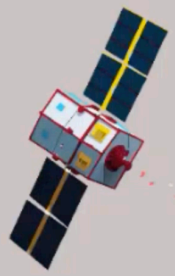

ESPER
satellite imagery
Saving the planet through data
Ullas Vijaya Bhanu
Principal Embedded Systems Engineer

OUR MISSION



Create a better future for Earth through precise and efficient land surface monitoring.

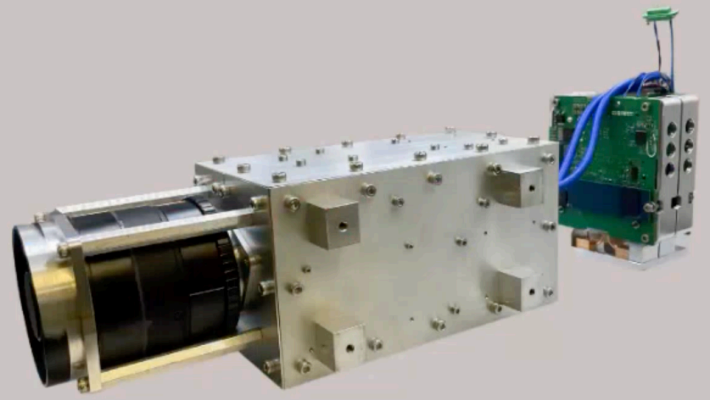
OUR SOLUTION

Esper is building a **network of satellites** with **hyperspectral sensors**, capable of capturing data-rich images

CURRENT CAPABILITY

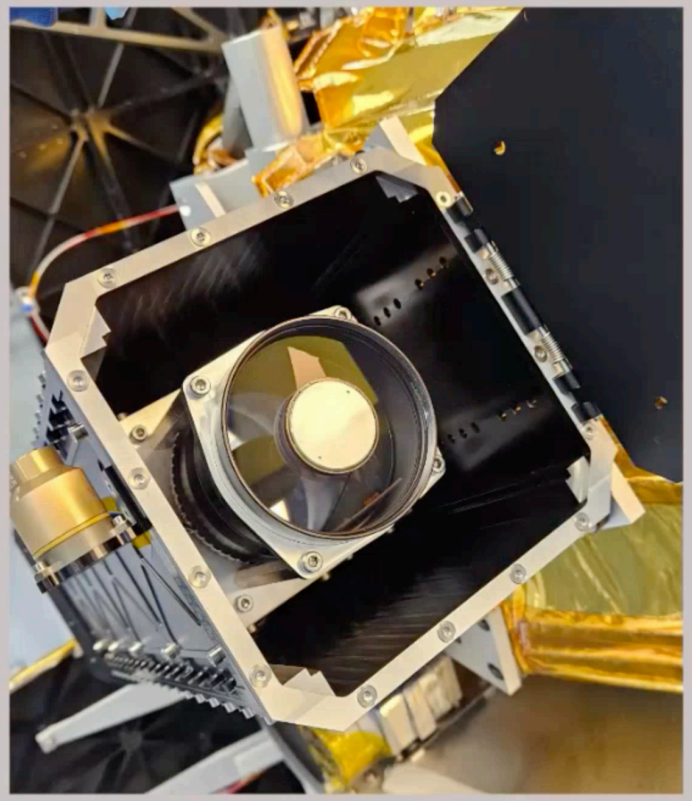
Our current sensor, the Esperesso, is designed to measure atmospheric and surface-level reflections.

It is capable of capturing 100 bands in visual to near-infrared wavelengths at 10m-30m spatial resolution.



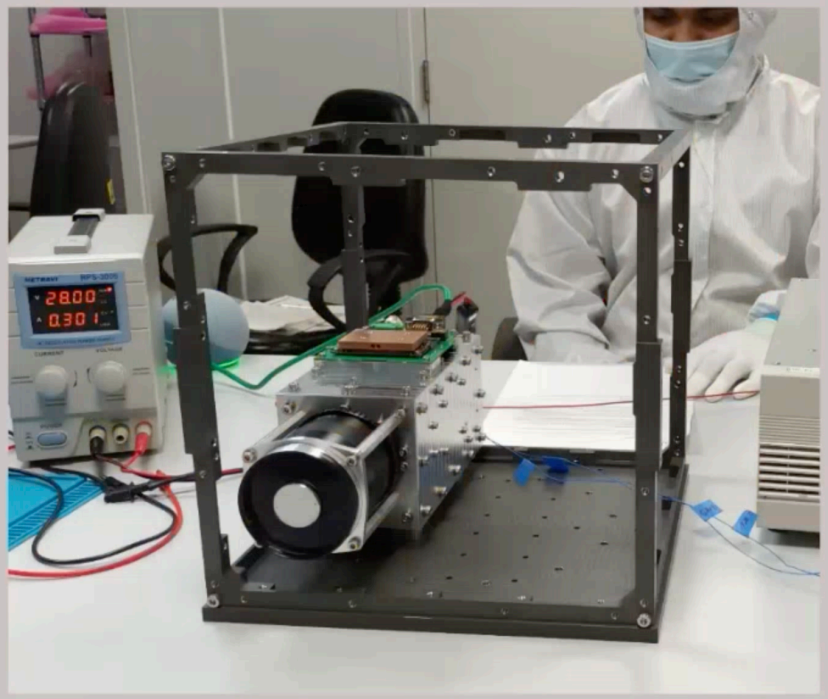
Esperesso Sensor with Spiral Blue's Space Edge-2

