galois Theory*, J.S. Milne
- (Note) *Group Theory*, J.S. Milne
- *Algebraic Curves and Riemann Surfaces*, Rick Miranda
- *Visual Complex Analysis*, Tristan Needham
- *Lie Groups and Algebraic Groups*, A.L. Onishchik and E.B. Vinberg
- *A Course in Arithmetic*, J-P. Serre
- *A Friendly Introduction to Number Theory*, Joseph H. Silverman
- *Complex Analysis*, E. Stein
- *Fourier Analysis*, E. Stein
- *Real Analysis*, E. Stein
- *A Course in Algebra*, E.B. Vinberg