# Jaiman Parekh

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## Education

**New Jersey Institute of Technology** Sep. 2022 - May 2026 (Exp.)
*Albert Dorman Honors College, Double Major in Applied Physics and Computer Science* *3.78/4.00*

## Experience

**Computational Science Intern** June 2025 – August 2025
*Black-box Optimization for Expensive Problems* *Naval Nuclear Labs, Pittsburgh*

- Implemented a Bayesian Optimization algorithm for maximization of high-dimensional, non-convex functions
- Developed scalable HPC workflows to perform over 100 benchmarking tests for common user applications
- Investigated various learning and sampling methods on performance across suite of scalable synthetic problems
- Explored theoretical and algorithmic improvements on special cases of computationally intense tasks
- Exposure to modern SWE/HPC practices and libraries as well as contributions to production code
- Granted L-level DOE security clearance

**Undergraduate Research Assistant** Jan 2023 – Present
*Magnetohydrodynamics (MHD) of Coronal Mass Ejections (CME)* *Center for Solar-Terrestrial Research, NJIT*

- Integrated a GPU-based renderer to HPC workflow for automated visualization of terabyte sized datasets
- Reduced runtime of MHD solver by over 50% by optimizing parallelization scheme for $\sim$150 CPU cores
- Refactored and version-controlled legacy modules to replace hardcoded constants with user arguments
- Built robust automation and error handling scripts now used by lab members to streamline job submission
- Confirmed consistency of novel method to trigger CMEs with observation through key MHD metrics

**Undergraduate Research Assistant** May 2023 – July 2023
*Nonlinear Fluid Dynamics* *NJIT*

- Investigated perturbative effects of viscosity and surface tension on resonant waves
- Applied numerical methods to study nonlinear wave instabilities, reducing error propagation in surface simulations
- Built custom experimental apparatus to validate models, linking theoretical predictions with observed data

**Tutor** Sept. 2023 - Present
*NJIT Math and Physics Departments* *Newark, NJ*

- Calculus(1/2/3), Differential Equations, Linear Algebra, Statistics, Classical Mechanics, Electrodynamics
- Work with students of all ability levels by guiding them through problem-solving approaches

## Projects

**Algorithmic Trading** Jan. 2025 - Present

- Built automated trading system for live financial data and executed trades through Alpaca and Polygon APIs
- Applied signal-processing and statistical techniques to denoise time-series data
- Built a modular pipeline for data ingestion and order handling
- Experimented with backtesting strategies on historical data

## Technical Skills

**Languages**: Python, Javascript, C/C++, Bash, SQL, Fortran, MatLab
**Dev Tools/Libraries**: Git, React, Express, Slurm, PyTorch, Parsl, Conda, GDB, NumPy, MatPlotLib, OpenMPI

## Awards and Presentations

**Albert Dorman Scholar**: Full tuition merit scholarship for 2022-2026
**Barry Goldwater Scholarship**: Finalist 2025; Semi-finalist 2024
**Presentations**: Presented at NJIT Undergraduate Research and Innovation symposiums; 2023, 2024