Judi Sandrock

Inspiring students across the world with authentic and hands-on space projects

“Space sovereignty and get to work!”

Fast forward to 2035

- WEF “global space economy will exceed US$1.8T
- Public and private sector already desperate for skills and capacity

The employees who will become productive that year are right now in grade 9 deciding which subjects to keep or drop!

Since 2015

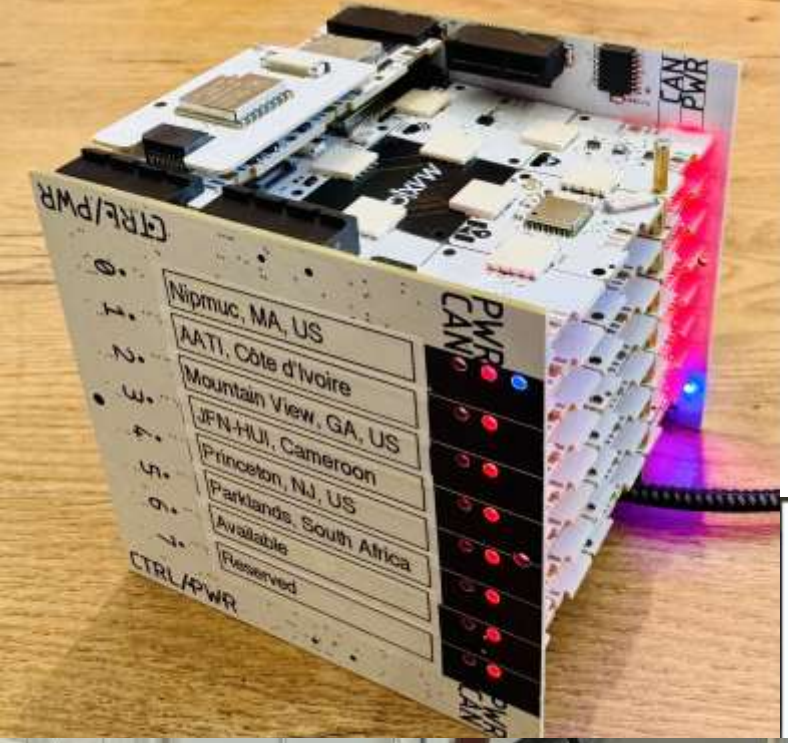
- Developed our own modular electronics for schools and space
- Over 80 ThinSats launched into orbit with our xChips
- Finalising 3rd set of experiments to the ISS
- Over 90% of our impact outside South Africa

