University of Colorado at Boulder HELIOS V Team February Status Report

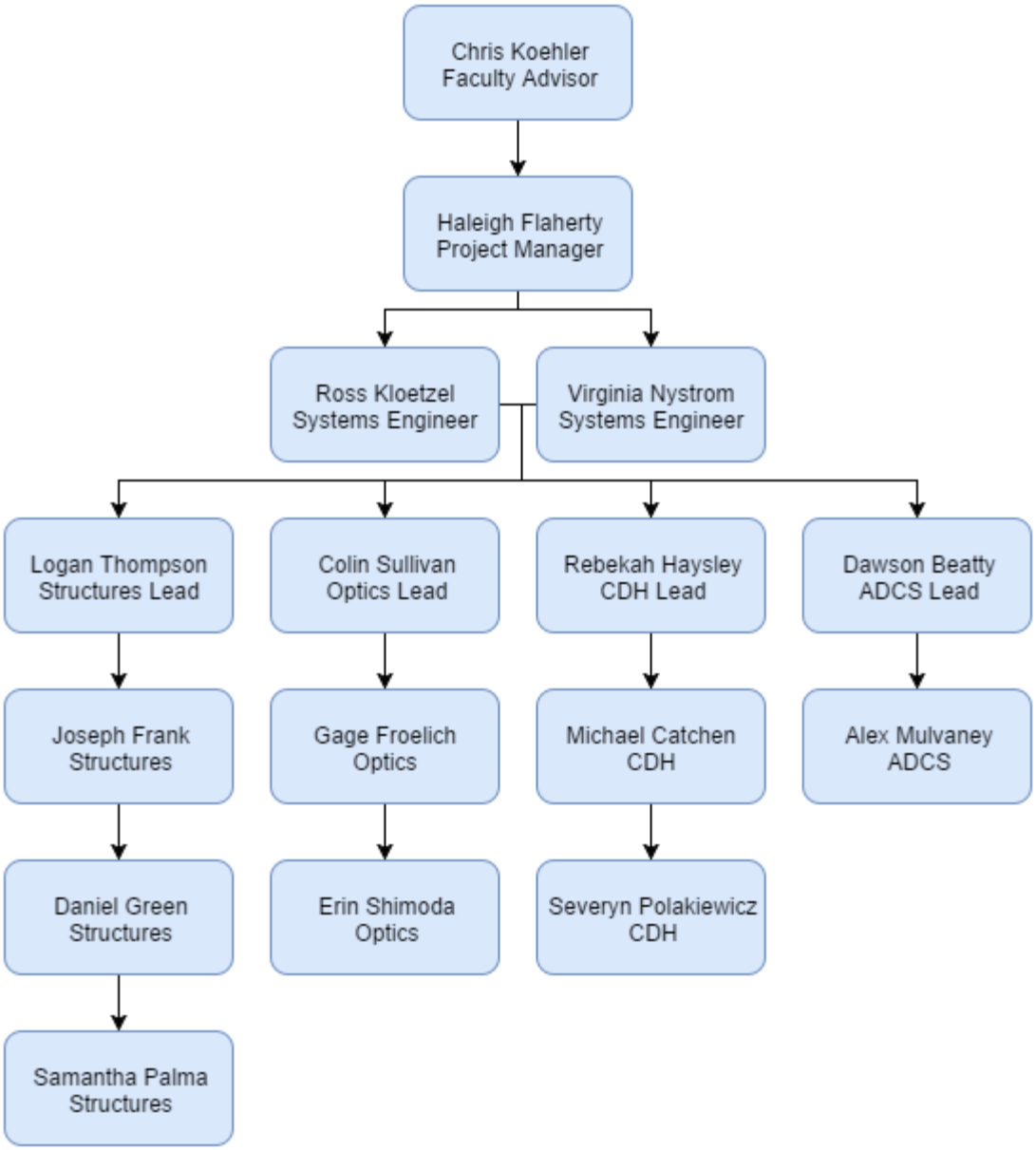
This month the HELIOS V team was officially formed and began training. The team is now comprised of 17 University of Colorado at Boulder students. This month the team spent about two weeks working closely with the students from HELIOS III and IV to be trained on the HELIOS payload. After training, the team began work on a Conceptual Design Review (CoDR) presentation that will be presented to mentors and other Space Grant students for feedback on the last day of February.

Team Demographics

Student	Ethnicity	Gender	Year	Major	Start Time	End Time	Grad/ Undergrad
Haleigh Flaherty	Caucasian	Female	Sophomore	Aerospace Engineering	January 2015	Current	Undergrad
Paige Arthur	Caucasian	Female	Junior	Aerospace Engineering	January 2015	Current	Undergrad
Ryan Cutter	Caucasian	Male	Junior	Aerospace Engineering	January 2015	Current	Undergrad
Erin Shimoda	Caucasian/ Asian	Female	Freshman	Aerospace Engineering	February 2015	Current	Undergrad
Virginia Nystrom	Caucasian	Female	Freshman	Aerospace/ Applied Math	February 2015	Current	Undergrad
Joseph Frank	Caucasian	Male	Freshman	Engineering Physics	February 2015	Current	Undergrad
Severyn Polakiewicz	Caucasian	Male	Sophomore	Aerospace Engineering	February 2015	Current	Undergrad
Rebekah Haysley	Caucasian	Female	Freshman	Mechanical Engineering	February 2015	Current	Undergrad
Colin Sullivan	Caucasian	Male	Freshman	Aerospace Engineering	February 2015	Current	Undergrad
Samantha Palma	Caucasian/ Asian	Female	Freshman	Mechanical Engineering	February 2015	Current	Undergrad
Ross Kloetzel	Caucasian	Male	Freshman	Aerospace Engineering	February 2015	Current	Undergrad

