Dr. James Girard Summer Undergraduate Research Program
Faculty Mentor – Project Application

Due Date: ***January 17, 2020 by 5pm***

Faculty Name: Dr. John Parker

Department: Physics and Chemistry

Research Project Title: Influence of Marangoni Instabilities in the Self-Assembly of Nanophotonic Devices

Research Project Abstract (Please provide an overview of your project -- this will be shared with students as a project description; maximum 250 words):

We study the self-assembly of nanophotonic arrays by examining the recurrent ring patterns formed by the expanding contact line of the gold nanoparticle colloid evaporating in the cylindrical container. Experimental observations of the contact line dynamics and peculiarities of the ring structure evolution are analyzed by adjusting the drying drop concept for the toroidal geometry. These systematic studies will help us consider mechanisms of contact line pinning that defines the slip-stick motion in self -assembly. We will also stress the possible role of surfactant molecules present in the colloidal suspension that affect the hydrodynamic Marangoni flow in the meniscus.