

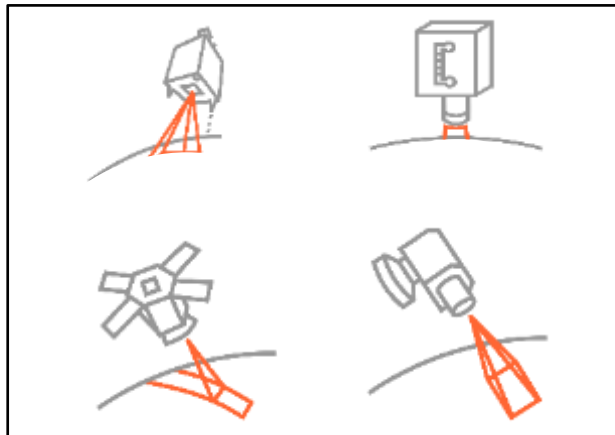
UrtheCast's High Resolution Imagery, HD Video and Synthetic Aperture Radar from Space for Smart Earth Observations

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Vice President Middle East, Africa and South Asia
Geo Smart Asia
22-14 August 2017

Who is UrtheCast? (pronounced "Earth-Cast")

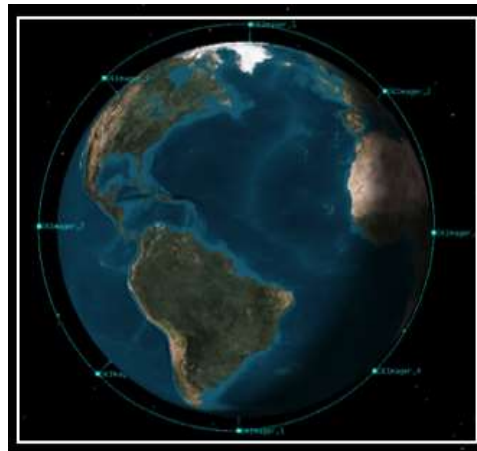
Canada HQ & Engineering | Spain Satellite Operations | USA R&D & Product Development ~ 250 people

Operational Satellites / ISS Sensors

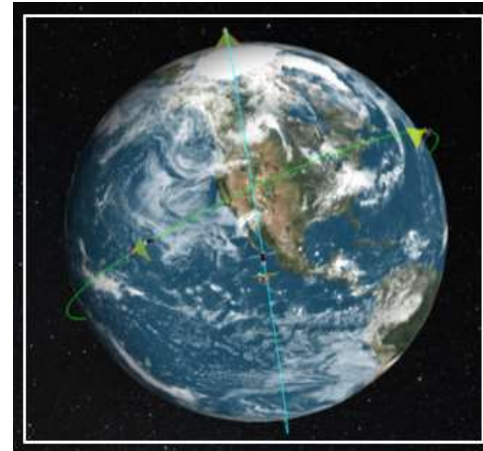


Serving the rapidly growing and evolving geospatial and geanalytics markets

Plans Announced for Future Satellite Constellations



8 Satellite UrtheDaily™



16 Satellite OptiSAR™

Customer funded and financed systems with unprecedented imaging capabilities

UrtheCast's EO Sensor System, Today

It already covers a broad range of imaging technologies, and it's evolving.



Deimos-1



MRC Theia



Deimos-2



HRC Iris



Deimos-2

High-Resolution Imagery



Pixel size	75 cm
Bands	5 (Red, Green, Blue, NIR, PAN)
Image width	12 km
Revisit time	2 days average, worldwide
Image time	Mid-morning (10:30 AM)