unicef

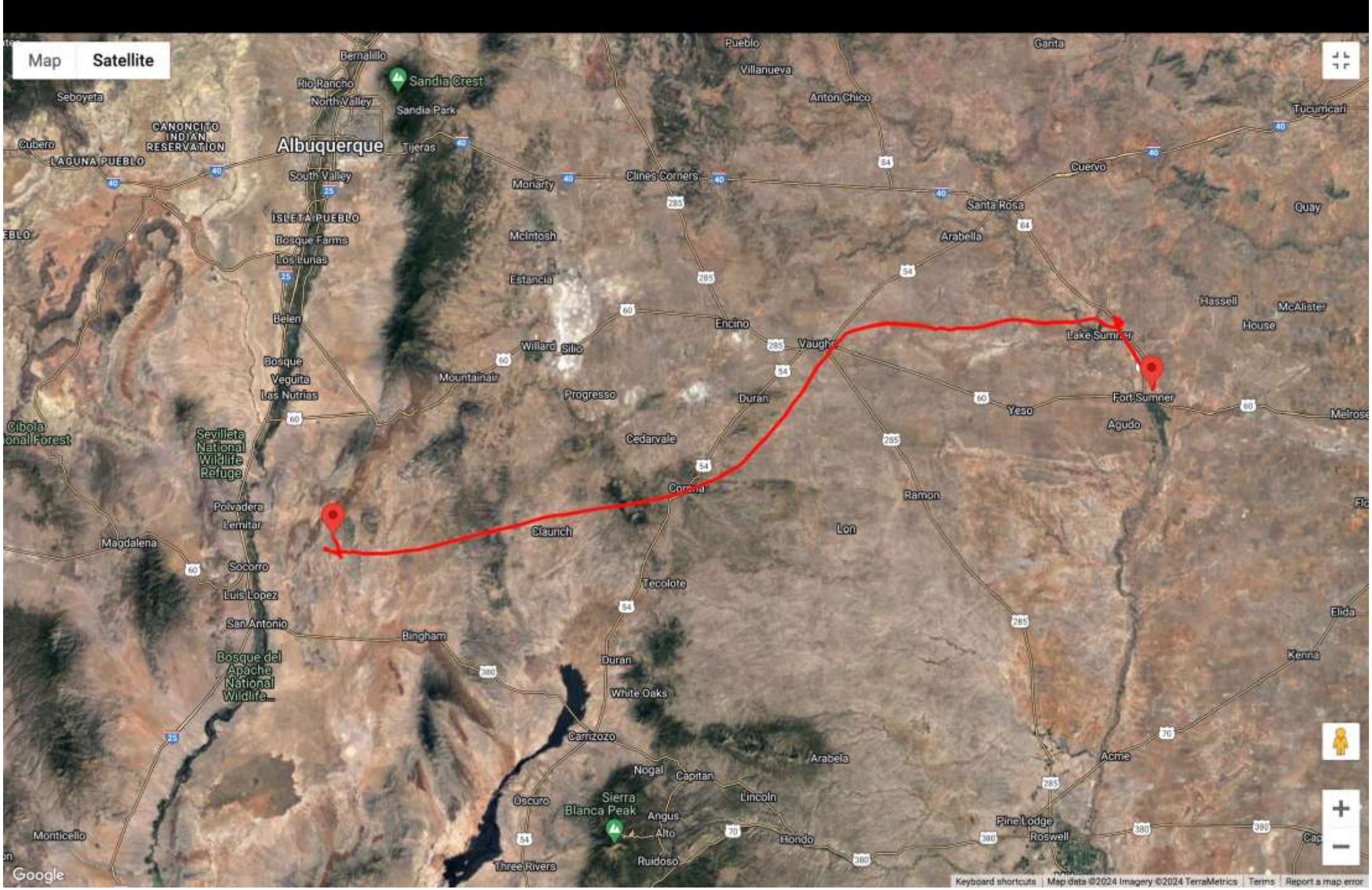
Two examples from South African schools

High altitude balloon launch with NASA 2024

ASRI Launch OTR 2025


CAN PWR
Nipmuc, MA, US
AATI, Côte d'Ivoire
Mountain View, GA, US
JFN-HUI, Cameroon
Princeton, NJ, US
Parklands, South Africa
Available
Reserved
CTRL/PWR


L-1: Forecast Trajectory for Salter Test Flight


Map
Satellite
Albuquerque
Sandia Crest
Rio Rancho
North Valley
Sandia Park
Bernalillo
Seboyeta
CANONCITO INDIAN RESERVATION
LAGUNA PUEBLO
Cubero
Tijeras
South Valley
ISLETA PUEBLO
Bosque Farms
Los Lunas
Belen
Bosque
Veguita
Las Nutrias
Sevilleta National Wildlife Refuge
Polvadera
Lemitar
Magdalena
Socorro
Luis Lopez
San Antonio
Bosque del Apache National Wildlife...
Monticello
Three Rivers
Sierra Blanca Peak
Ruidoso
Oscuro
Nogal
Capitan
Carrizozo
Bingham
Duran
White Oaks
Tecolote
Claunch
Cedarvale
Progresso
Mountainair
Willard
Silio
Encino
Estancia
McIntosh
Moriarty
Clines Corners
Vaughn
Duran
Yeso
Agudo
Fort Sumner
Lake Sumner
Santa Rosa
Arabella
Cuervo
Anton Chico
Villanueva
Pueblo
Ganta
Tucumcari
Quay
Hassell
McAlister
House
Melrose
Elida
Kenna
Acme
Arabela
Lincoln
Angus
Alto
Hondo
Pine Lodge
Roswell
Ramon
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Map data ©2024 Imagery ©2024 TerraMetrics
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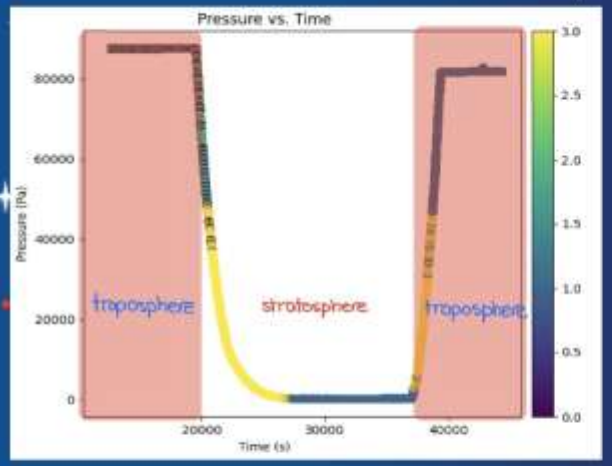
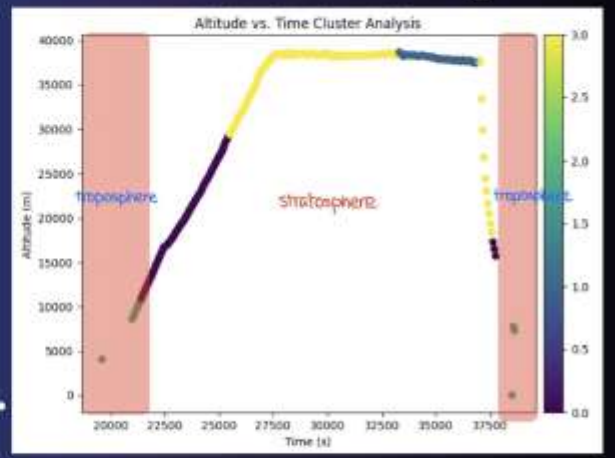
Report a map error

