

# Guy Blachar

## *Curriculum Vitae*

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## Research Interests

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My research interests lie in probabilistic and geometric group theory, and in particular the asymptotic behavior of random walks on finitely generated groups, word maps, and geometric properties of groups. I am also interested in Galois cohomology and the theory of rings and algebras, as well as in general probability theory.

## Education

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### PhD in Pure Mathematics

2019–Today

*Bar-Ilan University*

Advisors: Prof. Gideon Amir and Prof. Uzi Vishne

Dissertation title: The Law of Iterated Logarithm and Nonassociative Central Simple Algebras

### MSc in Pure Mathematics

2015–2016

*Bar-Ilan University*

Advisor: Prof. Louis Rowen

Graduated summa cum laude

### BSc in Pure Mathematics

2012–2015

*Bar-Ilan University*

Graduated summa cum laude

## Awards

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2022–2023 The Efim Diner's Award for Excellence in Math Teaching for Gifted Youth

2022–2023 Bar-Ilan University's Outstanding Lecturer Award

2020–2021 Rector's Prize for Outstanding Doctoral Students

2019–2023 Bar-Ilan University President's Scholarship for Excellent Doctoral Students

2012–2013 Dean's List

## Publications & Preprints

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- **Rank-stability of polynomial equations** (with Tomer Bauer and Be'eri Greenfeld), submitted. ArXiv preprint at arXiv:2401.04676.
- **Probabilistic laws on infinite groups** (with Gideon Amir, Maria Gerasimove and Gady Kozma), submitted. ArXiv preprint at arXiv:2304.09144.
- **Lipschitz harmonic functions on vertex-transitive graphs** (with Gideon Amir, Maria Gerasimove and Gady Kozma), accepted under minor revisions to Electronic Communications in Probability.
- **A law of iterated logarithm on lamplighter diagonal products** (with Gideon Amir), accepted under minor revisions to Groups, Geometry, and Dynamics.
- **Semiassociative algebras over a field** (with Darrell Haile, Eliyahu Matzri, Edan Rein and Uzi Vishne), to appear in Journal of Algebra (2024).
- **Identities of the algebra  $\mathbb{O} \otimes \mathbb{O}$**  (with Louis Rowen and Uzi Vishne), Contemporary Mathematics, Noncommutative Rings and their Applications VII: Algebra and Coding Theory, In honor of Tariq Rizvi, (Leroy and Jain, eds.), 2021, Vol. 785, 35-45, (2023).
- **Abelianization of the Cartwright-Steger lattice** (with Orit Selaben-David and Uzi Vishne), Algebra and Discrete Mathematics (2023).
- **Noncommutative inclusion-exclusion, representations of left regular bands and the Tsetlin library** (with Louis Rowen and Uzi Vishne), International Journal of Algebra and Computation (2021).
- **$\ell$ -weak identities and central polynomials for matrices** (with Eliyahu Matzri, Louis Rowen and Uzi Vishne), Proceedings of the workshop "Polynomial Identities in Algebras" (2021).

### Others

- SageMath interface to the GAP package GBNP (with Tomer Bauer), available at <https://gitlab.com/mathzeta2/gbnp>.

## Talks

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- Bar-Ilan Probability Seminar, March 2024.
- HUJI Probability Seminar, February 2024.
- TAU Groups and Dynamics Seminar, February 2024.
- Bar-Ilan Algebra Seminar, January 2024.
- World of Groupcraft III, September 2023.
- IMU Students Talks Day, September 2023.

- 14th Ukraine Algebra Conference, July 2023.
- Students Probability Day IX at the Weizmann Institute, May 2023.
- Poster session of the conference “Groups of Dynamical Origins, Automata and Spectra”, March 2023.
- Bar-Ilan Algebra Seminar, January 2023.
- Ben-Gurion Probability and Ergodic Theory Seminar, December 2022.
- Technion Probability Seminar, November 2022.
- Bar-Ilan Probability Seminar, November 2022.
- IMU Students Talks Day, September 2022.
- 2022 Brauer Group Meeting in Israel, June 2022.
- SageDays 110, October 2020.

## Teaching Experience

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Instructor:

- Introduction to Probability and Statistics for Financial Mathematics (Fall 23)
- Linear Algebra I (Summer 21, 22, 23)

Teaching assistant:

- Introduction to Probability and Statistics (Spring 21, 22)
- Group Theory (Fall 22, 23, 24)
- Rings and Modules (Spring 21, 23)
- Fields and Galois Theory (Fall 22, 23, 24)
- Mathematical Probability (Spring 21, 22, 23)
- Linear Algebra I (Fall 16)
- Algebraic Structures for Computer Science (Fall 16)

## Additional Activities

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- High level of programming in Python and SageMath.
- Arranged several study groups of some advanced topics in algebra and probability.
- Member of the organizing committee for the FPSAC '21 conference.
- Organizer (with Re'em Waxman) of a students seminar in the spring semester of 2023.
- Organizer (with Re'em Waxman) of a mathematical programming competition in the summer semester of 2023.