

## **EE/CprE/SE 491 WEEKLY REPORT 10**

**11/14/2024 – 11/21/2024**

**Group number: 9**

**Project title: Space Cyclones - COSMIC CAPSTONE CHALLENGE 2024-2025**

**Client &/Advisor: Bo Varga, Benjamin Rupp, Rachel Shannon**

**Team Members/Role: John Beuter (Team Lead), Daniel Sprout, Maheeka Devarakonda, Tanvi Mehetre, Riley Heeren, Ben Swegle**

### ○ **Weekly Summary**

Week Objectives:

- Create a prototype of our design
- Revise design documentation to reflect our progress
- Define weight and power requirements for our design
- Define net size both when expanded and stored

### ○ **Past week's accomplishments**

- John Beuter: Finished lighting talk slides. Include new prototype designs in design documentation.
- Daniel Sprout: Research into how to formulate the 'story' behind our project for our presentation. In addition to methods for mitigating reactive forces inherent to our design. <https://link.springer.com/article/10.1007/s40295-024-00458-3> - Kessler Syndrome  
[https://en.wikipedia.org/wiki/Contra-rotating\\_propellers](https://en.wikipedia.org/wiki/Contra-rotating_propellers) - mitigation for torque applied by rifling.
- Maheeka Devarakonda: Researched possible thrusters, nets, and spring mechanisms that can be used for the design. Aided in creating the CAD model. Continued research of mounts of smaller sizes.
- Tanvi Mehetre: Researched possible net sizes to capture a cube satellite and approximate the mass of the net.
- Riley Heeren: Learned what an Ashby chart was and how to use it to brainstorm net material ideas.

- Ben Swegle:

Created a CAD model in Solidworks of our net launcher design.

- **Pending issues** (If applicable: Were there any unexpected complications? Please elaborate.)

- John Beuter: N/A

- Daniel Sprout: N/A

- Maheeka Devarakonda: N/A

- Tanvi Mehetre: N/A

- Riley Heeren: N/A

- Ben Swegle: N/A

- **Individual contributions**

<b><u>NAME</u></b>	<b><u>Individual Contributions</u></b>	<b><u>Hours this week</u></b>	<b><u>HOURS cumulative</u></b>
John Beuter	Completed lightning talk, revised documentation, and attended COSMIC office hours.	3	14
Daniel Sprout	Methods for neutralizing torque (reversed propeller), Story formulation about kessler syndrome	2	21.5
Maheeka Devarakonda	Researched possible thrusters, nets, and spring mechanisms that can be used for the design.	2	24
Tanvi Mehetre	Researched net size and approximate mass of it.	2	21
Riley Heeren	Continued to research on materials	2	116
Ben Swegle	Created a CAD model for the net launcher design.	2	22.5

- **Plans for the upcoming week:**

Next week, we will progress towards printing and assembling a model of our design to test launching.

- **Summary of weekly advisor meeting:**

We received feedback from our NASA advisor, Ben Rupp, regarding changes to the current CAD model. We analyzed and assessed the current design and are working towards eliminating many problems with it. We were also advised to look into various considerations that we hadn't yet looked into.