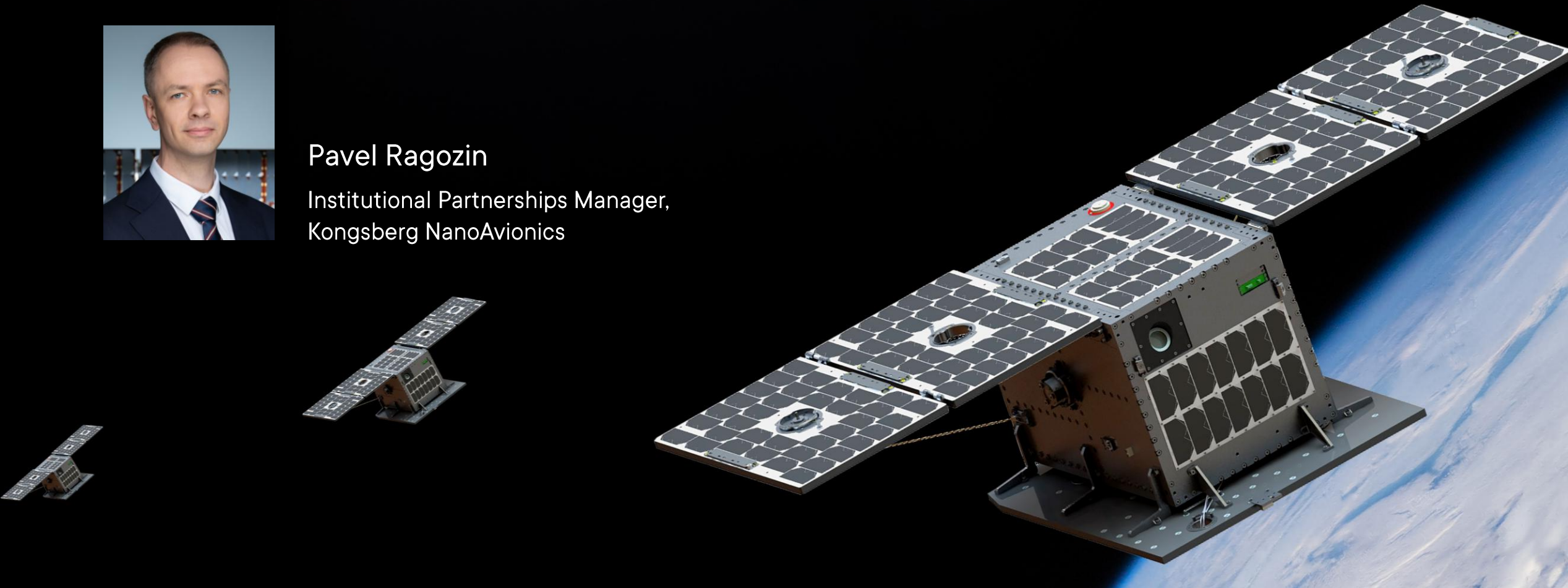


Small Satellite Use Cases for Disaster Monitoring and Preparedness



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Kongsberg NanoAvionics – a Prime Satellite Constellation Supplier

60+

Satellites
launched & 300+
in production

10+

Constellations
supported so far

190+

Customers in 50+
countries

250

Qualified engineers and
personnel working in
our team

5

Offices & manufacturing
facilities across the globe
(US, EU, UAE)



KONGSBERG

Owned by KONGSBERG –
a technological powerhouse



Satellite Advantages for Disaster Monitoring

01. Large Area of Coverage

- Observe 1000s of square kilometers in minutes.

02. Access to Remote and Hazardous Areas

- No physical presence required. Unaffected by wind, road access, or safety restrictions. Unaffected by weather or smoke (radar sees through clouds).

03. Repeated, Frequent Monitoring

- Tracking changes over time reveals risks before disasters emerge, supporting early warning and prevention.

04. Resilience to Local Disruptions

- Continue observing when disasters damage ground sensors, cut power, or make drone and aircraft deployment impractical.



Satellite Capabilities for Disaster Monitoring

Featuring NanoAvionics' customer and partner mission examples.

01. Synthetic Aperture Radar

- See through clouds & smoke
- Measure ground movement (InSAR)
- Up to 15 cm resolution

02. Multi/hyperspectral

- Monitor nature and infrastructure
- Assess damage
- Up to <50 cm resolution

03. Thermal Infrared

- Measure land surface temperatures
- Observe thermal anomalies
- Up to <3 m resolution

04. Internet of Things (IoT)

- Collect remote sensor data
- Send emergency alerts to phones
- Ensure critical communications during outages



Synthetic Aperture Radar (SAR)

SAR uses radar pulses to image Earth even through clouds and darkness.

