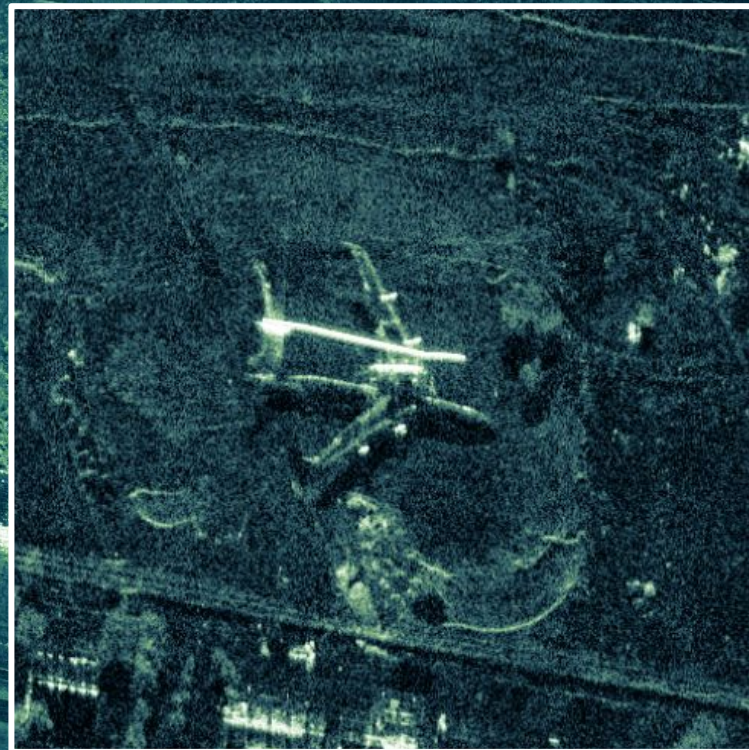


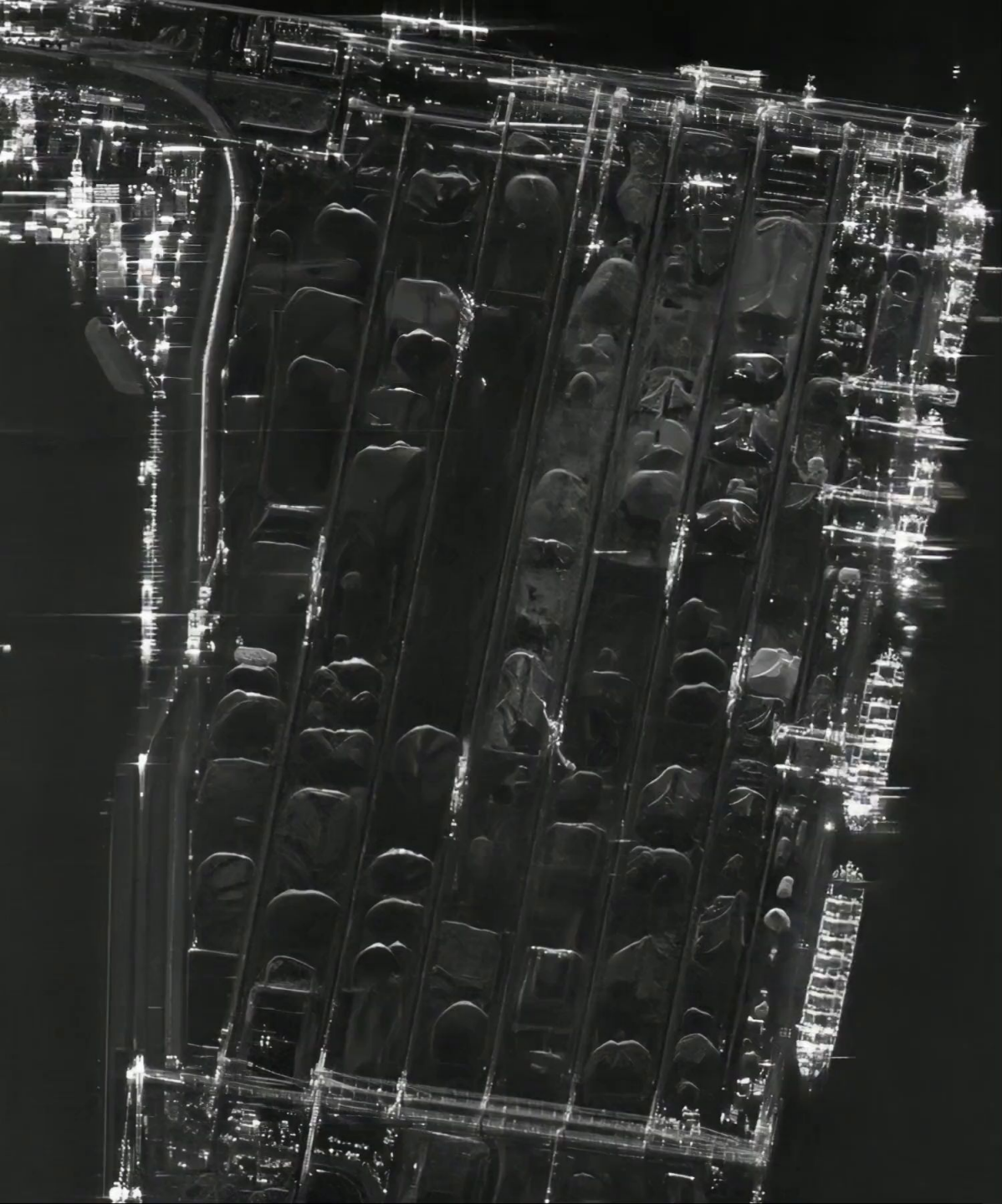
ICEYE

A NEW WAY TO UNDERSTAND EARTH

Tietotekniikan ja elektroniikan
seuran ekskursio

9.5.2023







RADAR IMAGING

**THROUGH CLOUDS
THROUGH DARKNESS**

ICEYE

THE WORLD'S LARGEST SAR SATELLITE CONSTELLATION

1 SATELLITE

2018

16 SATELLITES

2022

20+ SATELLITES

2023



Saturday, July 17, 2021
Today's Paper

The New York Times

☀️ 27°C 27° 16°

World U.S. Politics N.Y. Business Opinion Tech Science Health Sports Arts Books Style Food Travel Magazine T Magazine Real Estate Video

LIVE

Floodwaters Ebb in Europe; Death Toll Nears 160

- The figure is expected to rise. Firefighters and soldiers have begun clearing debris and unclogging roads.
- Extreme downpours like the ones that hit Germany are one of the most visible signs that the climate is changing as a result of global warming.



See the Impact in Satellite Images Towns in multiple countries have been devastated. We used radar technology to look through the clouds at the damage below. *Aisara Tiefenthäler, Christoph Koettl and Drew Jordan*



These maps show the extent of flooding in Europe's hardest-hit areas.

The Waters Are the Latest Sign of Global Warming

Floods like these had not been seen in perhaps 1,000 years.

In Texas, Top Two Republicans Steer Ship of State Hard to the Right

Different in style and background, Gov. Greg Abbott and Lt. Gov. Dan Patrick have come together to push an uncompromising conservative agenda.

Democrats See Edge in Early Senate Map as Trump Casts Big Shadow

Early fund-raising has given Democrats cause for optimism in key states as Republicans split over how closely to align with Donald Trump's preferences.

Forty-seven percent of Republicans said they weren't likely to get vaccinated, a recent poll has found.

Opinion

KARA SWISHER

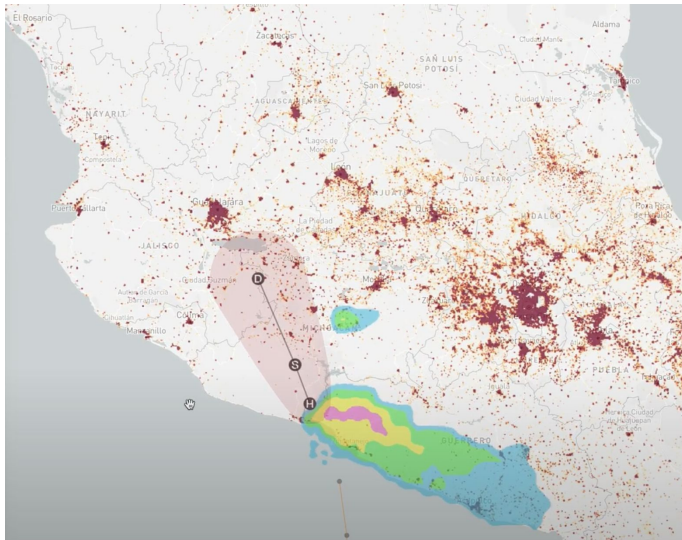
'They're Killing People'? Biden Isn't Quite Right, but He's Not Wrong.



