



# HASP Monthly Status Report

**Report Month:** March 2023  
**Submitted by:** Elsa Carreras  
**Submit Date:** 3 /25 / 2023  
**Institution:** Cu Boulder Space Grant  
**Payload Number:** 2023-03  
**Payload Name:** LunaSat Testbed

## I) Activities During Previous Month:

This past month we completed our internal PDR presentation, which went well. We made an avionics parts list and have started ordering parts needed for our circuit. We are still working on the parts list, but we have most of the parts ordered. We've started electronics and software testing, including setting up the Raspberry Pi and testing communication between the LunaSats and the RPi. We've been making testing documents for every test we have done and plan to do in the future and have been documenting the tests we are doing. We have a pretty good idea of a final circuit layout, which just needs to be tested soon. For structures we created two iterations of the payload, one at max size and one the size we want. We did this with foam structures and CAD. With the actual size of the payload, we created a weight budget for all the structures and avionics parts so that we can keep track of our weight. We also researched various materials for the insulation and outer coating, finally landing on Aluminum 6061 and Aerogel for the structure and insulation, respectively.

## II) Issues Encountered:

Some issues we encountered was the cost of the first insulation we were going to use, so we had to find another one that was accessible and within the bounds of the HASP requirements but also our requirements. We also ran into small issues with pricing of Aluminum and how much we want to use but, we figured out that if we ordered smaller sizes but more, it would work. We encountered a few issues this month. One of the biggest ones was trying to use external power for the LunaSats while they are connected to the RPi. We got data to work when the LunaSat was powered by the RPi but not when it was powered by an external source. External power for the LunaSats is important for our flight so we plan to continue testing to try to figure out what the problem is. We also are somewhat worried about fitting all the electronics inside our payload, but structures made the outline a bit bigger and with the small computer and a PCB we think it should all work.

## III) Milestones Achieved:

Internal PDR, In the process of ordering parts, Writing test plans, Finalizing structure design, finished requirements, and finalizing summer plans to ensure a smooth transition from Spring to Summer semesters.

## IV) Plans for Coming Month:

For future months we plan on ordering materials and creating the structure of the payload. We also will test the payload in CAD once we finish all the smaller things of the payload. This includes changing locations of some of the LunaSats on the model and adding the door to it. Once these are done, we can run an analysis of the payload to make sure it withstands the 5g vertical shock and 10g horizontal shock. We also want to test to make sure that it stays on the platform that HASP has given us. In the coming month we plan to continue testing, including more intensive communication between LunaSats and RPi, testing power regulation, testing the circuit on a breadboard, and testing RF in different environments. We plan to continue working on testing documentation so all tests can be replicated if needed and we hope to start designing a PCB by the end of the coming month.

## V) Other Comments or Questions for HASP Management:

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No questions or comments as of right now.

## VI) Team Composition and Organization:

| Name <sup>(i)</sup>    | Start Date | End Date | Role              | Student Status | Race <sup>(ii)</sup> | Ethnicity <sup>(iii)</sup> | Gender <sup>(i)</sup> | Disabled       |
|------------------------|------------|----------|-------------------|----------------|----------------------|----------------------------|-----------------------|----------------|
| Veronica Corral Flores | 9/9/22     | Present  | Faculty Advisor   | Faculty        | Mixed race           | Hispanic                   | Female                | No             |
| Mary Hanson            | 9/9/22     | Present  | Faculty Advisor   | Faculty        | White                | Non Hispanic               | Female                | No             |
| Elsa Carreras          | 9/9/22     | Present  | Project Manager   | Undergrad      | White                | Caucasian                  | Female                | Dyslexia       |
| Benjamin Hellem        | 9/9/22     | Present  | Systems           | Undergrad      | White                | Caucasian                  | Male                  | No             |
| Chloe Zentner          | 9/9/22     | Present  | Structures lead   | Undergrad      | White                | Caucasian                  | Female                | No             |
| Chris Brown            | 9/9/22     | Present  | Avionics lead     | Undergrad      | White                | Non Hispanic               | Male                  | No             |
| Hallie Hill            | 9/9/22     | Present  | Structures Member | Undergrad      | White                | Caucasian                  | Female                | Celiac Disease |
| Nicholas Mueller       | 9/9/22     | Present  | Structures Member | Undergrad      | White                | Caucasian                  | Male                  | No             |
| Brice Parrott          | 9/9/22     | Present  | Avionics Member   | Undergrad      | White                | Non Hispanic               | Male                  | No             |
| Zack Goldberg          | 9/9/22     | Present  | Avionics Member   | Undergrad      | White                | Caucasian                  | Male                  | No             |
| Jack McDonald          | 2/8/23     | Present  | Avionics Member   | Undergrad      | White                | Non Hispanic               | Male                  | No             |
| Emanuele Rimini        | 2/8/23     | Present  | Avionics Member   | Undergrad      | White                | Italian                    | Male                  | No             |
| Sebastian Vargas       | 9/9/22     | 12/12/22 | Avionics Member   | Undergrad      |                      |                            | Male                  |                |