

Name: Robert Leske

Year in Course: 3rd, Senior Year

Topic: Computational Chemistry

Mentor: Dr. Raymond Kapral, University of Toronto;
Dr. Dennis Salahub, University of Calgary

Title: Investigating the Vibrational and Electronic Effects on the Efficiency of Electron Transfer in Photosynthesis using Quantum Mechanics Simulations

Bio:

Robert Leske, known to most as Robbie, is a senior in the science research course at Pawling High School. He has always been interested in science and understanding why things happen the way they happen. Early in his school career, chemistry was his passion, and in high school, he became enthralled by physics, especially the field of quantum mechanics. In science research, Robbie went into the field of computational chemistry to pursue his passion for both of these sciences. His multidisciplinary research is also pertinent to the field of biology. The interplay of these various fields and the search for the most thorough understanding of phenomena around him excite his inner polymath. He is currently using quantum mechanics to simulate the dynamics of chlorophyll in different environments in order to understand how photosynthesis maintains high levels of efficiency. Systems like these have been shown to rely on quantum mechanics for the observations we make on the large scale, but the mechanisms are still unknown. He is very proud to be able to contribute to such an alluring and novel field of research.

In his free time, Robbie is a proud member of the Pawling mock trial team and math team, the former of which he has taken a minor leadership role. He is also a devoted member to the Pawling academic honor societies barring French, of which he is the vice president of the Science National Honor society and secretary of the Math Honor Society. His largest commitment outside of school is baton twirling. Robbie competes on state, national, and world levels with his team, the Silver Starlites. He has been a national champion in solo, two baton, three baton, and rhythmic for many different years. Additionally, he represented the US at the WFNBT world championships in Lillehammer, Norway in 2018 for his two baton routine. At this competition, Robbie placed third in the world.

Robbie will be attending North Carolina State University in the fall for physics, with hopes to continue his career into scientific research. He looks forward to twirling at state while furthering his education and making scientific connections. It is with great excitement that Robbie shares his research as the culmination of his past three years of work in this course and the final product of his high school career.

