

# 2025 NASA Student Launch

## Team 509: Payload

Virtual Design Review One

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Nathan Hardie, Kyle Mahoney, Neil Maldonado

# Team Introductions



Matthew Archibald  
ME - Structural  
Engineer



Donovan Dwight  
ME - Test Engineer



Nathan Hardie  
CE -  
Communications  
Systems Engineer



Kyle Mahoney  
ME - Fabrication  
Engineer



Neil Maldonado  
EE - Data Systems  
Engineer

# Faculty Sponsor and Advisor



Sponsor  
Shayne McConomy,  
Ph.D.  
ME – Teaching  
Faculty II



Advisor  
Taylor Higgins  
Ph.D.  
ME – Assistant  
Professor

# Project Objective

The objective of this project is to design and integrate a payload into a high-powered rocket for the 2025 NASA Student Launch Competition.



# Project Association



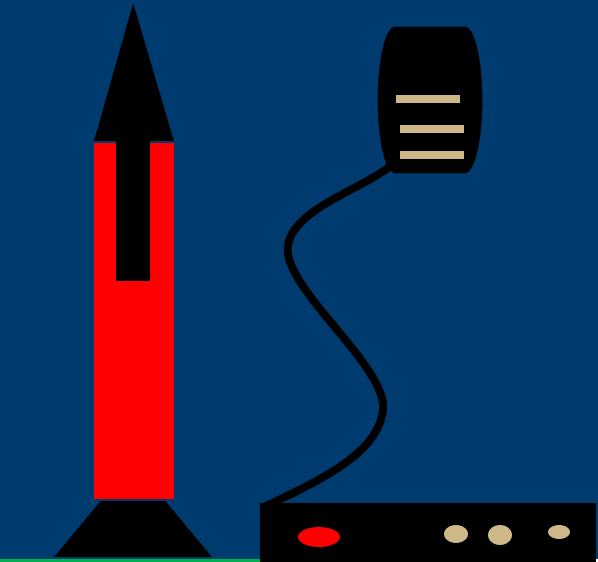
University Association  
FAMU-FSU College of Engineering  
ME Department

Government Association  
National Aeronautics and Space  
Admiration (NASA)

Club Association  
American Institute of Aeronautics  
and Astronautics (AIAA)