01. Flood Extent and Depth Mapping

- SAR is exceptionally responsive, as it can map large areas during any weather conditions. Water depth can be estimated via terrain data comparison.

02. Wildfire Damage Assessment

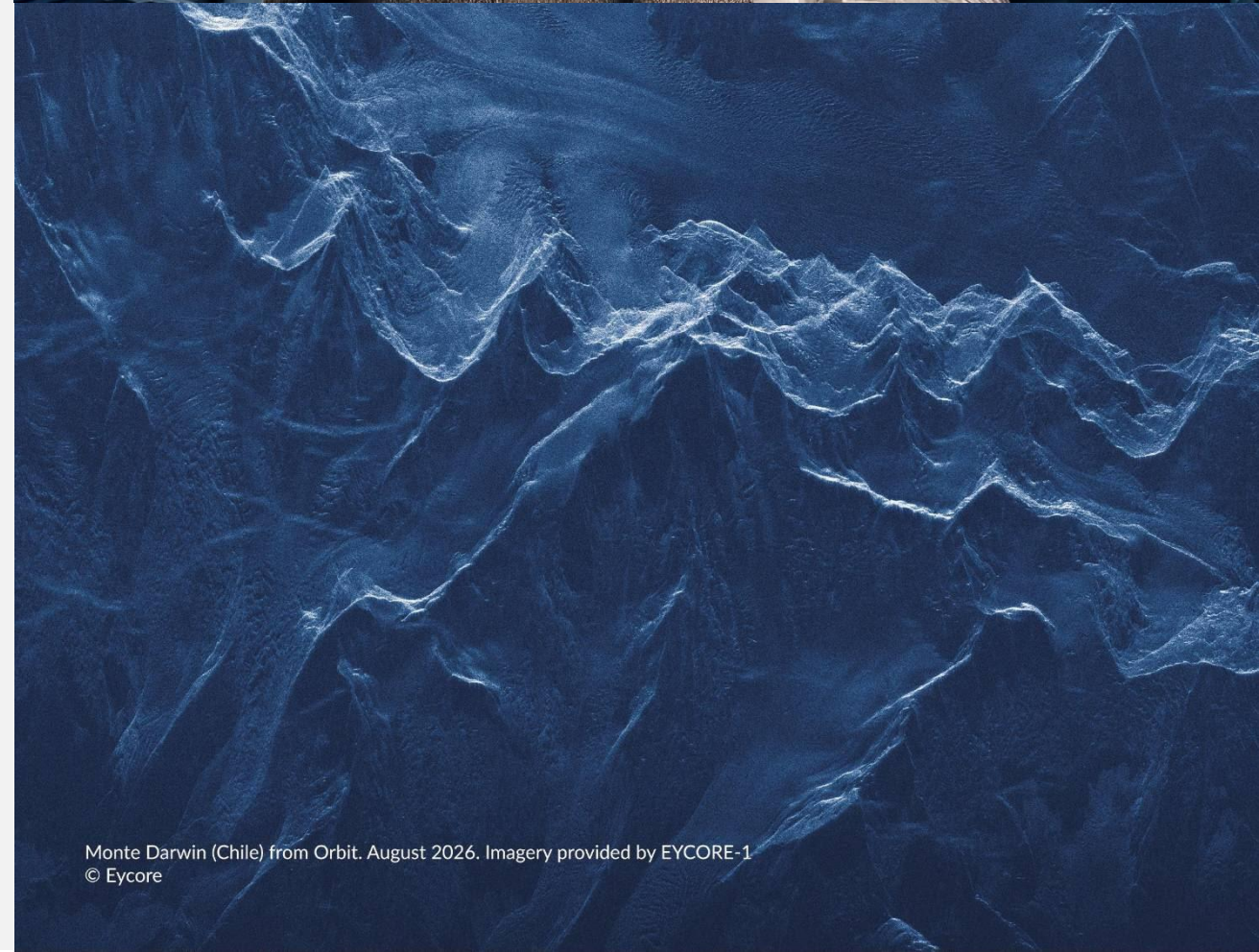
- Identify damaged or destroyed buildings through smoke to help prioritise inspections and relief efforts.

