

Eesha Das Gupta | PhD Candidate

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

✉ dasgupta@astro.utoronto.ca • astro.utoronto.ca/~dasgupta

Education

Academic Qualifications.....

- **University of Toronto** **Toronto, ON**
PhD Candidate **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, L^AT_EX, 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 H α 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

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

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

I marked student projects and exams, facilitated observing nights, and invigilated midterms and final exams.

Toronto ON

Fall 2022
- Teaching Assistant : The Sun and its Neighbours (AST101)**

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

I marked student projects, answered email inquiries, and managed discussion boards.

Toronto ON

Summer 2022
- Teaching Assistant : Life on Other Worlds (AST251)**

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

I marked student projects and exams.

Toronto ON

Winter 2022
- Teaching Assistant : The Sun and its Neighbours (AST101)**

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

I marked student projects and exams.

Toronto ON

Fall 2021
- Mentorship Committee Chair**

○ *Graduate Astronomy Student Association (GASA), University of Toronto*

I coordinated mentorship programs within the astronomy graduate student cohort at the University of Toronto.

Toronto ON

2020-21
- Teaching Assistant : Stars and Galaxies (AST201)**

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

I facilitated online tutorials and marked student projects for the course.

Toronto ON

Winter 2021
- Teaching Assistant : Observational Astronomy (AST301)**

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

I marked student projects and facilitated online programming tutorials for the course.

Toronto ON

Fall 2020
- International Student Coordinator**

○ *GASA Mentorship Committee*

I organized and compiled information for incoming international students and made sure the information is readily available to students.

Toronto ON

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

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

I marked midterm exams, final exams, and student projects for the course.

Toronto ON

Winter 2020
- Teaching Assistant : The Sun and its Neighbours (AST101)**

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

I helped with organizing observing nights, grading, and invigilating midterm and final exams.

Toronto ON

Fall 2019
- Physics/Maths Tutor**

○ *Rajghat Besant School, Krishnamurti Foundation of India*

I helped academically weak high school students with their physics and math curriculum.

Varanasi, India

October 2018–March 2019
- Peer Mentor**

○ *HHMI Sustaining Excellence Program at Drexel University*

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.

Philadelphia PA

Fall 2016, Fall 2017

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

Outreach and Science Communication

- **Astromania : The Astronomy Card Game** **Toronto ON**
Developer *2022-Present*
 I am developing a card game that captures the workings of real life astronomy research in its game mechanics. More info on the project [here](#).
- **AstroTours at the University of Toronto** **Toronto ON**
Co-Director *2021-22*
 I served as the co-director of AstroTours, a monthly astronomy public talk and outreach program at the University of Toronto featuring early career researchers. I managed the administration, finances, and assisted with volunteer management and overall operations of the AstroTours executive team.
- **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 *2019-2020*
 I managed the website, social media, and email account for [AstroTours](#) at the University of Toronto.
- **TeenSHARP** **Camden, NJ**
Tutor *2014-2018*
 I volunteered as a physics and math tutor for black and latino middle and high school students from low-income economic backgrounds as a part of the [TeenSHARP program](#).
- **Moder Patshala** **Philadelphia, PA**
Tutor *2015*
 I volunteered as a physics and math tutor for Moder Patshala, an after-school program for children of Bangladeshi-American immigrant families.

Department and Service Activities

- **Graduate Astronomy Student Association (GASA), University of Toronto** **Toronto ON**
GASA Tea Master *2019-20, 2021-22*
 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.

Talks

- **Towards Making an Astronomy Card Game** **Sydney, Australia**
Plenary Talk at the IAU CAP Conference 2022 *September 16, 2022*
 Talk on making of Astromania: The Astronomy Card game, at the time of its Kickstarter launch.

- **Webb's First Look at the Universe** **Toronto, ON**
UofT Family Care Office Family Event *September 2, 2022*
 Short public talk on the launch, workings, and first discoveries of the James Webb Space Telescope.

- **Star Talks** **Toronto, ON**
AstroTours Keynote 2022 *September 1, 2022*
 Stargazing session accompanied by a short talk on how people from Ancient India charted the night sky and captured science in their stories, mythology, and culture.

- **Stories from the Other Side of the World** **Online/Richmond Hill, ON**
Richmond Hill Public Library *July 25, 2022*
 Online talk on how people from Ancient India charted the night sky and captured science in their stories, mythology, and culture.

Poster Presentations

- **Discovering the Universe with AstroTours** **Sydney, Australia**
Poster Presentation at the IAU CAP Conference 2022 *September, 2022*
 Authors : Simran Nerval, **Eesha Das Gupta**

- **Impact of Novel RSG Wind Mass Loss Rates on Compact Object Mergers** **Online**
Poster Presentation at 2021 International HPC Summer School *July, 2021*
 Authors : **Eesha Das Gupta**, Maria Drout, Katie Breivik

- **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 TiSe₂ 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 TiSe₂ 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