# Background

Matthew  
Archibald



# Background

Matthew  
Archibald



# Key Goals



## KEY GOAL #1

Maintain high  
survivability for  
STEMnauts



## KEY GOAL #2

Radio  
transmission of  
at least three  
flight parameters



## KEY GOAL #3

Successful  
integration into  
full-scale and  
subscale rockets

# Assumptions



## Weather

- Average weather conditions
- No precipitation



## Rocket

- Rocket functionality



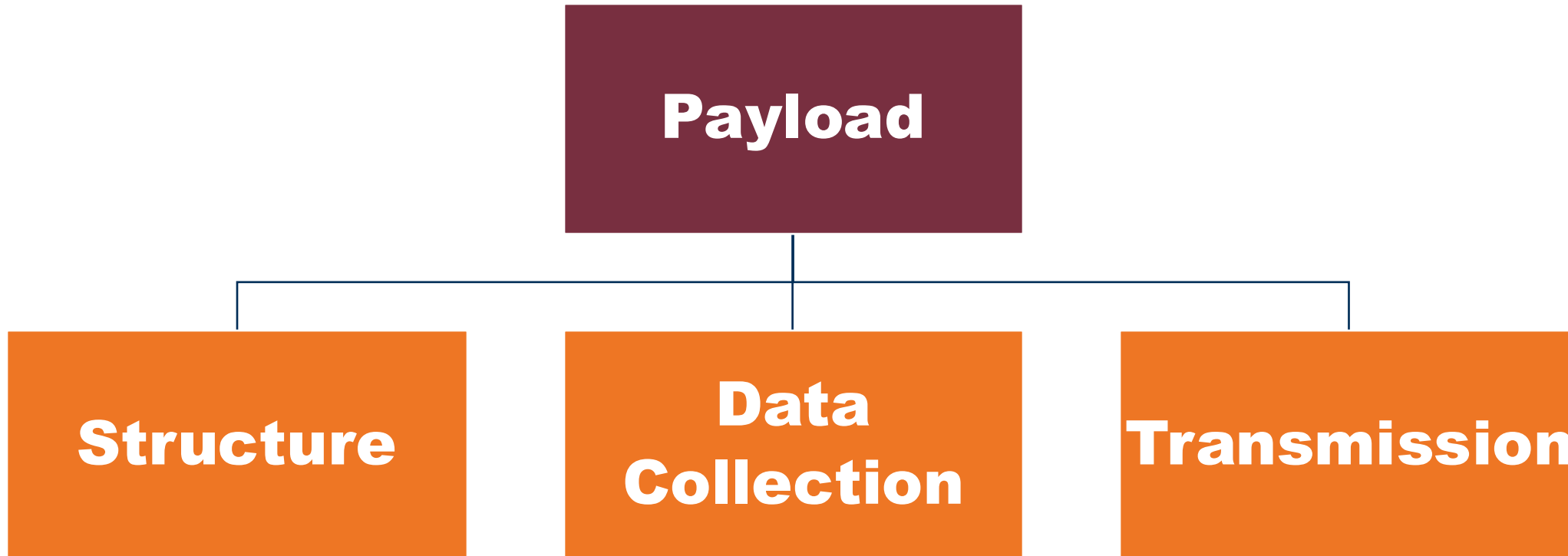
## Radio

- FTM-300DR transceiver

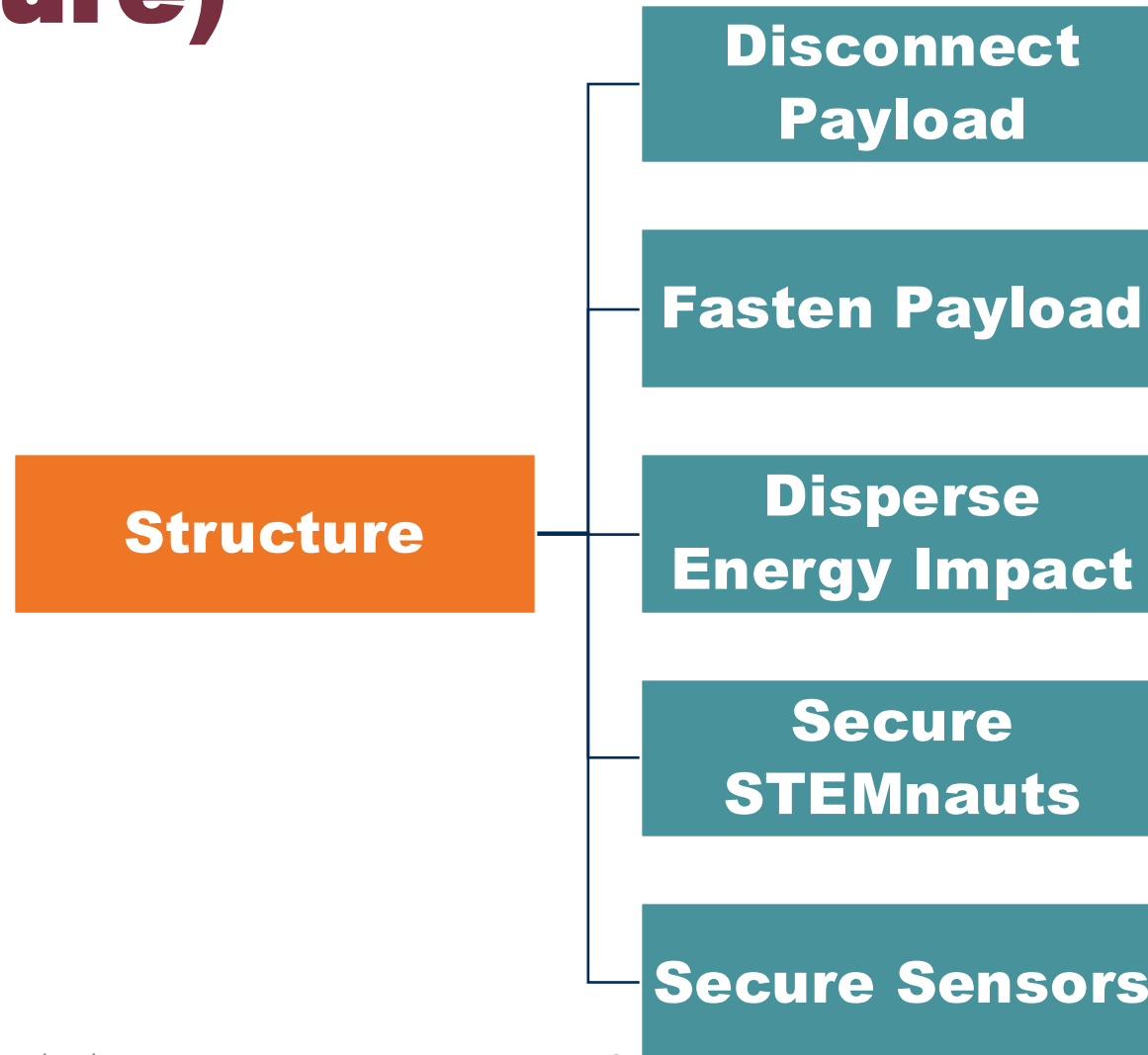
- FAA and NAR rules and regulations.
  - Weight: 0.55lbs
  - Materials selection
  - Fasteners: MIL-SPEC
  - Frequency limitations
- Valid communication license and callsign
- Four STEMnauts during flight test.