Major Applications & Markets

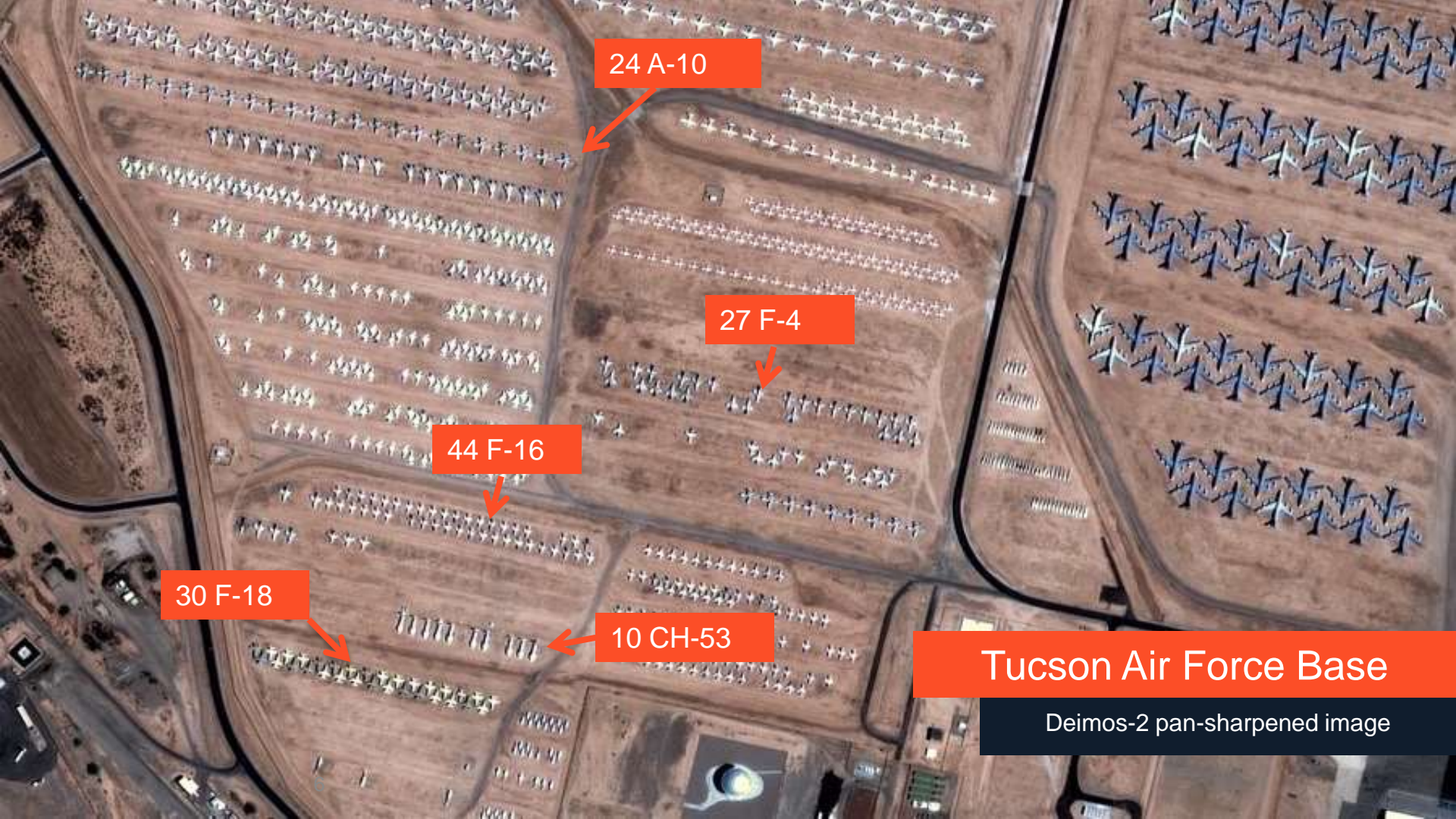
- Security
- Cartography
- 3D modelling (Digital Elevation Models)
- Frequent monitoring (Oil & Gas, Security...)





