

University of Colorado at Boulder SIMBA Team May Status Report

The SIMBA team started May with an end of semester presentation where each sub-team presented their progress of the past few months and their plans for summer. At the start of summer, the team reduced in size and the team structure changed a little depending on availability. Since then, the team has made a large amount of progress. The structures team has started machining the payload while the CDH team have worked with the EPS team to bread board the motor and sensors to begin testing code.

Team Demographics

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

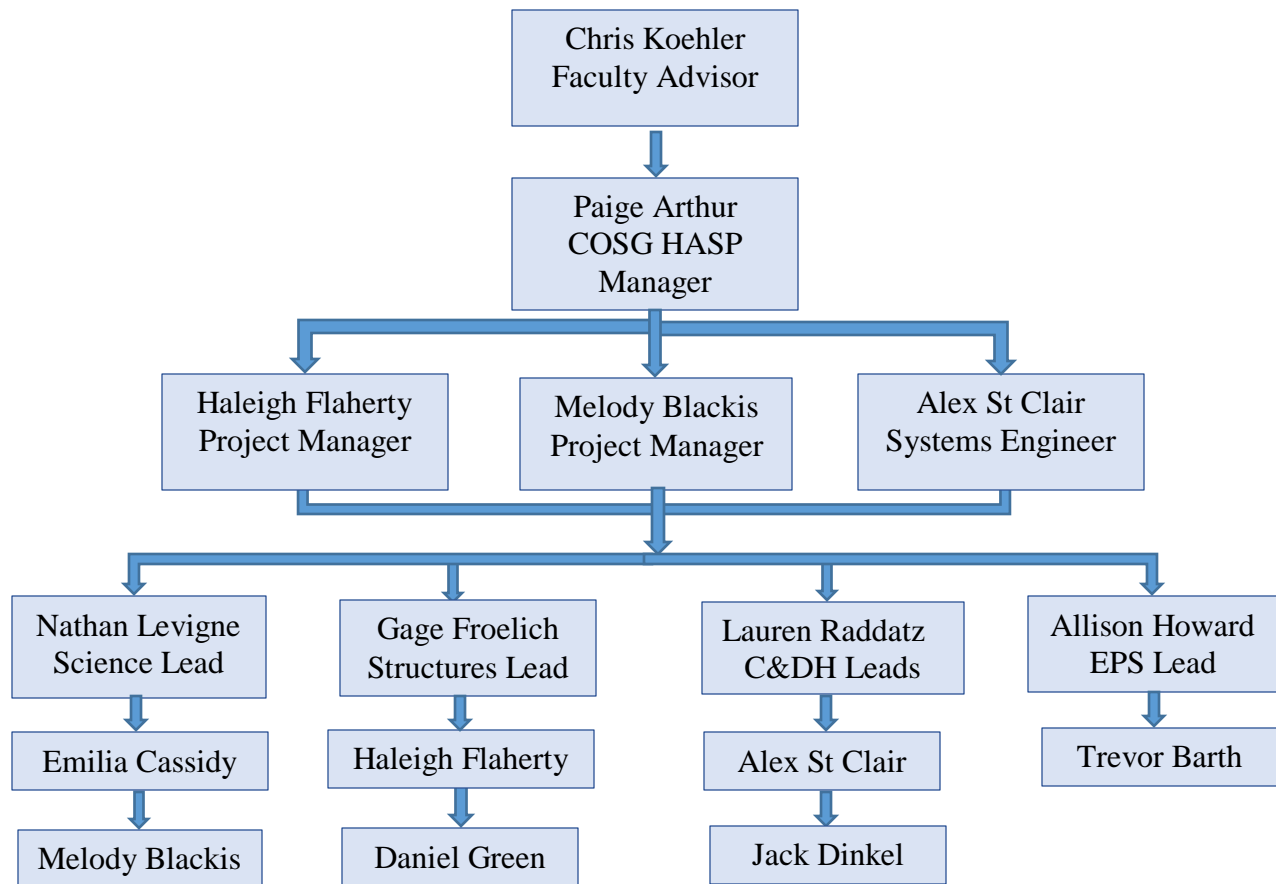
Trevor Barth: Caucasian male, freshman, Aerospace Engineering