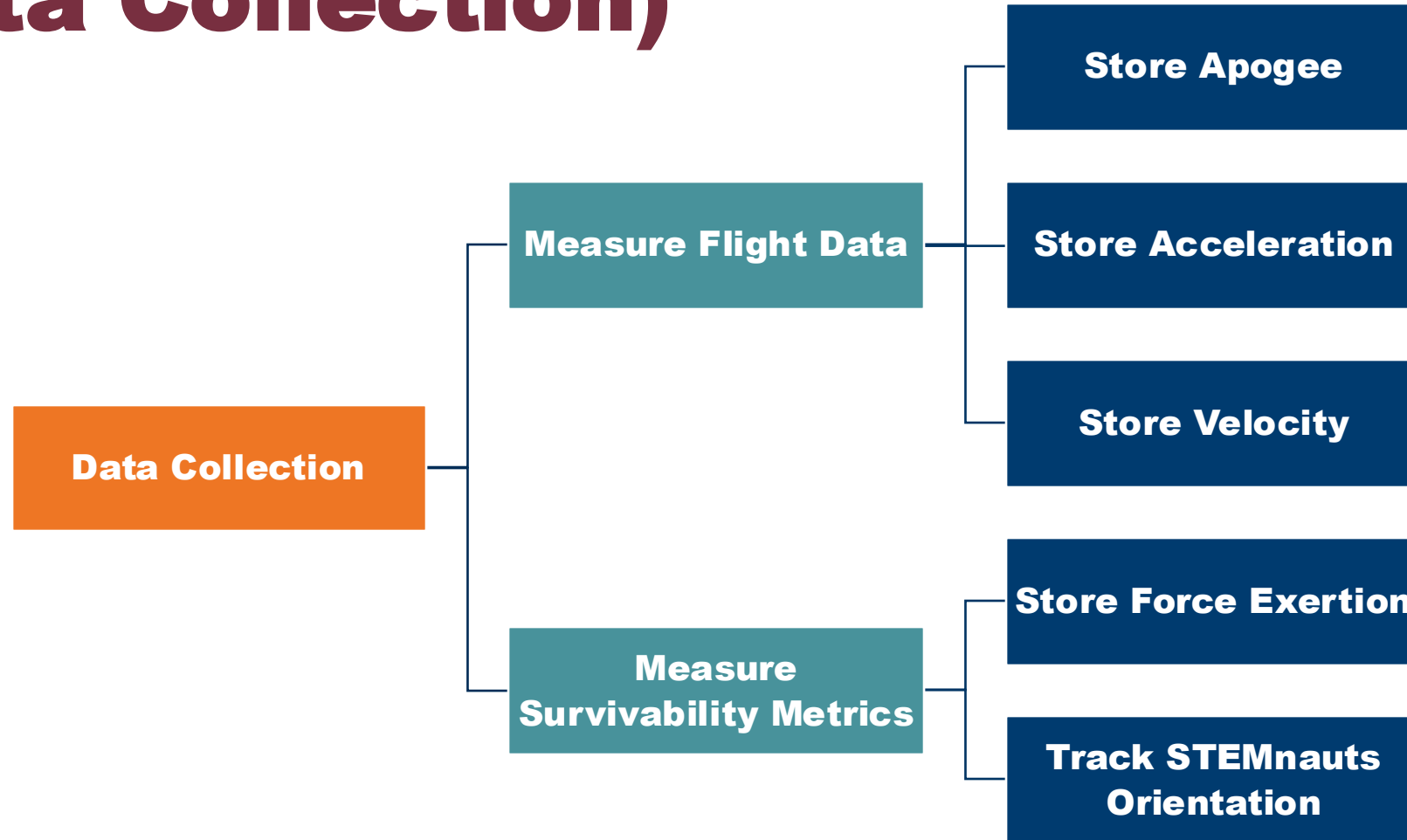
# Functional Decomposition



