Mathematics and physics were my favourite subjects in school. The thrill of independently testing the theories I'd just learned through simple experiments and seeing how closely the formulas matched the data fascinated me. I also realised that in both of these areas, delight and irritation went hand in hand, and, strangely, I enjoyed the struggle I had to go through when I was caught in a rut since, in the end, I always learnt something new.

This pattern continued during my undergraduate education when I majored in mechanical engineering. I found that solving real-world problems and finding for solutions to diverse occurrences around us were my passions. For example, one study that amazed me was on how birds fly and the prospects of artificially replicating it because it can save a significant amount of fuel required to fly. My interest narrowed down to fluid mechanics and heat transfer during my undergraduate studies. What I liked best about these courses was how intricate these systems are, and how difficult it is to predict them using simple analytical tools. I contacted Prof. Shantanu Pramanik at my institute for more guidance, and he introduced me to Computational Fluid Dynamics. I read numerous papers and books at first and implemented the algorithms through my own computer codes and validated the results to gain a thorough understanding of the subject.

I also took advantage of the extra time I had due to the pandemic's lockdown. I started a project at IIT Kharagpur under Prof. Rajaram Lakkaraju with the goal of learning how to conduct research professionally. The challenge we tackled was rather simple, involving the emptying of a bottle, but it was intriguing to see how complex such a simple system might be in terms of physics. I learnt how to conduct a literature review, identify the issue statement, pose questions, and organise the entire project in the most efficient manner possible. In terms of skills, I learned OpenFOAM, advanced visualisation using Python, and how to run simulations in High-Performance Computing clusters, modal decomposition techniques, and using LaTex for scientific writing. This project gave me hands-on experience in every stage involved in researching, starting from literature review to development of the manuscript.

Apart from this I also got introduced to Lattice Boltzmann Modelling (LBM) of fluid flow and heat transfer. I worked with jet flows using LBM under the guidance of Prof. Pramanik at my institute and I employed my computer codes for running the computations. I also got the taste of attending a conference when I participated in ISHMT-IHMTC 2021 at IIT Madras and presented our work in laminar jet flows using LBM. I believe that theoretical and practical exposure to any field should go hand in hand for best results and I practiced the same throughout my undergraduate research. I converted my computer to a mini-laboratory to visualize what I studied with full awareness about the implementation. These earned me confidence, helped

me minimize errors, and analyze the results, without which the study has no meaning.

It has taken a long time and numerous experiences to help me find my true passion. I am grateful to every person involved in the entire process for their valuable insights and will do my best to pay forward. I have experienced the joy of exploring the secrets of nature and I am determined to investigate further and hope to contribute to the field of fluid mechanics. To be specific, I am keenly interested in studying multiphase flows through non-conventional and self-learning models. I would also like to have some exposure in experimental studies during my doctoral studies. Cavitation is one such complex and interesting phenomenon and the project title which involved a mesh-free method like SPH intrigued me a lot. This phenomenon is abudantly observed in natural and industrial systems and the intricate details about their interaction with surroundings and the energy evolution in these flows can give useful insights. The joint doctoral programme hosted by IIT Kharagpur and University of Manchester provides the best setting for me to channel my enthusiasm and realise my ambition of making a contribution to science. I believe this opportunity if given to me will provide me with the ideal environment in which to learn and develop new skills that will not only enable me to conduct independent research in the future, but also to pass on those skills to future generations and inspire them to conduct research.