

EE/CprE/SE 491 WEEKLY REPORT 01

09/03/2024 – 09/19/2024

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 Davarakonda, Tanvi Mehetre, Riley Heeren, Ben Swegle

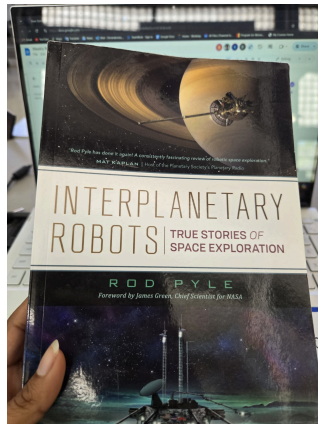
○ **Weekly Summary**

Week Objectives: Product Research and Idea Generation

This week was focused on product research and idea generation. The focus was on learning more about what In Space Assembly and Manufacturing (ISAM) is and what companies/organizations are out there that offer ISAM services or are working on ISAM projects.

- **Past week accomplishments** *(Please describe/summarize as to what was done, by whom, when and, collectively as a group. This should be about a paragraph or two in length. Bulleted points are acceptable as well. Please keep only your technical details related to your project. Figures, schematics, flow diagrams, pseudocode, and project related results are acceptable, but please ensure that they are legible (clear enough to read) and to provide an explanation. If researching a topic, please add a few details about what was learned and how it is relevant to the project. If two or more people worked on a single task, be sure to distinguish how each member contributed to the task. Specific details relating to the assistance provided to other members may be included here. **Do not include classwork, such as individual reflection assignments, and group meetings as part of your duties.**)*

- John Beuter: Researched companies currently working on ISAM capabilities. I discovered the organization MOOG and looked into how the organization created designs for ISAM capabilities.
- Daniel Sprout: Research on ISAM and C3. Reading the C3 information packet. Additionally research into current ISAM uses and use cases, as well as areas under development such as in-space manufacturing for fiber optic cables. Looking for information regarding how to design for 0g, and how designs change to adapt to the lack of 1g forces.
- Maheeka Davarakonda:
 - Read the C3 Information packet as well as 5 sources mentioned on the document
 - Reading the book “Interplanetary Robotics” by Rod Pyle to gain an understanding of innovations made in space so far.



- Worked on conducting initial market research and developing ideas for possible solutions.
- Developed questions on ISAM and the need/use for it in space.
- Connecting with a NASA contact to gauge an understanding of the current autonomous requirements to drive innovation.

IDEAS

What are the current ILM capabilities required?

What are the current ILM capabilities required?

What are possible ones?

What if?

- Things could fly out?
- range?
- kernel?

wheels in space?

insect fly?

fire in space? elements in space?

insect fly?

fire in space? elements in space?

Vacuum cleaners in space? make the impossible possible.

What are the current ILM capabilities required?

What are possible ones?

What kills satellites?

- * fuel depletion
- * space debris
- * radiation
- * solar radio outbursts

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- * space debris
- * radiation
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reduce space debris?

destroy? sustainability.

is there a new fuel way to orbit?

cost effective debris cleanup.

cost effective debris cleanup.

detector

magnet

detection and destruction from laser

movement: like help to where it needs to go

movement: like help to where it needs to go

* away from earth growing influence

in space construction of telescopes maybe all?

laser

magnet

movement: like help to where it needs to go

manufacture:

lets manufacture & shoot deep space objects.

8 out there

8

out there

manufacturing in space: > faster since materials behave differently

• Tanvi Mehetre:

1. The past week was spent getting to know more about the project and doing research about any existing solutions or ideas.
2. Researched about ISAM, any current projects related to it, and development in the sector.
3. Went through some research papers to learn more about ISAM and what are its benefits.
4. Researched OSAM by NASA.

• Riley Heeren:

This week consisted of ISAM market research and trying to assess the viability of different ideas in the current market. I researched different companies that already have a foot in the ISAM economy to see what their products looked like.

• Ben Swegle:

This week was spent researching ISAM and companies that are supporting new ISAM developments. My goal was to understand more of what ISAM is about and potential applications to help generate ideas for our project.

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

- John Beuter: N/A
- Daniel Sprout: N/A
- Maheeka Davarakonda: N/A
- Tanvi Mehetre: N/A
- Riley Heeren: N/A
- Ben Swegle: N/A

- **Individual contributions** *(Creating this section is optional, but it is **Required** to include the “Hours Worked for the Week” and their “Total Cumulative Hours” for the project for each member somewhere relevant in your report. Your individual weekly hours should be at a minimum of 6-8 hours for this course. So please manage your time well. Also, ensure that individual contributions support your claim to the weekly hours. Be honest with the reports.)*

<u>NAME</u>	<u>Individual Contributions</u> <i>(Quick list of contributions. This should be short.)</i>	<u>Hours this week</u>	<u>HOURS cumulative</u>
John Beuter	Conducted market research of other ISAM options.	1	1
Daniel Sprout	ISAM research and reading C3 documentation	2	2
Maheeka Davarakonda	Research, Reading Book, Ideation, Connecting with NASA	6	6
Tanvi Mehetre	Researched ISAM, OSAM, and went through research papers.	2	2
Riley Heeren			
Ben Swegle	Researched ISAM market, companies, and ideas.	1	1

- **Comments and extended discussion** *(Optional)*
Feel free to discuss non-technical issues related to your project.

- **Plans for the upcoming week**

Each team member is to generate 3 to 5 ideas using sketchnoting to prepare for an ideas review meeting with advisor Bo on October 6th.

- **Summary of weekly advisor meeting** *(If applicable/optional)*
(Provide a concise summary on the contents and progress made during the advisor meeting.)

Discussed expectations for the competition—established meeting timeline with faculty and industry advisor. We determined team roles and responsibilities. Created a Google Drive to share team content. Distributed the expectation of delivering 3 design ideas by the next

advisor meeting on October 6th.