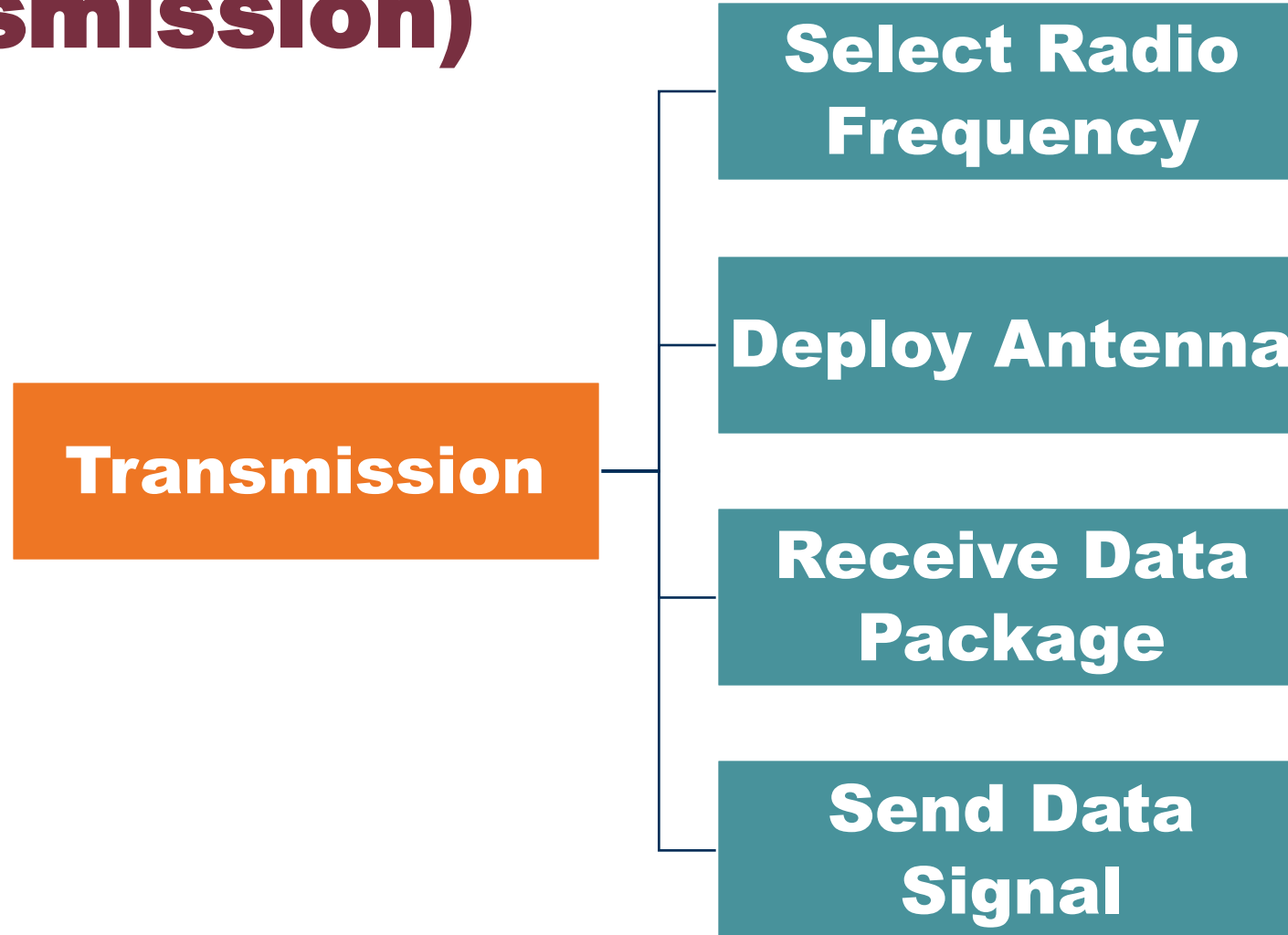
# Functional Decomposition (Structure)



