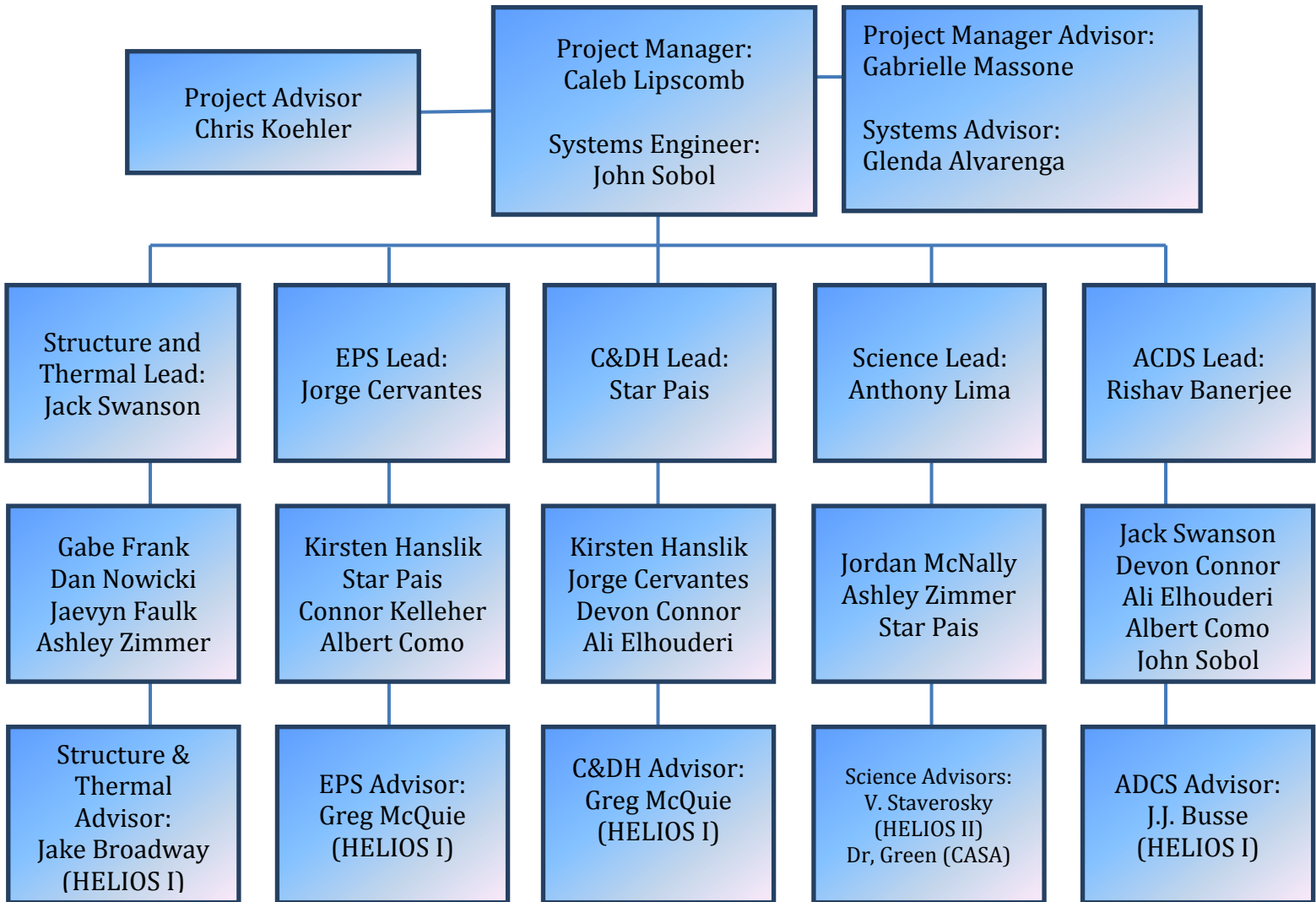


University of Colorado Boulder HASP project Monthly Status Report: January

Overview since 12/14/2012

After submission of our proposal on December 14, 2012, the HELIOS II project has recruited five new members. We have considered all of the comments made regarding the proposal and have implemented a plan and schedule to remedy all issues found during the review process. These corrections will be included in our re-submission of the HELIOS II proposal and the Concept of Design Review (CoDR), which will be completed and presented to the HASP and Space Grant faculty, respectively, on February 15th. The work done over the past month has involved recruitment, scheduling, detailing requirements, clarifying interface specifications, and furthering the design process.

Current Team Members and Leaders



1. Activities of Team Members

Following submission of the proposal, the team has continued meetings and regular contact throughout winter break to prepare for the CoDR in the event we were selected for a large payload spot. Each subsystem lead is now responsible for weekly progress reports. Additionally, weekly meeting times have been established for all subsystem teams. All subsystem leads are responsible for presenting a comprehensive testing plan and procedure document to be included in the CoDR. In addition, a comprehensive systems integration and testing document will be completed and included in the CoDR. The Structures/Thermal team is investigating alternate design options as well as materials in order to rectify potential thermal issues. The payload integration document on the HASP website will be used during all steps of the design process in order to meet all HASP platform requirements. The Science team is conducting further research into components and configurations necessary for the Solar Wavelength Imaging System (SWIS) system, including reviewing active/passive filter options as well as telescope barrel materials and dimensions. The SWIS team will be working with Dr Green from the Center for Astrophysics and Space Astronomy (CASA) and V. Staverosky from the HELIOS I team. The Attitude Determination and Control System (ADCS) team is similarly researching components, algorithms, feedback loops, sensors, and software necessary to track the Sun. In addition, they are evaluating the environmental extremes present during flight and designing the ADCS in accordance with these data in order to obtain optimal function. The Electrical Power System (EPS) team is creating a more detailed power system, including conversion, functional block diagrams, and specifying all components of the discrete commands. The Command and Data Handling (C&DH) team is working on researching components, software, algorithms, feedback loops, as well as characterizing the discrete commands available to control the payload.

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 on this refinement will be the SWIS imaging system and the ADCS, which are the most complex. In addition to funding provided by Space Grant, we are currently seeking other sources of funding including the Engineering Excellence Fund and Undergraduate Research Opportunity Program.

Specific issues we need to address:

- a. Establishing reaction times and rotation rates for the ADCS
- b. Remaining within operational temperatures and rectifying potential thermal issues

- c. Reducing effects of reflection on the SWIS and ADCS sensors
- d. Determining an effective filter system for the SWIS to prevent oversaturation of the solar images
- e. Precisely define the control program of the ADCS in tracking the Sun
- f. Defining the software and computing necessary to operate all systems

3. Milestones Reached

Following the acceptance of the proposal by HASP, we were able to interview and recruit five new members of the team through Space Grant Open House which took place on Thursday, January 17th, 2013. This brings the total number of team members to 15 students, 2 faculty advisors, and 6 student advisors. After final establishment of team composition, we have been successful in managing team activities and establishing a comprehensive schedule including weekly meetings for the entire team, each subsystem, and with the Space Grant faculty. We have also received and reviewed the Payload Summary and have established procedures to address all issues noted in the document.

4. Next Objectives

In the upcoming month, we will present our CoDR and make any necessary design changes. Throughout this process, we will address all issues outlined in the Payload Summary document and resolve the issues by the time of CoDR submission. Following the CoDR review, we will begin prototyping and testing components, primarily for the ADC system.