Eesha Das Gupta | PhD Student

David A. Dunlap Department of Astronomy & Astrophysics, University of Toronto

dasgupta@astro.utoronto.ca • astro.utoronto.ca/∼dasgupta

Education

Academic Qualifications

- **Drexel University** — **Philadelphia**
  Bachelor of Science in Physics, Minor in Mathematics, Cum Laude — *2014–2018*
  Cumulative GPA : 3.57/4.0

Achievements and Honors

- **College of Arts and Sciences, Drexel University** — **Dean's List**
  Dean's List, Fall, Winter 2017-18, Fall 2016, Fall 2014
- **College of Arts and Sciences, Drexel University** — **2018**
  Julius and Josephine Cohen Award for Judaic Studies, CoAS Honors
- **College of Arts and Sciences, Drexel University** — **2017**
  M. Russell Wehr Physics Award, CoAS Honors
- **Department of Physics, Drexel University** — **2016-17**
  Physics Fellow
- **College of Arts and Sciences, Drexel University** — **2016**
  Susan and Donald Larson Endowed Scholarship, CoAS Honors

Technical and Personal skills

- **Programming Languages:** Proficiency in: C++, Python; Basic ability with: Bash, Mathematica.
- **Other Software Skills:** SQL Server, gnuplot, LaTeX, MS Office suite, html, css.
- **Language Skills:** Fluent English, Native fluency in Hindi and Bengali, Conversational Telugu

Research Experiences

- **Department of Astronomy and Astrophysics, University of Toronto** — **Toronto ON**
  PhD Student — *October 2019–Present*
  I am currently working on simulating grazing collisions of exoplanets using the moving mesh hydrodynamic code Arepo. The project entails modelling super-Earth and mini-Neptune category planets as polytropes and determining how mass loss correlates with collision parameters. The objective of the project is to justify the observed spread in mean densities of exoplanets of these categories and would be a valuable contribution to understanding planetary evolution.

Department of Mathematics, Drexel University **Philadelphia PA**

Research Assistant *April 2018–September 2018*

I worked with Dr. Shari Moskow, professor in the Department of Mathematics at Drexel University, on solving the inverse problem for solutions to the Helmholtz Equation, for 2D materials with low and high contrast. I primarily used FEniCS, a finite elements PDE solver in python, for the purpose. This work has been published in the Journal of Physical Communications.

Department of Physics, Drexel University **Philadelphia PA**

Senior Research Student *September 2017–June 2018*

I worked with Dr. Stephen McMillan on computing intensity of HII regions in galaxies as a part of my undergraduate thesis. I did mock observations of Hα intensities using the radiative transfer equation. I used the package yt in python for the purpose. I defended my senior thesis in May 2018 for my Bachelors' degree.

Department of Physics, Drexel University **Philadelphia PA**

Research Assistant *March 2016–September 2016*

I worked on growth and characterization of few layer thin films of Titanium diselenide via Chemical Vapor Transport (CVT) under Dr. Goran Karapetrov. My task was to build a setup for growth and preparation of samples for characterization using optical and scanning probe microscopy. My project commenced with a research poster presentation at SPS PhysCon, 2016 in San Francisco, CA. I also presented my work at APS Conference of Undergraduate Women in Physics (CUWiP) at Princeton University in 2017.

Department of Physics, Drexel University **Philadelphia PA**

STAR Scholar *June 2015 - September 2015*

I worked with the IceCube collaboration to observe seasonal variation in flux of atmospheric neutrinos using data from the IceCube Neutrino Observatory at the South Pole. I wrote python scripts for generating count rate vs. time plots for neutrino events for 2 years of data. I presented my results at the STAR summer showcase and APS Conference for Undergraduate Women in Physics (CUWiP) at Wesleyan University.

Cosmic Ray Induced Bit Flipping Experiment (CRIBFLEX) **Philadelphia PA**

Research Assistant *October 2014 - September 2015*

The Drexel chapter of Society of Physics Students (SPS) was sponsored by SPS National in 2014, to conduct a student led balloon-borne experiment on effect of cosmic rays on electronics. We investigated bit flipping, a phenomenon where bits in solid state memory devices flip when hit by cosmic rays. I helped with calibration of equipment, and wrote a python program to generate plots for data from calibration testing.

Teaching and Mentorship Experiences

GASA Mentorship Committee **Toronto ON**

International Student Coordinator *2020*

As the International Student Coordinator for the Graduate Astronomy Student Association (GASA) Mentorship Committee, I am the major point of contact for students with questions or concerns about moving and adjusting to life in Toronto. My responsibilities also include organizing and compiling information for incoming international students, including how to interpret the annual income letter, Canadian taxes, the rental market, etc. and making sure the information is readily available to students.

Department of Astronomy and Astrophysics, University of Toronto **Toronto ON**

Teaching Assistant : Life on Other Worlds (AST251) *Winter 2020*

I will be grading midterm exams, final exams, and student projects for the course. I am also helping with invigilating midterm and final exams.