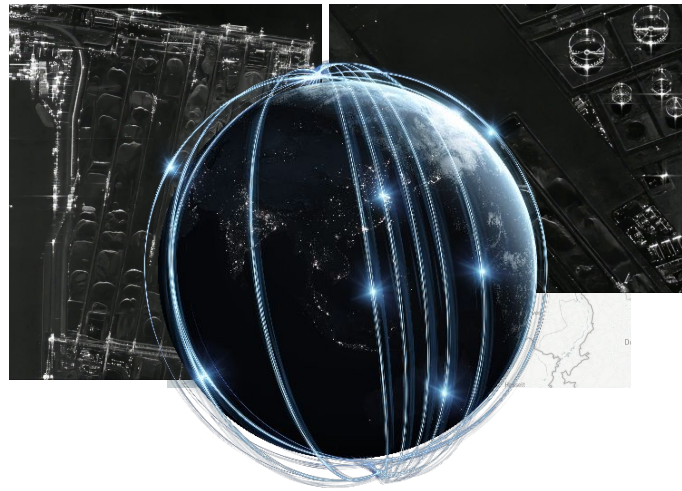
ANUPAM B. JENA

The Covid 'Birthday'

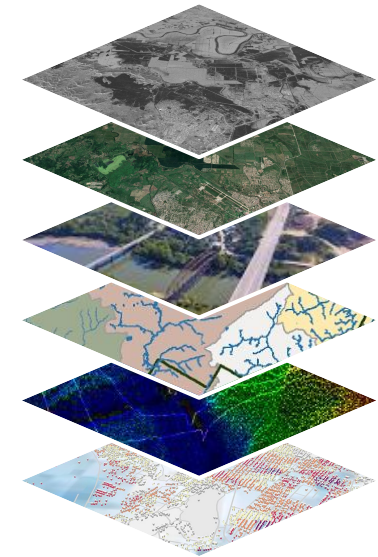




MODELING & PREDICTION



REAL-TIME OBSERVATION



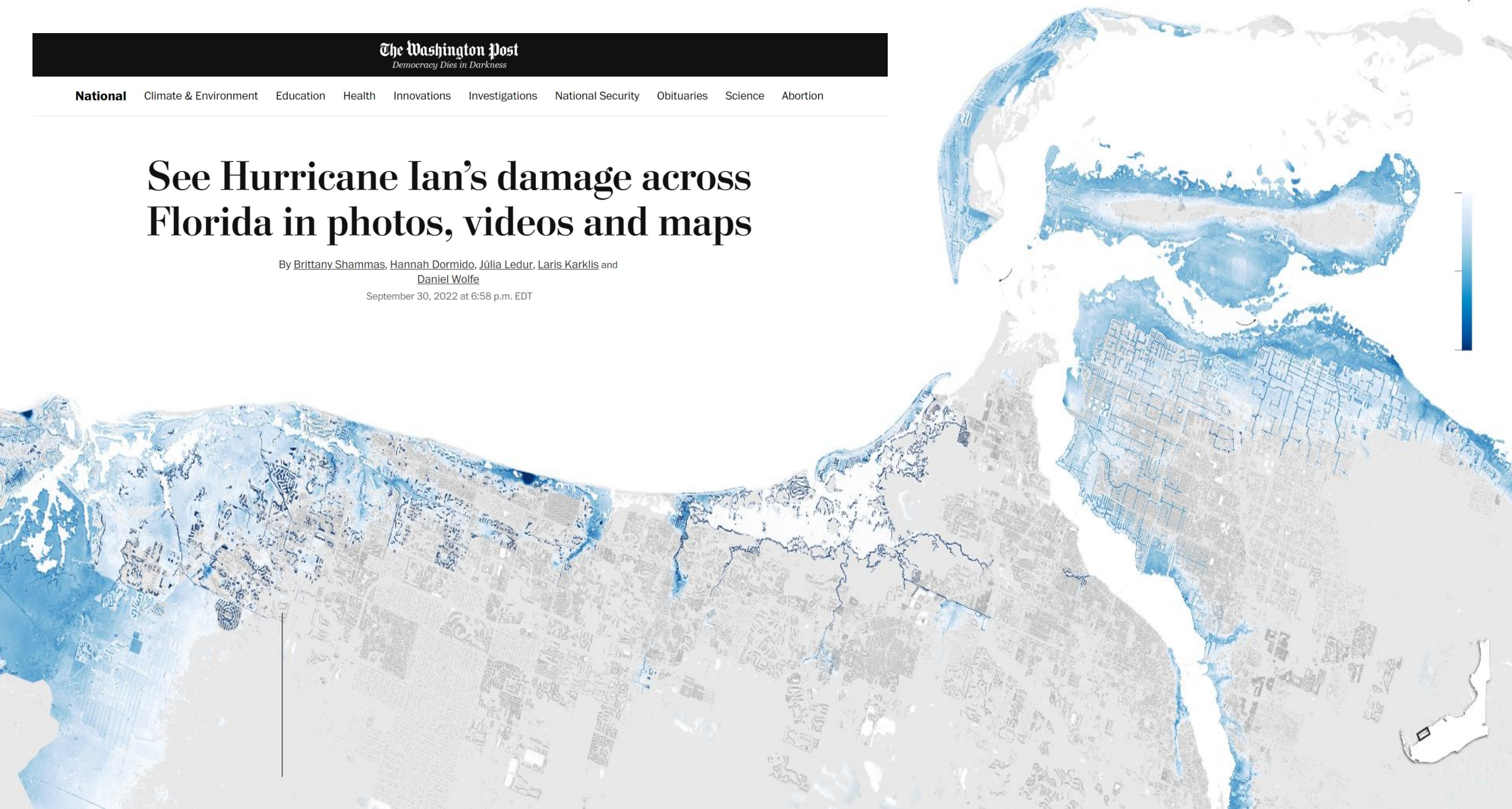
DETECTION & INSIGHT



See Hurricane Ian's damage across Florida in photos, videos and maps

By [Brittany Shammass](#), [Hannah Dormido](#), [Júlia Ledur](#), [Laris Karklis](#) and [Daniel Wolfe](#)

