

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Lift Off - Secondary Space Education (2)

Author: Ms. Isabella Piasecki
United States, bellapiasecki@att.net

Mr. Christopher Stephens
Merritt Island High School-NASA KSC, United States, cesflorida2015@gmail.com

EDUCATING AND INSPIRING THE NEXT GENERATION THROUGH CUBESATS

Abstract

This dissertation examines the creation of the Merritt Island High School-NASA KSC CubeSat “StangSat”, including the problems and solutions encountered when working on a cross-country program. StangSat was created in a partnership of NASA-KSC and Brevard County Schools in Florida. StangSat is the pioneering member of the Creating Understanding Broadening Education for Satellites (CUBES) program at NASA. Through the school, the group was given the task of creating a CubeSat that could measure shock and vibrations while on during launch, and transmit the data via a Wifi link to another satellite created by students at California Polytechnic Institute (Cal-Poly). The main problems encountered in the process were the technology used and the logistics of working on a pair of satellites across a continent. By being on and transmitting WiFi during flight, electromagnetic interference was likely between the CubeSats and the rocket they were travelling on. Through a series of testing, it was determined that using a hardened P-POD would minimize the interference. For many tests, several representatives from one of the groups had to travel across the country with the satellite to test the system with the other team. Later in the development process, the group discovered tools that allowed the teams to work closely without being near one another. The students were also given opportunities to test the satellites and the concepts involved - such as through a suborbital Garvey rocket launch and the program’s application to the CSLI.

Through NASA, the students were supplied with mentors, a lab, and funding to help them with the process. Students spend many hours of their own time developing the concept, satellite, and programming to ensure the mission is successful. Overall, StangSat has tested the satellite through means such as Day in the Life (DITL) tests and meeting with government officials to get cleared to launch, as any other satellite undergoing development would. The students believe that the satellite will achieve all of the mission goals during the satellite’s launch later in 2019, and provide valuable shock and vibration data that will be the first of its kind. This data will be used to help future CubeSat satellite programs with their development. Through the StangSat program, a fluid system has also been developed to allow for transcontinental cooperation on detailed projects. The success of the Stangsat program has proven the concept that the CUBES program works on the high school level.