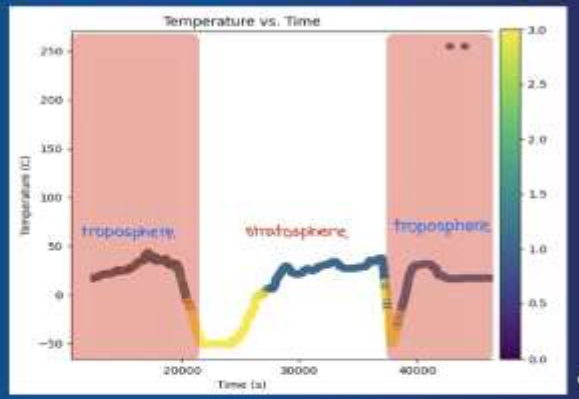
Pressure & Altitude Time Graphs

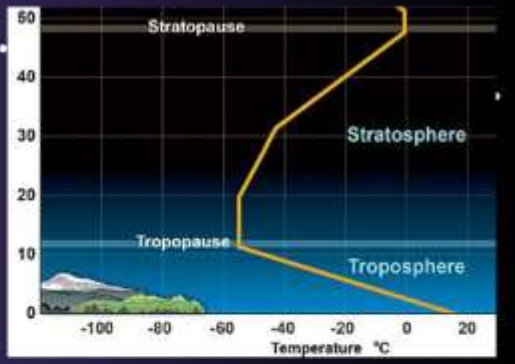


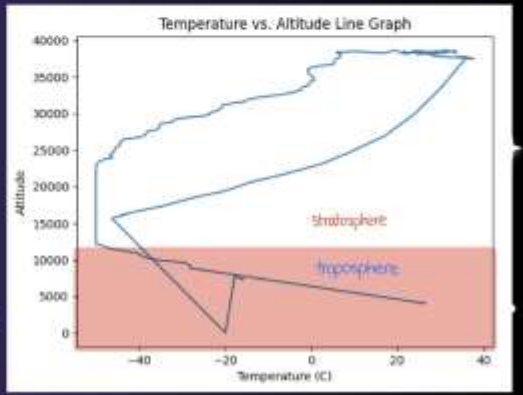


- The cluster analysis is remarkably accurate in indicating the transitions between the troposphere (green and purple) and stratosphere (yellow).
- The pressure behaved as expected, falling throughout the descent and stayin
- Both graphs indicate that the payload landed at a higher altitude than it starte location data supplied by NASA.
- The altitude graph indicates the high speed at which the balloon fell after it p
- distance between data points

Temperature Graphs

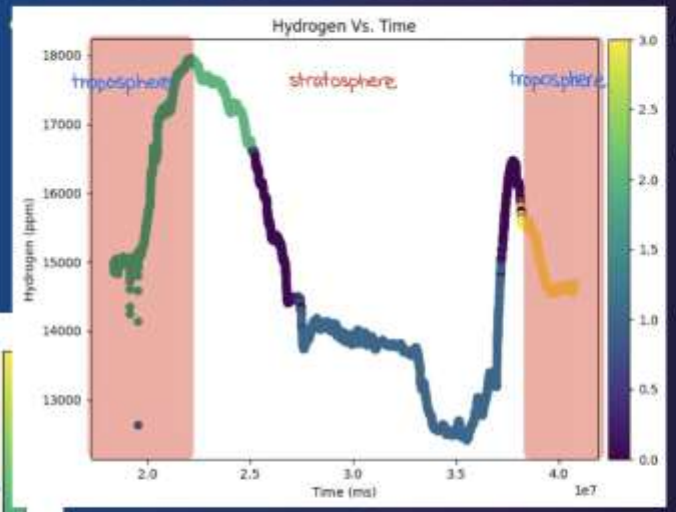




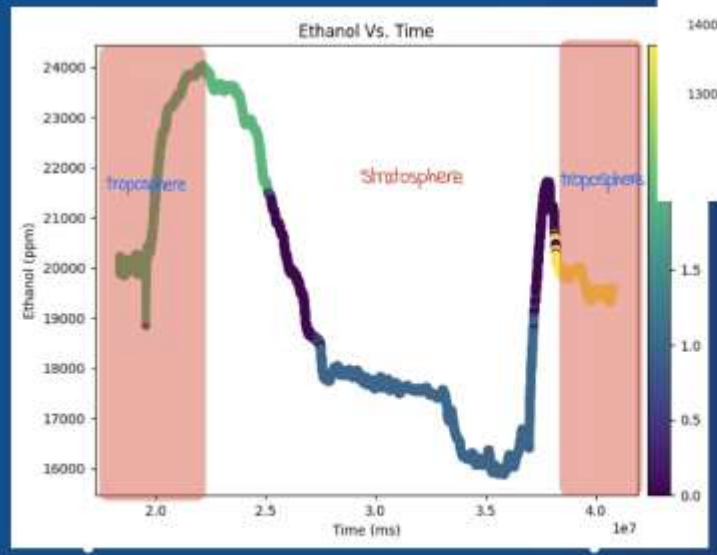


- All temperature graphs show the expected temperature variations found in the atmosphere.
- Temperature declines as the payload approaches the top of the troposphere, remains constant through the first part of the stratosphere, and then rises again until it reaches floating altitude.
- Temperature vs. Altitude is almost identical to the ideal graph on its ascent, and then changes on the descent with the change in speed