03. Storm and Earthquake Damage Assessment

- Rapid post-event assessments help locate heavily affected areas and accelerate assistance.

04. Ground Movement Monitoring (InSAR)

- Compare radar observations over time to measure ground subsidence, slow slope movement, earthquake displacement, or the stability of bridges, dams, and railways with millimeter-scale precision under suitable conditions.



Multi/Hyperspectral Optical Imaging

Optical reveals surface conditions & changes across the light spectrum.

01. Drought and Vegetation Stress Monitoring

- Identify unusually stressed vegetation and declining crop condition to support drought assessment and food-security planning.

02. Wildfire Burn Severity Mapping

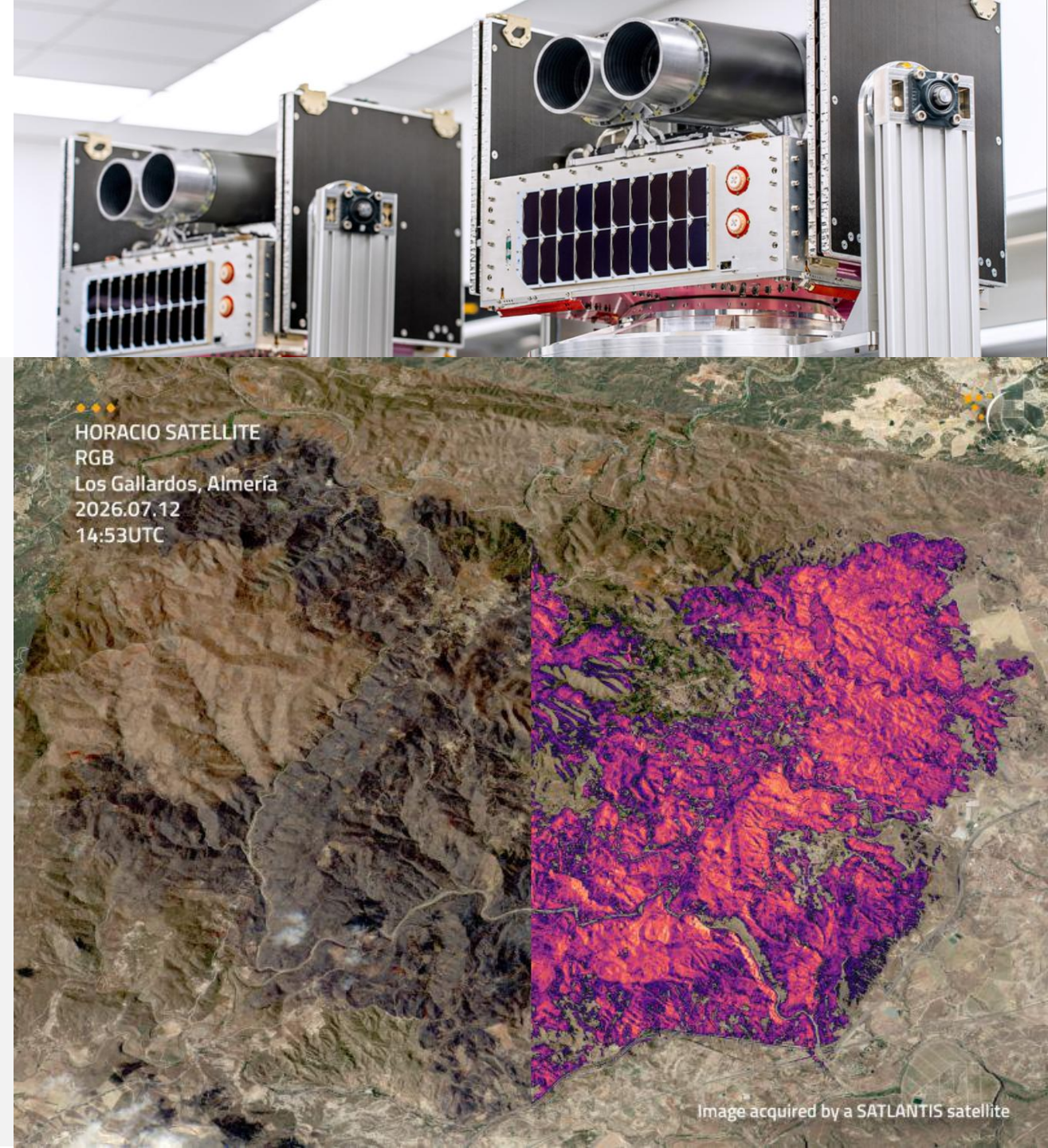
- Compare vegetation before and after fires to map burn severity and prioritise areas for restoration and erosion control.