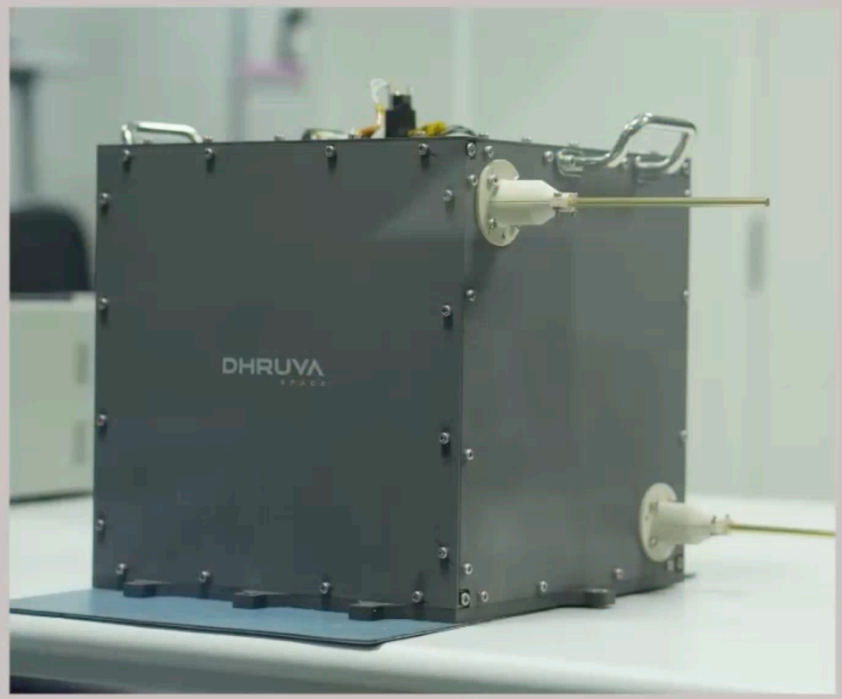
OVER THE RAINBOW-1



Launched March 2024

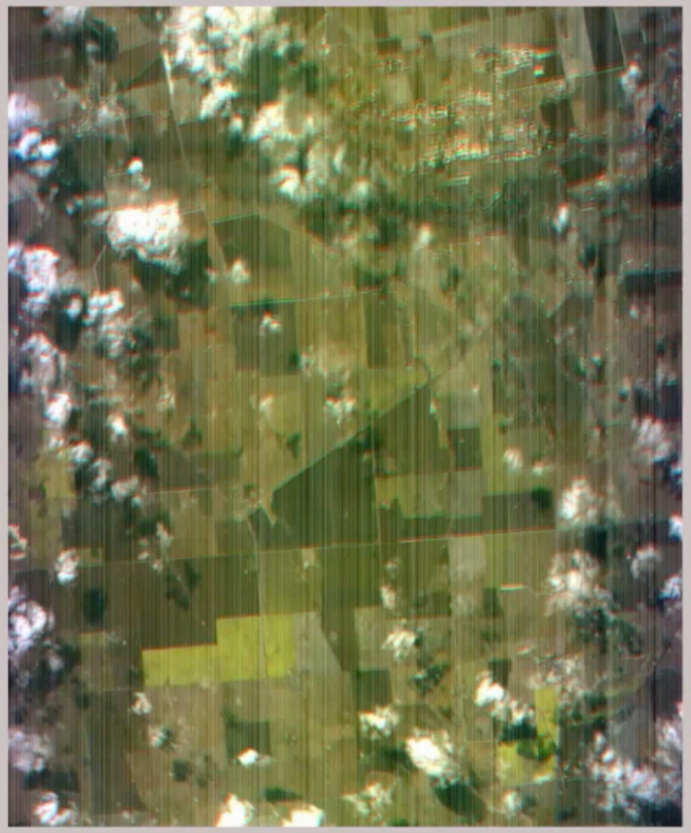
OVER THE RAINBOW-2





Launching January 2025

OVER THE RAINBOW-X



Now Delivering Data

- 150 bands
- Visual to Near Infrared
  - 470 nm to 900 nm
- Spatial Resolution of 10m
- Suitable for Agricultural and other Vegetation related applications.

