

Hello, I am John Galletta and I am from Smithtown, New York. I began research at the Laser Teaching Center in July of 2020 entering into my sophomore year at Smithtown High School West. My father was my first introduction into physics when he and I would watch shows like *How the Universe Works* with Morgan Freeman when I was far too young to even remotely understand them at about ten years old. Because of my love for science fiction in the form of Star Wars and Star Trek, I was eager even then to learn more about the intricacies of physics. When I reached middle school I began to read books that gave me at least a conceptual understanding of classical physics concepts and an extremely rudimentary understanding of relativity and quantum [physics]. During this time, I taught myself Python which I learned was great for entry-level computer science and was used in many physics labs. After reading The Science of Star Trek, I decided that I wanted to seek out a career in physics. Until high school, I continued to read conceptual books about physics, especially quantum field theory and quantum computing, but I never was able to form a deep understanding of either due to my lack of mathematical knowledge.

When I entered high school, I immediately advanced in math courses, and in my sophomore year, I entered into the science research program at my school. Knowing that I would need to find a mentor outside of school to pursue research into physics, I reached out to a number of research groups and was honored to become a member of the LTC. My first introductory work included experimenting with the thin lens equation and Gaussian beams, but my current area of interest lies in finding optical models for gravitational waves. As a high schooler, the mathematics behind relativity are daunting to say the least, but I am lucky enough to be able to work with Professor Khuri from the Mathematics Department and Dr. Jones from the LTC to grasp the math and procedure of theoretical and experimental physics and to progress in creating optical models for gravity.