Tristan Grams

**Award:** NASA Internship Program; $6000.00

**Status:** Junior, Biology

**Advisor:** Christine Bolz

**Research Topic:** NASA Jet Propulsion Laboratory Summer Intern

**Abstract:** The establishment of a permanent human presence on the International Space Station (ISS) raised new questions regarding the microbial burden inside this closed environment. High-efficiency particulate filters (HEPA) have been installed inside the ISS to reduce the level of harmful microbes that may affect an astronaut’s health. While multiple studies have investigated bacteria within the ISS, no research has been done to detect the viruses that attack bacteria, bacteriophages, which can be used for biocontrol of bacterial levels. Bacteriophages specifically infect bacteria, replicate, and lyse the bacterial host cell, releasing new progeny. The goal of this interdisciplinary project is to isolate and characterize bacteriophages obtained from ISS HEPA filter samples. In the process of isolating bacteriophages, two Bacillus species were recovered and identified from the HEPA filters. This research allows for the potential application of bacteriophages in therapeutics and in the control of microbial burden in space.

**Biography:** Tristan is a biologist who is currently studies Bacteriophages from the International Space  
Station at Carthage College. Tristan will be conducting research with Dr. Kasthuri  
Venkateswaran on assessing the ability of a microgravity environment to promote the transfer of antibiotic resistance and virulence genes between bacteria at Jet Propulsion Laboratory. In the future, he plans to attain a doctorate in immunology, virology, and microbiology to conduct research at a NASA facility.

**Congressional District:** 1

**Congressional Representative:** Paul Ryan