# Functional Decomposition (Data Collection)

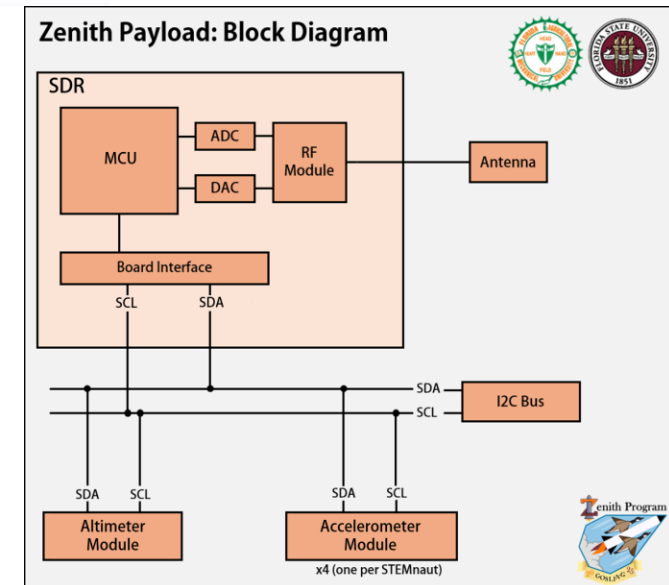
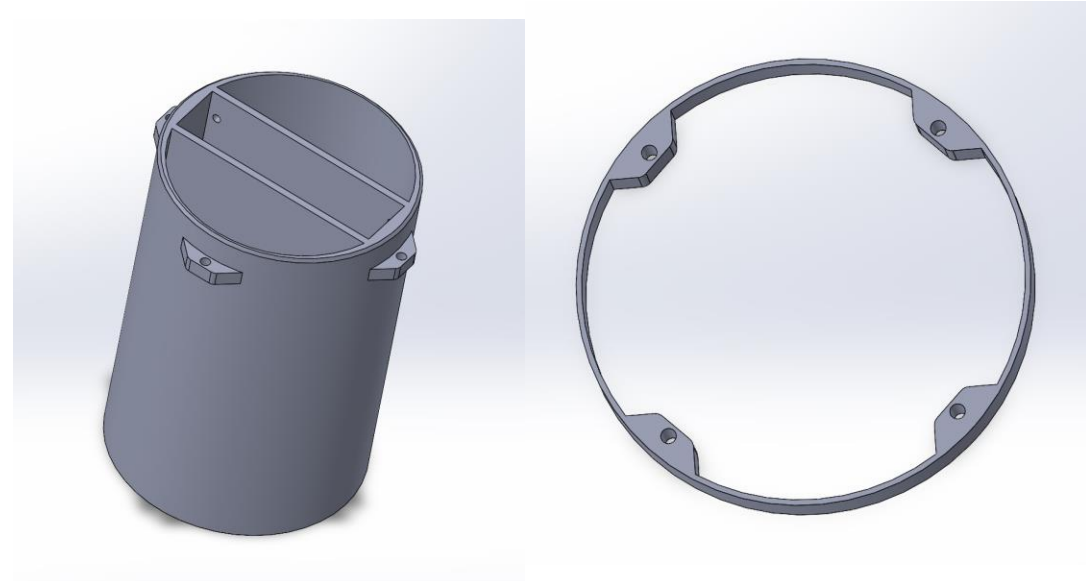