Hydrogen & Ethanol vs. Time Graphs



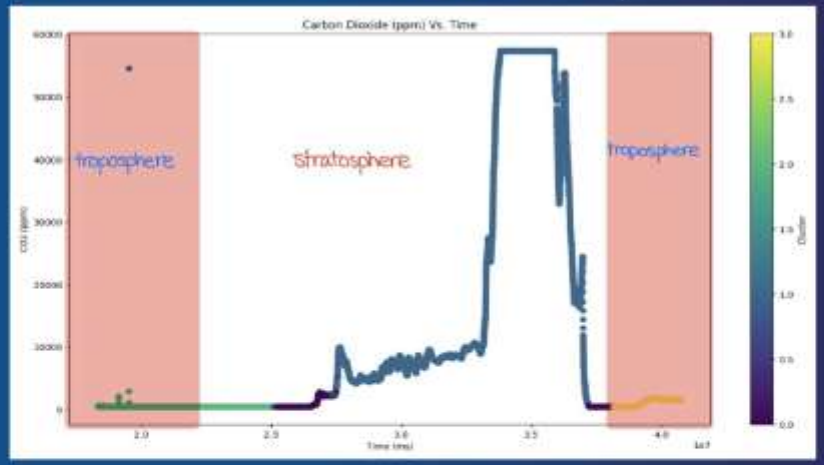
- For the most part, these recordings align with our expected results
- The gas levels rise at the start of the launch, but decrease as the balloon moves to higher altitudes

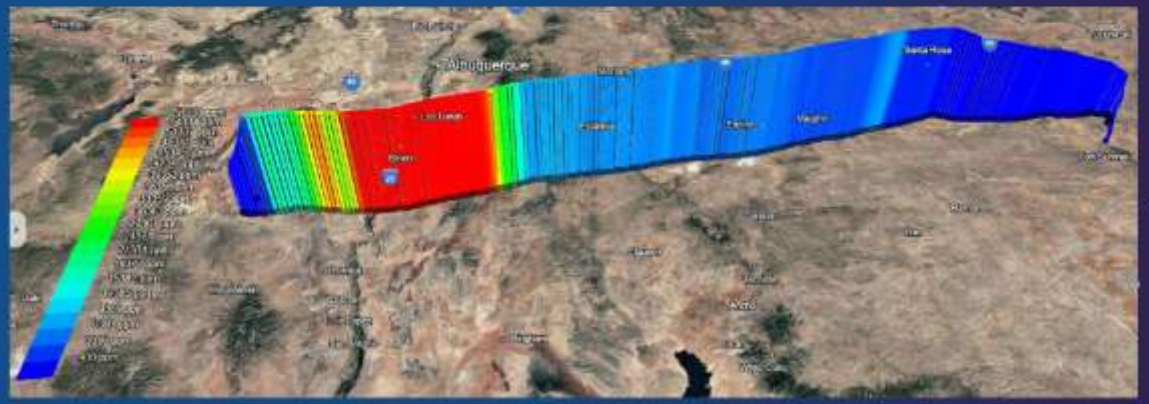


- Ethanol in the atmosphere has significantly increased over the past several decades, a result of the Clean Air Act Amendments of 1990.
- The acts mandated the use of oxygenated fuels in areas with high carbon monoxide, which exploded the sale and production of the substance.