Michael Catchen	Caucasian	Male	Freshman	Aerospace Engineering	February 2015	Current	Undergrad
Alex Mulvaney	Caucasian	Male	Freshman	Aerospace Engineering	February 2015	Current	Undergrad
Logan Thompson	Caucasian	Male	Freshman	Aerospace Engineering	February 2015	Current	Undergrad
Dawson Beatty	Caucasian	Male	Freshman	Aerospace Engineering	February 2015	Current	Undergrad
Gage Froelich	Caucasian	Male	Sophomore	Mechanical Engineering	February 2015	Current	Undergrad
Daniel Green	Caucasian	Male	Sophomore	Mechanical Engineering	February 2015	Current	Undergrad

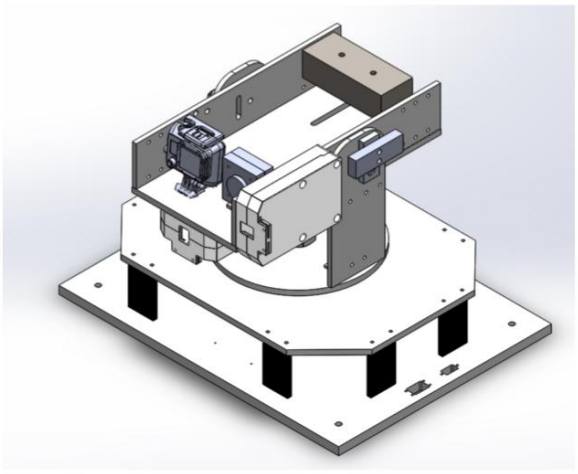
Team Organization



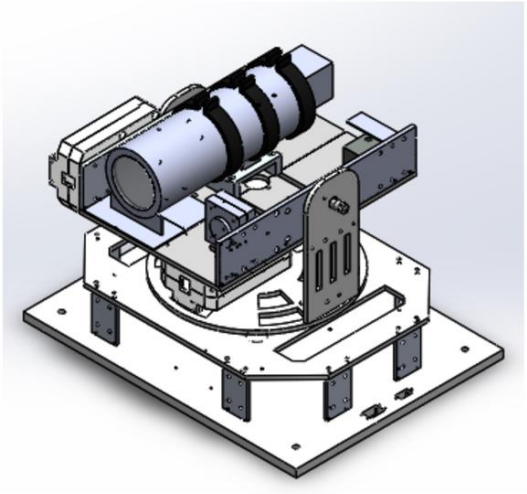
Accomplishments of February

Structures: The Structures team worked on training with the previous HELIOS team about the payload structure. During this they found that one of the bearings holding the upper housing had been damaged so they began work on improving and repairing the bearing. The team also focused on creating detailed SolidWorks models for the CoDR presentation of the new upper housing design. This includes visual comparisons between HELIOS IV and V to show the new changes such as the one show below.

Structural Changes



HELIOS IV



HELIOS V

Optics: The optics team has been working heavily on training with HELIOS III optics lead Dylan Richards and one of the directors of the Sommers-Bausch Obersvatory, Fabio Mezzalira. Through this training they have learned what research and progress was made on HELIOS III and now work to improve the system. Since most of the equipment such as the telescope, camera, and filters have already been purchased, they also began testing the hardware and will continue further testing in March.

CDH: The CDH team has been working with HELIOS IV's Cooper Benson and SIMBA's Jack Dinkel to learn Python and the details of the flight code. They will continue to learn all the details so that the team can work on optimizing the code. They have also started work on implementing a Raspberry Pi Zero into the system that will store the science images captured so that the camera does not slow down the rest of the system.

ADCS: The ADCS team, like the CDH team, has been working with HELIOS IV members Paige Arthur and Ryan Cutter to learn Python and the ADCS tracking algorithm. They have the same goal as CDH, to optimize the code for flight.

Systems: The Systems team has been working two major tasks. One, they have been working with the previous HELIOS IV team to learn the EPS systems and working on improving it with implementing the Pi Zero and attaching the new camera system. The other main focus is their systems engineering role. They have been meeting with the other subteams and been acting as a bridge between the teams to ensure that the team is working together when working on the new payload design.

Plans for March

The HELIOS V team will present the new design on the final day of February. After this presentation, they will go over the feedback and incorporate it into their next design. In March the team will present their next design review right after spring break. Before this presentation though, the subteams all have smaller goals that they will be working on. The structures team plans to complete repairs to the bearing on HELIOS IV so that the ADCS team can work with the current payload to see the tracking algorithm run. The optics team will work closely with Fabio Mezzalira to find order of filters for the science imaging system that will capture the best images. They will also get training about the star tracker system they plan to add to the HELIOS V design. The CDH team will finalize their training and begin code improvements and the systems team will continue work with each team as the design of the complete payload is improved.