Department of Astronomy and Astrophysics, University of Toronto **Toronto ON**

Teaching Assistant : The Sun and its Neighbours (AST101) *Fall 2019*

I helped with organizing observing nights, grading, and invigilating midterm and final exams. My job entailed facilitating students with their observing projects using a DSLR camera, Stellarium, Celestron telescopes, and a refractor telescope, and to provide timely feedback on their observing project plans and exams.

Rajghat Besant School, Krishnamurti Foundation of India **Varanasi, India**

Physics/Maths Tutor *October 2018–March 2018*

I helped high school students with their physics and math curriculum. My objectives were to assist them prepare for their Senior Secondary and Higher Secondary CBSE board exams, strengthen their elementary physics and math concepts, and increase their interest in these subjects.

HHMI Sustaining Excellence Program at Drexel University **Philadelphia PA**

Peer Mentor *Fall 2016, Fall 2017*

I was a Peer Mentor for freshmen physics majors, for two consecutive years. I helped incoming freshmen transition from high school to college as a TA for the University 101 course. I also organized Careers in Physics panels, social activities, and helped students understand physics journal articles.

Department of Physics, Drexel University **Philadelphia PA**

Physics Fellow *2016-17*

As the Department of Physics Fellow, I assisted freshmen physics majors with their introductory physics and math classes. My responsibilities included holding regular office hours, conducting midterm and final exam review sessions, and helping with computational physics assignments.

Other Work Experience

AmeriQuest Business Services **Cherry Hill NJ**

Programmer Intern *April 2017–September 2017*

At AmeriQuest Business Services, I was responsible for tuning and optimization of company databases in Microsoft SQL Server. I have also worked with Microsoft Business Intelligence tools such as PowerBI, Access, Excel and SharePoint to make data and reports accessible and presentable for employees and managers.

Poster Presentations

Poster Presentation at APS CUWiP at Princeton University **Princeton, NJ**

Growth and Characterization of $TiSe_2$ Thin Films *January, 2017*

Authors : **Eesha Das Gupta**, Goran Karapetrov, Mike Bowen

Poster Presentation at SPS Quadrennial Physics Convention **San Francisco, CA**

Growth and Characterization of $TiSe_2$ Thin Films *November, 2016*

Authors : **Eesha Das Gupta**, Goran Karapetrov, Mike Bowen

Poster Presentation at APS CUWiP at Wesleyan University **Middletown, CT**

Seasonal Variation in Atmospheric Neutrinos using IceCube data *January, 2016*

Authors : **Eesha Das Gupta**, Naoko Kurahashi Neilson, William Giang

Poster Presentation at STAR Summer Showcase **Philadelphia, PA**

Seasonal Variation in Atmospheric Neutrinos using IceCube data *August, 2015*

Authors : **Eesha Das Gupta**, Naoko Kurahashi Neilson, William Giang

Poster Presentation at APS April Meeting in Baltimore **Baltimore, MD**

CRIBFLEX : Cosmic Ray Induced Bit Flipping Experiment *April, 2015*

Authors : **Eesha Das Gupta**, Ed Callaghan, Keziah Sheldon, Zara Zahimi, et. al.

Publications

Detection of Thin High-Contrast Dielectrics from Boundary Measurements

Journal of Physical Communications *2019*

Authors : David M. Ambrose, **Eesha Das Gupta**, Shari Moskow, Valentina Ozornina, and Gideon Simpson

Outreach and Service Activities

AstroTours at the University of Toronto **Toronto ON**

Master of Internet *2019-20*

The University of Toronto AstroTours is a free monthly public event that consists of a talk about astronomy, planetarium shows and telescope observing run by graduate students. I manage the website, social media, and email account for the event.

Graduate Astronomy Student Association, DADDAA, University of Toronto **Toronto ON**

GASA Tea Master *2019-20*

I am in-charge of organizing weekly department tea hour along with three other people on behalf of the Graduate Astronomy Student Association (GASA). My responsibilities include sending out weekly department-wide emails for the tea hour, taking inventory and stocking tea from time-to-time, and acting as a point of communication with other GASA committees that may wish to host activities during the tea hour.

Drexel University Women in Physics Society **Philadelphia PA**

Vice President *September 2017–June 2018*

I was the Vice President of Drexel Women in Physics Society (WiPS) in my senior year of undergrad. One of Drexel WiPS' focus is physics outreach within the Philadelphia area, which I was regularly involved with. My other tasks involved budget allocation, organizing social activities, and co-ordinating conference travels for organization members.

Drexel University Women in Physics Society **Philadelphia PA**

Treasurer *September 2015–June 2017*

I was also the Treasurer of WiPS for two years, before taking over as the Vice President. My tasks involved managing finances, allocating funds to events, assisting with fundraisers, and organizing a budget for APS Women in Physics grant proposal. I was the primary point of contact for outreach activities for the entirety of my duration as a Women in Physics Society officer.