Infrastructure: Madrid

Airport



24 A-10

27 F-4

44 F-16

30 F-18

10 CH-53

Tucson Air Force Base

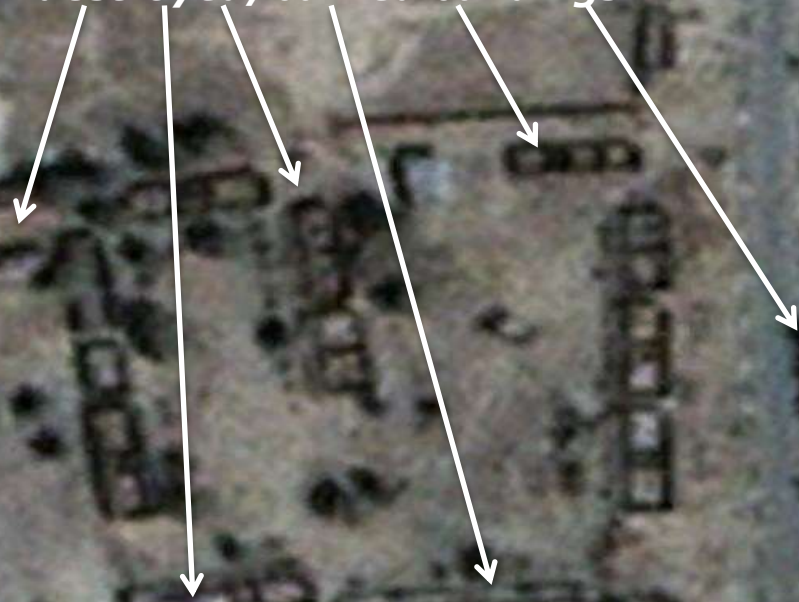
Deimos-2 pan-sharpened image



Change Detection

BEFORE: Google Earth – October 30, 2013

destroyed/burned buildings



Change Detection

AFTER: DEIMOS-2 pan-sharpened image (75cm/pixel) of Limani (Cameroon) – January 31, 2015

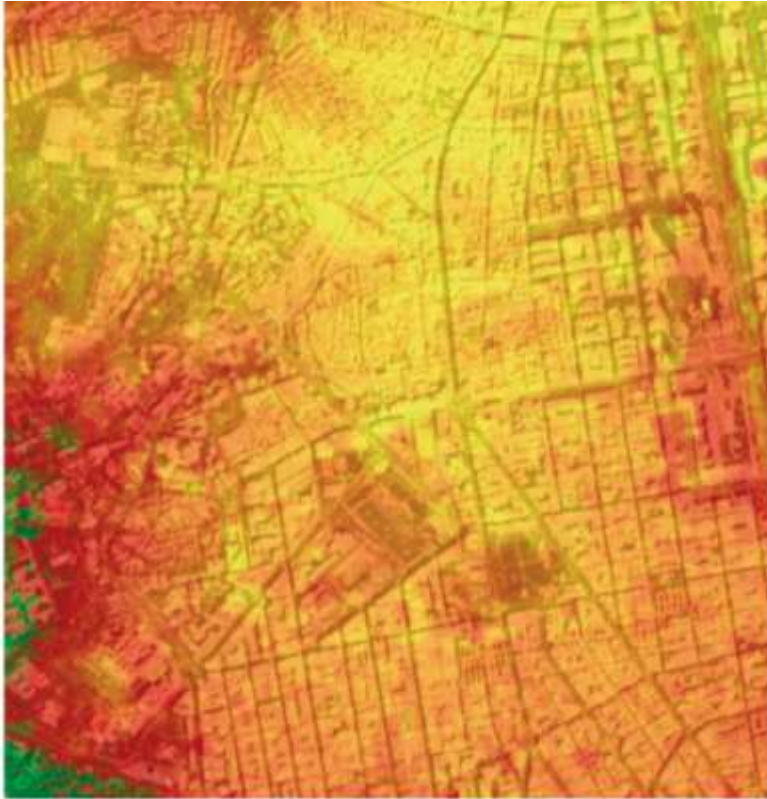


Deimos-2, Bassel el Assad International Airport, Latakia, Syria – Dec.6, 2015



Deimos-2, North Thunder Exercise, King Khalid Military City, Saudi Arabia – Feb.21, 2016

DEM PORTFOLIO



MADRID, SPAIN. CAPTURED BY DEMOS-2

The DEM portfolio



The products generated are compliant with the following specifications:

- 1.5 m seamless DTM and DSM products
- CE90, LE90 or other accuracy index
- GeoTiff and AutoCAD delivery formats
- Grid interval
- Edited DSM with hydrological consistency (i.e. flattening of water bodies, consistent flow of rivers, editing of shoreline)
- DTM corrected for different heights
- Homogenous standardized DEM for any location
- Unique quality: Superior elevation information anywhere

The PanGeo Alliance



A unique (and growing) fleet of 15 operational Earth Observation sensors

- 12 operational imagery sensors, plus 3 AIS satellites
- 56 satellites to be launched in the coming years
- Unprecedented portfolio: imagery (20m to 75cm/pixel), 4k full-color videos, AIS
- PanGeo Alliance members can provide Alliance data to customers worldwide

