



Cygnus & Veridis Quo: Iterative CubeSat Payload Design for Near-Space Spectral and Atmospheric Sensing

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University of Arizona SEDS ASCEND! Team

Overview: Developed a 2U CubeSat Module with Improved accessibility and uniform organization while still collecting altitude and spectral based data.

Introduction & Project Description:

We designed two lightweight payloads (one per semester) for near space research via high-altitude balloons.

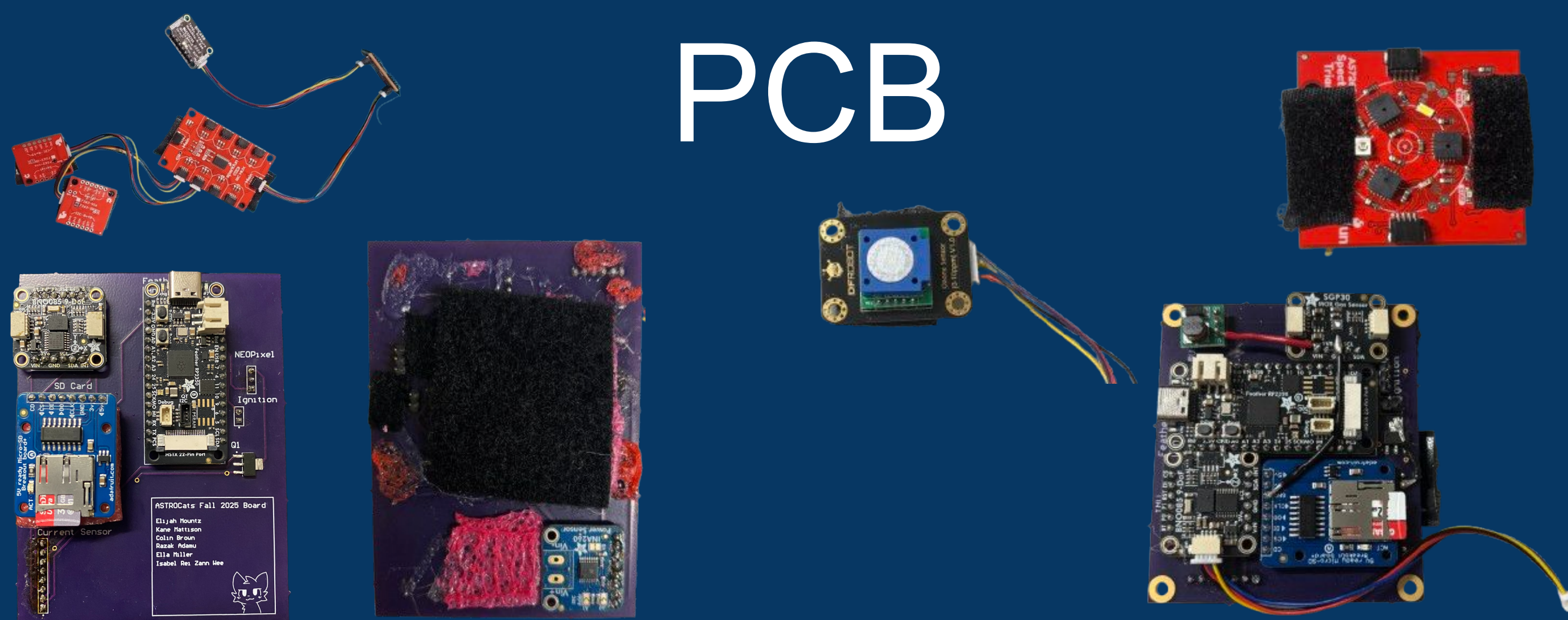
General Data Logging Fall: Pressure, Altitude, Temperature, Humidity, Ozone, 410-940 nm Spectrometer, Accelerometer, Gyroscope, Magnetometer

General Data Logging Spring: Pressure, Altitude, Temperature, Humidity, Ozone, 410-940 nm Spectrometer, Accelerometer, Gyroscope, Magnetometer

Results:

Data and video was successfully collected during both semesters. In the Fall, UV data was impacted by an acrylic window, and video ended before burst. In Spring we remediated both issues.

PCB



(Customized schematics and board using Altium Designer)
Fall 2025 on the left and Spring 2026 on the right

Housing

3D Printed CF PLA (Carbon Fiber)



Both iterations of the payload used exteriors of CF PLA and focused on accessibility for components.

