UROP Project 2020: Passively morphing airfoil
Professor Theresa Saxton-Fox, Aerospace Engineering Department

New technology developed by Professor Kai James of the Aerospace Engineering Department allows for an airfoil to be built that can change its camber depending on the forces it experiences from the fluid. The airfoil can therefore change between a high-lift / high-separation configuration to a low-lift / low-separation configuration depending on the forces it sees. This project focuses on pinpointing a force level at which the airfoil should switch configurations, helping finalize the design of the airfoil for ideal aerodynamics, and performing experiments on the airfoil in a wind tunnel to test its behavior.

We are looking for someone who is excited, motivated, and eager to learn about fluid dynamics and experimental work. The student will get exposure to the experimental study of fluid mechanics and turbulent boundary layers, measurement systems such as particle image velocimetry (PIV) and hotwire anemometry, and basic coding in Matlab and LabView. The student will also gain skills in thinking through research plans and presenting research outcomes.