03. Water Quality Monitoring

- Detect changes in sediment, turbidity, and algal blooms to guide water sampling and assess risks to water supplies.

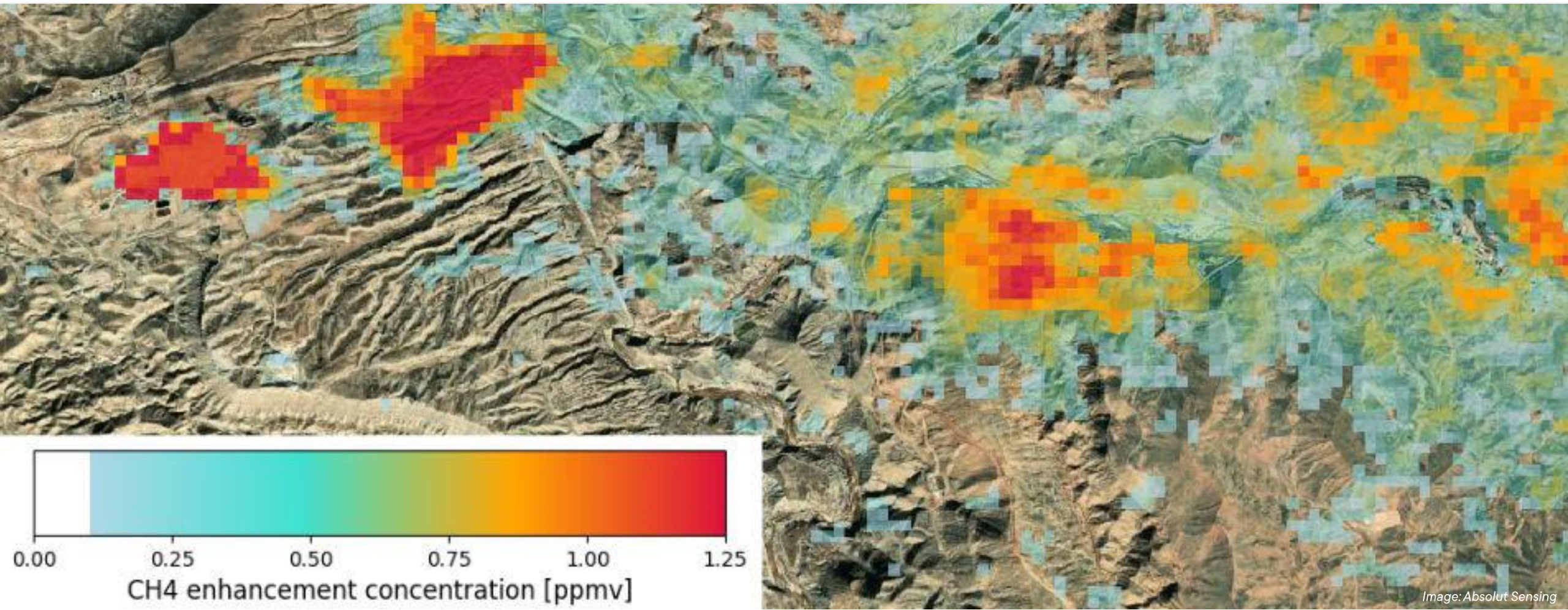
04. Disaster Damage and Access Mapping

- Use high-resolution imagery to identify damaged buildings, blocked roads, and landslide debris to support response planning, search and rescue.



Optical Can Also See the Invisible, Like Methane Leaks

Our customer satellites can detect methane leaks with emission rates as low as 100 kg per hour, helping prioritise inspections and repairs.



Thermal Infrared

Monitor land surface temperatures and heat anomalies, day and night.

01. Early Wildfire Detection and Monitoring

- Detect emerging fires, track active fire fronts, and identify residual hotspots to support early response, guide firefighting, and flag potential reignition risks.

02. Drought and Crop Water Stress

- Detect temperature changes associated with crop water stress even before visible deterioration to reduce water consumption and increase yields.

