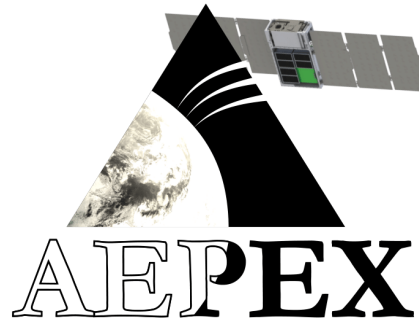
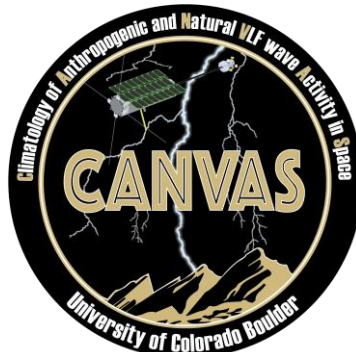


A Methodology for Successful University Graduate CubeSat Programs

Presenter: Aaron P. Aboaf

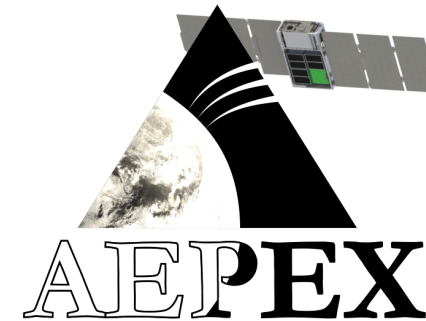
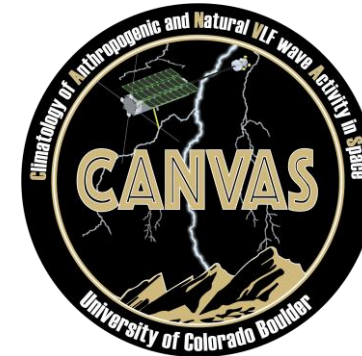
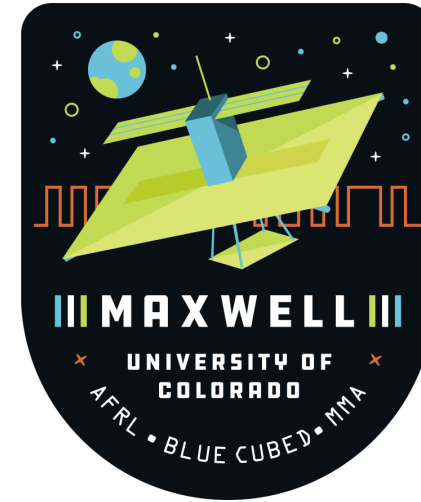
Authors: Aaron P. Aboaf, Elliott S. Harrod, Matthew Zola, Arunima Prakash, Scott E. Palo, Robert Marshall, Marcin D. Pilinski, Nicholas Rainville, Andrew Dahir, Vikas Nataraja, Bennet Schwab, Adam Gardell, Les Warshaw