# Functional Decomposition (Transmission)

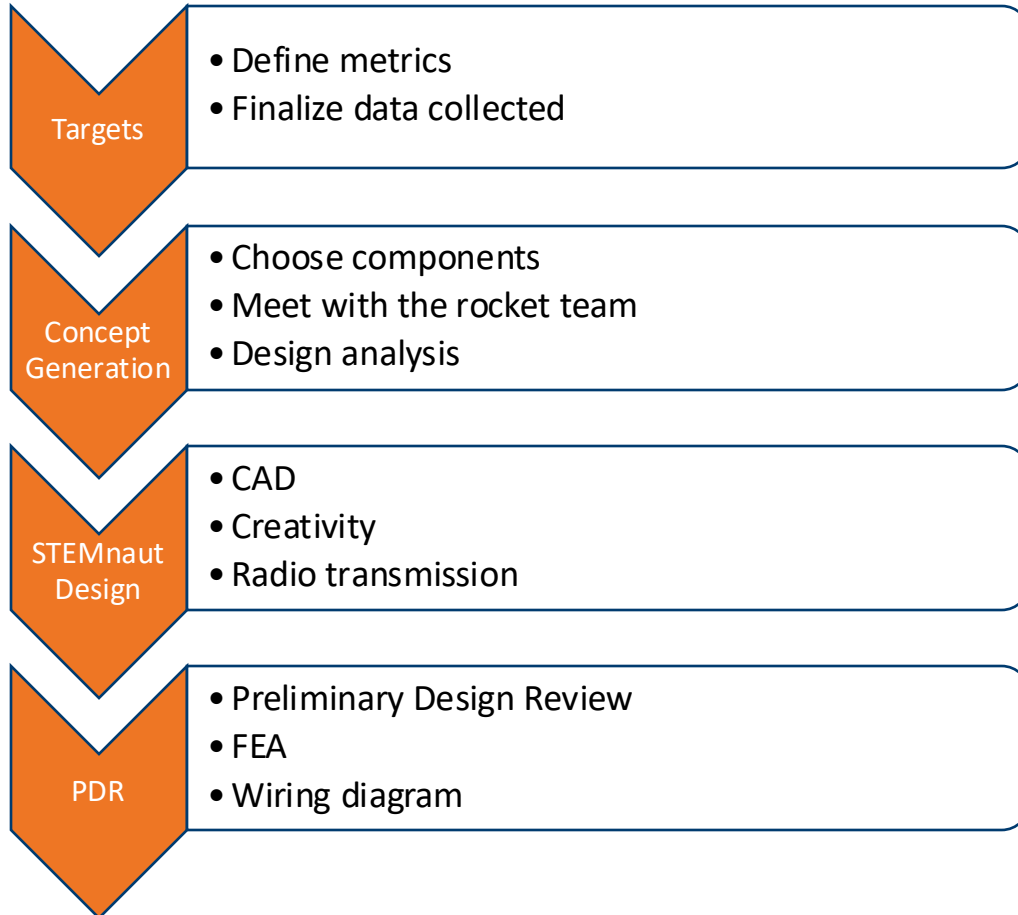


# Club Work

- NASA Deliverables
  - Proposal has been approved
  - Licensing and certifications
- Preliminary Payload Design
  - Layout and fastening method
- STEM Engagement
  - Planning lessons for middle & high school students
  - Aerospace experience opportunities for students
- Engineering
  - Research of components