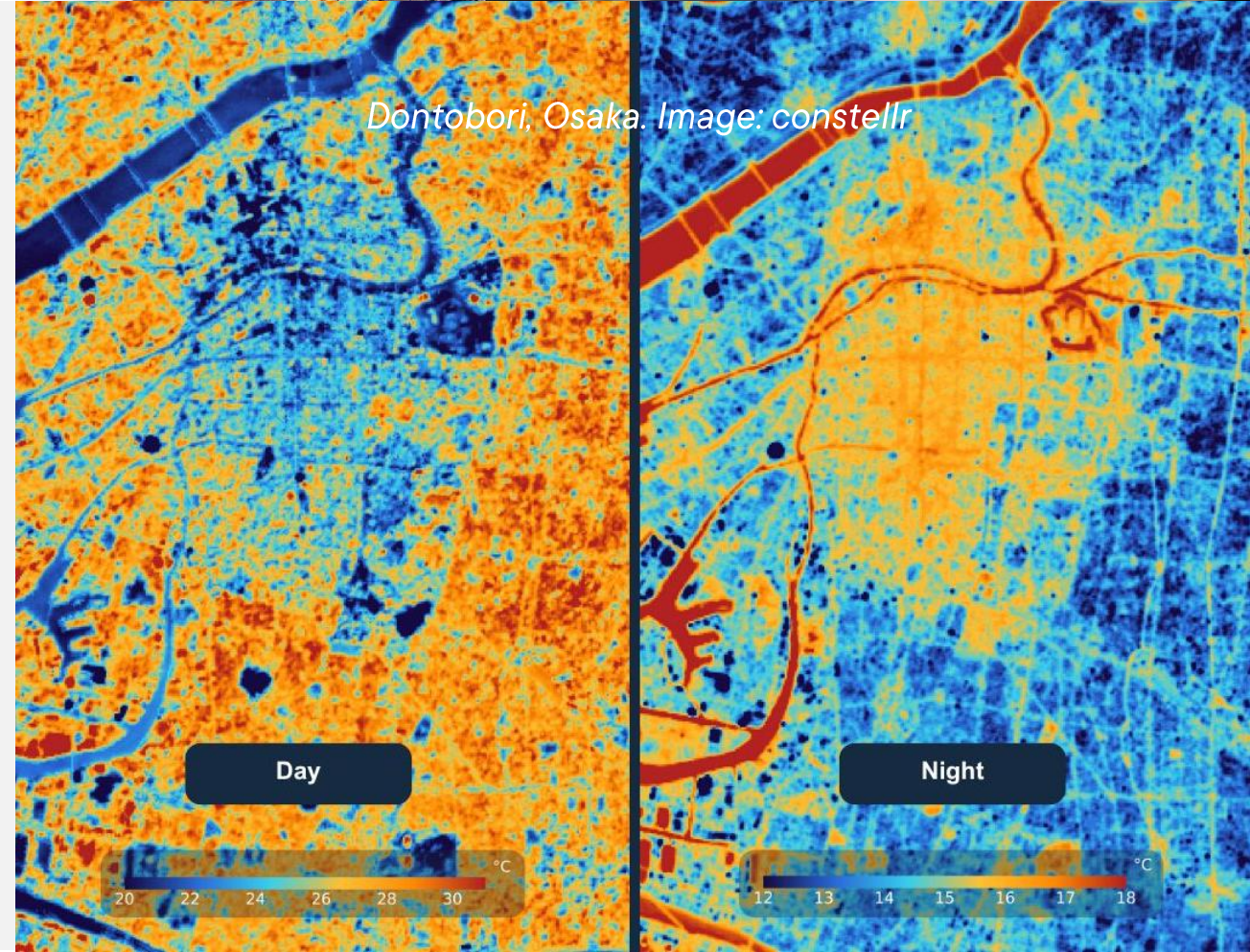
03. Urban Heat and Heatwave Preparedness

- Map surface hotspots and nighttime heat retention to prioritise cooling measures and support heatwave planning.

04. Oil Spill Monitoring

- Complement SAR observations with thermal contrast between oil and surrounding water to help map spills and guide clean-up efforts.

Confidential



Satellite IoT & Emergency Comms

Connect remote sensors and send alerts beyond terrestrial networks.

01. Flood Monitoring and Early Warning

- Connect remote water-level and weather sensors to support flood assessment and deliver warnings to emergency managers.

02. Wildfire Detection and Risk Monitoring

- Collect readings from forest sensors to identify fire-prone conditions and relay alerts when smoke or abnormal heat is detected.

03. Water and Infrastructure Monitoring

- Relay water-quality, flow, and equipment readings to flag potential contamination, leaks, or faults and guide inspections.