Context of the Paper



University of Colorado
Boulder

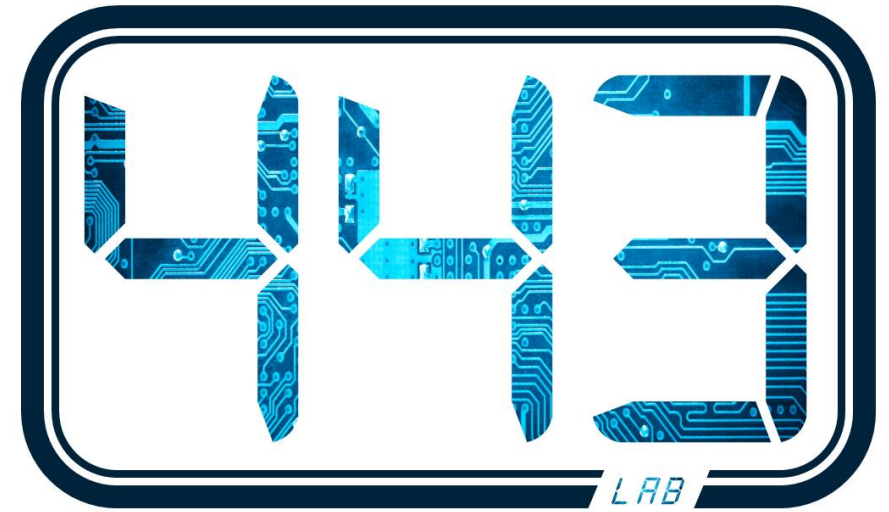
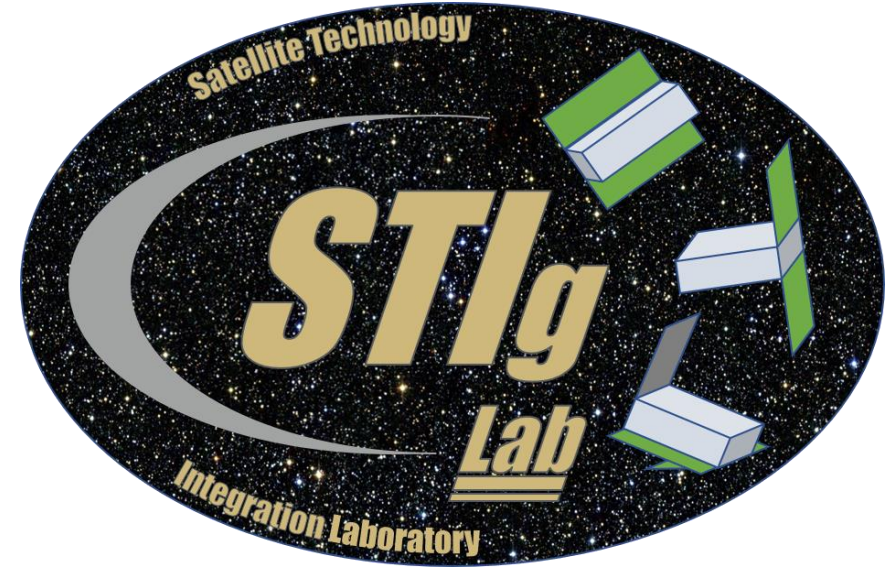
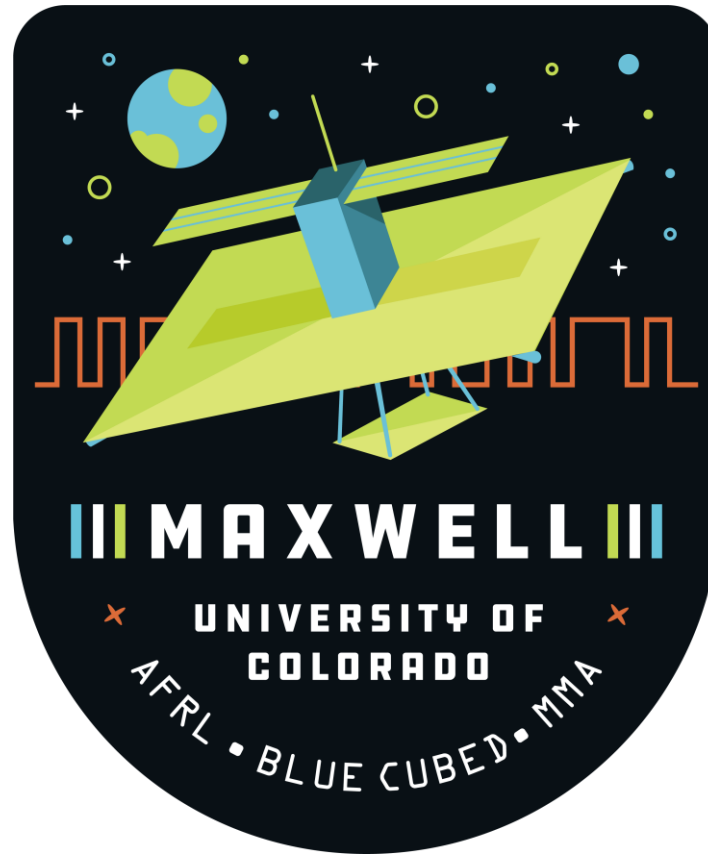
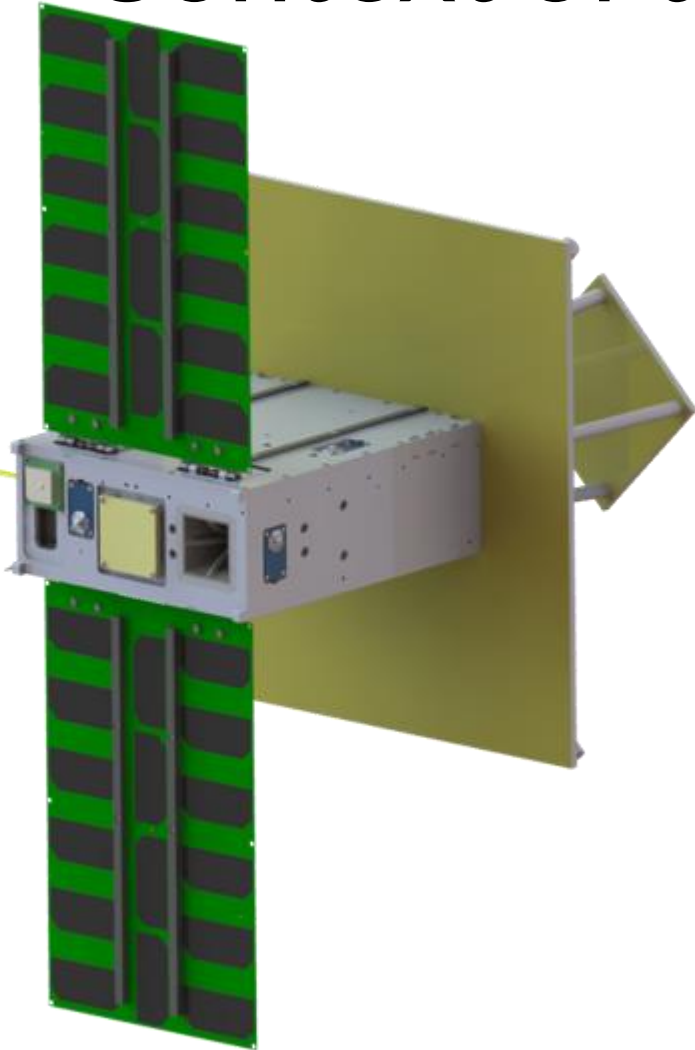