# Future Works



Artemis 2 Crew – Basis for STEM-naut Design

# Thank you for listening!

## Any questions?



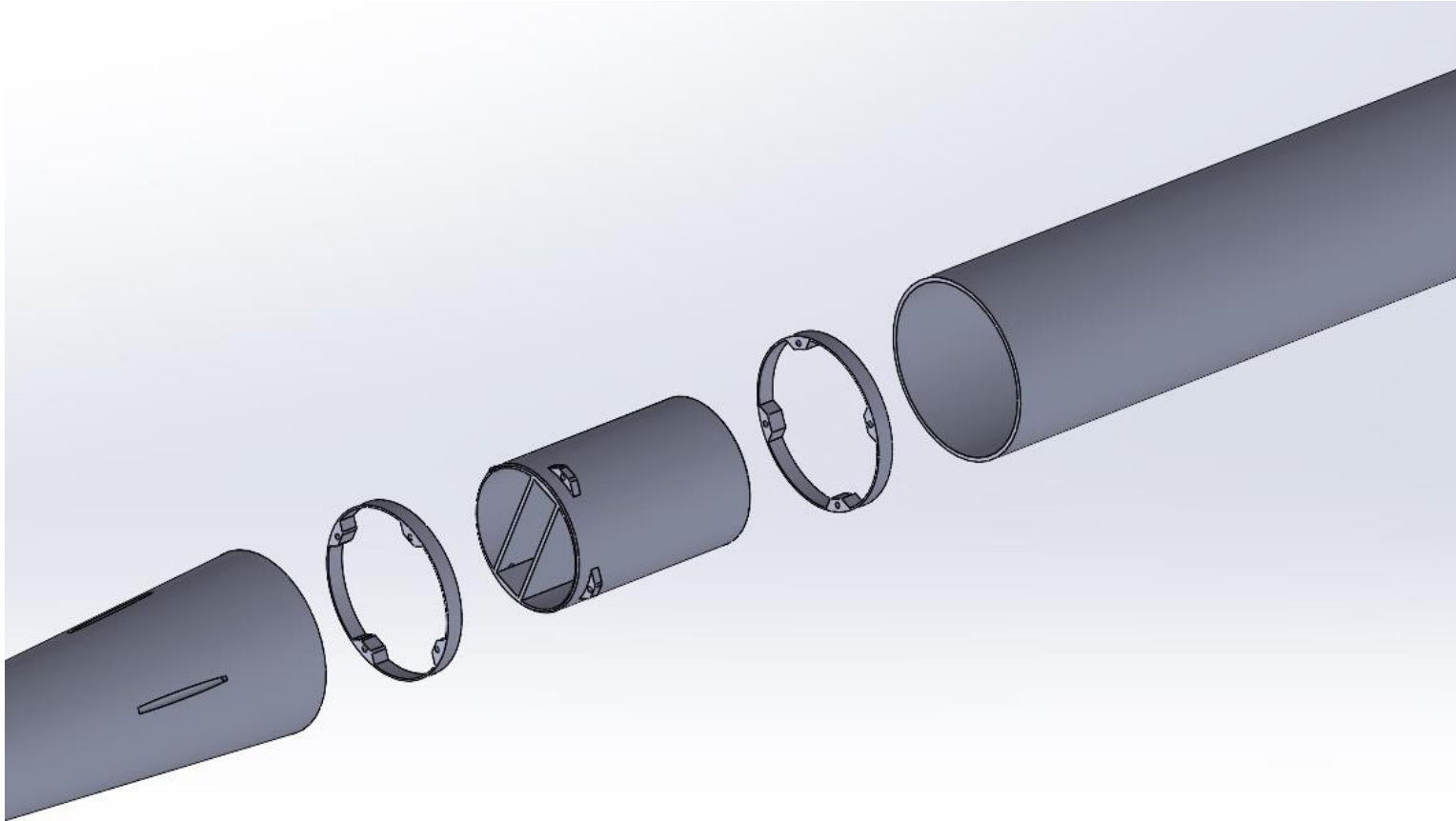
# References

NASA. (2025). NASA Student Launch Handbook. Retrieved from <https://www.nasa.gov/wp-content/uploads/2024/08/2025-nasa-sl-handbook.pdf?emrc=77b9f2?emrc=77b9f2>

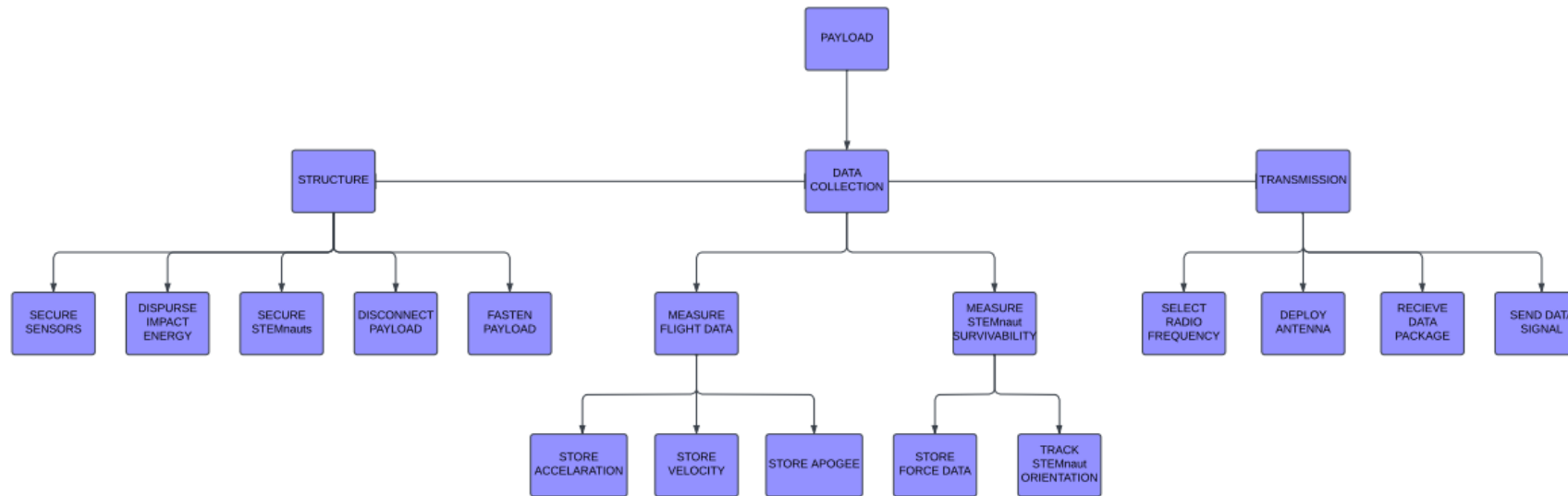
# Back Up Slides



# Preliminary Design Assembly



# Entire Functional Decomposition



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