Prateek Gupta CV

Prateek Gupta
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SUMMARY

Graduate student with an extensive research and teaching experience in Physics, as well as exceptional academic credentials. Blends lab management experience with academic training at the University of Toronto and the University of Edinburgh to offer solid skills in technical experiments and research activities. Incorporates a background in student recruitment outreach and tutoring to provide employers with proven organization and communications expertise.

EDUCATION

Master of Science, Theoretical Physics
The University of Edinburgh, Edinburgh, UK
Expected to complete study August 2023
Expected to graduate November 2023
Percentage: 69.3

Honours Bachelor of Science, Specialist, Physics and Astrophysics
University of Toronto, Toronto, ON
Graduated May 2022 with High Distinction
CGPA: 3.68

All India Senior Secondary School Certificate
Fahaheel Al-Watanieh Indian Private School, Kuwait
Graduated May 2018
Percentage: 90+ in Physics and Math, 86.6 Overall

TECHNICAL SKILLS

Languages: LaTeX, C, C++, Python, FORTRAN, MySQL, BASIC, Beamer
Operating Systems: macOS, Windows, Linux (CentOS on High Performance Computing clusters like Niagara and Graham.)

RESEARCH EXPERIENCE

Gravitationally Induced Entanglement in the Early Universe
Supervisor: Dr. Suddhasattwa Brahma Winter-Summer 2023

Recently scientists have proposed a mechanism for gravitons to entangle massive particles, thus showing the quantum nature of gravity, but it is based on an assumption of flat spacetime. In this research project, we aim to study the effects of introducing curvature in this mechanism, like the FLRW metric, and study potential applications in Early Universe Cosmology.

Reconstructing broadband spectropolarimetric signals using a novel method
Supervisors: Dr. Bryan Gaensler & Dr. Luke Pratley Academic Year 2021-22

We carried out an original research project in the field of Radio Astronomy and Cosmic Magnetism. Implemented multiple methods like `RM CLEAN`, QU-fitting and the novel method, non-parametric QU-fitting using Python to reconstruct broadband signals from multiple active galactic nuclei (AGNs) and compare these methods. We used parallel computing on High-Performance Computing (HPC) clusters under Compute-Canada, like Niagara and Graham, to complete our calculations.

Time Series Analysis on Long Term Measurements of Variable Stars in GCs
Supervisor: Dr. John R. Percy Summer 2021

We carried out an original research project in the field of variable stars and stellar evolution under the University of Toronto Work-Study Program in the David A. Dunlap Department of Astronomy & Astrophysics. The project entailed time series analysis, with existing software, on long-term measurements of variable stars in Globular clusters using data from the AAVSO and the ASAS-SN databases.

Simulating Transit Timing Variations of Exoplanets with `REBOUND`
Supervisor: Dr. Hanno Rein Summer 2021

We carried out an original research project in the field of Exosolar planets and Transit Timing Variations (TTVs). We used the N-body integrator `REBOUND` to simulate the TTV data for TRAPPIST-1, by using N-Body simulations for the exoplanets of that system.

TEACHING EXPERIENCE

Teaching Assistant: MATA35, Calculus II for Life Sciences Winter 2021

Facilitated a 1-hour tutorial session each week for approximately 20 students. Sessions included working through assignment problems, administering quizzes and demonstrating key problem-solving methods. Managed a detailed record of students' performance and attendance.

Teaching Assistant: PHYA11, Physics I for Life Sciences Fall 2020

Facilitated a 2-hour tutorial session each week for approximately 20 students. Sessions included working through problems in small groups, working on lab activities and demonstrating key problem-solving methods. Managed a detailed record of students' performance and attendance.

Physics Aid Center (PAC) Tutor Academic Years 2019-21

Guided students in PHYA10 and PHYA11 through difficult concepts and problems presented in class. Worked 3-6 hours per week throughout the semester.

ACADEMIC AWARDS

- British Council Scholarship for GREAT - The University of Edinburgh
- UTSC Dean's List Fall 2022
- DPES Student Leadership and Excellence Award 2021
- UTSC Dean's List Fall 2021
- UTSC Dean's List Fall 2020
- UTSC Dean's List Summer 2019

PUBLICATIONS

Percy, John R., and Gupta, Prateek. "Pulsating Red Giants in a Globular Cluster: 47 Tucanae." *Journal of the American Association of Variable Star Observers*, vol. 49, no. 2, December 2021. `https://app.aavso.org/jaavso/article/3789/`

PUBLIC OUTREACH

International Student Ambassador Winter 2020

Assisted the Office of Admissions and Student Recruitment in their outreach to applicants around the world. Acted as a friendly mentor that helped bridge the knowledge gap between expectations and reality when it comes to studying at U of T Scarborough.