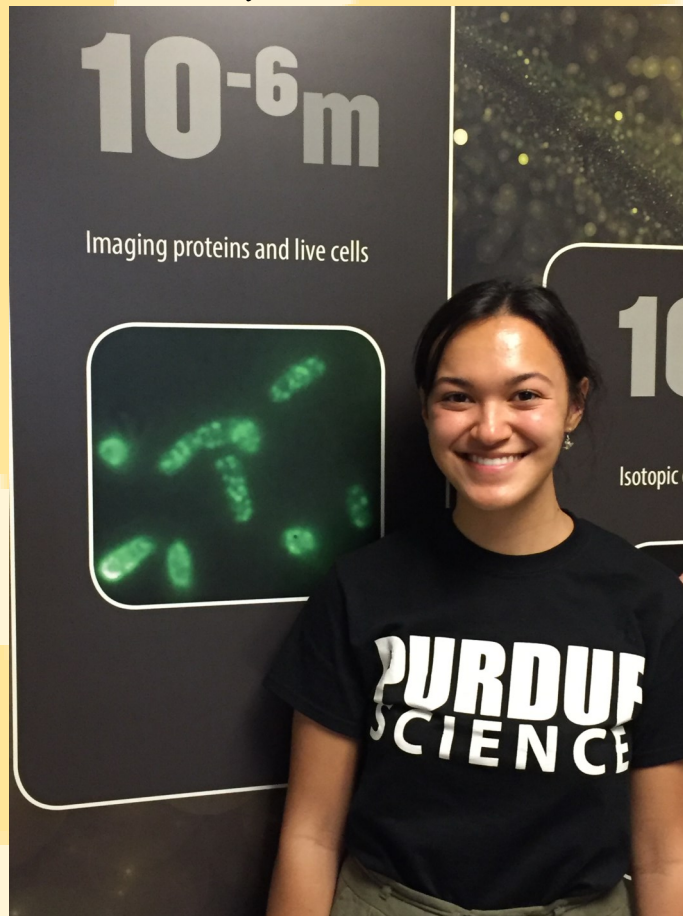


Department of Physics and Astronomy



Summer 2019— Abby Santos

Dr. Mugler's Group

The Monty Hall problem is a well known probability puzzle that is difficult for humans to solve, but it has been observed that much simpler organisms, like pigeons, are able to solve it quite easily. My project is driven by the question of whether even simpler organisms, namely bacterial populations, can solve their own version of the Monty Hall problem collectively through natural selection. The approach has been to computationally model genetic decision-making circuits that are common to many bacterial species, using an evolutionary algorithm to assess their success at finding the solution to Monty-Hall-like tasks. While developing problem solving skills, I have also been able to learn new programs. I am so thankful to have had the opportunity to work in Dr. Mugler's group. This experience has been a great foundation for whatever my future in physics has in store for me!