September 30, 2022 at 6:58 p.m. EDT





ICEYE as Global Digital Infrastructure

Objective

Real-time

Available, Reliable, Resilient

INFORMATION to enable new world of applications

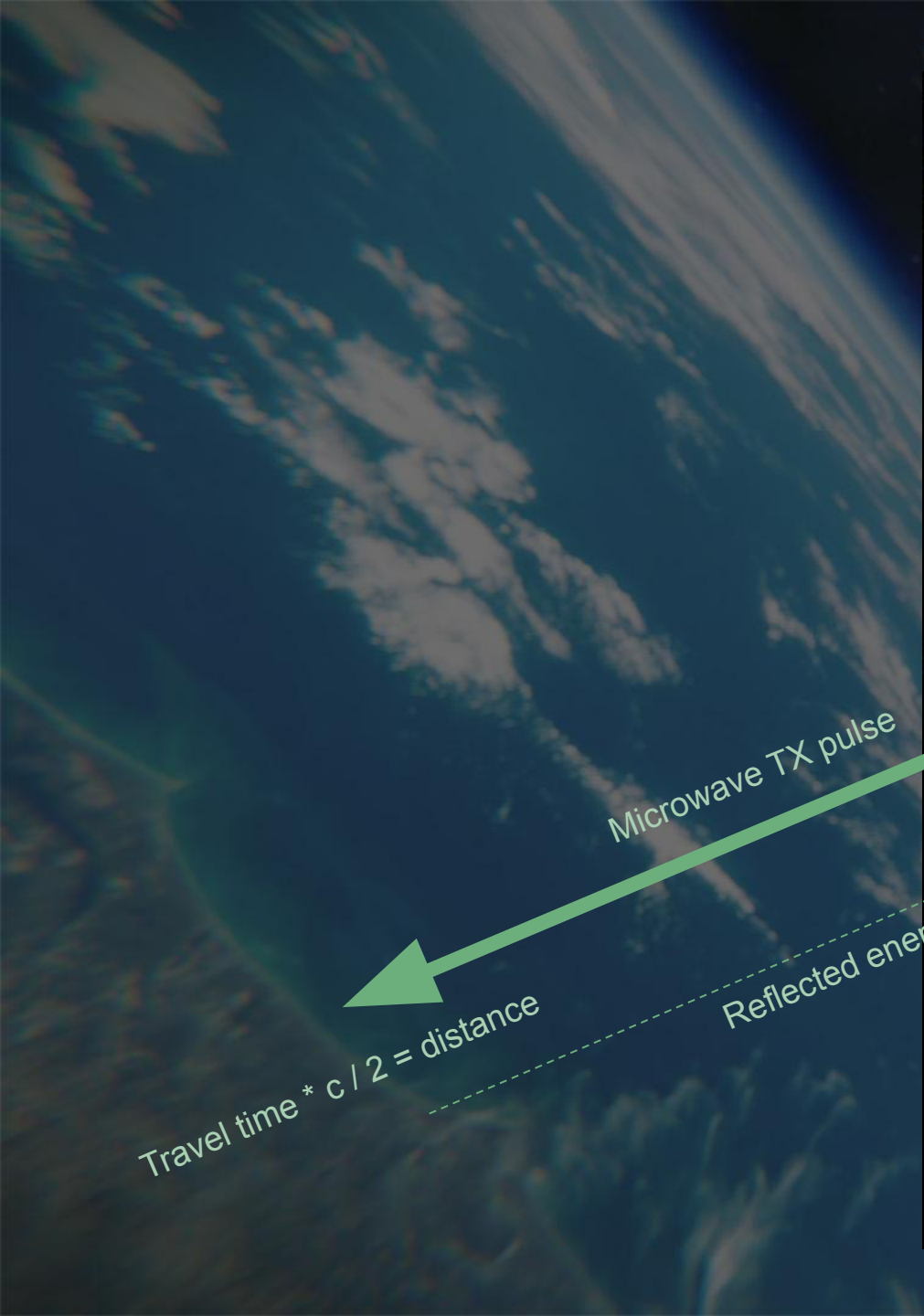


TRUE SITUATIONAL AWARENESS ENABLES SAFE AND EFFICIENT OPERATIONS

