Patrick McMillin
PHYS 493 Dr. Lau
2 March 2018

Colloquium Date: 2 March 2018
Colloquium Speaker: Dr. Daryl Preece
Colloquium Title: Throwing a Light on Problems in Cellular Mechanotransductors (using optically induced forces for studies of single cells)
Speaker Affiliation: Department of Physics and Astronomy at the University of California San Diego

Dr. Daryl Preece's research focuses on the use of optics and light to manipulate and study cells. Through the use of optical tweezers, his team can hold cells still and move them to particular locations. Additionally, through the use of polarizers and devices that add a phase shift to light waves, they are able to cause molecules to spin and rotate through the conservation of angular momentum. This is massively important since the rotation of a molecule that has a particular shape can cause a flow in the surrounding fluid. Flows within the cell or near the cell are very important, and are especially important to heart cells. In addition, the flows can manipulate the direction in which nerve cells grow. A future project that Dr. Preece will peruse is mapping fish neural pathways. This was the most interesting part of the talk to me, because studying the neural biology of living organisms can lead to medical developments for those who suffer from brain damage or neurological disorders. I would have liked Dr. Preece to talk more about these studies, and how these studies could lead toward advancements in medicine. I would have also liked him to talk more about how his team uses simulations and computational methods to aid in their research, which he mentioned only briefly. Overall I enjoyed the topics covered, and his presentation was very good. His slideshow incorporated small videos of experiments that he has performed, which gave a good visualization of what is going on at the molecular level and how his equipment interacts with the molecules.