Statement of Purpose

The discovery of any new material has influenced the lifestyle of the human race. The unearthing and usage of materials have classified primitive men into different ages like stone age, copper age, bronze age, iron age, etc. The gradual transition in lifestyle brought in by these materials had inculcated a curiosity in me even from my school days. Now, we have reached the digital age, where semiconductors rule the world because of their unique material properties.

My desire to know more about materials encouraged me to choose polymer science and engineering as the major for my undergraduate program. Polymer science and engineering in Cochin University of Science and Technology (CUSAT), India helped me gain knowledge in materials science and devices by providing courses such as plastic materials, polymer nanocomposites, polymers in electrical and electronics, thermodynamics and reaction engineering, and polymer physics and rheology etc. Polymers can be undoubtedly called as wonderous materials because of the unique properties they possess. During my third year of undergrad studies, I was fortunate to be a part of Prof. Sailaja's research group, where research primarily focused on the development of biomaterials. I approached her with the intention to be a part of some of her research activities. On seeing my genuine interest in the field and being quite impressed about my interdisciplinary idea, she authorized me a project and also helped me to find a position to carry out research works as a project student in her laboratory. I was able to functionalize nanocellulose derived from *Agave americana* which was later taken over by her group to develop a magnetically modulated nanocellulose for drug delivery and magnetic hypothermia application. I was fortunate enough to work to Prof. Prasanth Raghavan on the recycling of medical face mask during the COVID-19 pandemic period which bagged 1st prize in Kerala Science Congress. My B.Tech final year project in Indian Space Research Organization (ISRO), space agency of India, has helped me to understand the importance of materials development taken by every space agencies around the world. I was working with the propellant engineering research group to develop a synthetic and non-carcinogenic inhibition system for solid rocket motors. The tea-time discussions and the work experience with the brightest scientists of our nation indeed inspired me and I had decided to further explore the world of materials.

The thirst for exploring the materials world other than polymers lead me to pursue master's degree in Materials Science and Engineering from Indian Institute of Technology (IIT) Patna.

The courses provided by IIT Patna such as advanced materials characterization, materials processing and technology, structural and functional properties of materials, composite science and technology, rubber science and technology, alloy development, etc. has opened the complete potential of materials science to me. Meanwhile, the material graphene attracted my attention because of its astonishing properties. I was fortunate enough to meet Padmashree Dr. S Sivaram during this time and he extended his kind concern to co-supervise me for my M.Tech project and also he encouraged me to work on graphene like materials. Currently, I am working on the research project titled "large scale synthesis of few layers graphene using low shear mixing machineries" under the supervision of Dr. Dinesh Kumar Kotnees and co-supervision of Dr. S Sivaram. I gained hands-on experience on various processing and characterization techniques like ball milling, Haake internal mixer, Raman spectroscopy, XRD, UV-Vis spectroscopy. I am also expecting to use more characterization tools like HRTEM, XPS, AFM, and TGA in due course.

With an ossified background of working in various interdisciplinary projects and strong academic foundation, I am keenly interested to pursue my doctor of philosophy through the IIT Kharagpur – University of Manchester dual doctoral degree program. Many alumni, faculties, and friends who have pursued their studies at IITKGP and University of Manchester stated the uniqueness, standard and multi-cultural environment that makes it tremendously extraordinary. As a result of my thorough research regarding both the institutes, I have learned that, here one doesn't need to think twice while risking their hands-on creativity, where original thinkers are motivated courageously to take initiative for their dream projects with utmost cooperation by the world's most accomplished scientists working alongside who can help expand my fundamental knowledge of science, who can push me beyond my limits to redefine myself into a better scientist. Being a self-motivated student, who has an utter passion for novel/interdisciplinary ideas, this program seems to be quintessential destination.