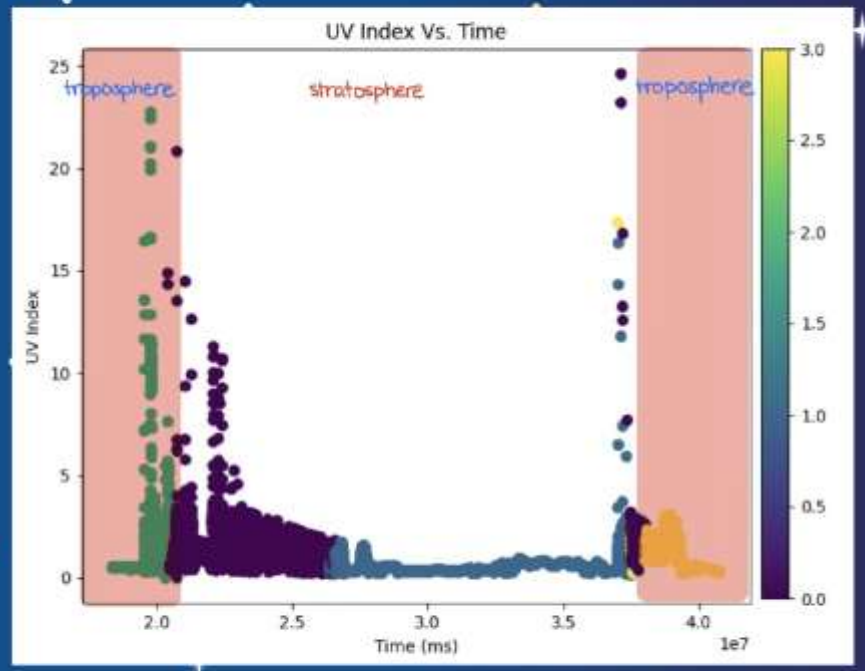
https://afdc.energy.gov/data/10323

Carbon Dioxide vs. Tir



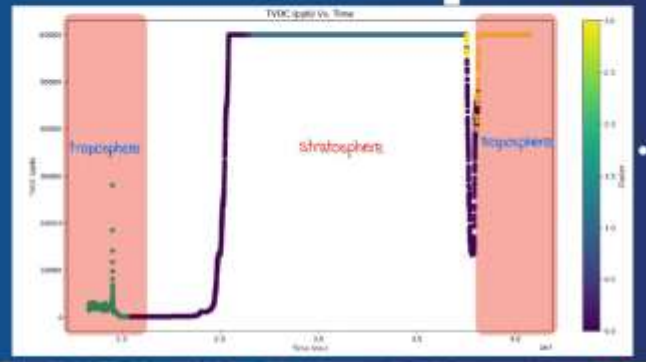


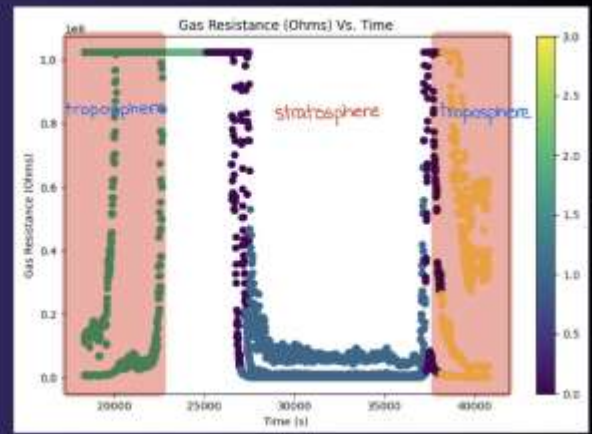
UV Index vs. Time Graph



- UV Index is supposed to increase greatly after the balloon passes through the clouds and reaches altitudes in the stratosphere
- This is the second graph that greatly contradicts our

Gas Resistance & Volatile Compounds





- Although our BME688 gas scanning sensor did not record data in the way we anticipated, we were able to record gas resistance
- Lower gas resistance reading indicate poor air quality
- It was exciting to realize that our gas resistance and volatile compounds data all line up with our previous anomalies
- Since the anomalies were also recorded on two different sensors, we could accurately assume that the balloon passed through some kind of stratospheric intrusion

Explaining Our Atmospheric Gases Data

After realizing that the balloon passed through a stratospheric intrusion, we started research to try and determine exactly what the payload may have encountered. Because of the spike in carbon dioxide, we focused on events that release large amounts of carbon dioxide into the stratosphere.

List of the 45 volcanoes with continuing eruptions as of 16 August 2024

Volcano	Country	Eruption Start Date	Last Known Activity	WVAR
Karymsky	Russia	2024 Jun 20	2024 Aug 16 (continuing)	Yes
Kanlaon	Philippines	2024 Jun 3	2024 Aug 16 (continuing)	Yes
Whakaari/White Island	New Zealand	2024 May 24	2024 Aug 16 (continuing)	Yes
Ubinas	Peru	2024 May 6	2024 Aug 16 (continuing)	
Taal	Philippines	2024 Apr 12	2024 Aug 16 (continuing)	Yes
Lewotobi	Indonesia	2023 Dec 23	2024 Aug 16 (continuing)	Yes
Reykjanes	Iceland	2023 Dec 18	2024 Aug 22 (continuing)	
Marapi	Indonesia	2023 Dec 3	2024 Aug 16 (continuing)	
Mayon	Philippines	2023 Apr 27 ± 2 days	2024 Aug 16 (continuing)	
Etna	Italy	2022 Nov 27	2024 Aug 16 (continuing)	Yes
Ebeko	Russia	2022 Jun 11	2024 Aug 16 (continuing)	Yes
Poás	Costa Rica	2021 Jun 25	2024 Aug 16 (continuing)	Yes
Great Sitkin	United States	2021 May 26	2024 Aug 16 (continuing)	Yes
Merapi	Indonesia	2020 Dec 31	2024 Aug 16 (continuing)	Yes

14 August-20 August 2024 Cite this Report

AVO reported that slow lava effusion in Great Sitkin's summit crater continued during 13-20 August. Seismicity was low with few small daily earthquakes. Slightly elevated surface temperatures were identified in partly cloudy satellite views during 18-19 August. Weather clouds often obscured satellite and web-cam views. The Volcano Alert Level remained at Watch (the third level on a four-level scale) and the Aviation Color Code remained at Orange (the third color on a four-color scale).

