Eesha Das Gupta | PhD Student

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

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Education

Academic Qualifications

- **University of Toronto** — **Toronto, ON**
  PhD Student — *2019–Present*
- **Drexel University** — **Philadelphia, PA**
  Bachelor of Science in Physics, Minor in Mathematics, Cum Laude — *2014–2018*
  Cumulative GPA : 3.57/4.0

Achievements and Honors

- **C. A. Chant Fellowship** — **2020-21**
  DADDAA, University of Toronto
- **International Entrance Scholarship** — **2020-21**
  DADDAA, University of Toronto
- **Graduate Program Fellowship** — **2019-20**
  DADDAA, University of Toronto
- **Faculty of Arts and Sciences Alumni + Friends Graduate Fellowship** — **2019-20**
  Faculty of Arts and Sciences, University of Toronto
- **Julius and Josephine Cohen Award for Judaic Studies** — **2018**
  College of Arts and Sciences, Drexel University, CoAS Honors
- **M. Russell Wehr Physics Award** — **2017**
  College of Arts and Sciences, Drexel University, CoAS Honors
- **Physics Fellow** — **2016-17**
  Department of Physics, Drexel University
- **Susan and Donald Larson Endowed Scholarship** — **2016**
  College of Arts and Sciences, Drexel University, CoAS Honors
- **Dean's List** — **Fall, Winter 2017-18, Fall 2016, Fall 2014**
  College of Arts and Sciences, Drexel University

Technical and Personal skills

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

Research Experiences

- **Department of Astronomy and Astrophysics, University of Toronto** **Toronto ON**
  PhD Thesis Project *April 2020–Present*
  My PhD thesis explores the role of angular momentum (AM) in stars and star systems. I investigate effects of wind mass loss on stellar populations and analyze core spin rates using rotational AM transport in the interior of stars. I am using the 1D stellar evolution code MESA, and the binary population synthesis code COSMIC for the project. **Supervised by :** Kristen Menou, Maria Drout, Katie Breivik.

- **Department of Astronomy and Astrophysics, University of Toronto** **Toronto ON**
  First year PhD Project *October 2019–April 2020*
  I tried simulating grazing collisions of exoplanets using the moving mesh MHD code AREPO. The project entailed modelling super-Earth and mini-Neptune category planets with extended atmospheres as polytropes and determining how mass loss correlates with collision parameters. **Supervised by :** Kristen Menou, Chris Matzner.

- **Department of Mathematics, Drexel University** **Philadelphia PA**
  Research Assistant *April 2018–September 2018*
  I worked on solving the inverse problem for solutions to the Helmholtz Equation for 2D materials with low and high contrast as an undergraduate co-op research assistant. I primarily used FEniCS, a finite elements PDE solver in python, for this work. This work has been published in the Journal of Physical Communications. **Supervised by :** Shari Moskow, David Ambrose, Gideon Simpson.

- **Department of Physics, Drexel University** **Philadelphia PA**
  Senior Research Student *September 2017–June 2018*
  I did mock observations of Hα flux on star forming regions simulated in FLASH by numerically integrating the radiative transfer equation. I used the package yt in python for ray tracing and visualization. I defended this work as my senior thesis in May 2018 for my Bachelors' degree. **Supervised by :** Stephen McMillan, Joshua Wall.

- **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). My task was to build a setup for growth and preparation of samples for characterization using optical and scanning probe microscopy. **Supervised by :** Goran Karapetrov.

- **Department of Physics, Drexel University** **Philadelphia PA**
  STAR Scholar *June 2015 - September 2015*
  I worked with the IceCube collaboration to observe seasonal variation in atmospheric neutrino flux using data from the IceCube Neutrino Observatory at the South Pole. I wrote python scripts to perform time domain analysis of neutrino events. **Supervised by :** Naoko Kurahashi Neilson, William Giang.

Teaching and Mentorship Experiences

Mentorship Committee Chair **Toronto ON**
Graduate Astronomy Student Association (GASA), University of Toronto *2020-21*
I coordinated mentorship programs within the astronomy graduate student cohort at the University of Toronto.

