



Spark Talk!

The Future of the College of Letters & Science

Dean William G. Thomas III
October 16, 2025



College of Letters and Science (CLS) Student Ambassadors



AUTHORS

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Supervisor:

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Design and Development of Balloons and Instrumentation for High Altitude Data and Systems

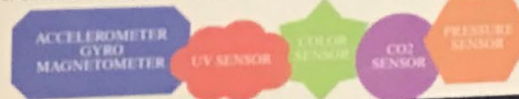
AFFILIATION



W.A.L.T.E.R.

Wide-Spectrum, Altitude, Light, Temperature, and Environmental Reporter

The Wide-Spectrum, Altitude, Light, Temperature, and Environmental Reporter, or W.A.L.T.E.R., is a Printed Circuit Board (PCB) that interfaces with the BOREALIS-designed Basic Operational Board for Circuit Assembly and Testing (B.O.B.C.A.T.) to gather data on a 3-D printed CubeSat.



W.A.L.T.E.R. PROCESS

1. Sensor Research
2. Schematic Design
3. Design
4. Design and coding
5. Design and coding
6. Design and coding



A.S.P.E.N. PROCESS

1. Gore Math
2. Cut 13 Gores
3. Seam-seal gores
4. Attach fill-arm and vent
5. Connect lines
6. Make the end buttons

The final step was to launch and fly the balloon! This is a picture during fill on flight day.



A.S.P.E.N.

Airborne Spherical Plastic Endangering Nature

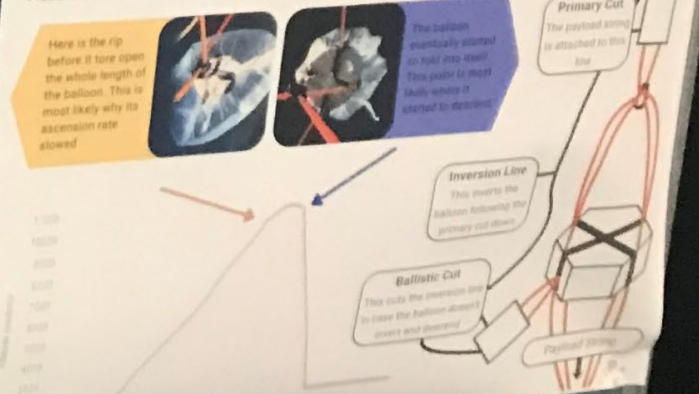
The Airborne Spherical Plastic Endangering Nature is a zero-pressure balloon, meaning it doesn't seal the helium in the balloon. The balloon vents out unnecessary helium through the bottom and equalizes its own pressure, causing it to invert until the balloon is either inverted or the sun falls. This balloon was made over about two weeks using plastic with a thickness of 20 microns.



BALLOON LAUNCH ANALYSIS

Launched: 10 July, 2025 | 6:42AM MDT | 12:42 UTC
Distance: ~30 miles
Maximum Altitude: 10704 meters | 35118 feet
Predicted Float Altitude: 21336 meters | 70000 feet

Balloon Mass: 2.204 kilograms
Payload String Mass: 2.642 kilograms
Total Mass Lifted: 4.846 kilograms
Wind Speed at Launch: ~10 miles/hour



WHAT I LEARNED

W.A.L.T.E.R. is still a work in progress, but I have already learned a lot about what goes into the process of making instrumentation for physics research. I have learned how to use Fusion360, the basics of PCB design, improved my soldering skills, and developed my understanding of the software used to program the PCBs.

A.S.P.E.N. failed prematurely, which was disappointing. I learned a lot about the physics behind how zero-pressure balloons work, and this led me to develop an effective process for building them. I wrote a Python code to predict the float altitude based on the

CLS student Aspen McKee at the Student Research Celebration



CLS 2025 Distinguished Professor Dana Longcope and U.S. Fulbright Scholar, Liz Shanahan



CLS Celebrating Graduate Student Scholarship



CLS Graduate Students Ben Weber and Max Rubino, Flying D Ranch



CLS's Dr. Devon Orme, Field Geology Course



CLS Welcome Tent, first day of classes, August 2025



CLS 2025 Writer-in-Residence Tyler Austin Harper



CLS's Dr. Liz Arnold and Dr. Beth Burroughs, MSU Science Day, February 2025



Dr. Susan Kelly with Dr. Kathy Crawford, 2025 Honorary Alumni Awards



Dedication of the Elouise Cobell Arbor, American Indian Hall, October 13, 2025



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MSU Commencement



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