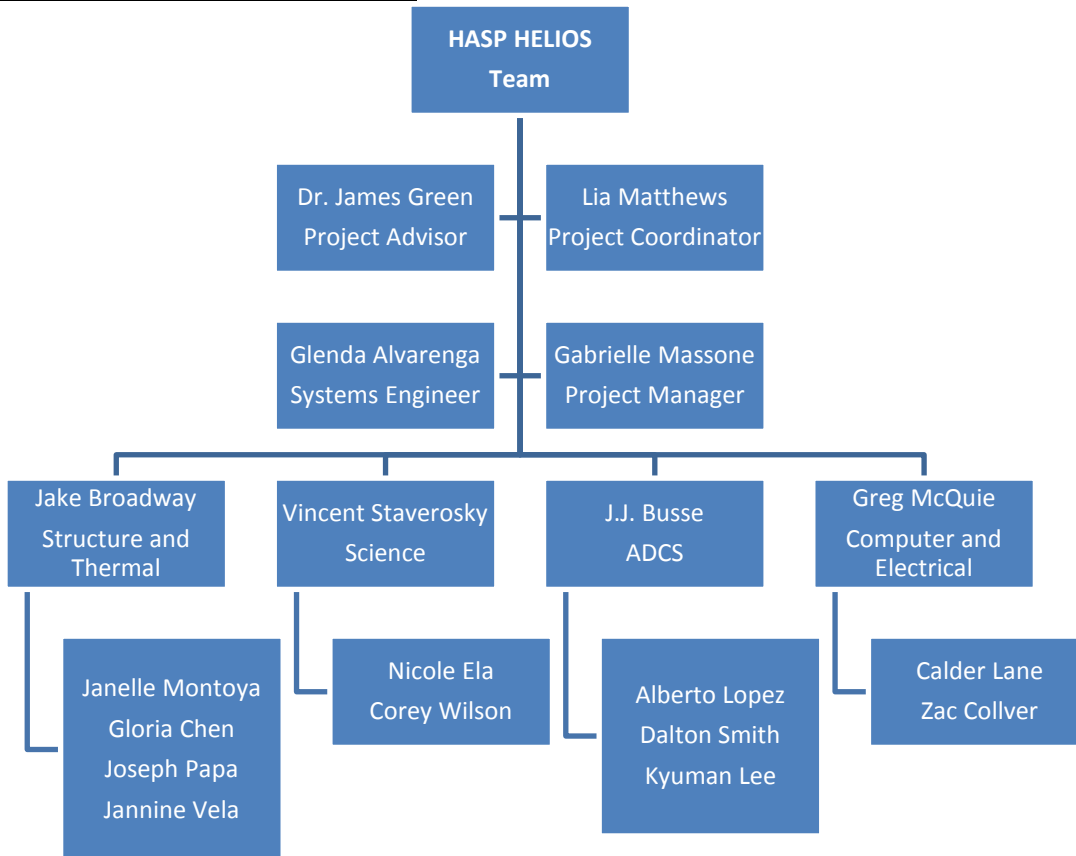


## Monthly Status Report: January

### Overview since 12/16/2011:

After submission of our proposal on December 16, 2011, the HELIOS project has recruited four new members and has lost two. We have completed a considerable portion of the Conceptual Design Review (CoDR), and plan to present that on February 9<sup>th</sup> to the Space Grant faculty and the director and staff of the Center for Astrophysics Space and Astronomy (CASA). The director, Dr. James Green, was the principle investigator of the Cosmic Origins Spectrograph on the Hubble telescope, and now acts as an active advisor and critic for our project. We are also actively seeking CU faculty advisors for each section of the team. A large portion of the work over the past month has involved detailing requirements, clarifying interface specifications, and considering the details of the payload summary.

### Current Team Members and Leaders



Should a deficiency in one section arise, team members will adjust responsibilities to compensate immediately. Additionally, both the Systems Engineer and Project Manager are capable and willing to assist any section. The four new members of the team are upperclassmen or graduates with extensive experience to aid in the design process.

### **1. Activities of Team Members**

Following the proposal submission, the team continued meetings and contact throughout winter break to prepare for the CoDR in the event that we were selected for a large payload spot. Each section head is now responsible for completing weekly progress reports, and regular team and leadership meeting times have been established. The Structural team is investigating alternative design concepts that would help potential thermal issues. They are also rectifying

any miscalculations concerning the HASP interface and payload footprint. The Science team is conducting further research into the parts and configurations necessary for the SHAIRC system; they are working under the guidance of Dr. Green and experienced Space Grant members. The Attitude Determination and Control team is similarly researching the exact components, algorithms, feedback loops, sensors, and software necessary to track the Sun; additionally, they are evaluating the tolerances and reaction rates necessary to operate. The Computing and Electrical team is creating a more detailed power system, including conversion, functional block diagrams, and specifying all components of the discrete commands. They are also working closely with Structure and Thermal to discern the causes and prevention of electronics overheating, as it has been an issue in previous CU HASP payloads.

We are working closely with the previous CU HASP Team, SPARTAN-V, to build upon what they have already accomplished and discovered.

## **2. Issues Encountered**

We recognize the complexity of the current project concept, and are working towards refining all system designs within the bounds of our current budget and team capabilities. The primary focus of this refinement will be the SHAIRC imaging system and the ADCS, which are the most complex. In addition to what is provided by Space Grant, we are currently looking for other sources of funding, including grants offered by the engineering department and CASA.

Other issues we need to address include:

- Establishing more precise tolerances and reaction times for the ADCS
- Remaining within operating temperatures, and rectifying potential thermal issues
- Defining the components and scope of the SHAIRC system
- Defining the position and communication of sensors to track the sun
- Creating the software and computing necessary to operate the ADCS and SHAIRC

## **3. Milestones Reached**

Following the acceptance of the proposal by HASP, we were able to interview and recruit several new members of the team through the Space Grant Open House, Thursday January 19<sup>th</sup>. This brings the total number of team members to 17 students and 2 advisors. After establishment of the team, we have been able to fully manage team activities, including the planned CoDR presentation and meetings. We have also begun collaboration with the previous HASP team, since our missions are similar. This will potentially help avoid repeating past mistakes and accelerate the development of the project. We have also reviewed the Payload Summary in detail and have plans to address all major issues noted in the document.

## **4. Next Objectives**

In the upcoming month, we will be presenting our CoDR and making any necessary design changes as a result of feedback from this. Throughout this period, we will continue team meetings and research. We are also going to document a revised management plan. Ideally, following the CoDR presentation, we would begin construction of small prototypes and assembly of some components to begin testing as soon as possible. This allows the greatest amount of time for testing before integration.