

I still remember the day when gravitational waves were first detected at LIGO. I sat on our sofa reading an article about it while being completely amazed. I decided to read “The Big Questions: The Universe” by Stuart Clarke. After I read the chapter on black holes, I knew that physics was the right path for me.

This went hand in hand with my already strong interest in mathematics, in which I had already been competing on a high level. In 3rd grade, I won Kalmar, the most prestigious maths contest for that age group. This was a great experience that inspired me to study even harder. In high school, I achieved 14th (2019) and 6th place (2020) at the Mikola National Olympiad. I came in 8th (2020) at the Szilard Competition in Modern Physics. Preparing for this was quite challenging since the curriculum included topics like the uncertainty principle, the energy released in fusion processes, and working with the Schrodinger equation. I achieved 17th place at the National Mathematical Olympiad in 2021. I am especially proud of this since I was competing against students a year older than me. Throughout high school, I have solved the monthly maths and physics problems of the Mathematical and Physical Journal for High Schools. These problems often required days of research and thinking. Participating in team competitions taught me how to communicate efficiently and work in teams. In Durer, our team came in 2nd in mathematics (2020), and the following year we won in physics.

To pursue my interest in physics, I visited the International Physics Olympiad training sessions, where we solved advanced problems that often required higher-level mathematics. It really amazed me how easily some challenging thermodynamics problems can be solved using entropy. I enjoyed taking part in an experimental study group organized by the Budapest University of Technology. My favourite experiment was measuring the viscosity of air and the surface tension of a soap solution. Due to my interests in mathematics, I decided to participate in the bi-monthly Erdos Mathematics School, where the most recognized teachers come to teach talented students advanced mathematics over the whole weekend. We also discussed topics like Ramsey numbers and the Riemann zeta function, which showed me the edge of modern mathematics. As an addition to the camps and training sessions, I joined Milestone Institute of Advanced Studies. Learning advanced integration techniques in the Calculus modules proved to be extremely beneficial in solving different physics problems. Proving Euler’s formula using the Taylor-series and the irrationality

of pi showed me how powerful calculus can be. I also took English-speaking modules on Linear Algebra, Mechanics, Electromagnetism, Markov Chains, and Academic Writing.

In addition to mathematics and natural sciences, I also became really interested in computer science. With my interest in quantum mechanics, I decided to research quantum computing on my own. Using IBM's Python-based qiskit library, I was able to simulate many different quantum environments. It was immensely satisfying to finally apply all the knowledge I acquired at Milestone and Erdos in an applied way. Besides giving me a good intuition on how quantum algorithms like Grover's Algorithm or the Quantum Fourier Transform operate, I also got introduced to the concept of Hilbert spaces, matrix exponentials, and unitary matrices.

I think that the greatest achievement of my education is my ability to grasp the beauty and elegance of the symphony that lies behind the theories of physics and mathematics. I aspire to become a lead researcher, I believe the cutting-edge facilities and world-renowned professors of UK universities provide the best environment for that to come true.