SWARM-EX



University of Colorado **Boulder**

Context of the Paper



Getting Started

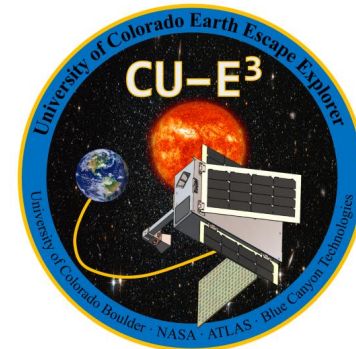
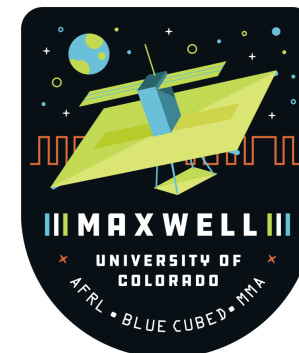
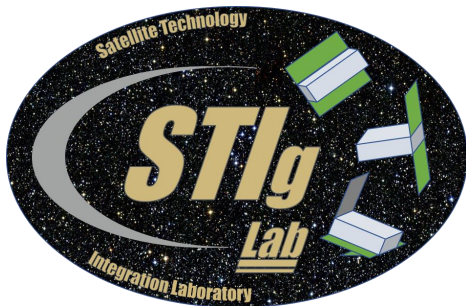
- Establishing a project sponsor
 - Funding & external accountability



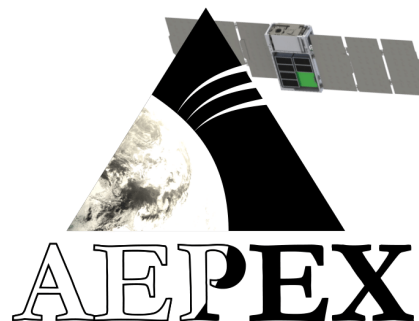
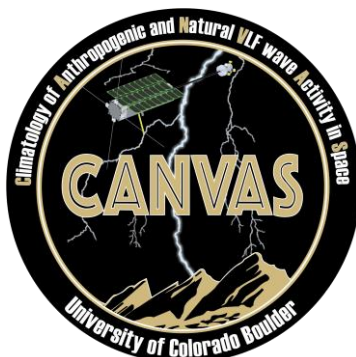
- Establishing a way to recruit and retain personnel
 - Flexible incentives & extended opportunities

- Balancing programmatics with technical work
 - Task tracking, document tracking, & meetings



