

University of Colorado at Boulder SIMBA Team February Status Report

This month Team SIMBA worked to improve the design of our payload. After reviewing the comments on the proposal, our team has chosen to go with a passive microbe collection system rather than the active system in order to remove the pumps from the design. Since this decision, the team has presented the new design in a concept of design review presentations to other members of CU's Colorado Space Grant as well as some members of our biology department. The new design uses a single stepper motor which rotates a bolt to raise and lower the microbial capturing unit (MCU). We believe the new design solves many of the problems SIMBA's other designs encountered with sealing the payload, decontamination, and microbial capture.

Team Demographics

Paige Arthur: Caucasian female, sophomore, Aerospace Engineering

Haleigh Flaherty: Caucasian female, freshman, Aerospace Engineering

Melody Blackis: Caucasian female, freshman, Aerospace Engineering

Nathan Levigne: Hispanic male, freshman, Aerospace Engineering

David St Clair: Caucasian male, freshman, Aerospace Engineering

Trevor Barth: Caucasian male, freshman, Aerospace Engineering

Lauren Raddatz: Caucasian female, freshman, Aerospace Engineering

Ryan Wall: Caucasian male, sophomore, Aerospace Engineering

Allison Howard: Caucasian female, freshman, Electrical Engineering

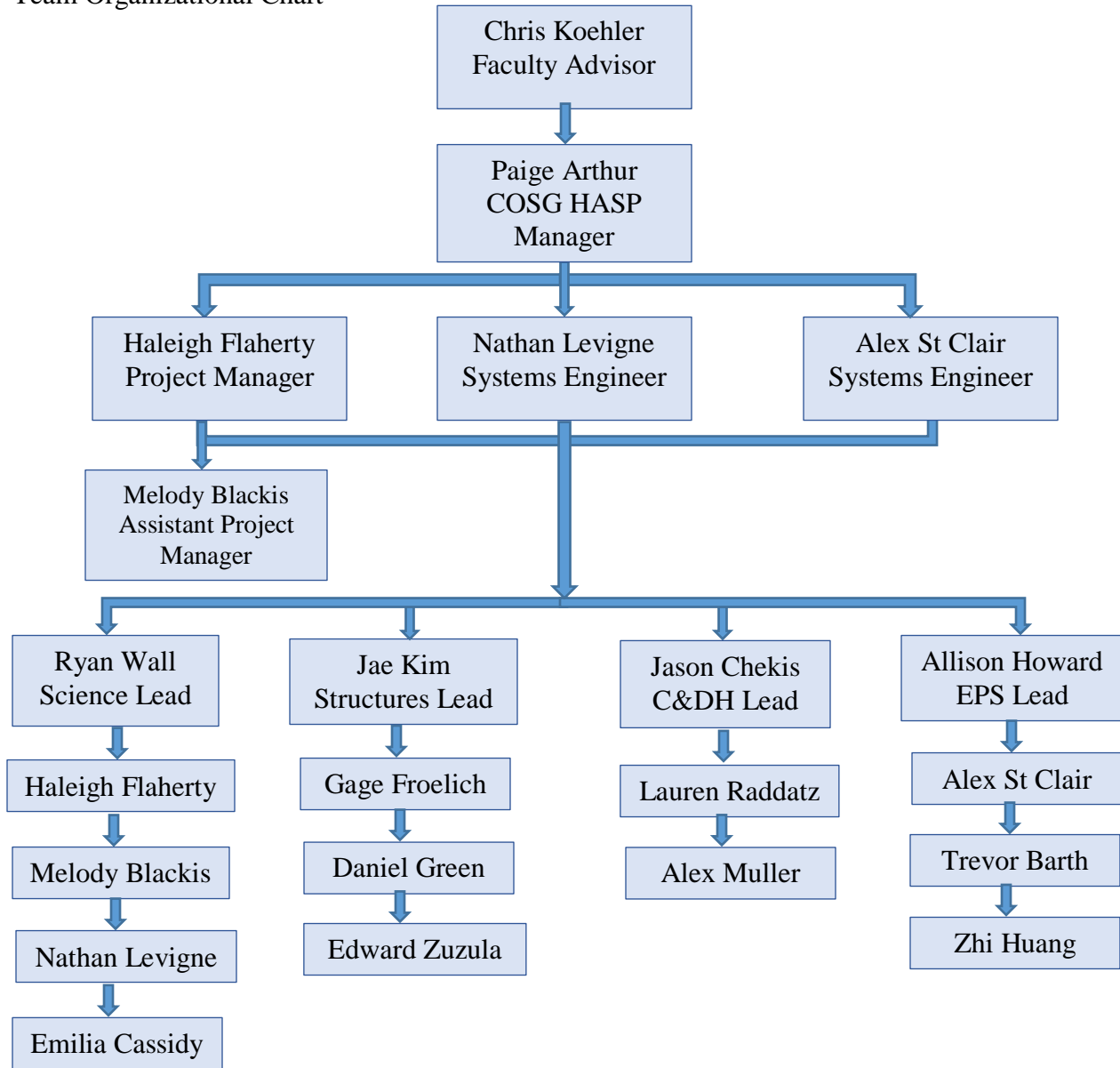
Gage Froelich: Caucasian male, freshman, Mechanical Engineering

Jae Kim: Asian male, freshman, Aerospace Engineering

Jason Chekis: Caucasian male, senior, Astronomy

Zhi Huang: Asian male, freshman, Aerospace Engineering

Team Organizational Chart



Accomplishments of February

Structures: The structures team has been working in depth with the rest of the team on the new payload design. With the science they worked to improve the design of the MCU, handling problems with sealing and latching the clean zone. They began researching stepper motors with the EPS team to create a trade study for the upcoming PDR presentation that will help make the decision on which type of motor we will be using on SIMBA. They have also created several Solidworks drawings of the different designs and now are adding more detail to the newest design including how they plan to assemble the payload.

Science: The science team has been research intensive this month. One of their topics was to research sterilization procedures in order to start creating the necessary pre and post launch procedures that will be needed for decontaminating the payload. The sterilization also has an impact on the kinds of materials that can be used within the clean zone area so the science team worked with structures to eliminate the possibility of 3D printing pieces due to its challenging nature to sterilize. After receiving feedback from the biology department they finalized the decision to use polycarbonate filters over mixed cellulose ester filters and have been further researching the kinds of tests we will perform on the microbes once retrieved.

EPS: The electrical power systems team focused on finalizing choices for the electrical components this month. This involved working with the science team on the kinds of environmental sensors would be the most useful for SIMBA's mission. They also researched and created a trade study of types of buck converters under consideration for using on SIMBA and have otherwise finalized the parts that will be used on SIMBA and plan to start bread boarding in March.

CDH: The Command and data handling team meet with HELIOS members and researched microprocessor choices this month. After this, they have decided on using a Raspberry Pi B+ for SIMBA.

Plans for March

In the first week of March SIMBA is having a preliminary design review presentation to get feedback on the improved design. This PDR will include trade studies for parts of the design that are still under consideration and responses to the CoDR feedback. The goal of the presentation is to receive more feedback on possible design flaws that the team has overlooked and to get input that will help the sub teams make their final choices on aspects of the design such as buck converter and motor type to use. March 19th SIMBA will have its critical design review in order to get feedback once more in order to finalize the payload design. The goal is to complete the design before spring break, March 23rd – 27th, so that construction can begin in April.