MEERA PATEL

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EDUCATION

University of Amsterdam — GPA: 8.3/10 09/2024 – Present

M.Sc. in Physics and Astronomy

- *Selected Coursework:* Astroparticle Physics, General Relativity, Gravitational Waves, Cosmology, Machine Learning, Programming C++
- Involved in outreach programs to promote physics and astronomy at Nikhef, giving tours to a variety of audiences.

Boston University — GPA: 3.6/4 09/2018 – 05/2022

B.A. in Physics

- *Selected Coursework:* Computational Physics, Advanced Laboratory

AWARDS

Olga Igonkina Foundation Travel Grant — €2,500 12/2025

Funded 2-week research visit to AstroCENT/NCBJ, Poland to conduct photoluminescent measurements using nanosecond pulsed VUV laser in liquid argon for Master's thesis work. Planning to fabricate calibrated wavelength shifters for use as references in VULCAN experiment.

EXPERIENCE

Master's Thesis Project 09/2025 – Present

Nikhef — *Amsterdam, NL*

- Collaborate with supervisor Dr. Tina Pollmann in experimental work for the VULCAN experiment at Nikhef, which is measuring photoluminescence at VUV wavelengths for TPC detector R&D work.
- Planning to install an optical chopper along beam path to measure photoluminescence time decay constants.
- Designing hardware upgrades for vacuum setup using CAD software, including a new cooling setup for the SiPMs, reducing dark count rates.
- Refactoring data processing and analysis software to increase efficiency by >10x using Python, and Jupyter Notebooks.
- Upgrading analysis pipeline to include advanced techniques such as matched filtering to regain sensitivity lost to noise.
- Supervision of bachelor's students working on VULCAN experiment and on practicum projects.

Microbiology Technician 06/2023 – 12/2023

Merieux Nutrisciences — *Minneapolis, MN, USA*

- Preparing food and environmental samples for microbiological analysis of many kinds of pathogens.
- Utilizing LIMS and Zeta software for lab management and tracking samples, media, and preparation times.
- Completing self-driven lab management tasks, including sample and media management, calibrating machines, plating control samples, and taking environmental samples.

Research Assistant 02/2020 – 10/2022

Boston University, Department of Physics — *Boston, MA, USA*

- Collaborate with research advisor Dr. Rob Carey in computational work for the Fermilab g-2 experiment, which aims to measure anomalous magnetic moment of muon to high precision.
- Programmed 3 analysis tools for data visualization using C++ with ROOT, and Python with NumPy, MatPlotLib.
- Developed and finalized particle extrapolation C++ programs for muons, using the CERN GEANE package to take electron data backward in time and obtain muon beam distribution at point of particle decay.

- Increased speed, performance of programs by 4x for particle extrapolation by project completion by implementing package features and reducing number of unnecessary steps taken by program.
- Revamp track fitting by changing best guess initial time of straw tracker data by small amounts.

PROJECTS

Kerr Blackhole Visualizer (Github link) 06/2025 – Present

- Using Fortran to simulate and visualize light paths around a rotating (Kerr) black hole.
- Implementing ray-tracing algorithm to simulate light bending and gravitational lensing effects.
- Generating visualizations of accretion disks and photon spheres around Kerr black holes.

Physkit (Github link) 01/2025 – Present

- Python package for fundamental constants, unit conversions, and common physics equations.
- Designed to assist students and educators in physics with easy access to essential tools.
- Features include unit conversion functions, fundamental constants database, and easy CLI access.

SKILLS

- **Technical:** C/C++, Python (NumPy, Matplotlib, PyTorch, Jupyter), Java, Fortran, Bash, Linux, Git
- **Professional:** Data analysis, Data visualization, Technical writing, Communication, Team collaboration, Supervision of junior members
- **Languages:** English (Native), Gujarati (Native), Hindi (Native), French (Intermediate)