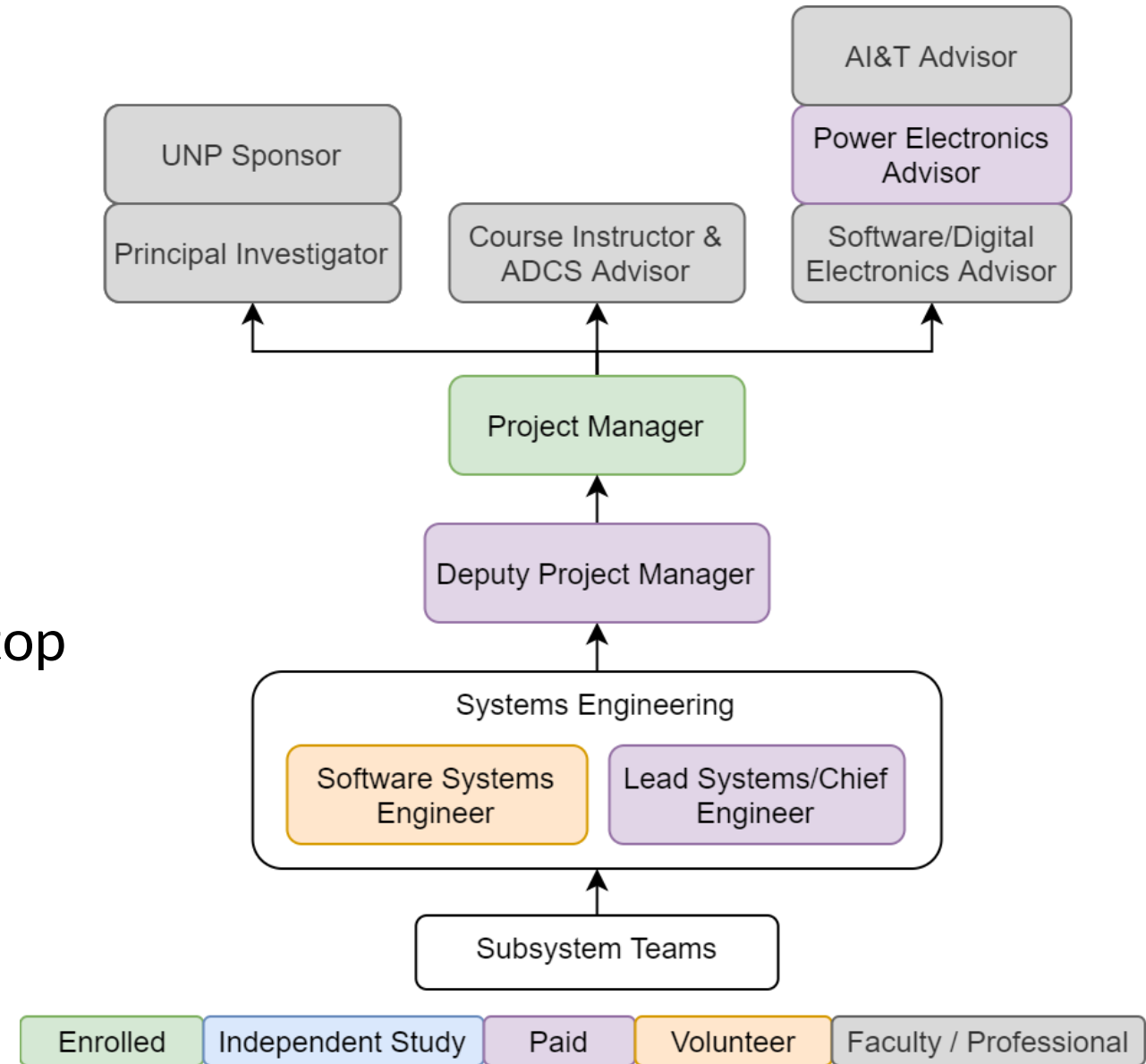


Program Infrastructure



Leadership

- Leadership's responsibilities
 - Institute, manage, and enforce policies and procedures
 - Set the example
- Long-term success
 - Identifying strong students for top level positions
 - Longer term commitments
- Recognizing stellar work
 - Commend students at team meetings doing excellent work



