

Letter of motivation

I am very delighted to know about the Ph.D. application advertisement from the Nicolaus Copernicus University within the Doctoral School of Science and Natural Sciences-Academia Scientiarum Thoruniensis (AST). While I was going through the research domain of Paweł Tecmer, I found an impressive track record of achievements, and the best thing that attracted me was the description of the projects, which says *"Novel quantum chemistry approaches for modeling charge transfer properties in organic electronics"* and *"Advancement of pCCD-based methods to modeling electronic structures and properties of organic solar cells"*. I always had the curiosity to explore the new dimension, and since we all know that experimentally we are restricted with our techniques and tools, which was mentioned by Paweł too, *"Since experimental manipulations with possibly large amount of organic compounds are very time-consuming, the optimization of new and promising organic photovoltaic compounds can be more efficiently done with computer simulations at the quantum level."* I truly agree with it, and so I would like to become a part of such an exciting project where I could apply my knowledge from my organic background to the project, which would be a synergistic approach. I have some programming skills in Python that would be beneficial for the implementation of the project, and I am ready to acquire new skills as required. I had always been a top rank holder during my Bachelors and Master's, which could be justified from the rank scored, i.e., **All India Rank 10, where thousand candidates appeared in the exam**, and have many more such achievements which I have added to my CV. Here I want to justify that I am ready to take on new challenges in a positive way, as demanded by the project.

My curiosity to explore new things and work for better understanding started during my Master's study in India, when I was involved with Prof. B.K. Patel and his research group at the Indian Institute of Technology Guwahati (IITG). The graduate seminar course helped me a lot to shape my research skills during my master's study. I got the highest grade in theory, practical, and project of organic chemistry, which raised my interest in research, but the main exposure was during the presentation of my project work to Prof. P.S. Mukherjee (IISc, Bangalore, India), through which we had a lot of interaction. My publication shows how fascinated I am with the research field. Upon reflection on my past research experience, I have learned to be more adaptable. These qualities make me suitable for this Ph.D. position.

While getting into the details of my publication, my main objective was the synthesis of natural products like compounds with privileged scaffolds that are likely to have potential biological activities. Indoloquinoline(tetracyclic-fused quinoline) alkaloids were the result of Microwave Assisted Cascade synthesis, which is one of the most important classes of heterocycles due to their immense biological activity, including the ability to interact with DNA as an intercalator to inhibit topoisomerase II activity. According to recent results, some new indolo[2,3-b]quinoline types of natural products isolated from the leaves of *Justicia betonica* exhibit exceptional pharmacological properties, such as potent antiplasmodial, antiproliferative, and antitumor activity. Indoloquinoline alkaloids are an integral part of the design, development, and synthesis of various modern commercial drugs and other biologically active polycyclic heterocycles.

I know that my Master's thesis is not so close to the field of this project, but still, the idea is development for a better future. I would like to use my full knowledge for this project as an organic chemist and have the flavour as *Theoretical Physicist*.

Moreover, the background of my Master's program had quantum project work and seminar courses, which makes me suitable to undertake this field of research. My research experience makes me capable of overcoming obstacles and challenges in research. My optimistic attitude and adaptability make me perfect for the field of research. So I would be very proud to join and work with his innovative team of well-established organisations, where I shall get the opportunity to prove myself successfully in a highly motivated and progressive environment that dynamically works towards the growth of the organisation. Thank you for taking the time to read my letter. I am very excited and looking forward to having further discussions.