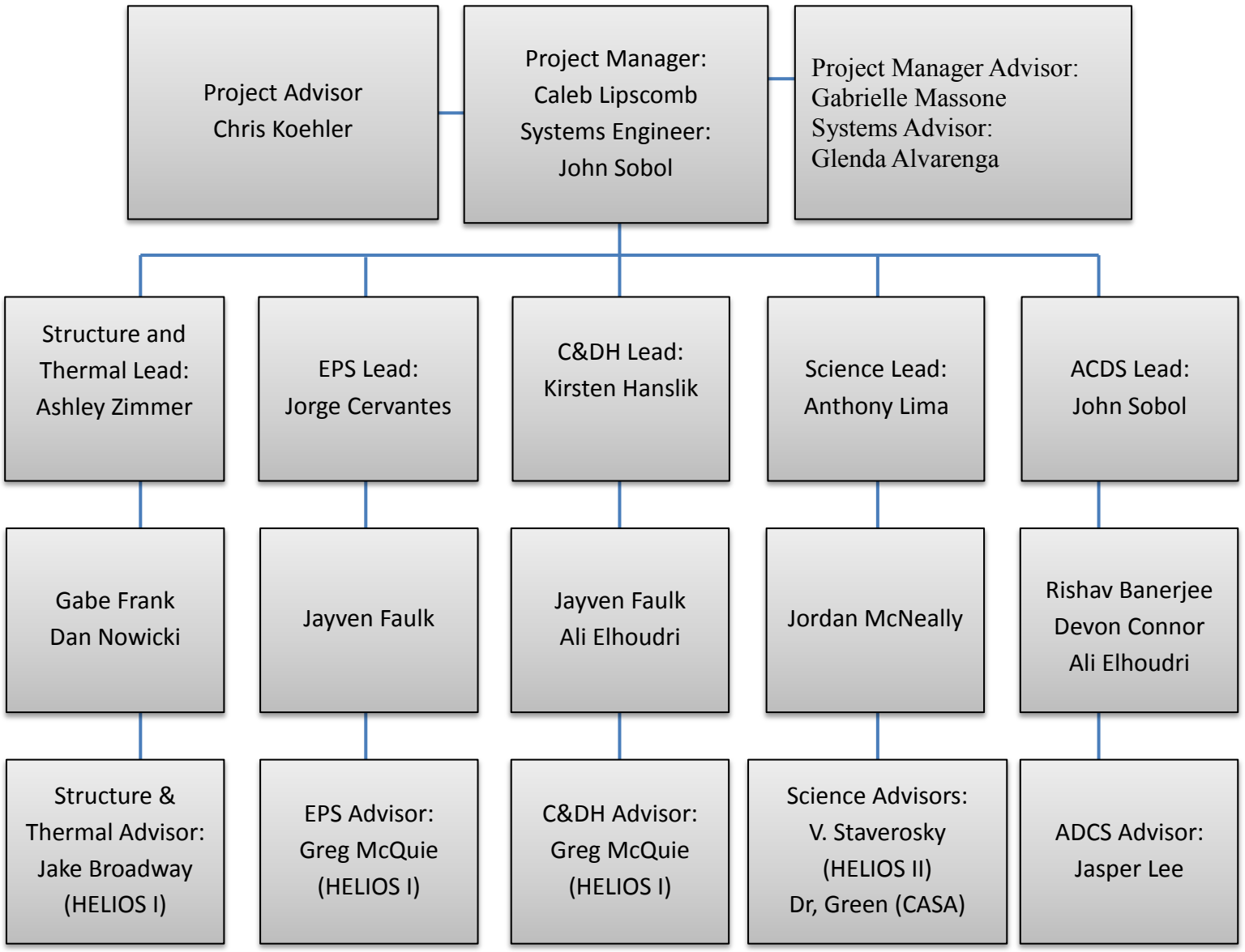
University of Colorado Boulder Monthly status Report: April 26, 2013

Overview since 3/29/2013

In the last month, HELIOS II has ordered parts and began component level testing. HELIOS II expects to have fully functioning subsystems by the end of May. Additionally, HELIOS II has confirmed funding from UROP; however HELIOS II is still awaiting a response from EEF about funding. Finally, HELIOS II is experiencing a major team structure change as several members return home for the summer and will be unable to work on the project.

Current Team Members and Leaders

Several of the HELIOS II team members are returning home for summer, however HELIOS II will have plenty of experienced personnel to work on the payload over the summer. A new personal organization chart has been created for the summer:



1. Activities of Team Members

Since our last report, a number of parts were ordered to allow the team to begin component-level testing and characterization. For the electrical power system, buck converters and linear regulators were tested for their operational quality. For C&DH, thermocouple temperature sensors were used to test the temperature-monitoring system of HELIOS II. Additionally, a Pandaboard was salvaged from HELIOS II and the team has begun characterization and functional testing of the board. For Structures, metal plates have begun to be machined to the appropriate dimensions and will be tested for tolerance and heat-dissipation by the end of May. For ADCS, light sensors, op amp circuitry, stepper motors, and Arduino Due microcontroller were tested for functionality and synergy. For SWIS, lenses and filters were ordered and tests have begun to characterize their function and reliability.

Due to the nature of the school year, several students on the team will be going home to their respective states for the summer. This will leave the HELIOS II team with less manpower for the upcoming months. The Management has adjusted the team organization and schedule to reflect the loss of students during the summer. Remaining students will assume subsystem leadership at the end of the school year in order to maintain the current organizational system. These promoted students have the full confidence of team management and Chris Koehler. The only concern vexing the project at this point is the reduced number of students available for work during the summer. However, it is the opinion of the management that this disadvantage will be offset by the increase in available hours to work during the relatively course-less summer period.

2. Issues Encountered

Several issues have been encountered during prototype construction and component testing. The major issues include:

a. Using the multiplexer to read multiple photodiodes correctly. The ADCS Arduino microcontroller can currently read 3 photodiodes at once, however when the sensors are connected to the multiplexer, the Arduino does not receive accurate readings from the photodiodes.
b. Loss of several team members. Some of the team members are returning to their home towns for the summer and will not be able to work on the project.

3. Milestones reached

The filtration system of the camera has been proven to filter out all light except that characterized as Hydrogen-Alpha. The Buck converters and linear regulators have been shown to successfully convert 30VDC to the appropriate voltage needed for HELIOS II, and to successfully draw only the requisite power as outlined in the HASP RFP. The side plates of the structure have been successfully machined to flight-readiness, all that remains is the top and bottom plates and the integration of the structure with the HASP interface. The ADCS system has successfully read the input from 3 light sensors simultaneously using the amplification circuit, and has successfully implemented a code to spin and stop the stepper motors. The Pandaboard has been proven to be operational and currently the subsystem team is learning how to operate it, ie software/coding. So far, all scheduled deadlines have been met by the team and it is the opinion of the management that the project is on track for successful and timely completion.

4. Next Objectives

The next major goal for HELIOS II is to complete component level testing and construct fully functioning prototypes for each subsystem. Additionally, HELIOS II will seek to successfully transition into the new summer team and the change in the work environment. After subsystems are complete, full subsystem testing will be initiated; subsystems will test their functionality on their own and when working with other subsystems.