

Name: Logan Grove

Year in Course: 3rd, SeniorYear

Topic: Quantum Information

Mentor: Dr. Cortiñas, Yale University

Title: Finding Quantum Solutions to Classical Problems:
How Quantum Mechanics Can Solve Problems That Are
Classically Impossible To Solve

Bio:

Logan Grove is a Senior in the Science Research Program. He is currently heavily academically involved, taking 5 AP's in addition to Science Research. In 1964, John Bell published a paper providing an experiment that showed how quantum entanglement did not allow particles to communicate. In this paper, he included the Bell Inequality, which has some astounding applications. Using the properties of quantum mechanics like entanglement and superposition, Logan has been working on using these theories to attempt partial quantum communication. Over the past two years, he has worked with his mentor Mr. Rodrigo Cortiñas to develop his research. He has worked extensively to develop his knowledge in the topic as well as coding in Python to develop control experiments. He is studying how the effects and special properties of the Bell experiment and qubits can be applied through to real life applications for communication.

He finds this project interesting because, for him, understanding quantum mechanics gives a glimpse into how the world functions on the most basic, "true" level. It also brings up some very interesting philosophical arguments, as the concept of realism, (whether or not something really exists) becomes blurry. He has always loved science, and discovering how things work. Quantum mechanics, despite its challenging and convoluted nature is appealing because of what it reveals about the true nature of reality. This class gives him the opportunity to have an actual excuse for spending hours a week "researching" quantum physics.

