Refath Bari

rbari002@citymail.cuny.edu

Phone: 631-220-7652

Website: Refath Bari

Education

- **The City College of New York** — 3.95/4.00 GPA
  B.S. Physics, Junior (100/120 Credits) — *January 2021 - Present*

Scores

- **General GRE: 331/340** (167/170 in Mathematics, 164/170 in Reading, 5.5/6 in Writing)
- **SAT: 1580/1600 & ACT: 36/36** (Perfect Score in SAT Math, Pefect Score on ACT)

Research

- **Transport of Nitrogen in Ocean Worlds** — Dec 2021 - Present
  (R. Bari and A. Levi, in prep)
  - Simulated transport of N_2 in exoplanets using Density Functional Theory and Molecular Dynamics in conjunction with Equilibrium thermodynamics. In collaboration with Amit Levi of the Harvard Center for Astrophysics and Braude College of Engineering. Submitted to *The Astrophysical Journal* in August 2023.
- **Simulating the Action Principle in Optics** — Jan 2021 - Mar 2023
  (R. Bari, 2023)
  - Numerical solution to the generalized Brachistochrone Problem. Published in *The Physics Teacher*.
- **Radiation in a Moving Cavity** — Jan 2022 - July 2023
  (R. Bari, 2023)
  - A new formula for relativistic reflection from an inclined mirror is introduced. We use this formula to rigorously prove that a moving clock remains a clock. Numerical analysis of the long-term path of radiation in a cavity is also presented. Submitted to *The European Journal of Physics*.
- **A Bridge from Maxwell to Einstein** — Jan 2020 - Sep 2020
  (Mentored by Dr. Daniel Kabat)
  - Under Lehman College Professor Dr. Daniel Kabat, I developed simulations that illustrate the intimate relationship between Electromagnetism and Special Relativity. I subsequently penned a 30-page manuscript on the project.
- **Artificial Intelligence Researcher** — Jun 2021 - Jan 2022
  (Mentored by Dr. Carlos Meriles)
  - Created Convolutional Neural Networks to identify Magnetic Noise in Nitrogen Vacancy centers data. Worked in Meriles Condensed Matter Lab at CCNY in the Center for Discovery and Innovation.

Outreach

- **"Simulating the Action Principle" Talk, American Association of Physics Teachers Summer 2032**
- **"Motivating the Action Principle" Talk, American Astronomical Society 242nd Meeting**
- **55 Days in Dharavi** A book on the poor people in the Dharavi Slum of Mumbai. Inspired by my travels in India.
- **My Pushback against Remote Learning** An op-ed on Remote Learning. Published in *The Washington Examiner*.
- **Math4Bronx** An informal program that involves solving math equations on construction boards of the Bronx, to inspire the poor residents to pursue STEM. Recognized by Vice President of CUNY Lehman College and President of MAA.
- **Celestron Ambassador** Popularized Astronomy by serving as an Ambassador for Celestron Telescopes.

Awards

- **NYC STEM Talent Grant, Last Mile Education Fund** Received grant to pay for tuition.
- **CCNY 2023 Martin Tiersten Scholar** Awarded to the best student in Classical Mechanics at City College.
- **CCNY Alumni Foundation Slagowitz Family Scholarship** Nominated by Department to receive $5000 Award.
- **CCNY 2022 Goldwater Scholar Nominee** Nominated by City College for the 2022 Goldwater Scholarship.

Courses

- **Physics:** Thermodynamics (A), Quantum Computing (A), Computational Physics (A), Electromagnetism I (A-), Electromagnetism II (A-), Classical Mechanics (A+)
- **Math:** Computational Math (A+), Differential Equations (A+), Vector Analysis (A+)