

# Statement of Purpose of Sarker Anik Iqbal

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As a young man having the first glimpses of science, things that captivated me most were galaxies, stars and the outer space. When I was in my 11<sup>th</sup> grade, I watched a TV show on black holes and got so spellbound that I couldn't keep it out of my mind. I kept on watching television programs on space and universe and started reading science magazines. As I watched, read and listened, I came to know that the subject that deals with these is Astrophysics. As I moved from secondary level to undergrad, the passion for astrophysics and space sciences only grew in me and propelled me towards the exciting world of physics.

I qualified in the 2004 admission test of University of Dhaka, the top ranked university in Bangladesh and got myself admitted to the Department of Physics. At the inspirations of our knowledgeable faculties, I started reading advanced physics books and attending weekly seminars in which researchers and faculties from different universities discussed many engrossing topics. In my junior year I attended a 3-day long seminar workshop on Astrophysics, where internationally renowned scientists like Professor Jamal Nazrul Islam delivered lectures. These lectures broadened my mind and stimulated my thoughts to a greater extent.

In my undergrad program, I enjoyed quantum mechanics, plasma physics, solid state physics and computational physics. As an MS student of the Department of Theoretical Physics, I am currently studying general relativity and cosmology, quantum field theory, equilibrium statistical mechanics and condensed matter physics. As I find general relativity and cosmology very fascinating, I look forward to explore further into it.

I enjoy solving challenging problems in quantum mechanics and electrodynamics. I am a member of a campus study group where we collect difficult and non-standard problems from books and websites and try to solve them both analytically and computationally. In our study group, we frequently face problems that can't be solved analytically. As I know C++ from my school days, I try to solve them by computer programming. In my junior year, I took the programming and scientific computing course. At that time, I created a model of solar system as an assignment, in which the trajectories of all the planets were plotted on a graph using C++. I am currently concentrating on simulation based problems and plan to investigate the scope of using parallel algorithm techniques in physics simulations.

My thesis work is on fuzzy physics in which we investigate the behavior of superfluids under different external magnetic field influences. This project needs an extensive knowledge of quantum field theory and proficiency in computer simulations. I am confident that this project will greatly enhance both my analytical and computational abilities.

Purdue University has active research groups working on the areas that enthrall me most. The areas where I am confident to be useful and contributive are high energy, extragalactic and plasma astrophysics. I am particularly interested in astrophysics of black holes, gamma ray bursts, dark matter detection and galactic dynamics. If asked about my other interest areas, I would like to name nanoscience and quantum information. I can use both my analytical and computational skills to carry out worthwhile researches in these areas.

My supervisor noted once, "Physics is the most social science; physicists come from the society, and after earning a PhD, return to the society." After completing PhD, I want to return to Bangladesh and pursue my career as a teacher in a university as well as a researcher. I want to lead the younger generation towards the magical world of physics and at the same time contribute to researches on areas relevant to my expertise and interest.