University of Colorado at Boulder SIMBA Team June Status Report

The SIMBA team has made a large amount of progress this month. At the start of June, the team worked together to create a schedule that would keep the team on track. They have stayed on schedule and now the payload is nearly completed and will be ready for payload integration testing to begin in July.

Team Demographics

Haleigh Flaherty: Caucasian female, sophomore, Aerospace Engineering

Melody Blackis: Caucasian female, sophomore, Aerospace Engineering

Nathan Levigne: Hispanic male, sophomore, Aerospace Engineering

David St Clair: Caucasian male, sophomore, Aerospace Engineering

Trevor Barth: Caucasian male, sophomore, Aerospace Engineering

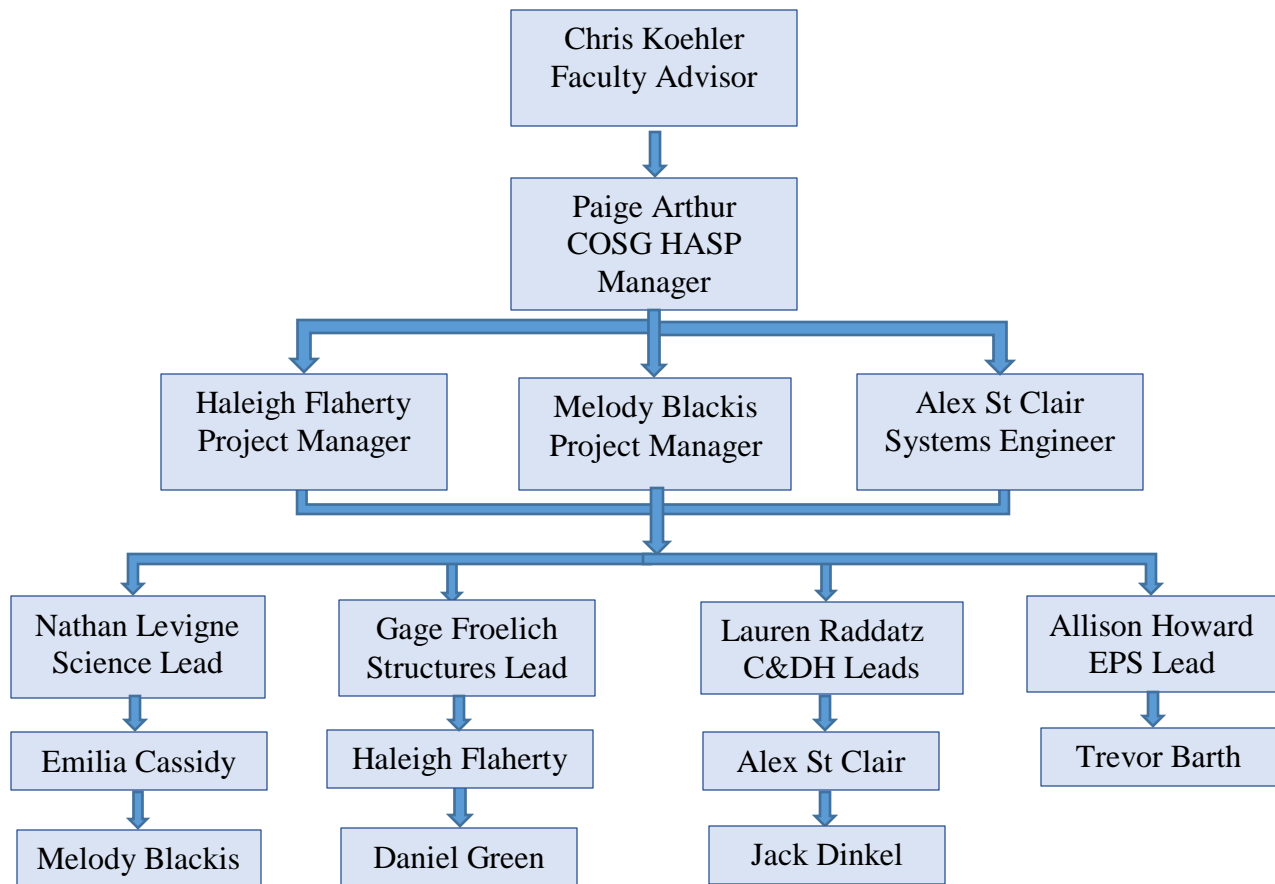Lauren Raddatz: Caucasian female, sophomore, Aerospace Engineering

