

Rajya Vardhan Goel

Gurugram, India | gvrajya@gmail.com | rajya.space

EDUCATION

University of Massachusetts Amherst, B.Sc. in Physics and Astrophysics

May 2026

Chancellor's Award, \$64,000 scholarship

Amherst, MA

- Relevant coursework: **Linear Algebra, Applied Statistics**, Multivariate Calculus, Ordinary Differential Equations, Mathematical Methods in Physics, Computational Physics (Python), Statistical Physics & Thermodynamics, Quantum Mechanics I & II, Advanced Mechanics.

EXPERIENCE

Research Consultant

Jul. 2026–Present

WorldQuant BRAIN, Gold Level Quant Researcher

Remote

- Research and submit **systematic equity signals** into a live production pool, held to hard thresholds on **Sharpe ratio, turnover, and correlation** against every signal already in the book.
- Signal families across price and volume, options-implied volatility, analyst revisions, short interest and news sentiment, traded on a US large-cap universe and neutralized to sector; best current signal runs at **2.45 Sharpe** at 0.53 turnover.
- Built a backtesting harness that runs continuously on a cloud VM at 2,000 to 4,000 simulations a day, with every result logged to one corpus now past 7,700 tested signals. Ranked **#38 in India** on the platform leaderboard.

Data Engineer (Contract)

Feb. 2023–Present

Department of Classics, University of Massachusetts Amherst

Amherst, MA

- Built a **document automation pipeline** that turns a 50,000-entry multilingual bibliography into a structured, searchable database. A full run finishes in about **11 minutes** and replaces work the department had been budgeting in years.
- Designed and ran the evaluation that chose the models: scored Gemini, DeepSeek, Qwen and GLM against a hand-labeled answer key on accuracy, speed and **cost per record**, then picked the combination that cleared the accuracy bar at the lowest cost.
- Built and run **multi-agent workflows** that draft candidate records, check them against a validated reference set, and automatically re-run anything below a confidence threshold instead of passing errors downstream.
- Cut unresolved records on a 10,000-entry backlog by half, then built a review dashboard so a non-technical reviewer can sort and correct the remainder without engineering help.
- Fine-tuned a smaller open model on in-house examples to handle routine parsing at a fraction of frontier-model cost.

RESEARCH EXPERIENCE

Statistical Physics Student Researcher

Jun. 2024–May 2026

Lattice Dynamics & Coupled Oscillator Simulations, with Professor Jon Machta

Amherst, MA

- Built large-scale simulations of coupled oscillator systems in **C++ and Python** to locate the point at which the system flips between synchronized and disordered behaviour.
- Ran and catalogued **12M+ Monte Carlo simulations** as multidimensional parameter sweeps on a university compute cluster.
- Measured how long the system holds memory of its own past and how far spatial correlation extends, using autocorrelation decay and rolling-window Moran's I.

Student Researcher

Fall 2024

Analysis of Galaxy Quenching Pathways, Astro 301

Amherst, MA

- Classified galaxy evolution pathways from JWST observations using principal component analysis and Gaussian mixture models; cleaned and standardized multi-band photometric data and wrote up the results as a formal paper.

TEACHING EXPERIENCE

Undergraduate Teaching Assistant, Physics 132 (Electricity & Magnetism), UMass Amherst

Fall 2025

- Led discussion sections and built supplementary problem sets with the course instructors.

SKILLS

Quantitative & Finance: Equity alpha research, signal backtesting and out-of-sample validation, Sharpe and turnover optimization, sector neutralization, correlation and risk constraints, time-series analysis, Monte Carlo simulation, stochastic modelling, principal component analysis

AI Systems: Claude Code, Cursor, Codex; multi-agent orchestration, agent workflow design, LLM evaluation and benchmarking, prompt engineering, model fine-tuning (SFT, LoRA), retrieval-augmented pipelines

Tools: Python, R, Excel, Git, LaTeX, SLURM; currently learning C++ and kdb+/q