04. Emergency Alerts During Network Outages

- Deliver public warnings via satellite to standard mobile devices when terrestrial networks are unavailable.



Fusing Signals from Multiple Sources

Building a clearer operational picture by combining different data.

Wildfire Example: Bordeaux, France, 29 July 2026

- Features constellr's 1° kelvin accuracy land surface temperature measurements at 30m resolution - currently the highest thermal resolution available commercially (from satellites).

01. Understanding the Thermal Landscape

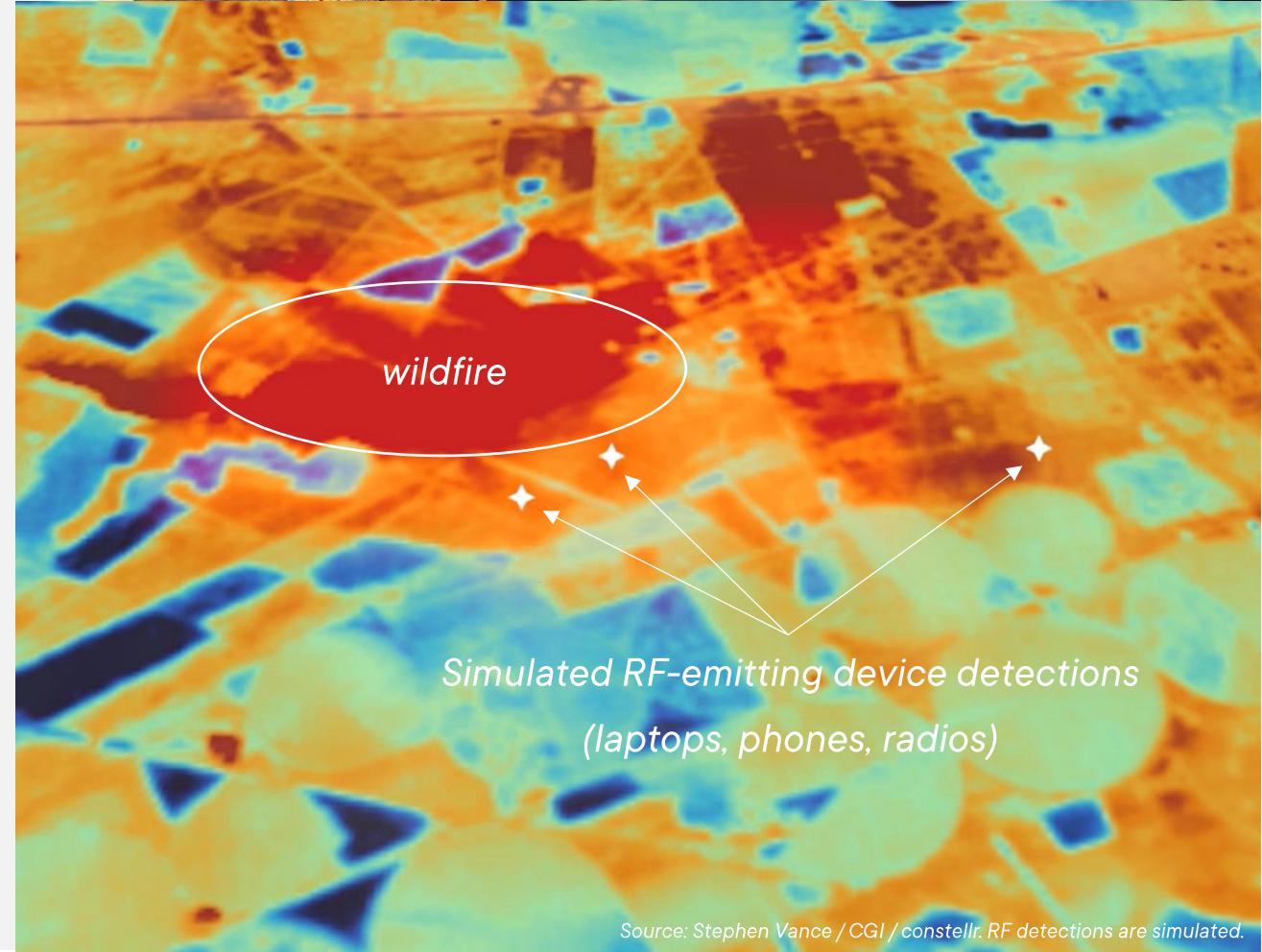
- constellr thermal imagery reveals heat patterns and provides context around the affected area.