Allison Howard: Caucasian female, sophomore, Electrical Engineering

Gage Froelich: Caucasian male, sophomore, Mechanical Engineering

Jack Dinkel: Caucasian male, sophomore, Computer Science

Emilia Cassidy: Caucasian female, senior, Microbiology

Daniel Green: Caucasian male, sophomore, Mechanical Engineering

Team Organizational Chart

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                        Chris Koehler
                        Faculty Advisor
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                        Paige Arthur
                        COSG HASP
                         Manager
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 Haleigh Flaherty      Melody Blackis         Alex St Clair
 Project Manager       Project Manager       Systems Engineer
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Nathan Levigne   Gage Froelich     Lauren Raddatz    Allison Howard
 Science Lead    Structures Lead    C&DH Leads         EPS Lead
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Emilia Cassidy   Haleigh Flaherty   Alex St Clair      Trevor Barth
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Melody Blackis   Daniel Green        Jack Dinkel
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Team Organizational Chart

Accomplishments of June

Structures: Structures has been working out the final design details and machining the payload this month. Each week they spend three days in the machine shop to complete parts, and the rest of the week the use to prepare and finalize designs for the next part to be machined. This schedule has allowed the structures team to complete all machining needed for the payload. After machining was completed, many of the parts were then epoxied together. Those parts are currently curing, allowing the structures team time to work installing insulation on exterior walls and preparing the walls for mounting the electronics.

In addition to building and assembling the payload, the team has also implemented many other design aspects. This includes ordering the parts for the seal and working on motor tests with the CDH and EPS teams. In July, the team will paint the walls, assemble the payload and begin testing.

Science: In June, the science team focused on practicing their decontamination tests. They are working on getting the decontamination procedure as accurate as possible to reduce risk of contamination on the real payload. With these tests, they have also run several control filters that go through the same handling processes but are not exposed to contaminate. This allows the team to check if their methods are a contamination source as well as practice for the real mission, which will also include a control filter. The science team has also worked on training with using DAPI stain and the scanning electron microscope. After their first DAPI test was unsuccessful, they completed another test that looked at each of their steps in the set up procedure to find the source of the problem. Once the error was found they have been able to work on improving their method.

EPS: This month the EPS team had the PCB printed and began populating it. While populating the PCB, they found a few errors so they worked to improve the design. This includes changing the layout of the humidity sensor, widening a few traces, and making it easier to assemble. The new PCB has been ordered and will arrive next week so EPS can begin to populate the new one.

CDH: The CDH team has been working with all of the electronics this month to test and improve the code. They focused on improving the performance of the sensors and Raspberry Pi. This included working on failure analysis and redundancies in the code. They have also worked on implementing the uplink and downlink in the code and working on the commands needed with uplink.

With structures, they were also able to test their motor code with the actual payload parts. This allowed them to confirm the steps for the motor to take to fully deploy the filters, and confirm that the motor ran smoothly with the MCU attached.

Plans for July

The main focus of July will be to successfully integrate the payload and prepare for HASP integration in August. For structures, this means they will fully assemble the payload in the first week so that testing can begin as soon as possible. Tests they will run include thermal, pressure, testing the seal, then they will begin full mission simulation tests. In July they will also work with the science team on the preflight decontamination and assembly procedures. The science team will begin working on decontaminating real parts from the payload. They will also run mission simulation tests which will include the full decontamination and identification procedures. EPS will complete populating the PCB as soon as possible so that it can be used in the testing with structures. CDH's main focus for July will be to finalize their code through testing with structures to ensure that all electronics and running and recording data properly. In July, the sub teams will be working together so by the end of the month, the SIMBA team will be prepare for integration testing with HASP.