	Medium Resolution 8 sensors in orbit 21 to be launched						High Resolution 4 sensors in orbit 18 to be launched					Very High Resolution 4 sensors in orbit 9 to be launched				SAR 8 to be launched	Video 1 sensor in orbit	AIS 3 sensors in orbit	
	Daimos 1	Landsatmapper BC	KazSatSAT	Thales	KazEOSat 2	Urthecast	Landsatmapper HD	Dubaitat 1	TH-1	TatEOS 1	KazEOSat 1	Daimos 2	Dubaitat 2	Khalifatat	OptiRAR	OptiRAR	Iris	DR-1	Perseus M
Country	Spain	US	Kazakhstan	Canada	Kazakhstan	Canada	US	UAE	China	Singapore	Kazakhstan	Spain	UAE	UAE	Canada	Canada	Canada	Russia	US
Type	Optical MR	Optical MR	Optical MR	Optical MR	Optical MR	Optical MR	Optical HR	Optical HR	Optical HR	Optical VHR	Optical VHR	Optical VHR	Optical VHR	Optical VHR	Optical VHR	SAR	Video 4K	AIS	AIS
Launch	2009	2016	2017	2013	2014	2018	2017	2009	2010, 2011, 2015	2015	2014	2014	2013	2017	2020	2020	2013	2014	2014
Local time A/L	10:30	10:30	22:30	155 Orbit	10:30	10:30	10:30	10:30	22:00	Orbit Inclined 15°	22:30	10:30	22:00	22:30	10:30, inclined	10:30, inclined	155 Orbit	10:30	10:30
Lifetime	10 years	>5 years	>5 years	>5 years	7 years	>7 years	>5 years	>5 years	7 years	>5 years	7 years	7 years	7 years	7 years	>7 years	>7 years	>5 years	>5 years	>5 years
Agility	-	±25°	±30°	-	±35°	-	±25°	±15°	±30°	±15°	±35°	±15°	±15°	±15°	±15°	±15°	±15°	-	-
Spatial Resolution	30 m	20 m	18 m	5 m	5 m	5 m	2.5 m	2.5 m	2.0 m	1.0 m	1.0 m	75 cm	1.0 m	0.6 m	0.6 m	1 m	1.0 m	1.0 m	
Spectral Bands	5	5	6	4	5	6	5	Pan + 4	Pan + 4	Pan	Pan + 4	Pan + 4	Pan + 4	Pan + 4	Pan + 4	4, 4x1	3 (RGB)	-	
Swath	650 km	420 km	300 km	30 km	77 km	300 km	25 km	20 km	60 km	12 km	20 km	12 / 21 km	12 / 21 km	12 km	16 km	12 km	6x1 km	-	
Satellite/Sensors	1	12	1	1	1	8	18	1	5	1	1	1	1	1	8	8	1	1	3



The UrtheDaily™ Concept

Our Global-Coverage Constellation for Better Geoanalytics

A state-of-the art constellation designed to meet market needs while remaining cost-effective.

Product: Multispectral, 5m/pixel imagery, with full global daily coverage

Service: Through the cloud, and via APIs, all based on the *UrthePlatform*

- Developed following years of study
- A natural evolution of our Deimos-1 and Theia experiences
- Incorporates market lessons learned via current assets and customers

An unprecedented and disruptive product/service, tailored for Geoanalytics

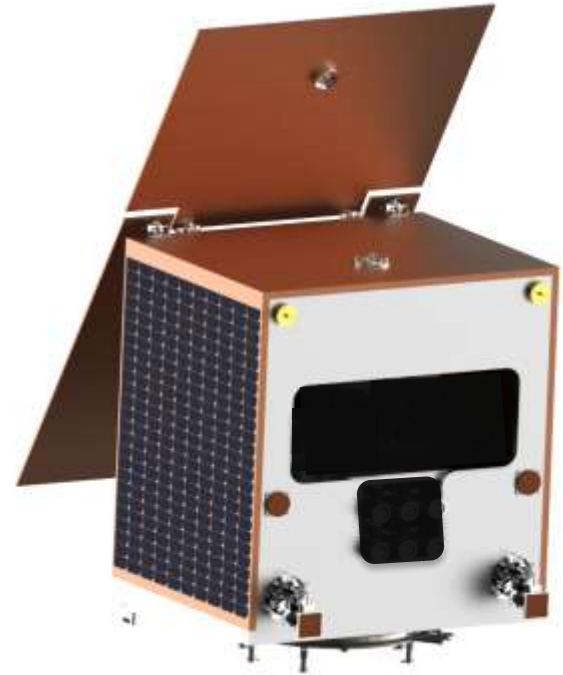


***“The entire world
(140 million km²),
imaged everyday
at 10:30 AM,
at 5m GSD,
available through
a user-friendly
cloud platform.”***

UrtheDaily™ Spacecraft

Built in partnership with Surrey Satellite Technology Ltd.

