

I, Brinti Mondal, am currently enrolled in the M.Sc.-Ph.D. program in Energy Science and Engineering, at IIT Bombay, India. Currently, I am working in the field of Electrochemical Energy storage systems.

During my bachelor's, I graduated in Chemistry with Chemistry being my major subject along with Physics and Mathematics being my minor subjects. In my master's program which is an amalgamation of Physics, Chemistry, and Material Science togetherly with an overall interdisciplinary knowledge, I learned and credited several courses on thermodynamics and statistical mechanics, electrochemical energy storage, methods in analytical technique, to enhance my knowledge in the field of electrochemistry and supercapacitors. So, having diversified research interest in supercapacitors, electrochemical cells, and energy storage and devices.

Currently, I am working on the application of metal oxide doped metal-organic framework (MOF) in the field of electrochemical energy storage systems, specifically in supercapacitors. I have done the literature reviews on "Flexible Supercapacitor" and "Application of metal oxide doped MOF on supercapacitors". My research plan included the optimization of synthesis techniques and various synthesis conditions and the use of various electrolytes, specifically "Redox-additive electrolytes" and "Room Temperature Ionic Liquids (RTILs)", to enhance its capacitance, energy density without sacrificing the high power density and thermal stability over a long period. But due to pandemic, with the limited options, I have focused on understanding "The synergy amongst various metal oxide, suitable for doping on MOF for supercapacitor application" and then I learned "EIS analysis with PNP and MPNP modeling".

In support of my candidature, that I have done a short-term internship, under **Dr. Smarajit Polley, at Bose Institute**, in the Bio-physics lab. Though previously I was introduced to characteristics of graphene oxide (as a electrode material for supercapacitors), my internship introduced me to its another important application, when I did the literature review on **"bioelectrochemical systems integrated with membrane-based technologies for water and wastewater treatment"**. This particular interest kept growing and as a part of my research interest I found that my proposal **"Desalination of saline water by Fe-Al impregnated Graphene oxide electrode-Membrane Capacitive Deionization (MCDI)"** can be a perfect match for the as proposed project **"Synthesis of graphene and graphene- based composites using agriculture waste for desalination"**.

I believe my earlier projects and experience have made me competent enough to apply for, keeping in mind the high research values at your place.

I firmly believe that my exposure to various research projects has trained me in undertaking rigorous research. It has made me conversant with essential research methodologies, reviewing research literature, proposing innovative ideas, gaining proficiency in scientific writing, polishing my presentation skills, and working collaboratively in laboratories. I believe in simultaneously achieving individual excellence, along with committed teamwork towards goal-oriented tasks. I have forefronted several team projects during coursework and have organized co-curricular activities which have strongly enhanced my leadership qualities. I have mentored my juniors in the master's program and been a part of social events.

Given a chance, I am confident about contributing positively with my knowledge, and being a part of the activities in your group would expand my research horizon in return.