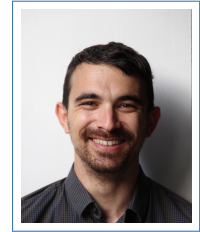


# Lior Alon

CV

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## Research interests

Mathematical physics, Fourier analysis and quasi-crystals, spectral geometry and nodal count, quantum chaos and quantum graphs.

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## Academic Appointments

- 2024-2025 **Instructor**, Massachusetts Institute of Technology (MIT).  
Department of mathematics.
- 2022-2024 **Post-Doctoral Associate**, Massachusetts Institute of Technology (MIT).  
Simons collaboration for waves localization. Host - David Jerison
- 2020-2022 **Post-Doctoral Member**, Institute for Advanced Study (IAS), Princeton.  
Host - Peter Sarnak

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## Academic Degrees

- 2015-2020 **Ph.D. in mathematics**, *Technion*, Haifa, Israel.  
*Quantum Graphs - nodal count, Neumann count and generic eigenfunctions*. Supervisor - Prof. Ram Band. Direct track.
- 2012-2015 **B.Sc. in mathematics and physics**, *Technion*, Haifa, Israel.  
Cum Lauda.
- 2006-2009 **B.A. multidisciplinary curriculum**, *Haifa University*, Haifa, Israel.  
As part of the naval academy training. Magna Cum Lauda.

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## Awards

Excellence in research:

- 2020 The Foundation for Excellency in Mathematics award for outstanding doctoral dissertation (Technion).
- 2019 Jacobs scholarship (Technion).
- 2018 Haim Hanani prize (Technion).
- 2018 Pinchi scholarship (Technion).

Excellence in teaching:

- 2018-2019 Consistent excellence in teaching prize.
- 2017 Excellent teaching assistant prize.

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## Publications

### Published:

- L. Alon, C. Vinzant. *Gap distributions of Fourier quasicrystals with integer weights via Lee–Yang polynomials*. Rev. Mat. Iberoam. (2024), DOI 10.4171/RMI/1485
- L. Alon, M. Goresky. *Morse theory for discrete magnetic operators and nodal count distribution for graphs*. Journal of Spectral Theory 13.4 (2023): 1225-1260
- L. Alon, A. Cohen, C. Vinzant (2023). *Every real-rooted exponential polynomial is the restriction of a Lee-Yang polynomial*. Journal of Functional Analysis. doi: 10.1016/j.jfa.2023.110226
- L. Alon (2023). *Generic Laplacian eigenfunctions on metric graphs*. Journal d'Analyse Mathématique. doi: 10.1007/s11854-023-0308-x
- L. Alon, R. Band, G. Berkolaiko (2022). *Universality of nodal count distribution in large metric graphs*. Experimental Mathematics, 1-35.
- L. Alon, R. Band (2021). *Neumann Domains on Quantum Graphs*. Ann. Henri Poincaré 22, 3391 - 3454. doi:10.1007/s00023-021-01061-0
- L. Alon, R. Band, M. Bersudsky, S. Egger (2020). *Neumann domains on graphs and manifolds*. Analysis and Geometry on Graphs and Manifolds, vol. 461, 203-249.
- L. Alon, R. Band, G. Berkolaiko (2018). *Nodal Statistics on Quantum Graphs*. Communications in Mathematical Physics, 1–40. doi:10.1007/s00220-018-3111-2
- Y. Shapira, M. Mutzafi, G. Harari, I. Kaminer, L. Alon, M. Segev (2016). *Cerenkov radiation from particles carrying orbital angular momentum in a cylindrical waveguide*. Conference on Lasers and Electro-Optics (CLEO), 1-2

### Preprints:

- L. Alon, M. Kummer, P. Kurasov, C. Vinzant. *Higher Dimensional Fourier Quasicrystals from Lee-Yang Varieties*. arXiv:2407.11184 (2024)
- L. Alon, J. Urschel. *Average Nodal Count and the Nodal Count Condition for Graphs*. arXiv:2404.03151 (2024)
- L. Alon, M. Goresky. *Nodal count for a random signing of a graph with disjoint cycles*. arXiv:2403.01033 (2024)

### PhD dissertation:

- L. Alon (2020). *Quantum graphs - Generic eigenfunctions and their nodal count and Neumann count statistics*. Technion, Haifa, Israel. arXiv:2010.03004

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## Selected Talks

### Selected seminar talks

- 2023 *Fourier Quasicrystals and Lee-Yang polynomials*. Mathematical physics seminar, Texas A&M.
- 2023 *Fourier Quasicrystals and stable polynomials*. PDE and Analysis seminar, MIT.
- 2022 *A magnetic interpretation of the nodal count on graphs*. CSDM, IAS. <https://www.ias.edu/video/magnetic-interpretation-nodal-count-graphs>
- 2021 *Neumann domains and count on metric (quantum) graphs*. Mathematical physics seminar, UC-Davis.

2020 *Towards universality of the nodal statistics on metric graphs*. Analysis seminar, IAS. <https://www.ias.edu/video/analysis/2020/1012-LiorAlon>

2019 *A universal limit conjecture for nodal statistics of quantum graphs*. Applied mathematics seminar, Yale.

### Selected conference talks

2023 *Quantum graphs and algebraic geometry*. Workshop on Algebraic Geometry in Spectral Theory, ICERM.

2020 *Towards universality of the nodal statistics on metric graphs*. Quantum graphs in Mathematics, Physics and Applications, Stockholm University, Sweden.

2019 *Nodal and Neumann count distributions of quantum graphs*. Geometric aspects of harmonic analysis and spectral theory, Technion, Israel.

2018 *Quantum graphs, a central limit type conjecture for the nodal statistics*. Israel Physical Society annual meeting, Hebrew University, Israel.

2017 *The nodal count distribution for quantum graphs*. Analysis and geometry on graphs and manifolds, Potsdam, Germany.

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## Academic service

2018–today **Referee jobs.**

*Inventiones, Journal of Spectral Theory, Journal of mathematical physics, Annals Henri Poincare, Experimental Mathematics, proceedings of the 8th ICCM*

2018–2020 **Graduate Seminar organizer.**

Initiating and organizing the 'What Is' seminar, mathematics graduates seminar. Mathematics department, Technion.

2018 **Summer projects.**

Mentoring undergraduate students in a summer project together with Ram Band. Center for Mathematical Sciences, Technion.

2017 **Summer mini-course.**

Initiating and organizing a mini-course on k-theory. Mathematics department, Technion.

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## Teaching experience

2019 **Calculus, T.A.**

2015–2019 **Multivariable Calculus, T.A.**

2016–2018 **Introduction to Probability, T.A.**

2018 **Complex Analysis, T.A.**

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## Extra curricular activities

2016–2020 **Social events.**

Initiating and organizing the annual 'wine & cheese' social event for graduate students. Mathematics department, Technion.

2015–2020 **Students representative.**

Public activity as the representative of math graduate students. Students Association of the Technion.

2012–2015 **Students representative.**

Public activity as the representative of math undergraduate students. Students Association of the Technion.

2012-2017 **Competitive sports.**  
Member of the Technion rowing crew, 3 times state-champions.

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## Non-academic experience

**Seven years of service in the Israeli Navy as a naval officer.**

**Rank: Lieutenant commander (res.)**

2011-2012 **Head of department, naval operations platoon.**  
Planning, and executing highly complicated operations. Navy representative to civilian organizations. In charge of knowledge management

2009–2011 **Operations specialist officer in a missile boat.**  
Leading a team of 15 soldiers. Operating technological systems.

2006–2009 **Naval academy.**

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## Languages

Hebrew (native speaker), English.