TRUST ENABLES MARKETS

TRUST ENABLES AGREEMENTS ON GLOBAL SCALE

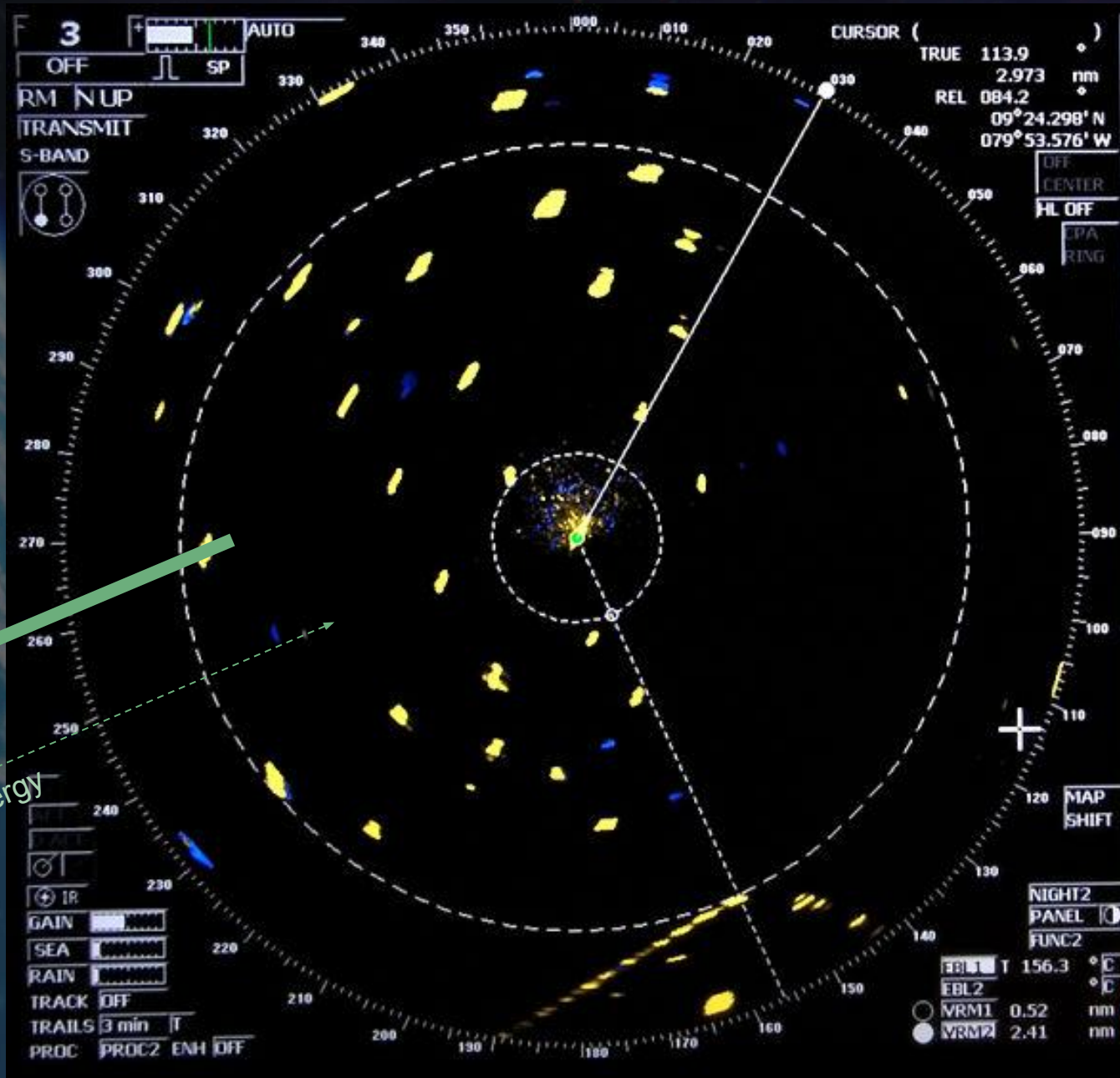


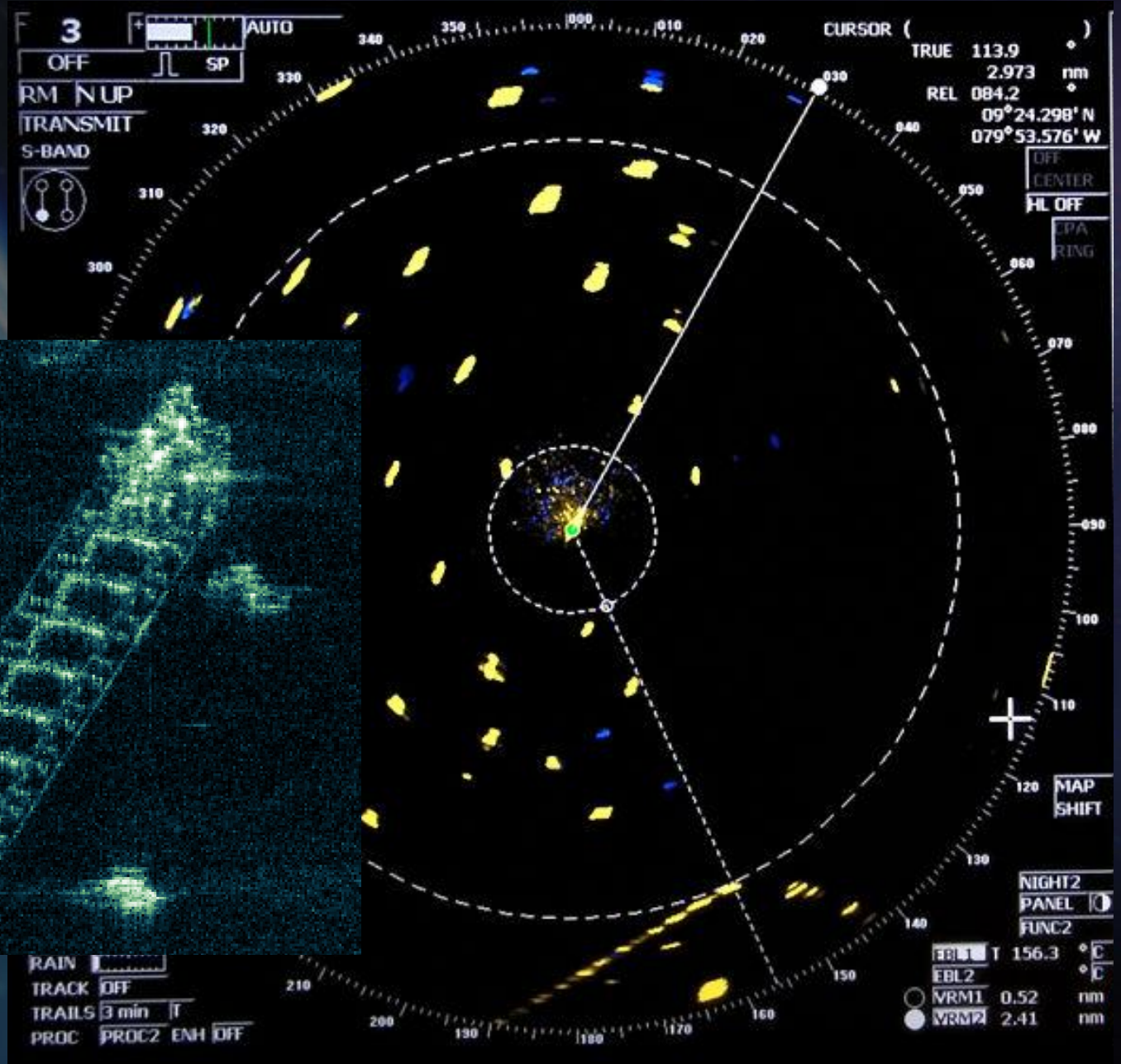
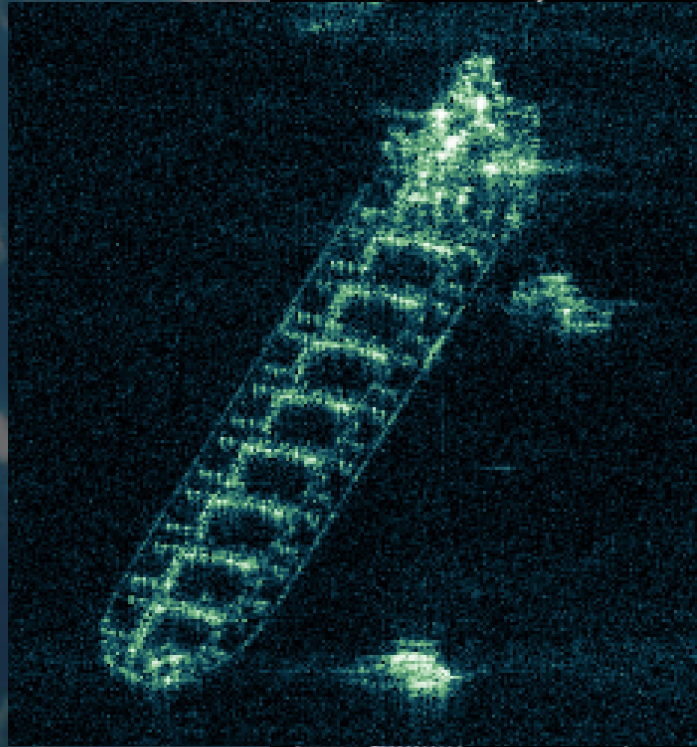
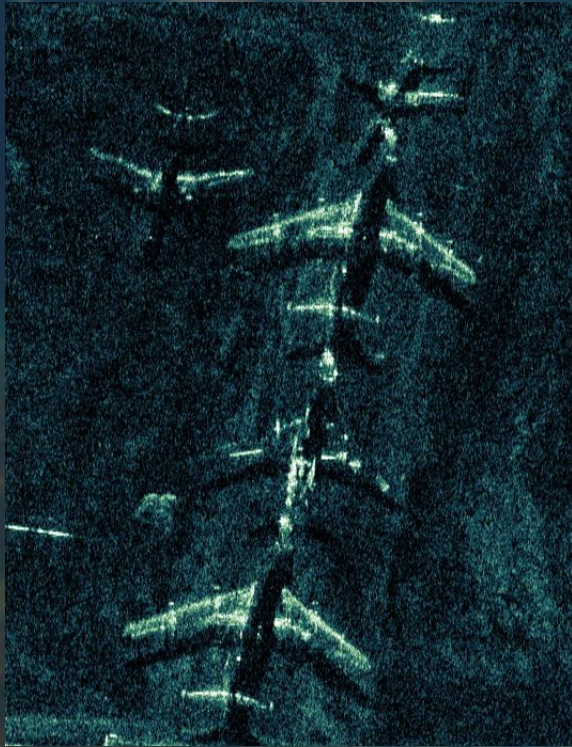