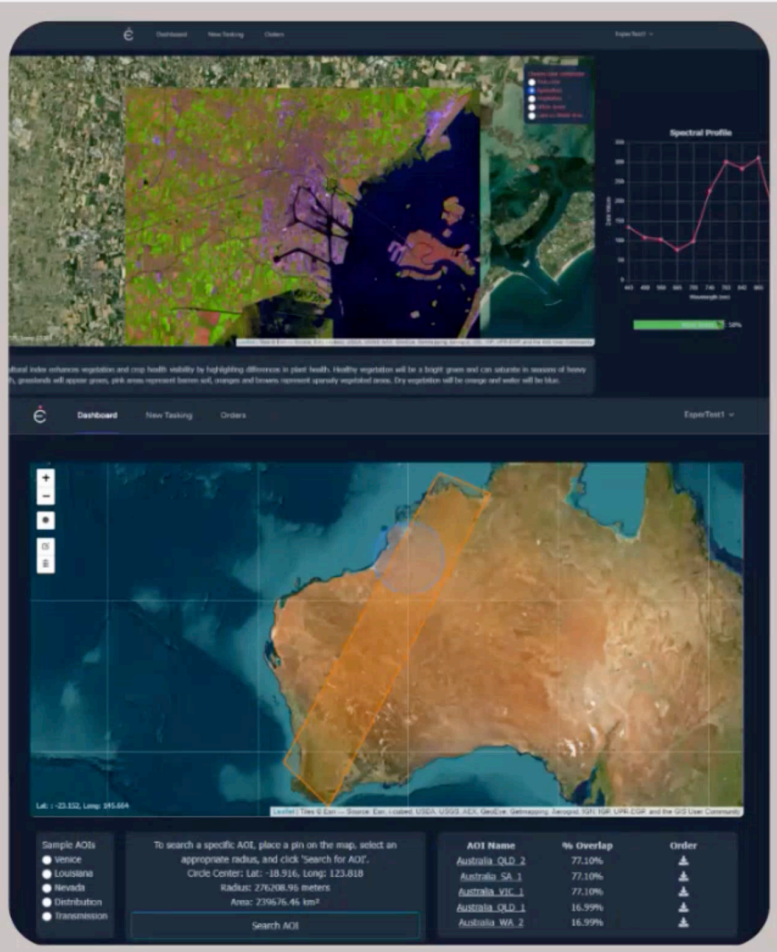
THE ESPEROKO

- 144 bands
- Visual to Shortwave-Infrared
  - 400 nm to 1700 nm
- Spatial Resolution of 13.5m
- Targeted launch in 2026
- Suitable for Mining, Energy and Defence

In-lab testing of Esper's sensors

EarthTones

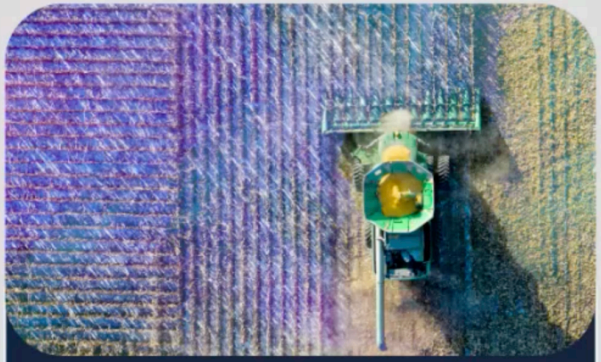
- EarthTones is Esper's Analytics platform.
- EarthTones utilises data from Esper's sensors, our partners' satellites and other available data sources to provide insights for chosen applications.
- EarthTones is also the interface to task Esper's and our partners' satellites.
- All EarthTones functionality is also available via API.



Quality and versatile data of the earth can solve problems across **many industries**.

ENERGY

- Mineral Identification
- Exploration of New Mining Sites and Key Minerals
- Oil and Gas Leak Assessments



AGRICULTURE

- Crop Health Monitoring
- Soil Moisture Mapping
- Water Stress Analysis

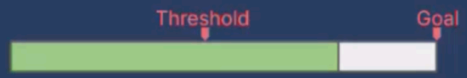
CLIMATE

- Forest Fire Detection
- Ocean and Glacier Monitoring
- Early Detection of Droughts