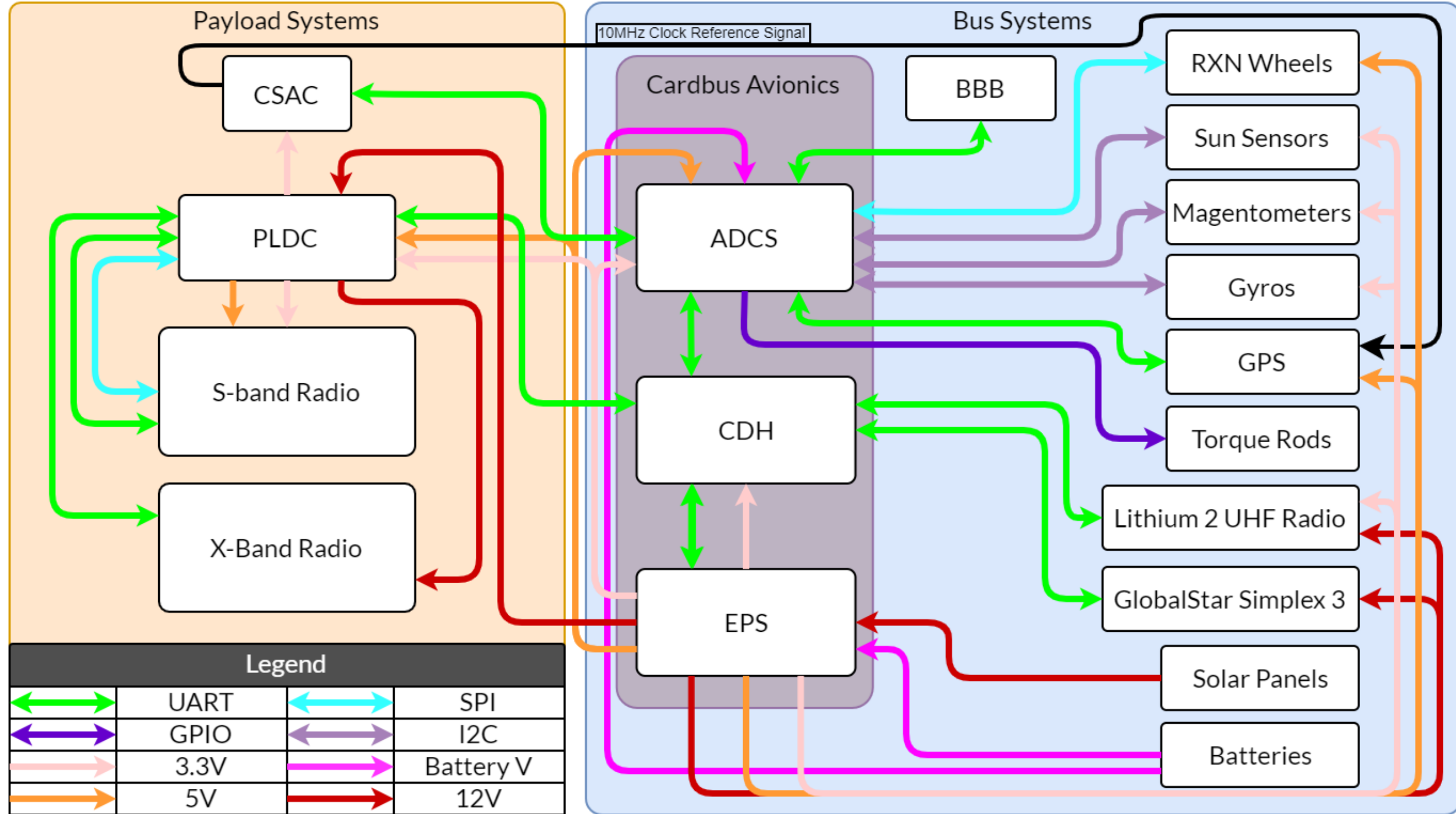
Recruitment & Training

- Recruitment is one of the tallest poles to knock down



Training Approach:

- Iterative
- Detailed onboarding process
 - High level system overview
 - Smaller groups doing hardware specific training
 - Deep dive into a chosen subsystem with the responsible engineer
- Knowledge transfer relies on tracked documentation, regular review schedule, and specific tasks for new members

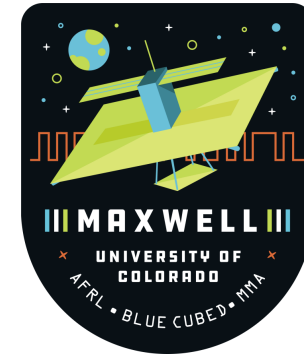
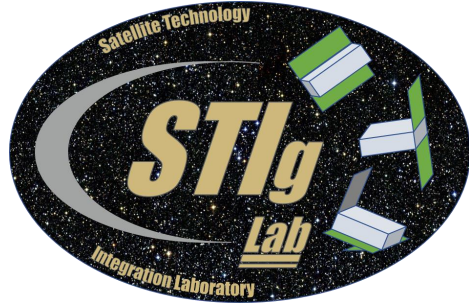


Team Communication

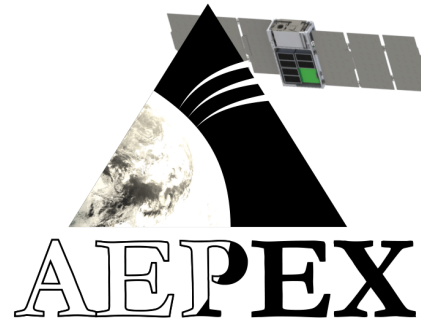
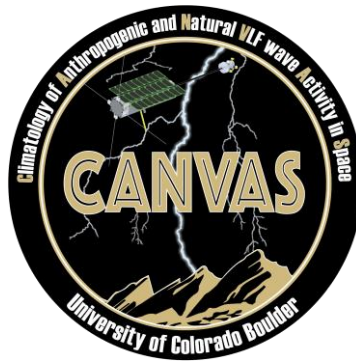