Travel time * c / 2 = distance

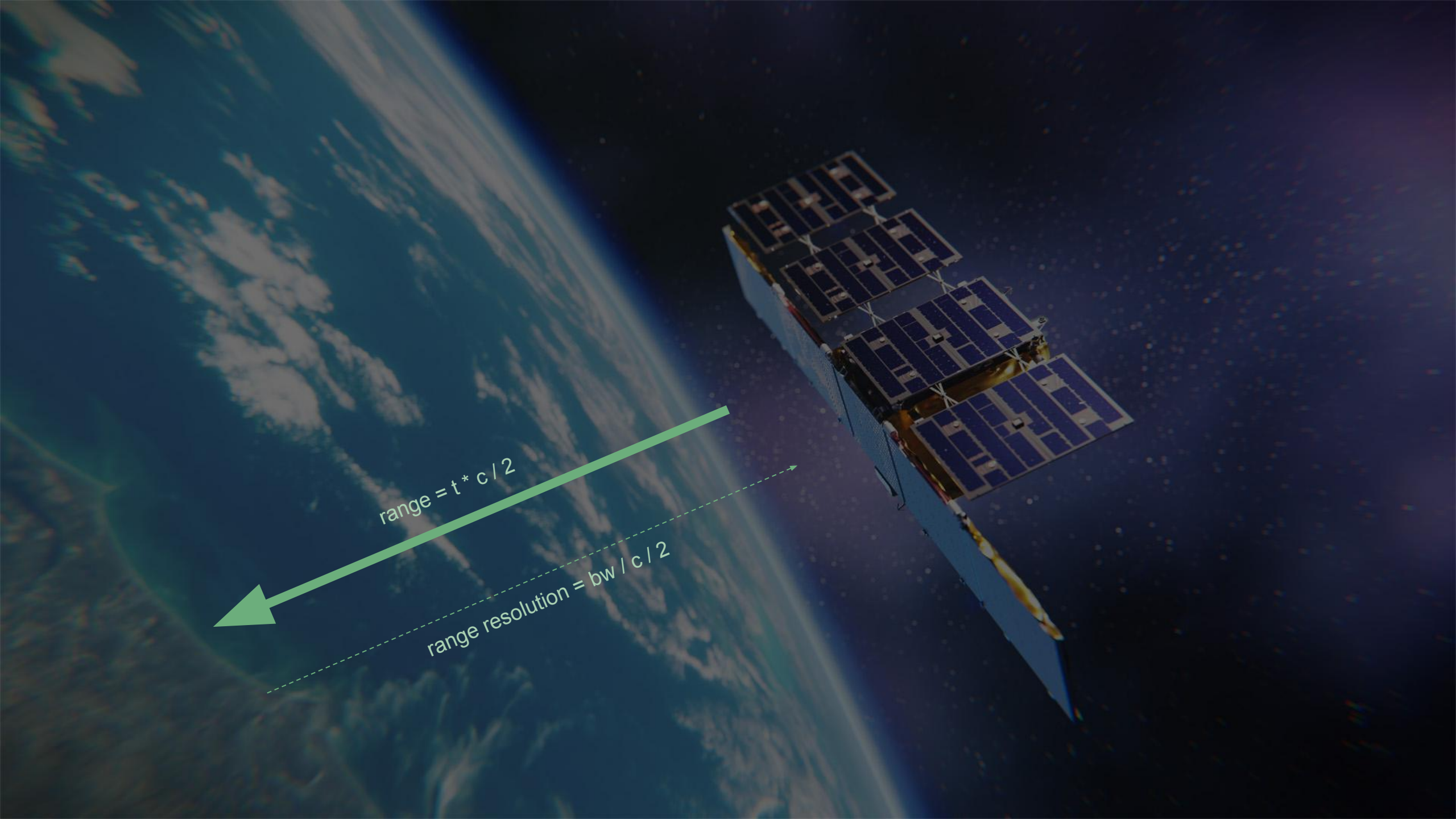
Microwave TX pulse

Reflected energy



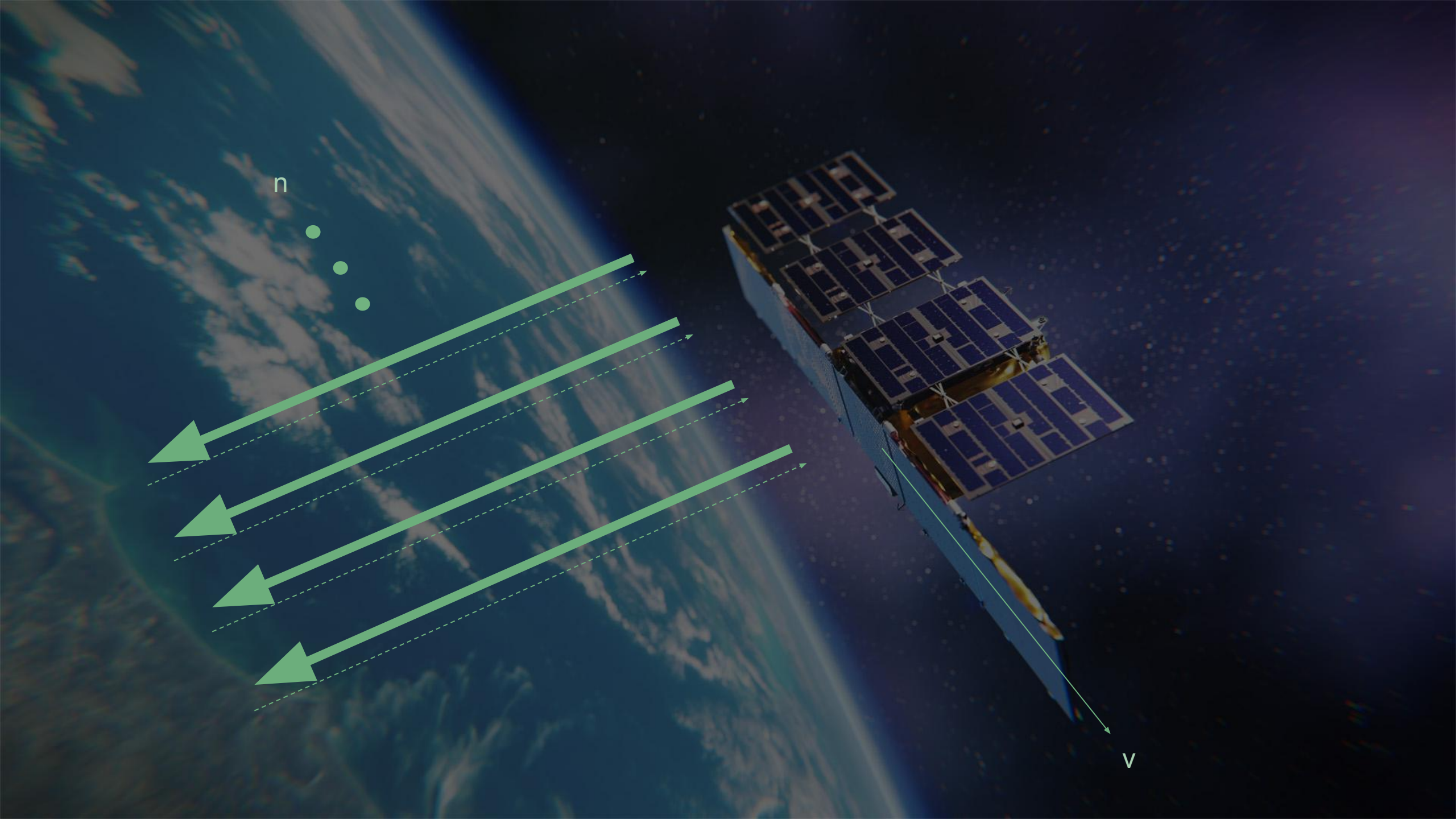






$range = t * c / 2$

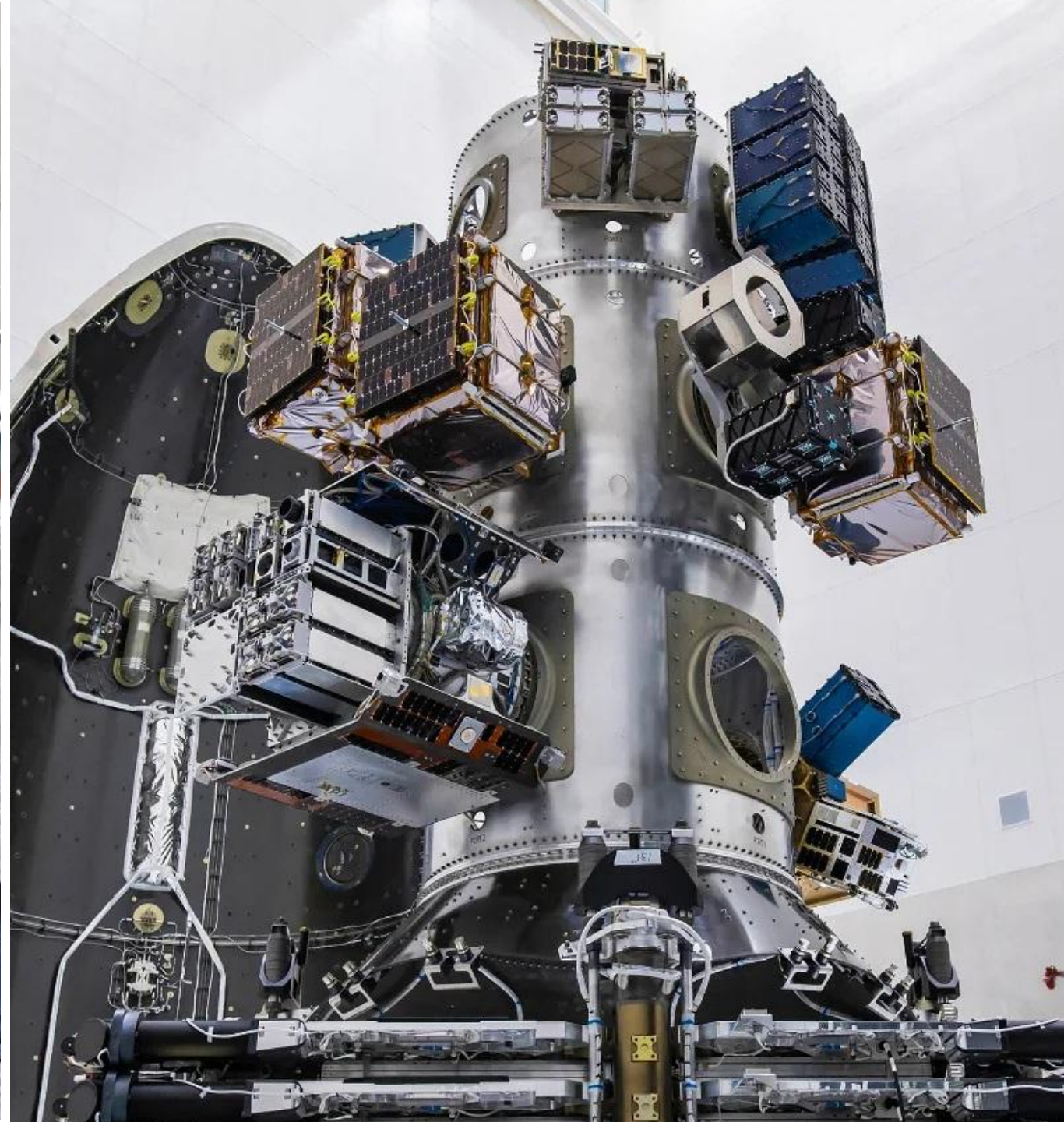
$range\ resolution = bw / c / 2$

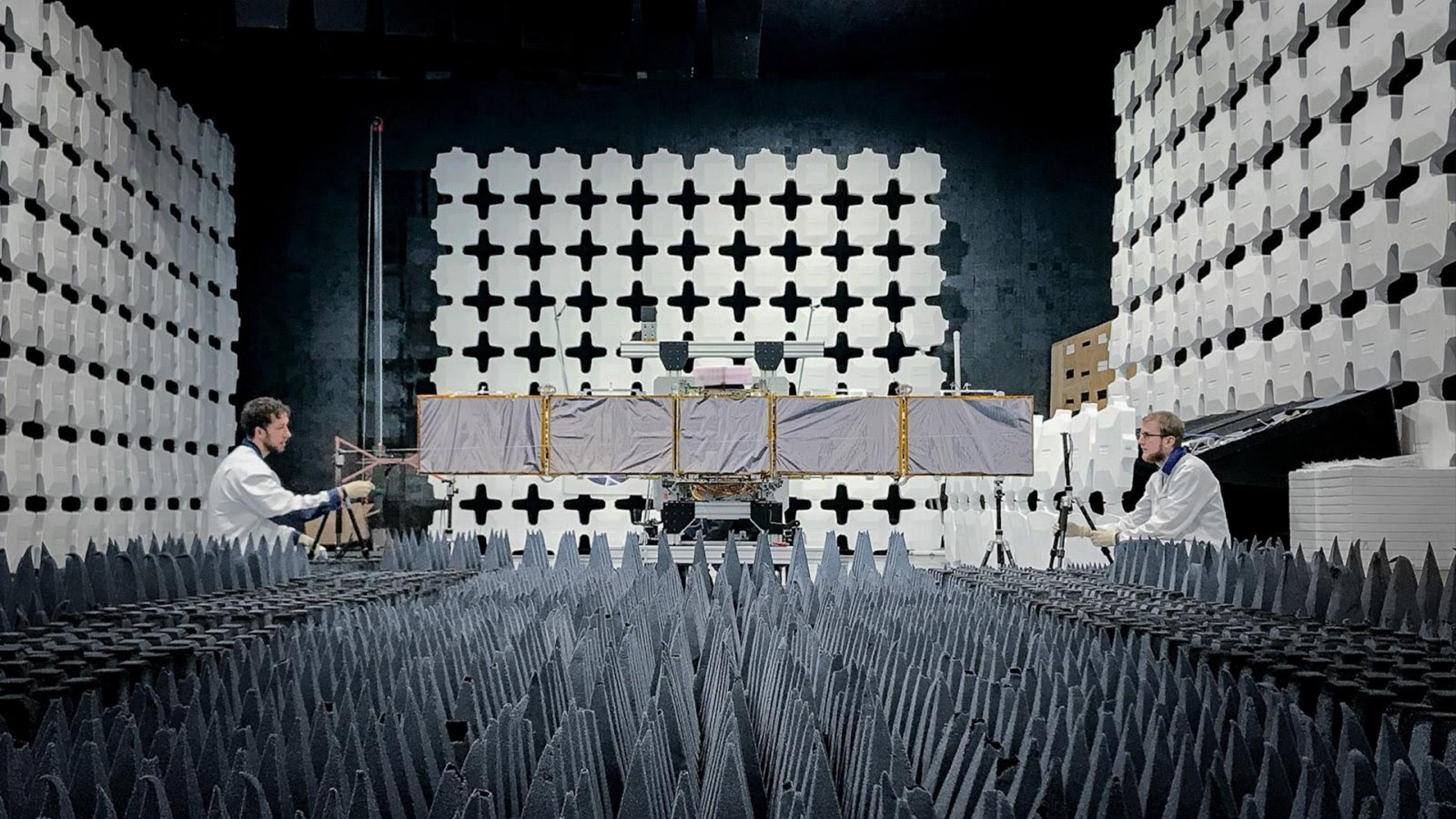


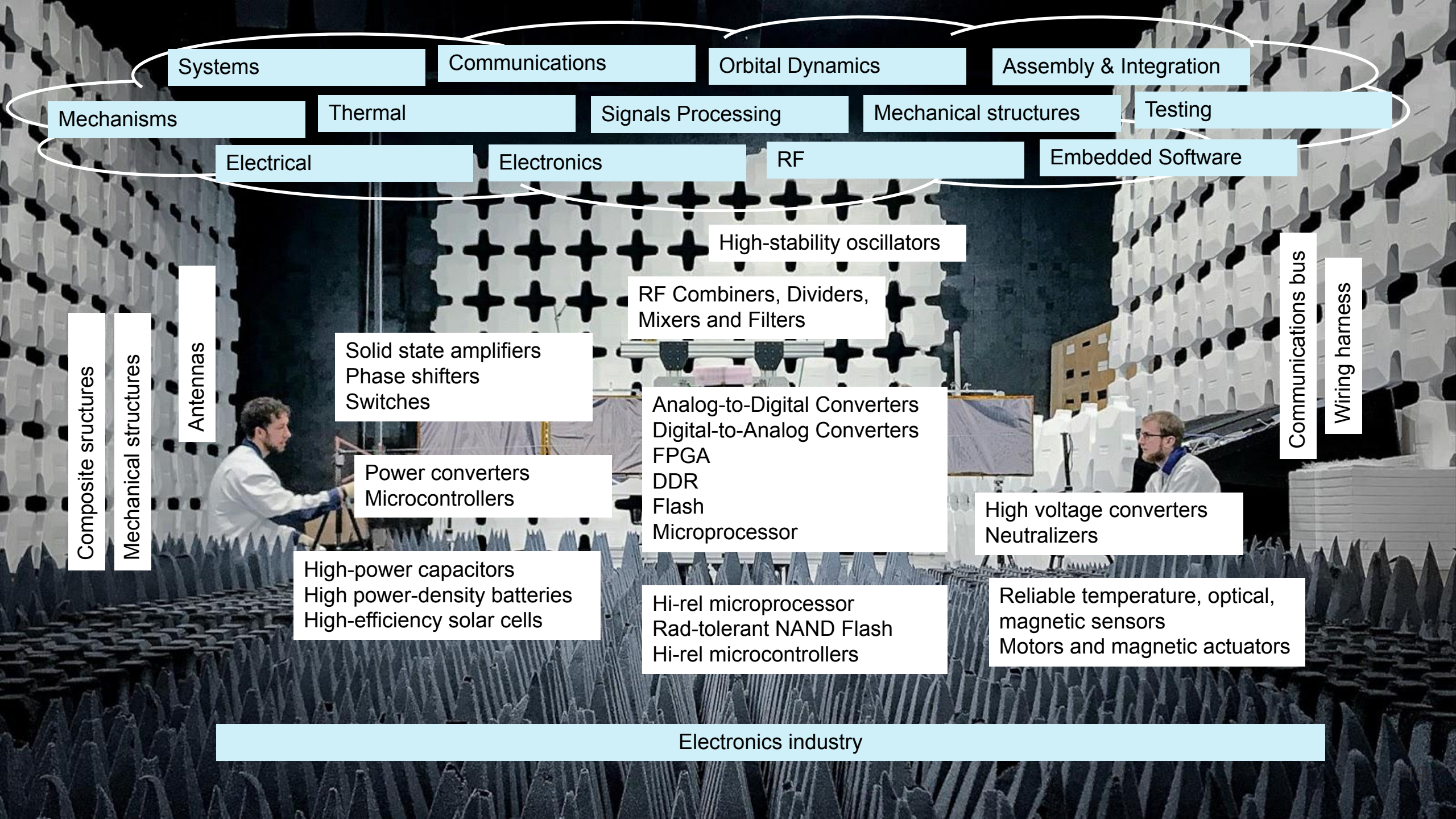
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Systems

Communications

Orbital Dynamics

Assembly & Integration

Mechanisms

Thermal

Signals Processing

Mechanical structures

Testing

Electrical

Electronics

RF

Embedded Software

High-stability oscillators

RF Combiners, Dividers,
Mixers and Filters

Solid state amplifiers
Phase shifters
Switches

Analog-to-Digital Converters
Digital-to-Analog Converters
FPGA
DDR
Flash
Microprocessor