02. Locating Potentially Exposed Assets or People

- Simulated SignalSense detections locate RF-emitting devices near the incident, helping identify potentially exposed assets or people and prioritise response.

Outcome: Clearer operational picture to focus response efforts

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Source: Stephen Vance / CGI / constellr. RF detections are simulated.

Considerations for Satellite Ownership

Owning space infrastructure is not always necessary, but small satellites have dramatically reduced the cost of sovereign space assets.

01. World's Fastest Available Acquisition & Processing Chain

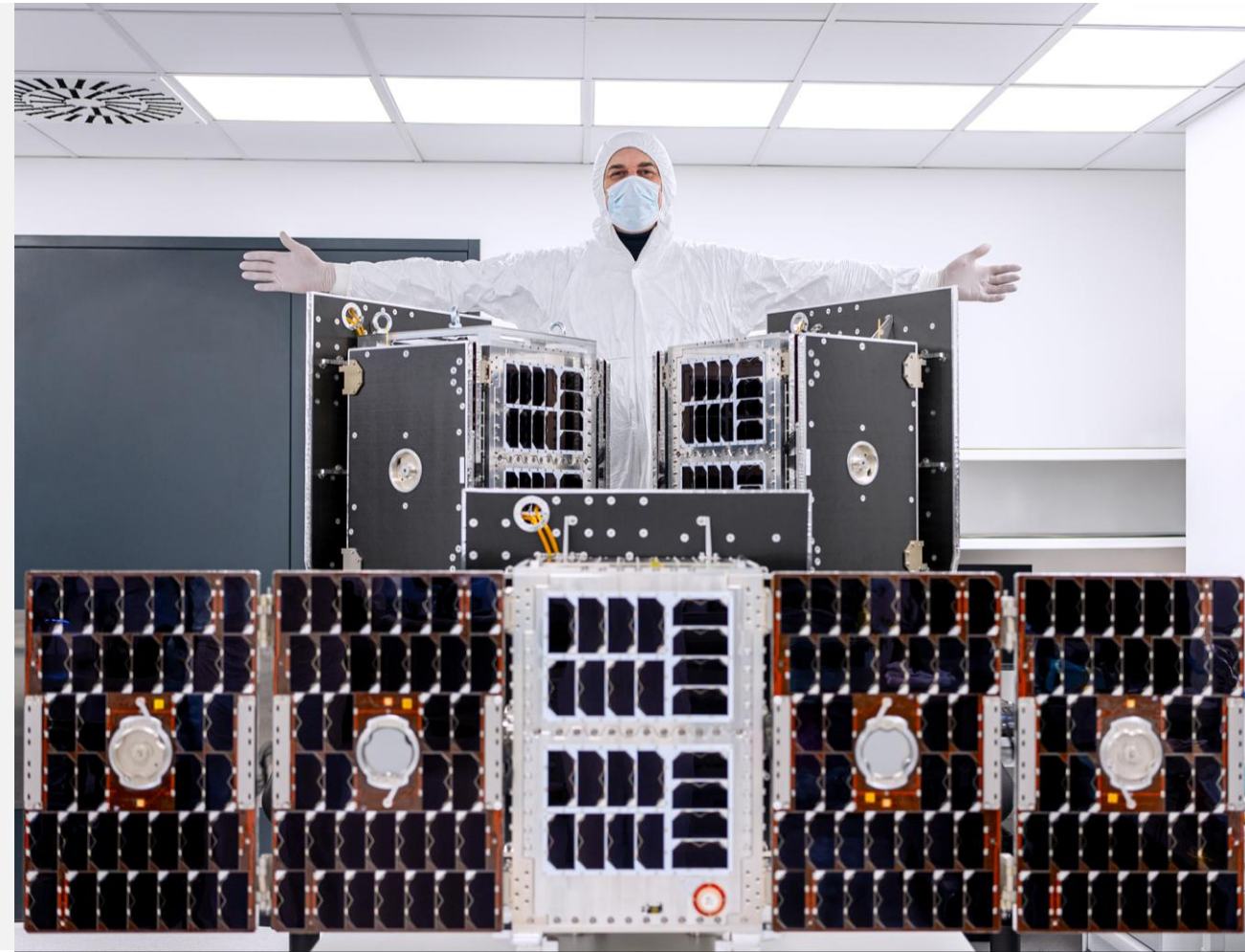
- Through KSAT, the KONGSBERG group offers Earth observation services combining rapid satellite data delivery, operational monitoring, and 24/7 analysis and emergency support.

