



THE GRADUATE SCHOOL

Application for Graduate Admission Supplementary Application – Astronomy (ASTR)

Please upload the response to the questions below to the *Uploads Requirement* section (*Supplementary Application*) of the online application.

Last Name Mahmudunnobe First Name Md Middle Name
Date of Birth (MM/DD/YY) 08/08/2000

Supplementary Application

Please respond briefly to the following questions:

1. Why are you interested in a Ph.D. in Astronomy?

I became interested in astronomy since my active involvement in International Astronomy Olympiad as a participant and later as a trainer and leader. Through my diverse academics and research experiences, I have honed my research interests in observational astronomy using machine learning-based approaches. Astronomy is a subject that always captures how insignificant we are compared to the vast universe, yet how dedicated we are in our understanding of this cosmos. I also want to take part in this quest for knowledge; I want to understand the beauty and mystery of this universe. This is what motivates me to pursue a research career in astronomy, particularly in stellar and galactic observational astronomy.

Another motivation that drives me is my community. I always remember which community I came from and how the lack of resources can be a barrier to STEM education there. Thus, in the long run, my goal is to advance astronomy research and increase accessibility in astronomy education through global collaboration. I believe that a successful grad school program will give me the knowledge, skills, networks, and opportunities to achieve my dream.

2. Why are you interested in the University of Maryland?

The University of Maryland College Park's Astronomy Graduate Program presents me with unique and enriching opportunities to build on my research experience in star clusters and my programming skills in mathematical modeling to collaborate with renowned faculty members. I am particularly interested in researching star and planet formation and star cluster dynamics under the *Galactic Astronomy* subgroup and the theoretical modeling of galaxy formation and evolution under the *Cosmology* subgroup of the *Center for Theory and Computation*.

I am also greatly interested in the numerical modeling of solar system dynamics under the *Planetary* group. Using my expertise in programming, deep learning, and numerical simulation, I would be thrilled to contribute to Dr. Hamilton's work to understand the dynamics of the solar system and star cluster, Dr. Richardson's work on inspecting the origins of the solar system as well as his work on the computational approach to understand the evolution of small solar system bodies, and Dr. Diemer's work on star formation histories in galaxies and investigating structure formation through modeling. Moreover, the University of Maryland would be ideal for me as it presents opportunities for collaboration with NASA scientists through CRESST II and the Joint Space-Science Institute and other cluster computing facilities.

3. Why are you interested in the research areas that you selected under the “Areas of Interest”? (in the Educational Intent section of the application)

The specific research area I chose is the following (in order): Stars and Star Formation, Observational Astronomy - Optical and Numerical Simulations.

Two things drive us to a specific research area: exposure and my interest. Most often, we only got interested in the field to which we got exposed, and we had the chance to learn more about that. If and when we got exposed to multiple areas, this is where we can truly bring in our interest and select the path which fascinates us most.

I am still in the first phase of my journey toward astronomical research. I chose the star formation as my first choice because this is the only area where I have research experience. And since my first research, I have enjoyed unveiling these twinkling stars' mysteries. I want to know more about how the protostellar cloud converges into a star, what type of processes and feedback this generates and how it impacts the stellar structure and evolution. The study of stars is still predominantly dependent on our optical observation, and this is why I chose optical observation as my second interest.

The third choice is again an area where I got exposed more, and I was able to hone enough skills to work on that area. As a physics and Data Science major, I need to take several computational modeling courses. And my favorite course was the numerical simulation of the physical systems, where we simulated from N-body systems to computational fluid dynamics. I want to apply this skill to understand the star formation process even better.