Teaching Assistant : Stars and Galaxies (AST251) **Toronto ON**
Department of Astronomy and Astrophysics, University of Toronto *Winter 2021*
I facilitated online tutorials and marked student projects for the course.

Teaching Assistant : Observational Astronomy (AST301) **Toronto ON**
Department of Astronomy and Astrophysics, University of Toronto *Fall 2021*
I marked student projects and facilitated online programming tutorials for the course.

International Student Coordinator **Toronto ON**
GASA Mentorship Committee *2020*
I organized and compiled information for incoming international students and made sure the information is readily available to students.

Teaching Assistant : Life on Other Worlds (AST251) **Toronto ON**
Department of Astronomy and Astrophysics, University of Toronto *Winter 2020*
I marked midterm exams, final exams, and student projects for the course.

Teaching Assistant : The Sun and its Neighbours (AST101) **Toronto ON**
Department of Astronomy and Astrophysics, University of Toronto *Fall 2019*
I helped with organizing observing nights, grading, and invigilating midterm and final exams.

Physics/Maths Tutor **Varanasi, India**
Rajghat Besant School, Krishnamurti Foundation of India *October 2018–March 2018*
I helped academically weak high school students with their physics and math curriculum.

Peer Mentor **Philadelphia PA**
HHMI Sustaining Excellence Program at Drexel University *Fall 2016, Fall 2017*
I helped incoming freshmen transition from high school to college. I also organized Careers in Physics panels, social activities, and helped students understand physics journal articles.

Physics Fellow **Philadelphia PA**
Department of Physics, Drexel University *2016-17*
I assisted freshmen physics majors with their introductory physics and math classes.

Other Work Experience

AmeriQuest Business Services **Cherry Hill NJ**
Programmer Intern *April 2017–September 2017*
I helped with tuning and optimization of company databases in Microsoft SQL Server. Additionally, I used Microsoft Business Intelligence tools to make data and reports accessible for employees and managers.

Poster Presentations

Impact of Novel RSG Wind Mass Loss Rates on Compact Object Mergers **Online**
Poster Presentation at CASCA 2021 Annual General Meeting *May, 2021*
Authors : **Eesha Das Gupta**, Maria Drout, Katie Breivik

Growth and Characterization of $TiSe_2$ Thin Films **Princeton, NJ**
Poster Presentation at APS CUWiP at Princeton University *January, 2017*
Authors : **Eesha Das Gupta**, Goran Karapetrov, Mike Bowen

Growth and Characterization of $TiSe_2$ Thin Films **San Francisco, CA**
Poster Presentation at SPS Quadrennial Physics Convention *November, 2016*
Authors : **Eesha Das Gupta**, Goran Karapetrov, Mike Bowen

Seasonal Variation in Atmospheric Neutrinos using IceCube data **Middletown, CT**
Poster Presentation at APS CUWiP at Wesleyan University *January, 2016*
Authors : **Eesha Das Gupta**, Naoko Kurahashi Neilson, William Giang

Seasonal Variation in Atmospheric Neutrinos using IceCube data **Philadelphia, PA**
Poster Presentation at STAR Summer Showcase *August, 2015*
Authors : **Eesha Das Gupta**, Naoko Kurahashi Neilson, William Giang

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

Ask An Astronomer Service **Toronto ON**
Volunteer *2020-Present*
I answer the Ask An Astronomer email service for universe.utoronto.ca.

AstroTours at the University of Toronto **Toronto ON**
Master of Internet *2019-Present*
I manage the website, social media, and email account for AstroTours at the University of Toronto.

Graduate Astronomy Student Association (GASA), University of Toronto **Toronto ON**
GASA Tea Master *2019-20*
I co-hosted weekly department tea hour on behalf of the Graduate Astronomy Student Association (GASA)

Drexel University Women in Physics Society **Philadelphia PA**
Vice President *September 2017–June 2018*
I helped with budget allocation, organizing social activities, and co-ordinating conference travels for organization members. I also actively coordinated the organization's outreach efforts

Drexel University Women in Physics Society **Philadelphia PA**
Treasurer *September 2015–June 2017*
I managed finances, allocation of funds to events, assisted with fundraisers, and wrote grant proposals for funding. I was also the primary point of contact for outreach activities.