Power converters
Microcontrollers

High voltage converters
Neutralizers

High-power capacitors
High power-density batteries
High-efficiency solar cells

Hi-rel microprocessor
Rad-tolerant NAND Flash
Hi-rel microcontrollers

Reliable temperature, optical,
magnetic sensors
Motors and magnetic actuators

Composite structures

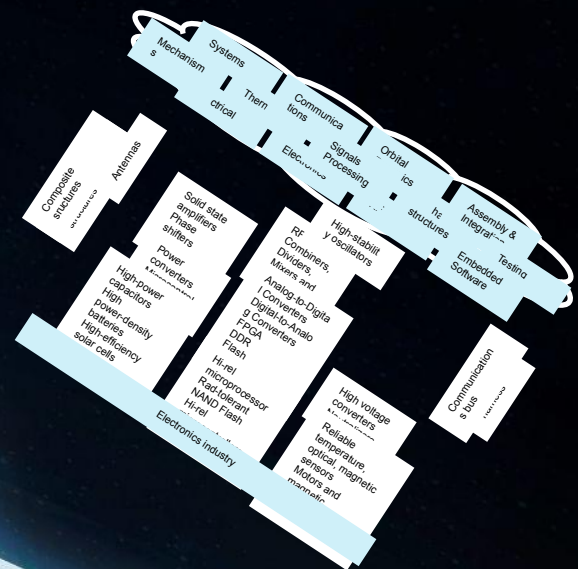
Mechanical structures

Antennas

Communications bus

Wiring harness

Electronics industry



Global ground network of link antennas

Secure operations and data delivery
 Global high-speed data backhaul
 Massive high-availability storage
 Massively parallel data processing

Computing industry
 Electronics industry

Customer interfaces and systems

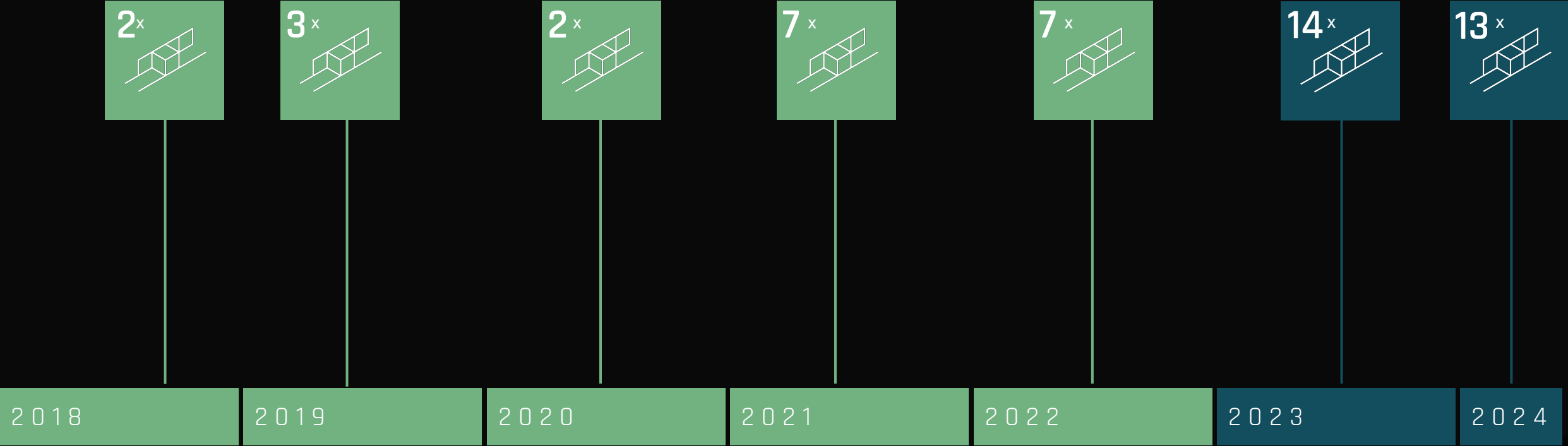
Fleet operations automation
 Fleet optimization

A high-contrast, black and white image of the Earth from space. The planet's curved horizon is visible, with a bright light source (likely the sun) positioned just behind it, creating a lens flare effect. The surface of the Earth is dark, with numerous bright, irregular patches of light scattered across it, representing ice or snow. The overall scene is set against the deep blackness of space.

ICEYE

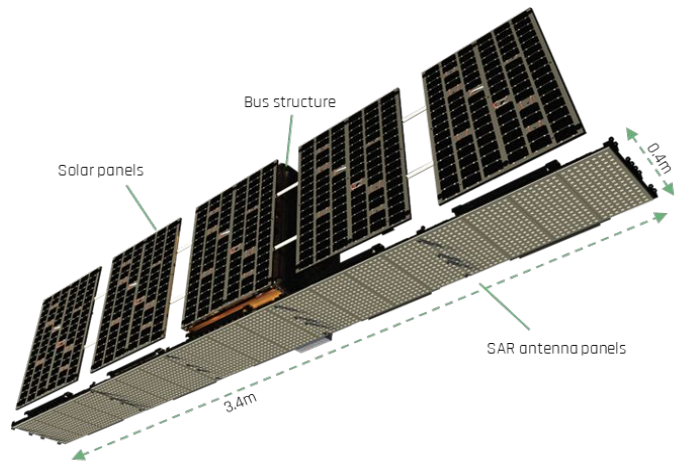
26 SATELLITES LAUNCHED SINCE 2018

ICEYE CONSTELLATION AND DEDICATED CUSTOMERS



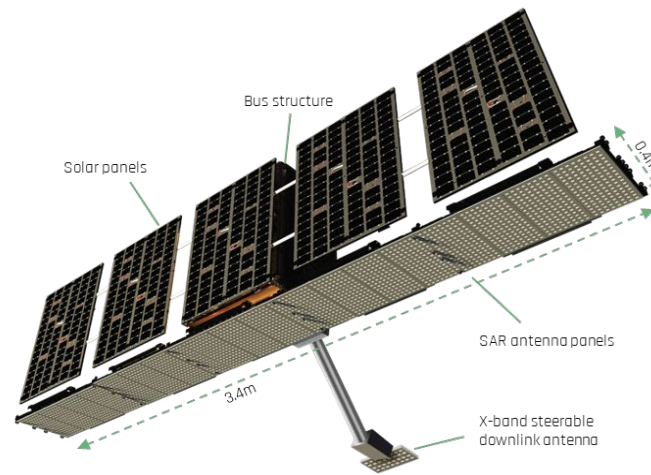
ICEYE SATELLITE TECHNOLOGY ROADMAP

Generation 2



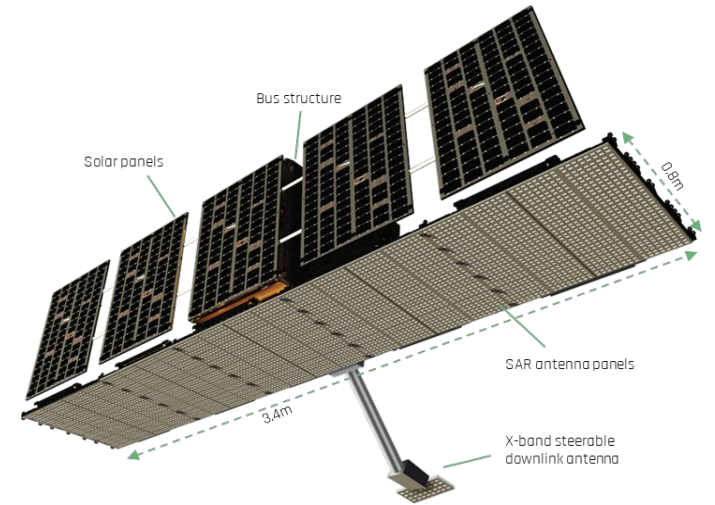
Key capabilities: 5 solar panels, 20 radar antenna panels with 299 MHz bandwidth and up to 500 Mbps X-band downlink

Generation 3



Key capabilities: 600 Mhz radar bandwidth & steerable downlink antenna for simultaneous imaging and downlink

Generation 4



Key capabilities: Double-wide SAR antenna including 40 radar panels and 1200 MHz radar bandwidth