- Facilitate the transfer of information quickly to the right people
- Keep the PI and Advisors involved
- Encourage people to ask questions in public channels

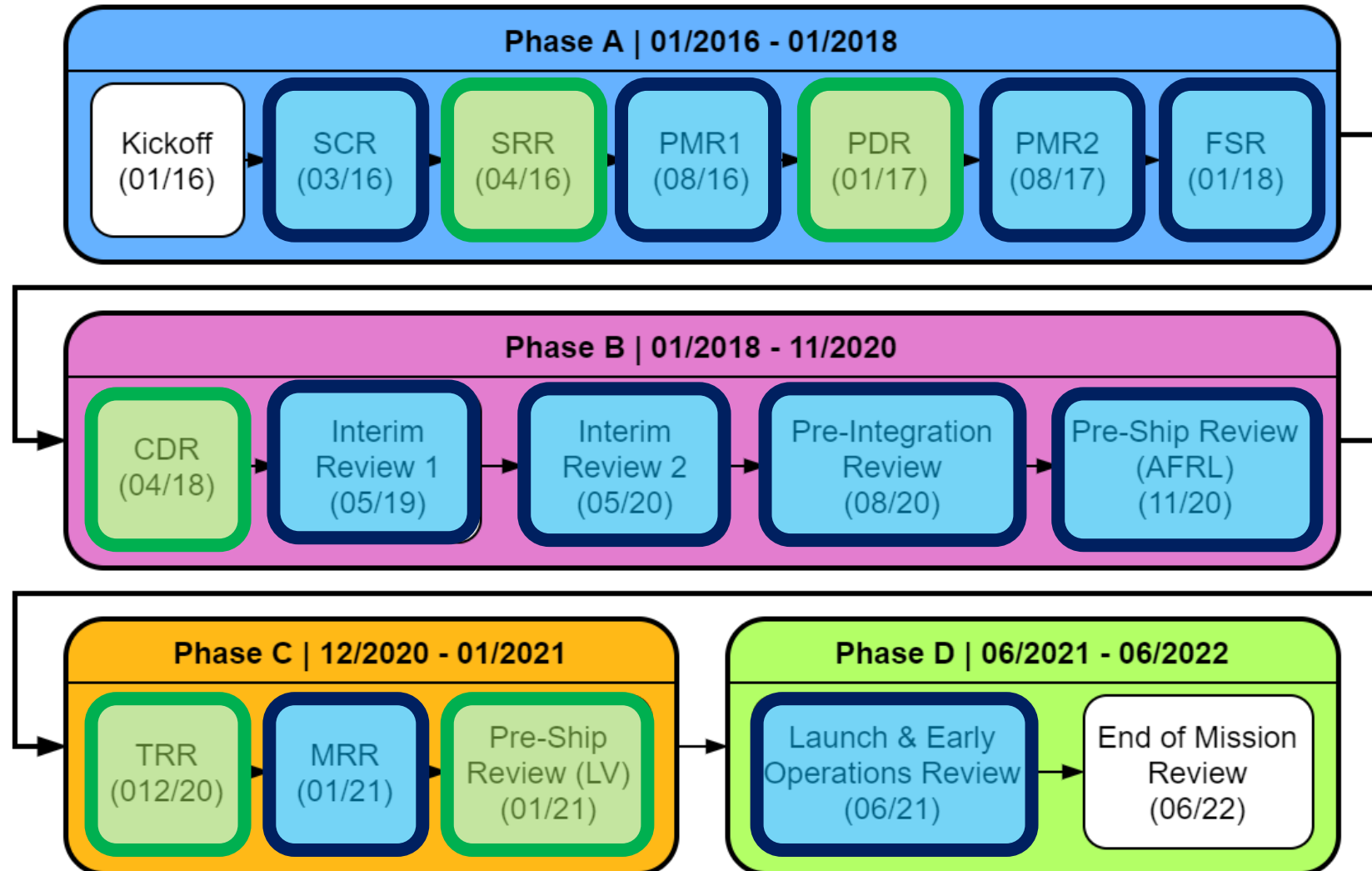




Project Infrastructure

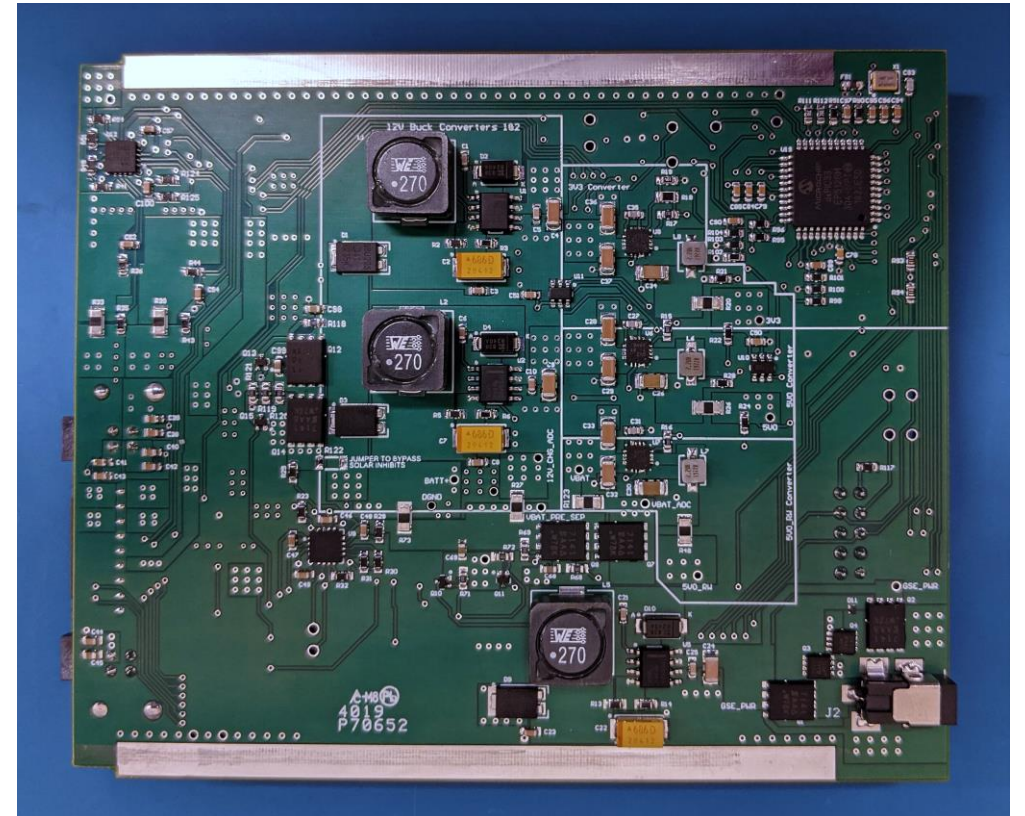


Project Lifecycle



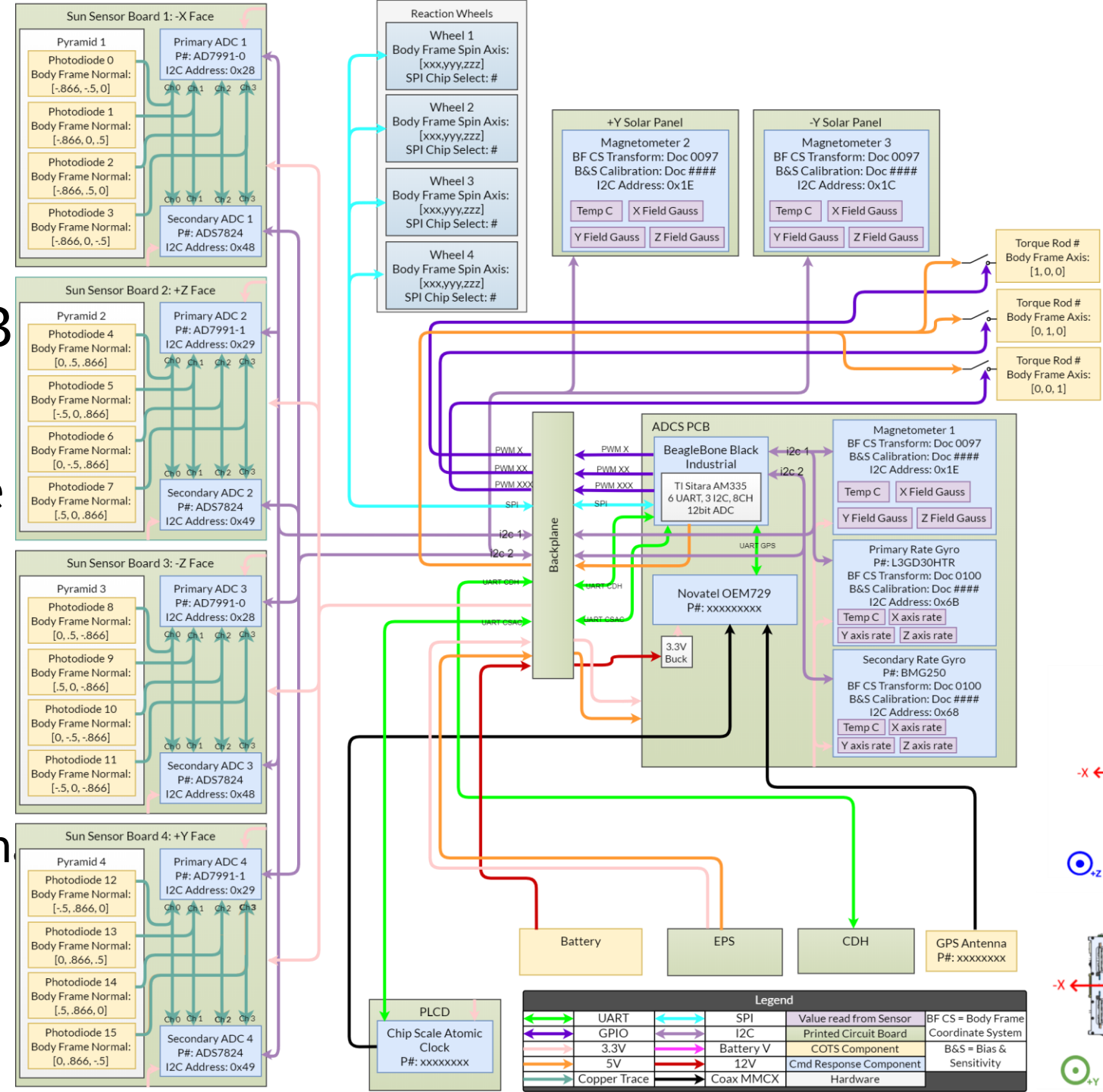
