National Aeronautics and
Space Administration

INSPIRE - ENGAGE - EDUCATE - EMPLOY
The Next Generation of Explorers

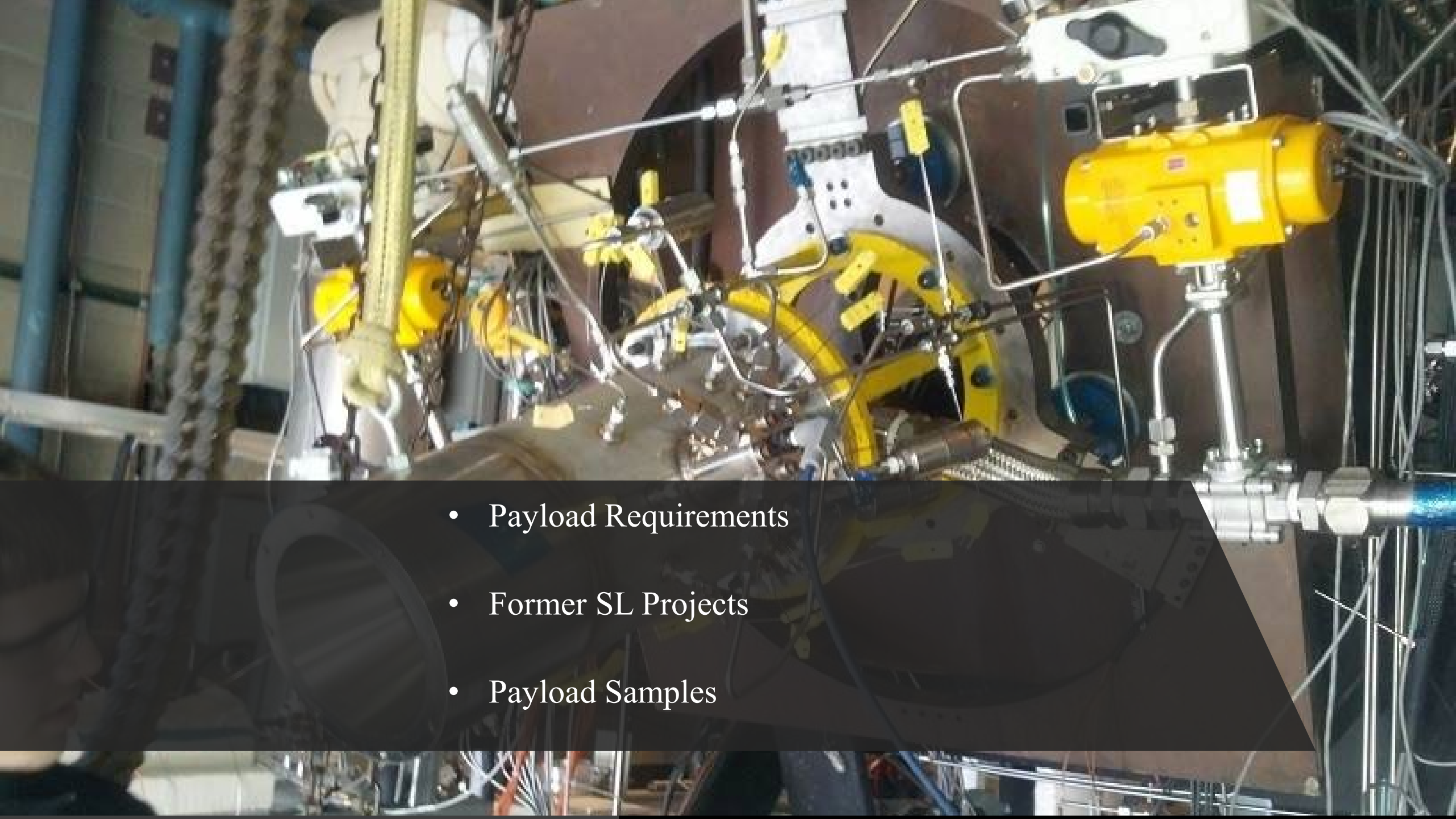






Student Launch - Payloads

John Eckhart
SL Technical Coordinator



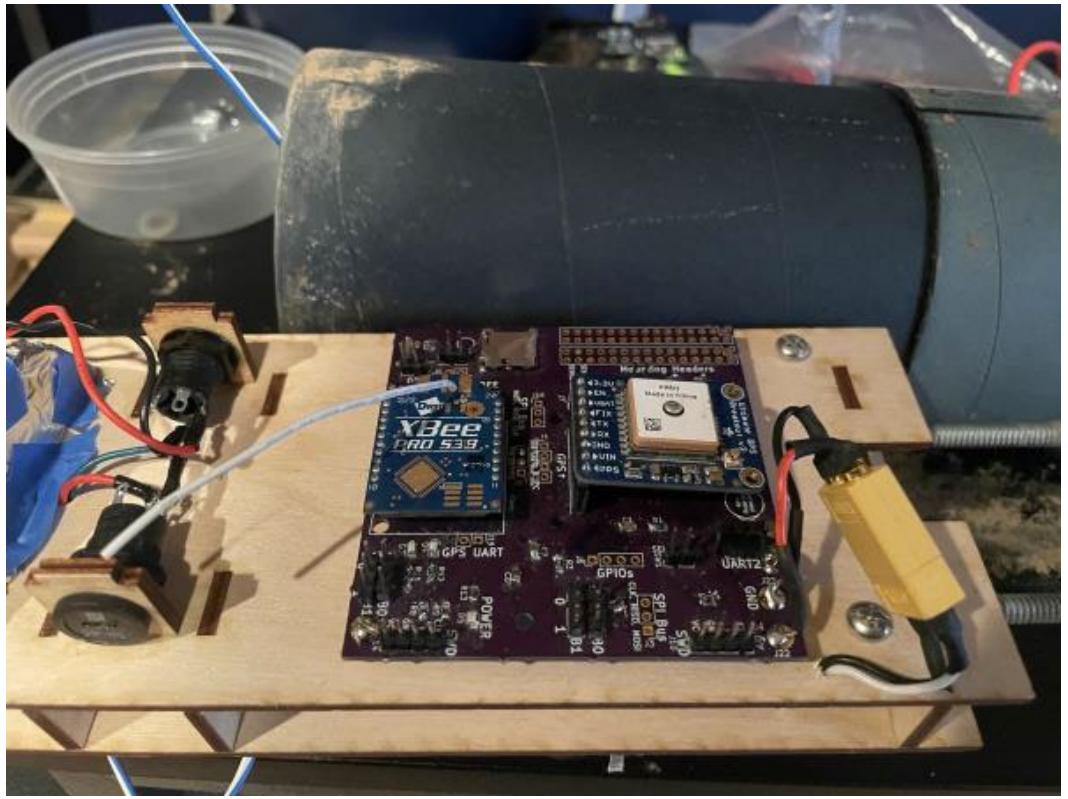
- Payload Requirements
- Former SL Projects
- Payload Samples

SLI Payload Requirements

- **The launch vehicle shall carry a science or engineering payload that is designed by the team and approved by NASA personnel.**
- Data from the science or engineering payload shall be collected and analyzed by the team following the scientific method and reported in the team's PLAR.
  - Engineering: Clear goal for final product
    - What are we trying to do or produce?
  - Scientific: Clear hypothesis or experimental question
    - What are we trying to find out? What do we think will happen?

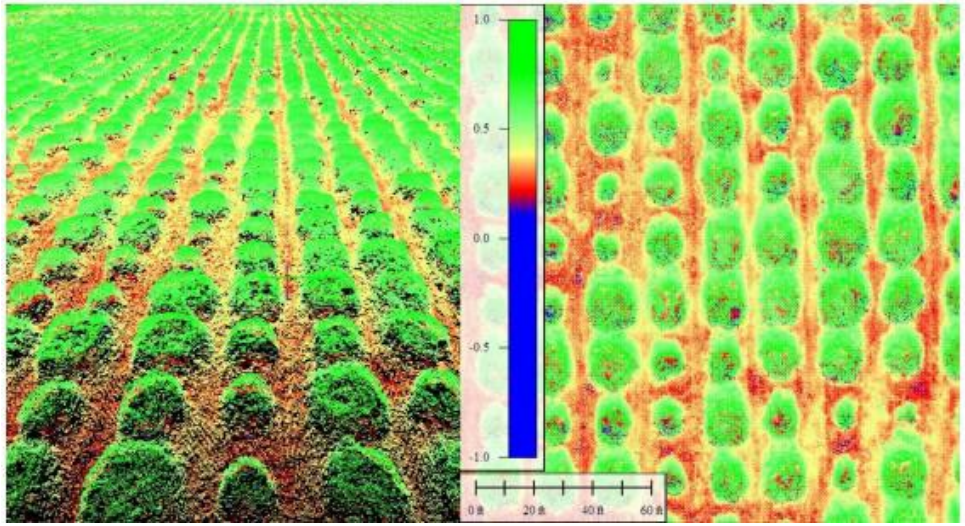
Former SLI Payloads

- Atmospheric Science
  - Temperature, pressure, humidity, etc.
- Biology
  - High G effects on slime molds, ladybugs, bamboo
  - Bacteria in atmosphere
  - Cricket respiratory effects
- Engineering
  - Solar panel efficiency
  - Hard drive latency
  - Fly wheel for roll stability
- UAV/Rovers
  - RC airplanes, steerable parafoils, etc.
  - Deployable drones to detect landing colored objects



SLI Payload Examples
Madison West High School 2020/2021

- Developing a multispectral imaging system for short-range land surveying, using images and data collected during the vehicle descent to generate a two-dimensional *Normalized Difference Vegetation Index* (NDVI) map. We will then create a three-dimensional point cloud terrain map.





USLI Payload Challenge 2020-2021

- Design, build, and launch a planetary lander capable of landing in an upright configuration or autonomously uprighting after landing.
- Self-level within a five-degree tolerance from vertical.
- Take a 360-degree panoramic photo of the landing site and transmit the photo to the team.





USLI Payload Examples

https://www.youtube.com/watch?v=Ul9EE3qlDOs





Questions?