FLOOD INSIGHTS & FLOOD EARLY WARNING

TOTAL
5598 BUILDINGS IMPACTED

■ HIGH	3085
■ MEDIUM	2132
■ LOW	381

Structure-level flood
depth

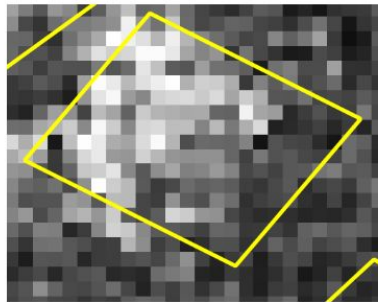
Blue shading represents
flood extent, gradation
shows depth

WILDFIRE MONITORING & BUILDING DAMAGE ASSESSMENT

NUMBER AND LOCATION OF IMPACTED BUILDINGS

- Vector format
- Binary classification
- Delivery target < 24h
- US geography, Onboarding EU

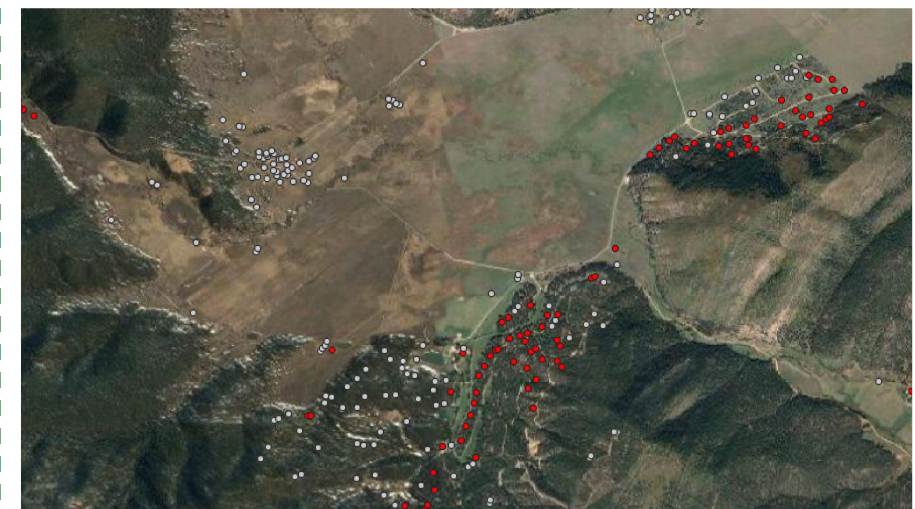
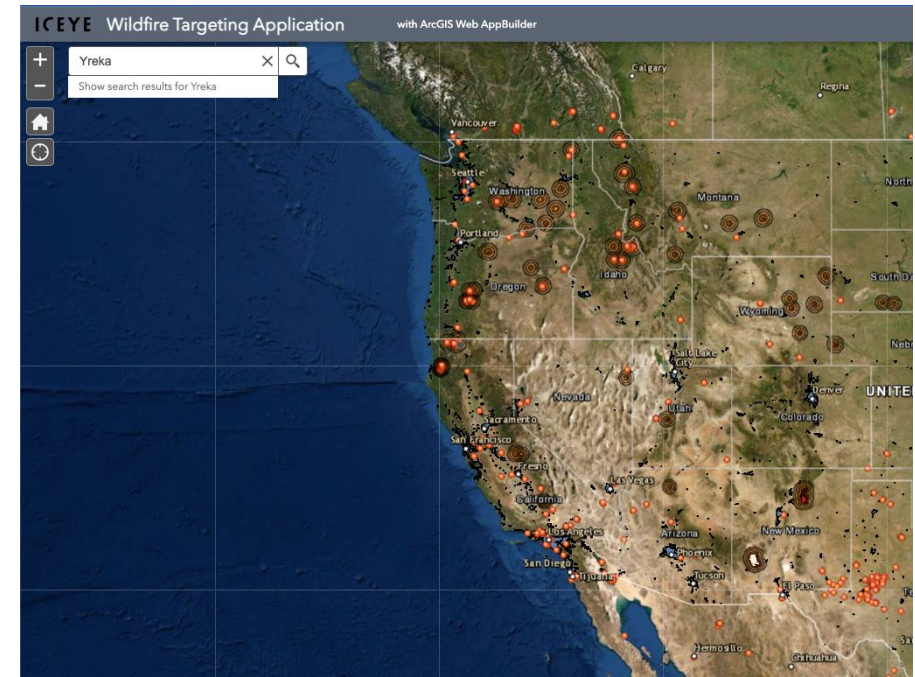
ANALYSIS INPUTS



SAR DATA



BUILDING FOOTPRINTS



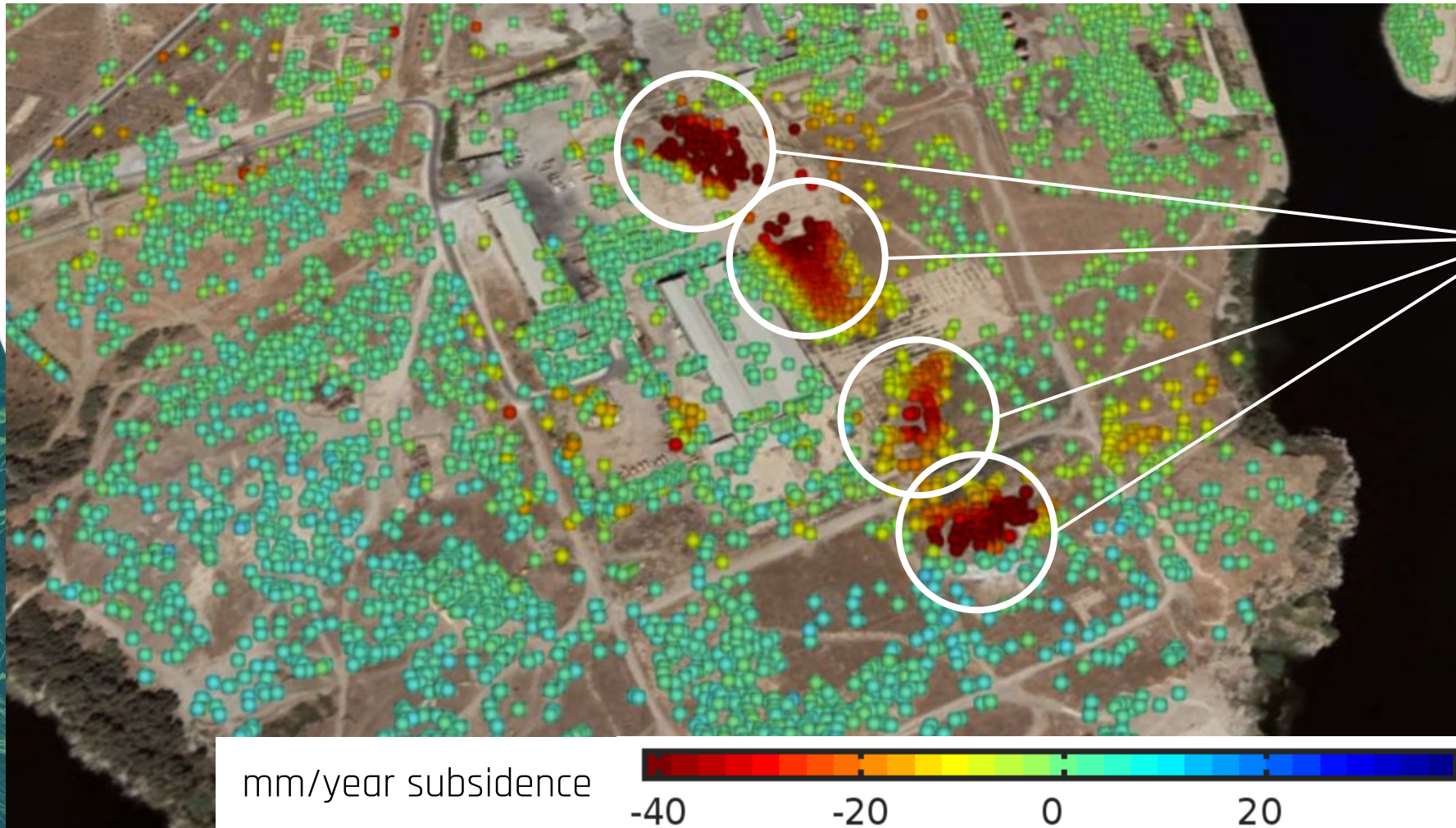
○ No damage

● Damage

ICEYE

INFRASTRUCTURE INTEGRITY MONITORING

Mosul Dam - Iraq



Red clusters signify areas of subsidence due to sinkholes