

Robert Grinshtein

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 R. Grinshtein

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Education

2021 - 2027



5th year undergraduate student, Lomonosov Moscow State University

Quantum Optics Technologies (QOT) lab, Quantum Electronics Department, Faculty of Fundamental and Applied Physics

GPA: 4.97/5.00

Research Experience

2024 - ...



Laboratory scientist. Quantum Technologies Center of M.V. Lomonosov, Lomonosov Moscow State University. Quantum Optical Technologies (QOT) lab.

Teaching and Leadership

2022



Teacher assistant. Krasnoyarsk Summer School: the circuits of constant current.

2024 - ...



Senior teacher. Krasnoyarsk Summer School: computational physics, theoretical mechanics, mathematical analysis for beginner physicists, introduction to quantum computing.

2025 - ...



Head of physical-mathematical tournament. Krasnoyarsk Summer School.

Science Projects

2022 - 2023



Programmable Interferometers using Spatial Light Modulators (SLM)

- Modeled a new class of optical interferometers based on multimode planar waveguides.
- Integrated a programmable Spatial Light Modulator (SLM) into the design to enable dynamic control of the interference patterns.

2023 - 2024



Mode Dynamics in Curved Multimode Waveguides

- Investigated the influence of waveguide curvature on spatial mode propagation in multimode integrated optical structures.
- Formulated a new computational method for tracking field evolution in curved waveguides utilizing coupled mode theory.

Science Projects (continued)

- 2024 - 2025  **Spatial Field Dynamics with Integrated Superconducting Planar Detector**
- Developed a theoretical model to simulate spatial field dynamics in multimode waveguides coupled with integrated extended superconducting detectors.
 - Quantified the impact of detector-induced losses on spatial field evolution to optimize detection efficiency.
- 2025 - present  **Linear-Optical Unitary Designs and Parameter Optimization**
- Developing a novel method to construct linear-optical unitary designs, focusing on minimizing the number of programmable parameters required across various optical architectures.

Research Publications

Conference Proceedings

- 1 R. Grinshtain and M. Saygin, "The spatial modes dynamics in curved multimode integrated optical waveguides," in *Proceedings of the 7th International School on Quantum Technologies (QTS'24)*, Miass, Russia, 2024, pp. 74-75.

Skills

Nationality	 Israeli, Russian
Languages	 English - Professional/Fluent; Russian - Native; Hebrew - beginner
Coding	 Python (Qiskit, NumPy, Torch, etc.), C++,  Git
Software	 ANSYS Lumerical
Hobbies	 Boulderling (6b+ - 6c), judo (state champion), skiing, photography, chess

Miscellaneous Experience

Awards

2021	 Silver medal , State Physics Olympiad
	 Bronze medal , State Mathematics Olympiad
	 Silver medal , All-Russian Physics and Mathematics Olympiad "Phystech"
2022	 Silver medal , Physical Faculty Mathematical Analysis Olympiad
2024	 Bronze cup , All-Russian Quantum Hackathon at QTS'24
2025	 Silver cup , 3rd All-Russian Quantum Hackathon "QUANT-NN" 2025

Miscellaneous Experience (continued)

Scholarships

2024  **Scholarship** for talented students of the Faculty of Physics in the 4th to 6th year who specialize in theoretical physics, Theoretical Physics and Mathematics Advancement Foundation “BASIS”

References

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Nikita Astrakhantsev

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