

# Anatoly Zavyalov

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## Research Interests

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Differential privacy, property testing, graph algorithms, sublinear algorithms

## Education

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### Boston University

Ph.D. Student in Computer Science – Advised by Sofya Raskhodnikova

Sep 2024 - Jun 2029 (expected)

### University of Toronto

H.B.Sc. in Applied Mathematics – 3.95 cGPA

Sep 2020 - Jun 2024

## Selected Publications

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1. S. Raskhodnikova, A. D. Smith, C. Wagaman, **A. Zavyalov**, "[Local Node Differential Privacy](#)". arXiv preprint arXiv:2602.15802 (2026).
2. J. Shallit, **A. Zavyalov**. "[Transduction of Automatic Sequences and Applications](#)". *CIAA 2023. Lecture Notes in Computer Science*, vol 14151.
3. A. D. Hincks, **A. Zavyalov**, D. Bansal. "A graph database solution for tracking the deployment and layout of a large radio interferometer". *SPIE Astronomical Telescopes + Instrumentation 2022. Proc. SPIE 12189*.

## Honors and Awards

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### NSERC Canada Graduate Research Scholarship - \$120,000 CAD

Awarded by the Natural Sciences and Engineering Research Council of Canada (NSERC).

May 2026

### Chair's Graduate Fellowship - \$10,000 USD

Awarded on admission to Boston University.

Feb 2024

### NSERC Undergraduate Student Research Award - \$7,500 CAD

Awarded by U of T Department of Computer Science.

Mar 2023

### SURP Fellowship & U of T Excellence Award - \$17,095 CAD

Combined funding for a research fellowship at the Dunlap Institute of Astronomy.

Apr-May 2021

### NSERC USRA (\$7,500 CAD) & Fields USRP – Declined

Received and declined offers for two separate summer research programs.

Mar 2022

### University of Toronto Scholar - \$3,000 CAD

Awarded by the University of Toronto for high academic achievement ( $\$1,500 \times 2$ ).

Aug 2021, Aug 2022

### Dean's List Scholar

Awarded for a cumulative GPA of 3.50 or higher.

2021, 2022, 2023

### Trinity College Academic Achievement Scholarships - \$1,500 CAD

Awarded by Trinity College for high academic achievement ( $\$500 \times 3$ ).

Nov 2021 - Nov 2023

## Talks

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1. “**Local Node Differential Privacy**”: University of Oxford (March 2026), Columbia University (April 2026), TPD<sub>P</sub> 2026 (Northeastern University, June 2026), FORC 2026 (Harvard University, June 2026), Workshop on Differential Privacy and Unlearning in Machine Learning (University of Copenhagen, June 2026).
2. “**Transduction of Automatic Sequences and Applications**”, C<sub>IAA</sub> 2023. (30 min) (Slides)
3. “**Automatic Sequences**”, Canadian Undergraduate Math Conference, 2023 (30 min) (Slides)

## Research Experience

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Max Planck Institute for Security and Privacy | Research Intern May 2026 - Present

- Researching differential privacy on graphs in the continual release setting, working with Tamalika Mukherjee.

Boston University | PhD Student Sep 2024 - Present  
Department of Computer Science

- Working in the areas of graph differential privacy and graph property testing, supported by a **Chair’s Graduate Fellowship**.

University of Waterloo | Research Assistant May 2022 – Jul 2022, May 2023 – Jul 2023  
David R. Cheriton School of Computer Science

- Researched and implemented algorithms into **Walnut**, a theorem proving software for automatic sequences written in **Java**, working with Professor Jeffrey Shallit.
- Research culminated in a publication and presentation at *C<sub>IAA</sub> 2023*.

University of Toronto | Research Assistant May 2023 – Aug 2023  
Department of Computer Science

- Researched algebraic methods for concurrent program verification and race condition detection, supported by an **NSERC Undergraduate Student Research Award (NSERC USRA)**.

University of Toronto | Research Fellow May 2021 – Apr 2022  
David A. Dunlap Department of Astronomy and Astrophysics

- Developed **Padloper**, a full-stack graph database solution for tracking deployment and layout of a large radio interferometer, using **JanusGraph**, **Flask** and **React**, working with Professor Adam Hincks.
- Padloper will be used for the **Hydrogen Intensity and Real-time Analysis eXperiment (HIRAX)**, the **Simons Observatory**, and **Canadian Hydrogen Intensity Mapping Experiment (CHIME)**.
- Research culminated in proceedings at *SPIE Astronomical Telescopes + Instrumentation 2022*.

## Teaching Experience

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Boston University | Teaching Fellow Sep 2025 - Dec 2025

- Teaching Fellow for **CSC237: Probability in Computing**

University of Toronto | Teaching Assistant

- TA for **CSC363: Computational Complexity and Computability** Jan 2024 - Apr 2024
- Lead TA for **CSC373: Algorithm Design and Analysis** Sep 2023 - Dec 2023
- TA for **CSC240: Enriched Introduction to the Theory of Computation** Feb 2022 - May 2022

## STEM Outreach

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SigmaCamp | Academic Administrator & Counselor

2022 - Present

- Directing *Problem of the Month*, a free international STEM competition for teenagers, which received over 2,000 solution submissions from 130+ students in 2024-2025.
- Assembled and managed a team of 12 subject leads and dozens of graders. Also managed the Qualification Quiz entrance exam, which received 650+ solutions submissions in 2025.

## Skills

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- **Human Languages:** English (C2), Russian (C2), German (B1), Portuguese (A2)
- **Programming Languages:** Python, JavaScript, C++, Java, PostgreSQL,  $\LaTeX$
- **Frameworks/Libraries:** ReactJS, Flask, NumPy, PixiJS