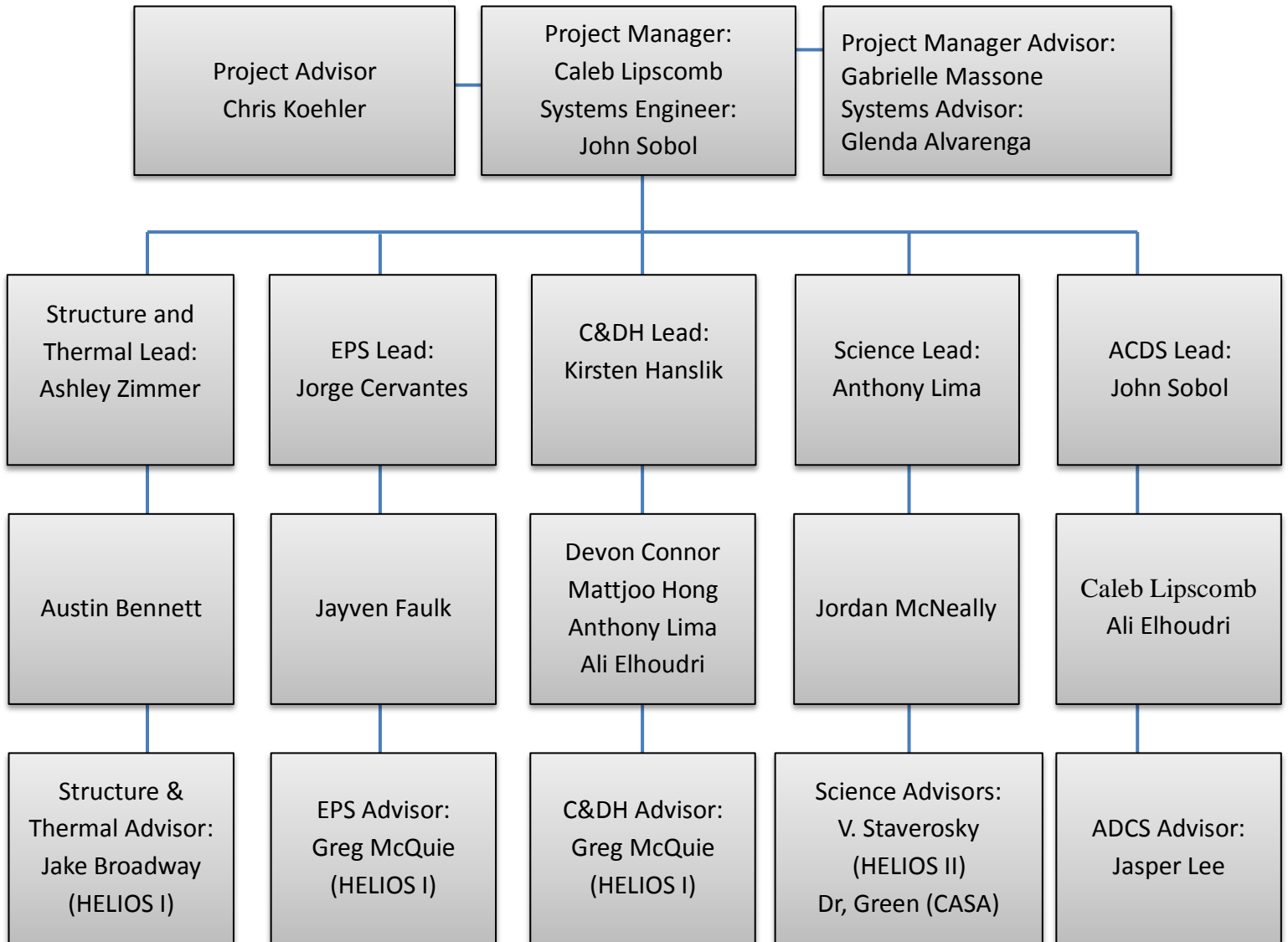


Overview since 9/27/2013

In the last month, HELIOS II has continued analyzing data collected during the 2013 HASP flight. HELIOS II is preparing to write the final science report due on December 13.

Current Team Members and Leaders:



### Activities of Team Members:

Since the last report, much has been discovered about how HELIOS II performed during the HASP flight. First, we have been analyzing the image of the sun captured by the science camera. We have confirmed that the sun's surface is visible in the image. In the image, granulation on the sun's surface is visible. As of yet, no sun spots have been confirmed in the image. Additionally, we compared our image of the sun to a Hydrogen-Alpha image of the sun captured by NASA's Solar and Heliospheric Observatory (SOHO) on September 3, 2013. In the SOHO image, we see similar granulation patterns, and 4 groups of sun spots. In the SOHO image, about 3 quarters of the sun's surface had little surface activity. This could possibly explain the lack of sunspots in our partial image of the sun.

Next, the performance of the ADCS system was characterized. The distance from the center of the sun in each ADCS camera image was measured and graphed on a scatter plot. From this, we were able to calculate statistics about the ADCS's performance. The mean distance of the center of the sun from the center of the image was 1.98 degrees to the right in the x axis and 3.94 degrees up in the y axis. The standard deviation of the sun's position was 0.935 degrees in the x axis and 2.95 degrees in the y axis. From the graph of the distance of the sun from the center of the ADCS image, it can be seen that the sun was above the y axis for the vast majority of the flight. This means the ADCS was consistently pointing the cameras lower than where the sun was. Several explanations of the downwards bias in the ADCS system are being examined.

The Electrical power system team discovered this week that the buck converter on the Pandaboard power line was no longer functional. After replacing the buck converter on the pandaboard line, the line provided the correct amount of power. We believe the buck converter overheated during flight. This is because the plastic label on that specific buck converter had completely melted off. Finally, the cause of 5 of the 6 losses of communication with the Pandaboard still remains unknown. However, the final time we lost communication with the panda board was because the power line to the pandaboard was damaged.

### Issues Encountered:

Only one major issue has been encountered by HELIOS II this month. The Command and Data Handling team has still been unable to discover the cause of the pandaboard failure before it lost power. The ground lost communication with the pandaboard 6 times. The last time was due to the pandaboard power line failing. The cause of the remaining 5 losses of communication remains unknown.

### Milestones Reached

HELIOS II was successfully able to identify the sun's surface in the single science camera image. Additionally, the performance of the ADCS system has been fully characterized. Finally, a power failure in HELIOS II's power system was recognized. This power failure was the cause of the final loss of communication with the pandaboard.

### Next Objectives

The science team will seek to identify and additional solar features in the science camera image. The science team will adjust various visual features of the science camera image in hopes of finding a previously hidden solar feature. The Command and Data Handling team will continue to search for the

unknown cause(s) of the first 5 losses of communication with the pandaboard. Finally, HELIOS II will be writing drafts of the final science report due in December.