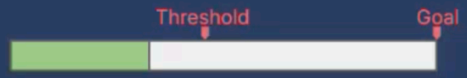
Aligning with CEOS-ARD

PFS Status

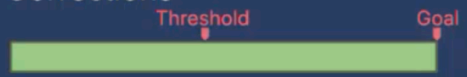
- General Metadata



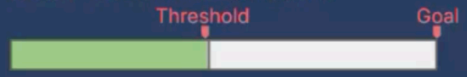
- Per-pixel Metadata



- Radiometric and Atmospheric Corrections



- Geometric Corrections

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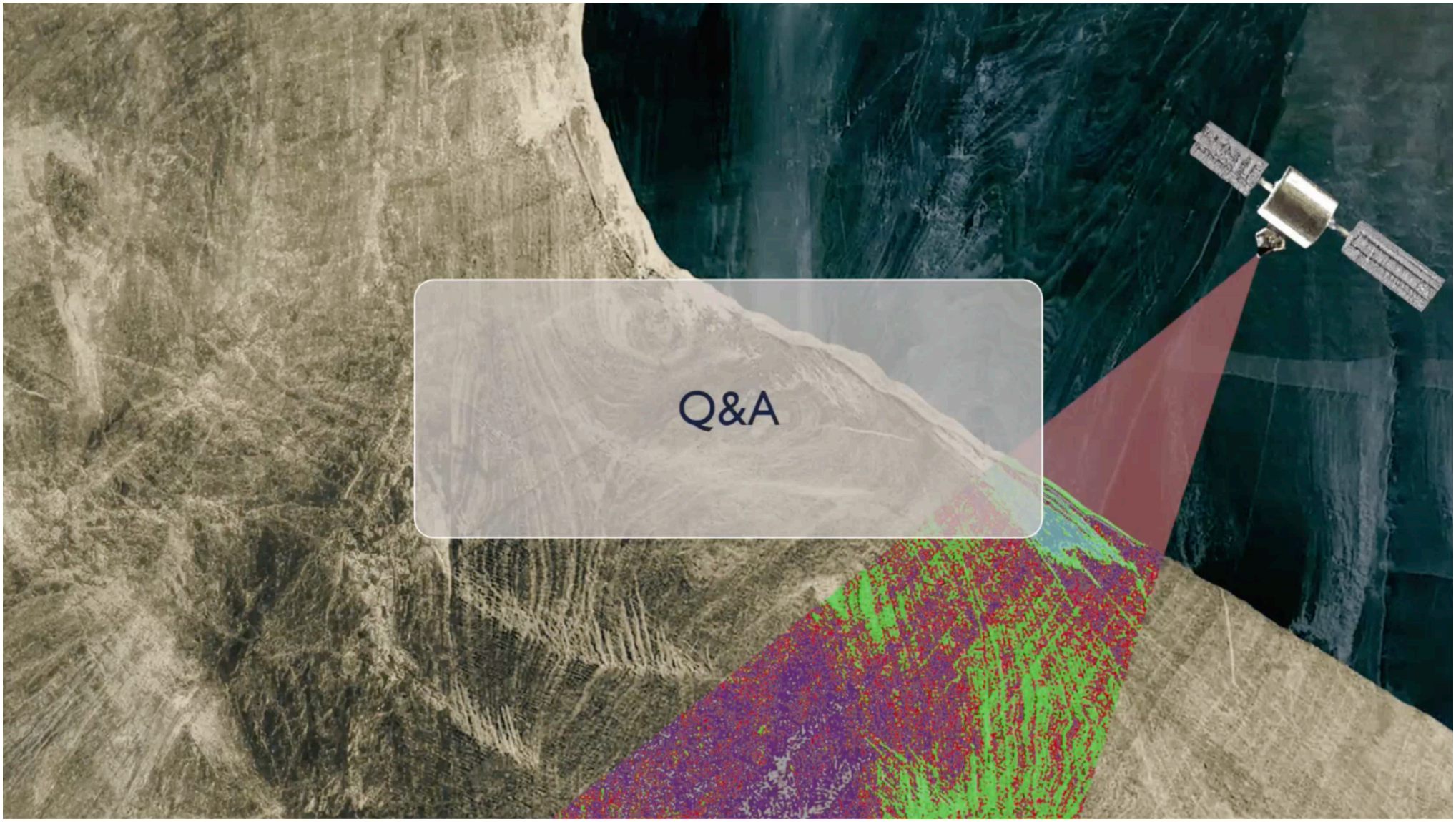
Future Directions and Opportunities for Collaboration

- Partnering with Swinburne University to develop an ML based super-resolution pipeline to create Harmonized data products.
- Exploring the integration of LiDAR or SAR data with hyperspectral imagery.
- Aiming to create fused products for deeper insights in applications like greenhouse gas monitoring and change detection.
- Committed to aligning with CEOS-ARD principles for data interoperability and are open to collaborations that will enhance the use of our data products across industries.


Q&A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www.espersatellites.co
hi@espersatellites.co