Source: US Geological Survey Alaska Volcano Observatory (AVO)

- Volcanoes are one of the most common causes of spikes in atmospheric carbon dioxide
- Volcanic emissions would also explain the decrease in the UV index because sulfur dioxide (a gas found in volcanic emissions) interacts with UV
- The emissions would also be recorded around the same altitude as the balloon float altitude
- We discovered that the closest volcanic activity to the balloon was from the Great Sitkin volcano in Alaska (Aug. 13-20, 2024)
- The Great Sitkin has been experiencing small eruptions throughout the summer of 2024

MAXIQ

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Good morning from Durban. 08:40

It seems the Phoenix flight test campaign was not quite 'over' as we thought it was when we departed Overberg a couple of weeks back. 08:41

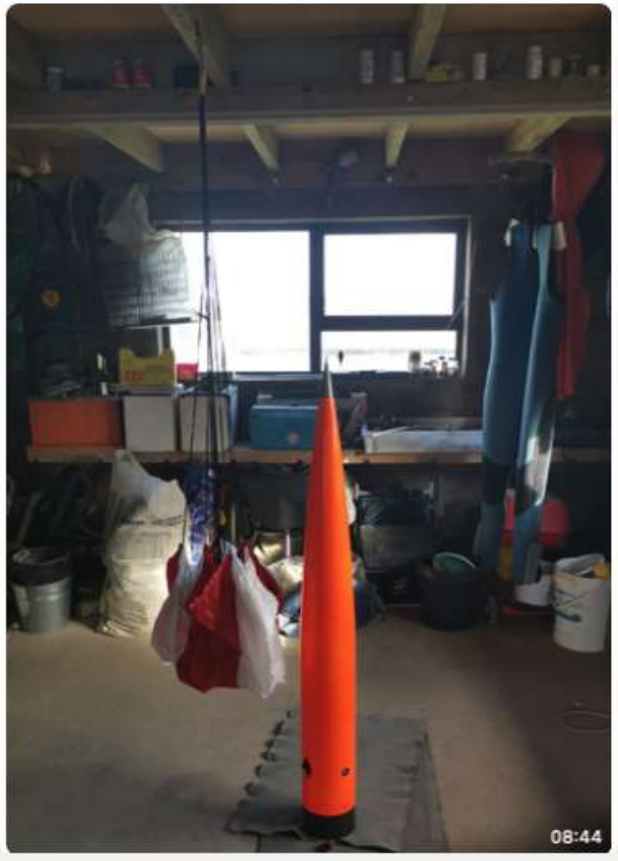
As you know, we tried our very best to recover the 1E nose cone on 4 December, but sea conditions made it impossible. We even searched the beaches hoping to find our payload washed up, as has happened twice before with Phoenix rocket airframes, but no luck.
We'd given up! 08:42

Well it turns out, Neptune wasn't done with the 1E nose just yet. 08:43

Just when we'd abandoned hope, the folks at OTR forwarded me this... 08:44

Mike Brooks

Forwarded many times



In a remarkable turn of events, a fishing vessel came across 'a strange orange object' bobbing in the ocean on 14 December, some kilometres south-east of the southern tip of Africa. 08:46

🎉 👍 🙂 🥳 8

Somewhat cautiously, they took it onboard and got the word back to OTR, who let us know. 08:46

In the past few days, SANSA scientists have taken the nose apart for us and inspected the rather soaked payloads. 08:47

My sincere thanks to Andre' for bravely taking a strange looking object on board his vessel, Jannie, Danie and Rudolph from OTR for getting us the news, and to Elda, Danie and the team at SANSA for getting the payloads out and trying to access data on the SD cards inside in the past few days. 08:48

👍 🙂 2

Unfortunately, not all of the cards could be read, but against all odds, we have video footage from two of the onboard cameras. 08:48

And so, although you've seen ground-based footage of the 1E launch from a few angles, we bring you one last video for the 2024 campaign.... 08:49

And this time you're invited to climb onboard as our Phoenix rocket makes it's spinning, supersonic dash to 38,000 feet. 08:50

