

Hi, my name is Michael Dapolito and I am from Merrick, NY. I began research when entering my junior year as a Physics major at Stony Brook University. I have always been interested in animals, biology and environmental science but did not know much about the field of physics. I was first introduced to physics and chemistry when I read, *A Brief History of Time* by Stephen Hawking. After reading *A Brief History of Time*, I decided I wanted to study chemistry. During my second semester at Stony Brook, I took my first physics class and then quickly switched my major from chemistry to physics. In the fall semester of 2017, I began undergraduate research in the Laser Teaching Center. My first project was optical tweezing but I am currently working on building a Fabry-Perot interferometer.

Joining the AMO (atomic, molecular and optical) physics research group in the Fall of 2017 has given me the opportunity to pursue the problems that interest me most and allowed me to learn about some of the most interesting and challenging questions in AMO physics today, outside of the standard undergraduate curriculum. Two of my experiments have focused on understanding some fundamental properties of light, namely, how to fully describe the resulting signal in a double-slit interference experiment using entanglement, and how light behaves at the single photon level via a Bell's inequality measurement. The other projects I completed focused on frequency locking and stabilizing lasers. I designed and constructed a Fabry-Perot interferometer that was used to accomplish frequency locking, and assembled a thermal feedback mechanism to achieve laser stabilization. These experiments have provided me with both technical hands-on skills and a better understanding of the underlying physics of lasers and light. My experiments in quantum optics and in classifying the signal from double-slit interference qualified me for an invitation to give poster presentations at the 2018 and 2019 Frontiers in Optics conferences. Attending these conferences has allowed me to experience and participate in the world of physics beyond laboratory research and the classroom in order to further my growth and professional development.