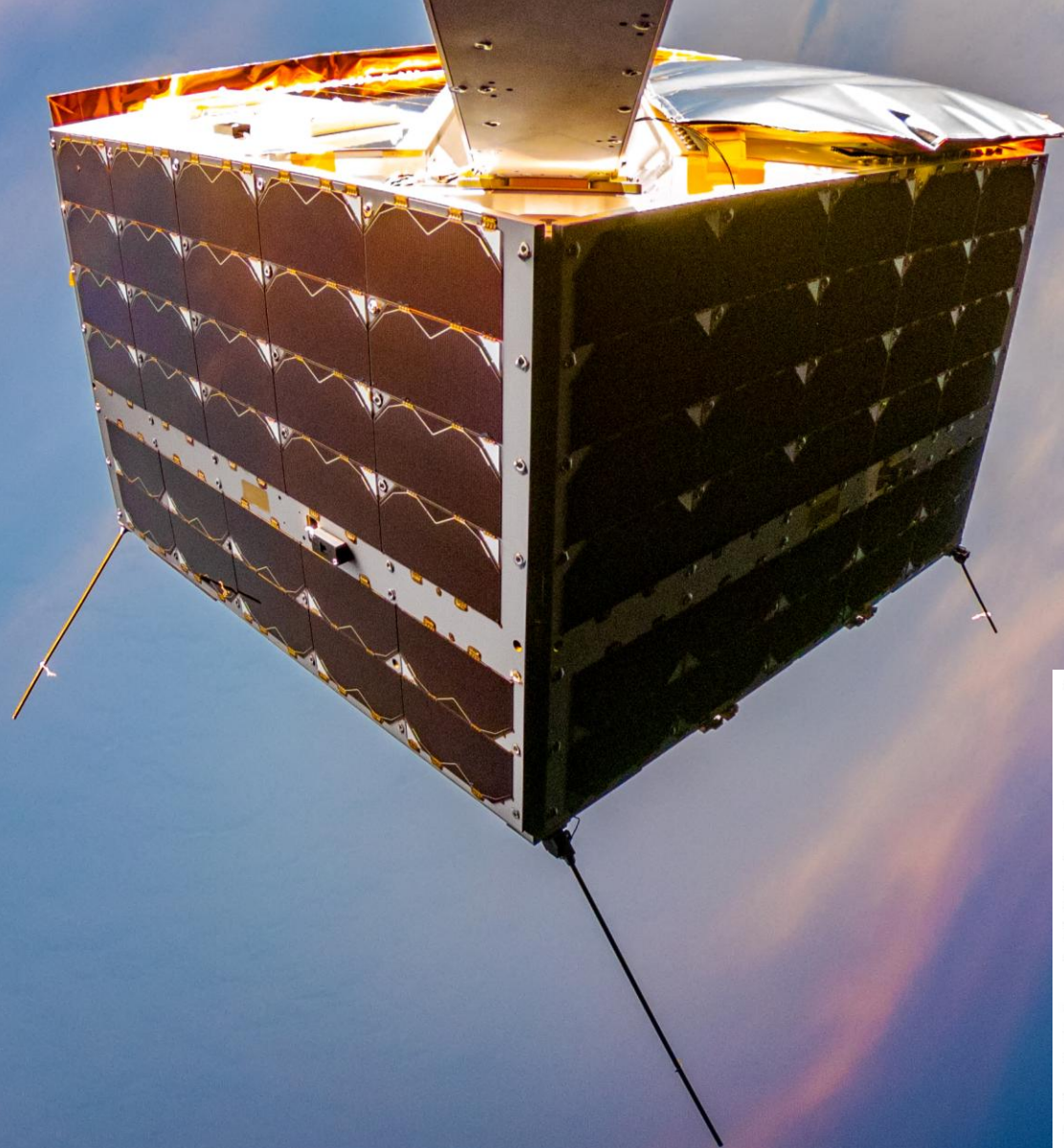
02. Transfer of Knowledge and Technology

- We and our partners specializing in Earth observation offer governmental organizations and research institutions TOK programs to help build sovereign space capabilities from satellite manufacturing to data analysis.

03. Satellites for Dual-use Applications

- Government-owned satellites can serve civil and national security needs, with surplus capacity sold or exchanged for access to partners' capabilities.





Thank You.

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