Lauren Raddatz: Caucasian female, freshman, Aerospace Engineering

Allison Howard: Caucasian female, freshman, Electrical Engineering

Gage Froelich: Caucasian male, freshman, Mechanical Engineering

Jack Dinkel: Caucasian male, freshman, Computer Science



Team Organizational Chart

Accomplishments of May

Structures: This month the structures team improved on many aspects of the SolidWorks model of the design in order to prepare for machining. Their main focuses have been minimizing the weight of the payload, improving the design of the seal, and updating the design with the actual parts that have been purchased. One of the design changes they have made include through lightening cuts and thinner walls to reduce weight. Due to the through lightening cuts, the design now includes a layer of insulation. They have also decided on using epoxy on the clean zones to seal them and plan to add a syringe filter to each zone. The syringe filters will allow for filtered air to pass into the zones so that there is no stress on them due to the pressure difference while ensuring that it will not contaminate the filters.

The structures team has begun machining the exterior walls. Currently, the walls have been cut to the correct dimensions, the lightening cuts have milled and the screw holes have been drilled and tapped. The walls will be assembled next week before the team moves onto machining the parts of the MCU.

Science: This month the science team continued decontamination testing and set up another experiment to expose two sets of 25 mm filters, one set wet and one dry, to the air for 12 hours. These filters were then going to be divided into three groups to test the decontamination processes earlier. Group 1 was to be placed in the autoclave, Group 2 was to undergo the bleach solution decontamination method, and Group 3 was immediately placed on the Lysogeny broth (LB) agar (which we determined last month are the agar we will use post flight). The filters from groups 1 and 2 were to be placed on LB agar plates after the decontamination tests were carried out. Unfortunately, due to poor weather conditions, the collection period was a failure and the science team was unable to conduct the rest of the procedures. The science team has reconfigured the experiment and is going to perform this testing next week. Instead of collecting unknown amounts of bacteria, the science team is going to populate two sets of 25 mm filters, one set wet and one dry, with known concentrations of contaminant and perform the decontamination tests. Then the team will use the DAPI (4',6-diamidino-2-phenylindole) stain to observe the concentrations of contaminant that remain after the tests to determine to more specific level of decontamination. These experiments will also include control filters to assure that contamination does not come from handling.

EPS: This month the EPS team has finished their schematic and finished the design of the PCB. The PCB is ready to be printed, although the EPS and C&DH teams decided that it would be best to wait to order the PCB until all the sensors were fully tested. This way, if any of the sensors need to be replaced with different sensors, the PCB design can be changed and reorder to order multiple, unnecessary printings.

CDH: The CDH team has made a lot of progress this month. After completing the sensor and motor codes, they have been working to test all of the components. They have bread boarded the motor and several sensors so far in order to test their codes. Currently with the Raspberry Pi B+ they have established remote communicate. Through working with the motor, they have quantified linear actuation. So far they have been very successful and plan to work on testing the remaining sensors next month.

Plans for June

During the month of June the team plans to make a lot of progress on completing the payload. The structures team's goal is to complete the payload so that it is ready to be integrated with the electronics and tested in July. This includes machining several more pieces and assembling them while ensuring that the payload is underweight. The electronics team will be ordering the PCB this month and will begin populating it as soon as it arrives. This also means that EPS and CDH can then work together to test the code on the completed PCB. CDH also plans to finish the other sensor testing to make sure all of their code works well. The science

team will run several tests in June. This includes practicing with the DAPI stain method of identification experiment. By the end of the month, the whole team will be prepared to integrate the payload in July so that full mission simulation testing can also begin.