# Armaan Ahmed

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## EDUCATION

- **The Johns Hopkins University** — Baltimore, MD
  *B.S. in Applied Math & Statistics + B.A. in Mathematics; Senior; 4.00 GPA* — *Aug. 2022 – June 2026*

- **Scarsdale High School** — Scarsdale, NY
  *High School Diploma; 4.00 (4.15/4.30) GPA* — *Aug. 2018 – July. 2022*

## SKILL SET AND INTERESTS

- **Programming:** Python, Java, Bash, C++, Javascript
- **Research:** Population Models, Stochastic Processes, Analysis, Probability

## EXPERIENCE

- **Teaching Assistant/Tutoring** — Baltimore, MD
  *The Johns Hopkins University* — *Sept 2024 - Present*
  - **Machine Learning Teacher Assistant (Spring, 2025):** Graded assignments for 100 students
  - **Probability Teacher Assistant (Fall, 2024):** Lead discussion sections, grade assignments, and proctor exams.
  - **Intro to Computing Teacher Assistant (Fall, 2024; Spring, 2024):** Hold office hours for students, grade assignments, and assist in class.
  - **Physics II Learning Assistant (Spring, 2024):** Assist students during discussion section on problem sets.
  - **Learning Den Personalized Tutor (Fall, 2023):** Tutor students on subjects ranging from Organic Chemistry to Honors Linear Algebra.

- **Foo Lab** — Minneapolis, MN
  *Student Researcher* — *Jan 2025 - Present*
  - **Investigating effect of senescent cells on tumor and cancer-treatment dynamics:** Leading a project investigating theoretical therapeutic strategies containing both anti-cancer and senolytic treatments to effectively reduce the tumor burden.
  - **Examining the site-frequency-spectrum in a population with selection:** Working with both Profs. Jasmine Foo and Kevin Leder to examine the site frequency spectrum in a population having driver and neutral mutations.

- **Noble Lab** — London, England
  *Student Researcher* — *Feb 2024 - Present*
  - **Investigating properties of a universal tree balance index:** Performing analytical work to investigate expected values of the $J_1$ index, along with minimal values in a special class of trees.
  - **Investigating extinction therapy:** Used simulations and analytical work to understand the theoretical merits of a two-sequence cancer therapy, where the second drug is applied whilst the tumor is still undetectable.

## MANUSCRIPTS & PREPRINTS

1. **Ahmed, A.**, Leder, K., & Foo, J. (2025). The Site Frequency Spectrum in an Exponentially Growing Population with Selection. *In preparation.*
2. **Ahmed, A.**, & Foo, J. (2025). A Theoretical Investigation into Incorporating Senolytics into Anti-Cancer Therapies. *In preparation.*
3. Manojlović, V.*, **Ahmed, A.***, Viossat, Y., Noble, R. (2025). Expected and minimal values of a universal tree balance index. *arXiv.* doi:10.48550/arXiv.2507.08615. *(Currently Submitting)*
4. Patil, S., **Ahmed, A.**, Viossat, Y., & Noble, R. (2025). Preventing evolutionary rescue in cancer using two-strike therapy. *Genetics.* doi:10.1093/genetics/iyaf255. *(Accepted Manuscript)*
5. **Ahmed, A.**, Whittington, J., & Shafaee, Z. (2023). Impact of Commission on Cancer Accreditation on Cancer Survival: A SEER Database Analysis. *Annals of Surgical Oncology.* doi:10.1245/s10434-023-14709-4

*These authors contributed equally to the work.