Sensors

- BME680
- Gravity Ozone
- AS7265x Spectral
- BNO085

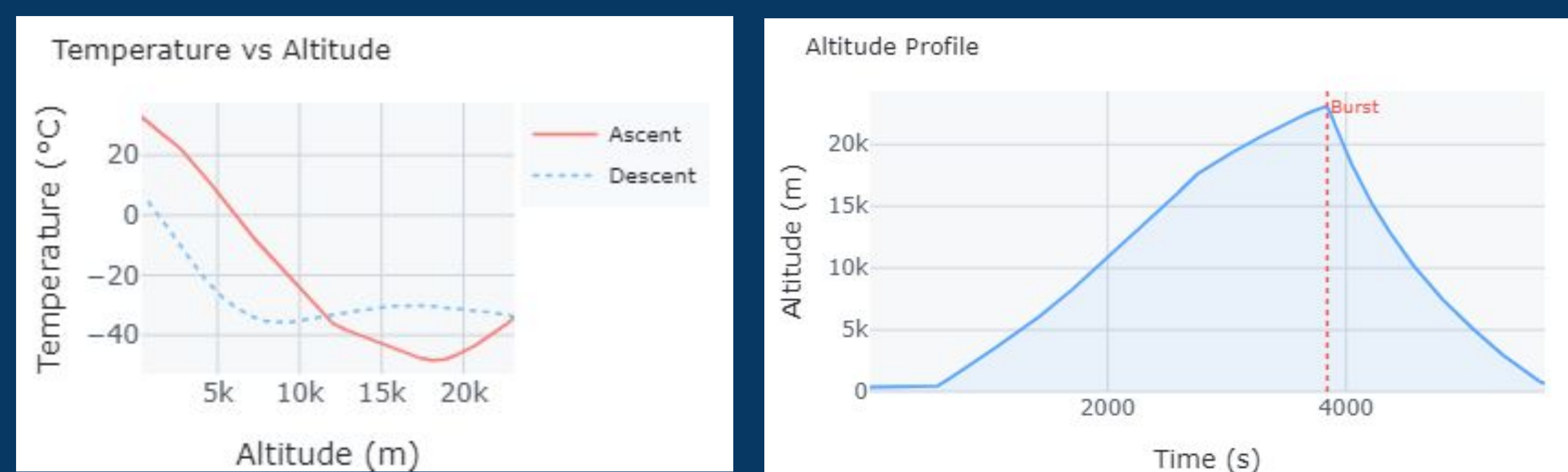


Durability Tests

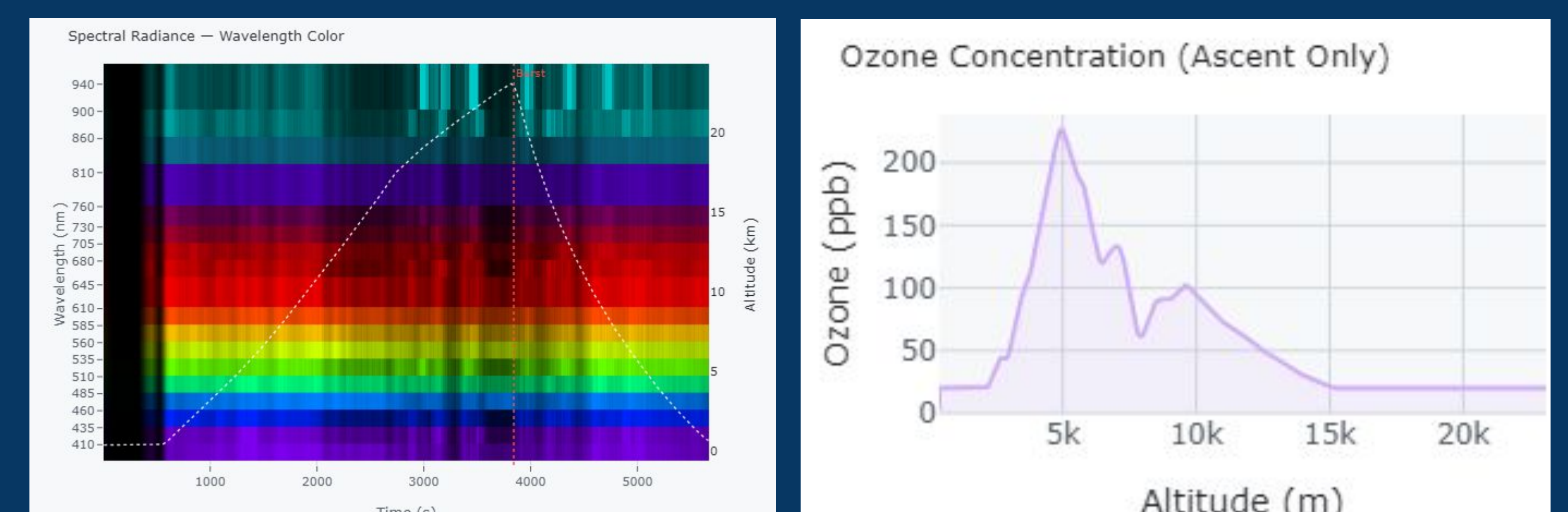


Drop, Kevlar, and durability tests were conducted to determine design efficiency.

Temperature and Altitude



Plot of Data



Future Projects: Integration of a weather anemometer, telemetry tracker using ground station, biology growth using algae

Scan QR code to see past flight footage!