Hardware

- Printed Circuit Board (PCB) tracking and version control
- Functional and acceptance testing



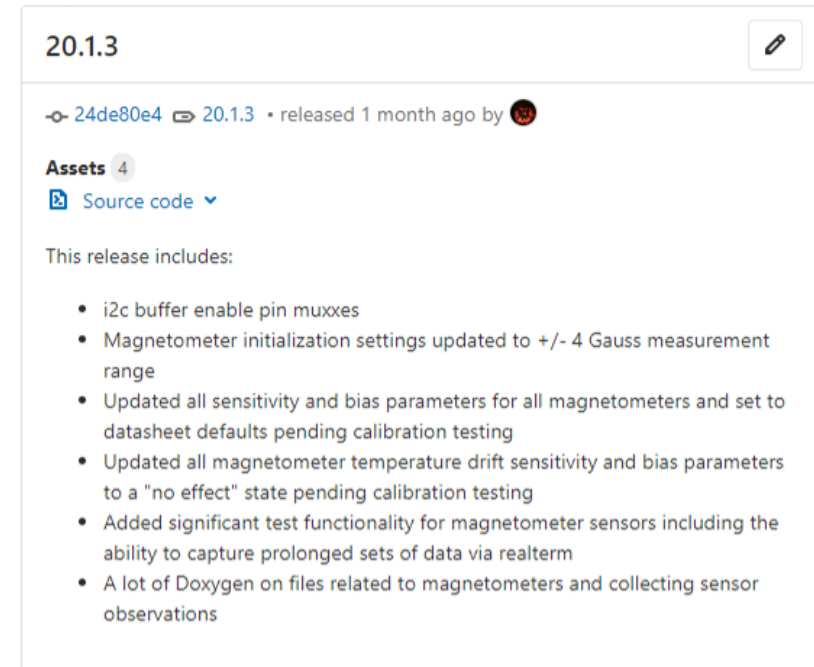
Hardware

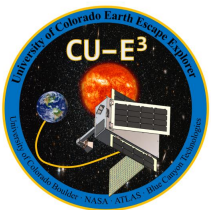
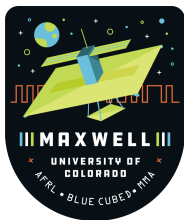
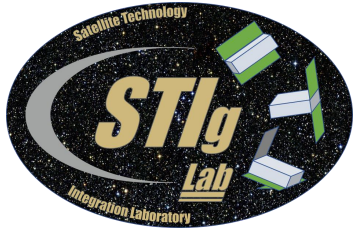
- Printed Circuit Board (PCB)
- Functional and acceptance
- Block diagrams
 - Power connections
 - Signal nets
 - Sensor configuration inform



Software

- Version control
 - Tracked releases with notes
 - Approved code release criteria
- Incremental testing
- Tracking tested versions





Questions?
Reach out to us!

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