Mike Brooks

Forwarded

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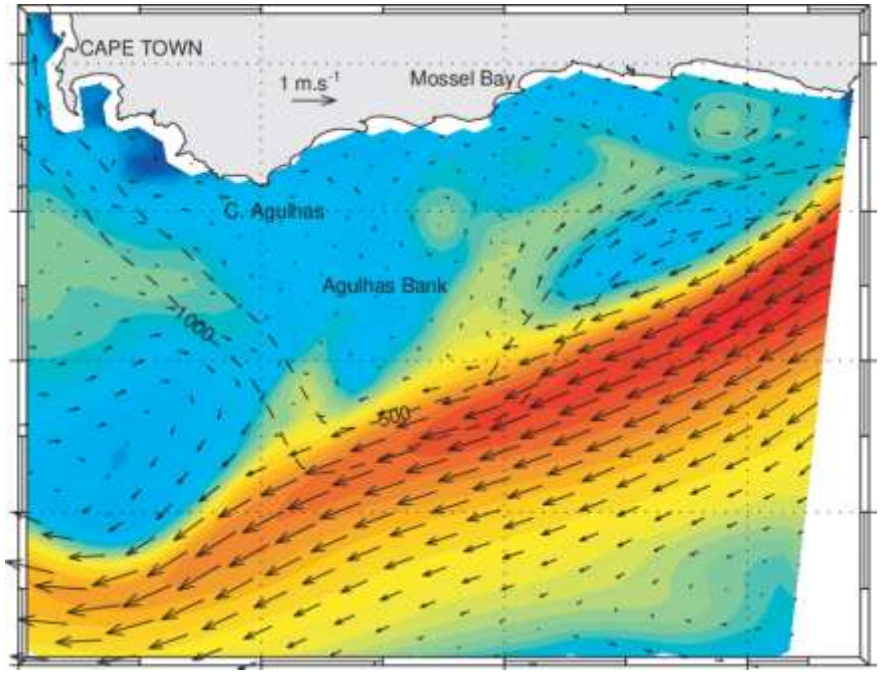
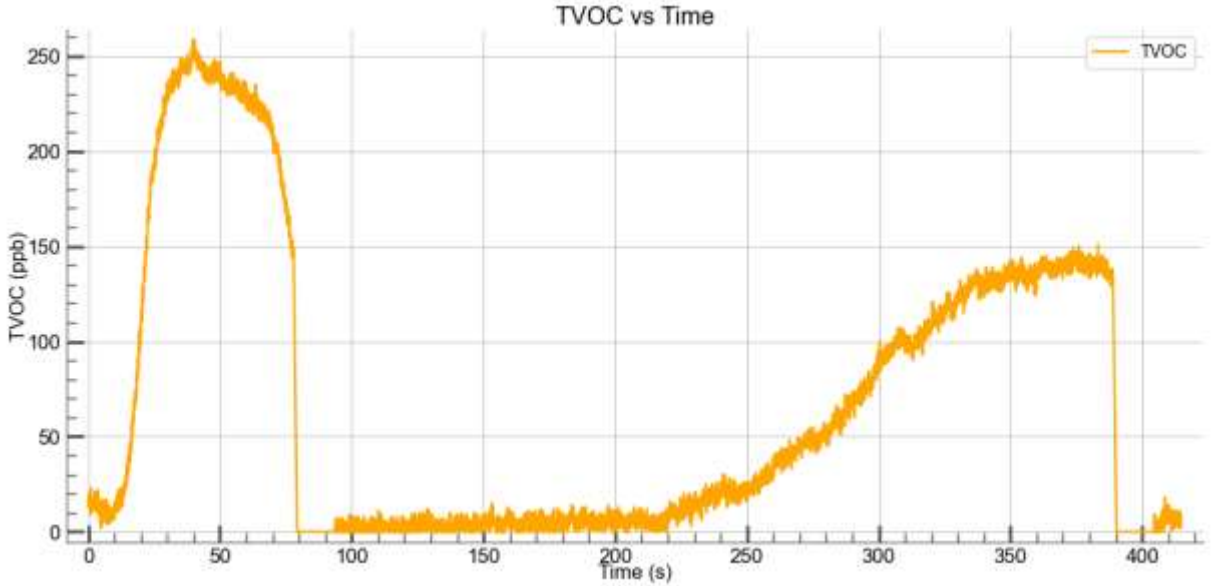
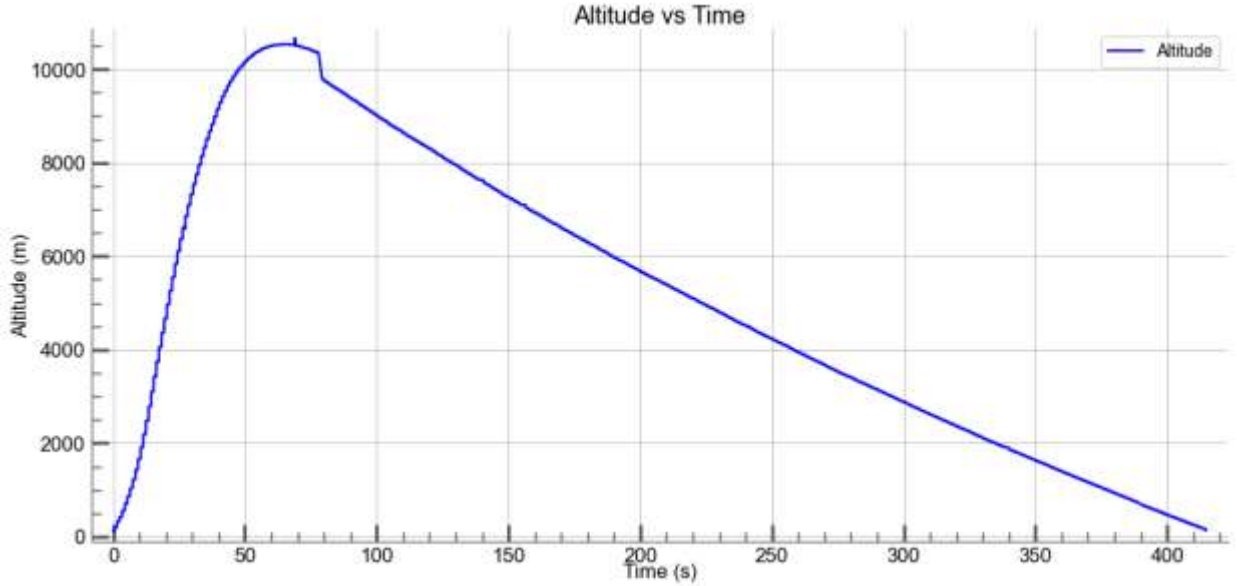
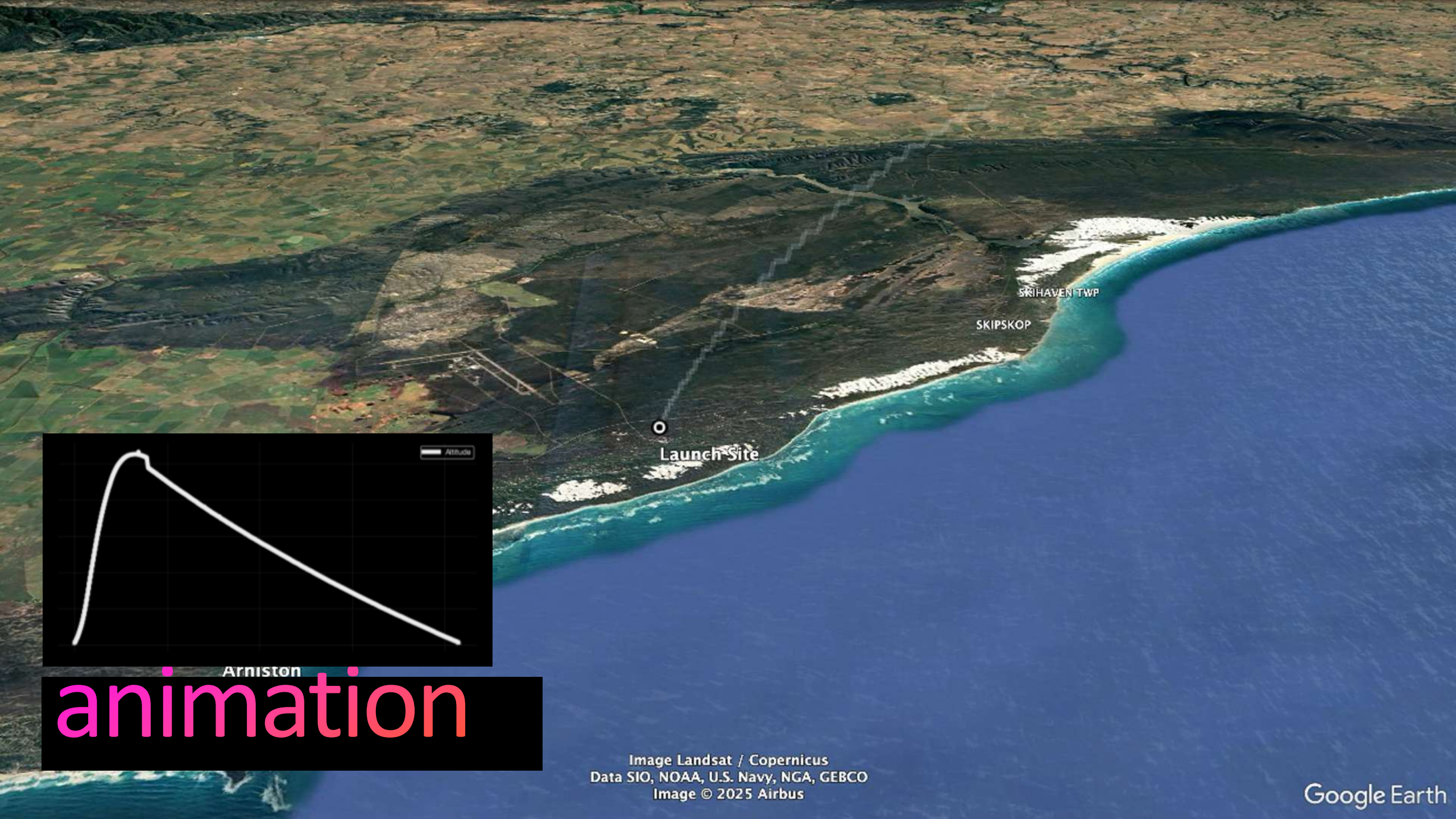
Parklands College

ASRI Sounding Rocket Launch








SKIHAVEN TWP
SKIPSKOP
Launch Site
Altitude
Arniston
animation
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2025 Airbus
Google Earth

Calling for funders - SA 2025 Space STEM Programme

SANSA Hermanus is doing all they can … please come on board:

- Private and public sector capacity development
- Authentic Space STEM outreach
- Non-profit B-BBEE level 1

The employees who will become productive that year are right now in grade 9 deciding which subjects to keep or drop!

MAXIQ.SPACE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