## Conferences and Workshops

1. Patil, S., **Ahmed, A.**, Viossat, Y., & Noble, R. (2025). Preventing evolutionary rescue in cancer using two-strike therapy. Congress of the European Society for Evolutionary Biology, Barcelona.
2. Patil, S., **Ahmed, A.**, Viossat, Y., & Noble, R. (2025). A Theoretical Analysis of Sequential Two Drug Anti-Cancer Therapy. Society for Industrial and Applied Mathematics DC-Maryland-Virginia, Baltimore.
3. **Ahmed, A.**, Yang, R., & Zhang, Y. (2025). Exchange Dynamics of Single Molecule in Phase Separated Droplet. APS March Meeting, Anaheim.
4. **Ahmed, A.** & Zhang, Y. (2024). Computational investigation of a de novo designed protein that separates into liquid droplets before crystallization. Institute of Biophysical Research Retreat, Washington D.C.
5. Yang, R., Wang, C., **Ahmed, A.**, Grigorev, V., Moulick, R., Woodson, S., & Zhang, Y. (2024). Exchange Dynamics of Single Molecule in Phase Separated Droplet. Institute of Biophysical Research Retreat, Washington D.C.
6. Esparham, A., **Ahmed, A.**, Shoar, S., & Shafaee, Z. (2024). Impact of Obesity on In-Hospital Outcomes Following Hepatic Resection: A Propensity Score Matched Analysis of the US National Inpatient Sample. Advanced Cancer Therapies, Puerto Rico.
7. **Ahmed, A.**, Whittington, J., & Shafaee, Z. (2024). Patterns of presentation and delivery of care of appendiceal neoplasms in the municipal safety-net setting. Society of Surgical Oncology Annual Meeting, Atlanta.
8. Esparham, A., **Ahmed, A.**, Shoar, S., & Shafaee, Z. (2024). National Trends, Complications, and In-hospital Outcomes for Patients Undergoing Immediate Implant-based versus autologous-based Breast Reconstruction: A Propensity Score Matched Analysis. Society of Surgical Oncology Annual Meeting, Atlanta.
9. **Ahmed, A.**, Whittington, J., & Shafaee, Z. (2024). Patterns of presentation and delivery of care of appendiceal neoplasms in the largest municipal health care delivery system in the United States. ASCO Gastrointestinal Cancers Symposium, San Francisco. doi:10.1200/JCO.2024.42.3_suppl.14
10. Kang, J., Momčilo, G., Urteaga, R. M., **Ahmed, A.**, & Ha, T. (2023). Engineered Helicase Replaces Thermocycler in DNA Amplification. The UKC.
11. **Ahmed, A**. & Shafaee, Z. (2023). Impact of Commission on Cancer Accreditation on Cancer Survival: A SEER Database Analysis. International Conference on Surgical Cancer Care, Boston. doi:10.1245/s10434-023-13332-7

## Relevant Coursework

*(Unofficial transcript available here)*

- Honors Analysis I (110.415; A+)
- Honors Analysis II (110.416; A)
- Control Theory & Optimal Control (553.797; A)
- Graph Theory (553.672; A+)
- Stochastic Differential Equations: An Introduction With Applications (110.653; A)
- Game Theory (625.741; A+)
- Probability (553.620; A+)
- Honors Mathematical Statistics (553.431; A)

## Awards

- **The Naddor Prize ($300 Award)** — Baltimore, MD
  *The Johns Hopkins University* — Apr 2025
  - **Award Description:** Provided for distinguished academic performance by an Applied Mathematics and Statistics student who is not a Senior.
- **Dean's ASPIRE Award Recipient ($2,250 Research Award)** — Baltimore, MD
  *The Johns Hopkins University* — Jan 2024
- **Dean's List (all semesters)** — Baltimore, MD
  *The Johns Hopkins University* — Jan 2023
- **Regeneron STS Semifinalist** — Washington D.C.
  *Society For Science* — Jan 2022

## Extracurricular Activities

- **The Johns Hopkins News-Letter** — Baltimore, MD
  *Writer* — Jan 2023 - Sep 2023
  - **Volunteer writer for the SciTech column:** I generally write articles weekly about different scientific topics. Duties include researching topics, interviewing scientists, and writing articles.