Orbit:	600 km SSO, 10:30 a.m. LTAN
Spacecraft Design:	Based on SSTL-250 Bus
No. of Satellites:	Eight, equally spaced
Mass:	340 kg
Size:	1.1 m x 1.1 m x 0.8 m
Sensors:	MSC and SSC
Downlink:	X-band, 1 Gbps
Data storage:	3 TB
Design Life:	7-10 year baseline
Launch:	Falcon 9 RTL (all 8 s/c)



Always imaging over land

Always nadir pointing

Always a 360 km swath

UrtheDaily™ Sample Imagery (simulated)

The whole Earth, everyday, at 10:30 AM, at 5m / pixel, with multi-band spectral diversity.

Example image at 5m / pixel



OptiSAR Constellation

16 Satellite Constellation

16 Satellites in two orbit planes

Altitude: 450 km

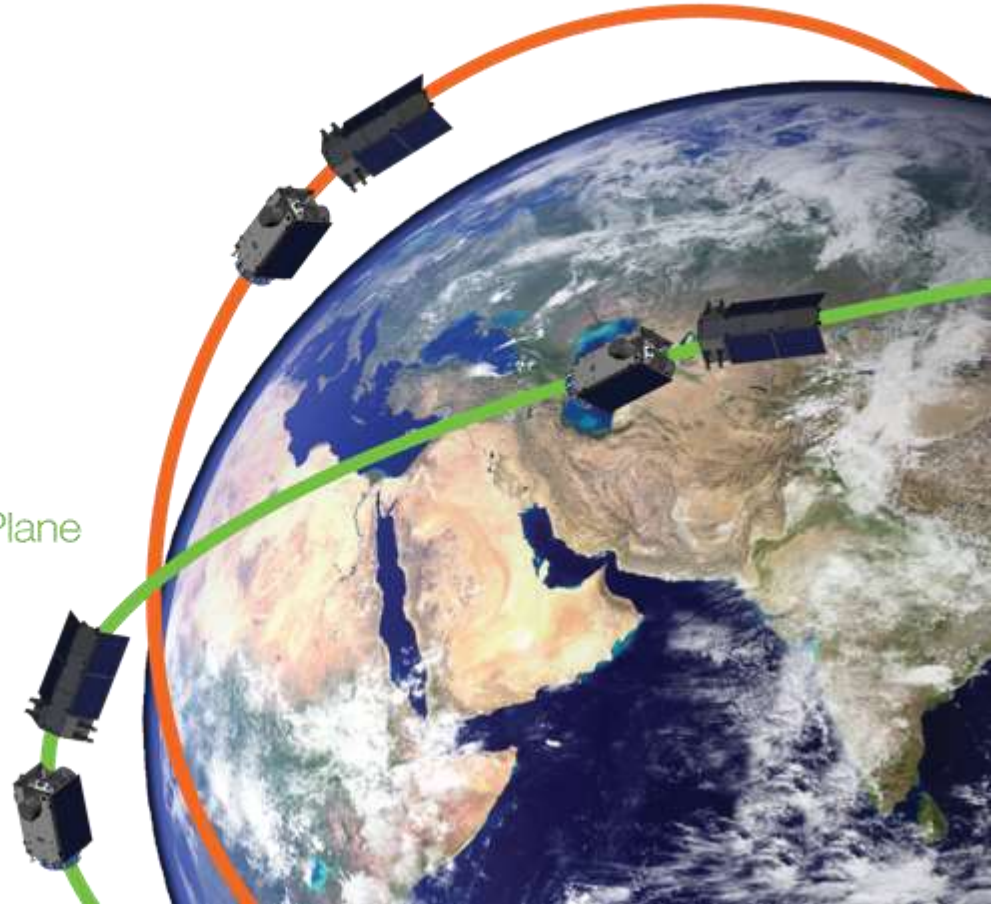
MIO: 30° ~ 45° incl.

SSO: ~10:30 a.m. ECT

Satellites are arranged in pairs:
SAR & Optical (SAR leads)

MIO Orbit Plane

SSO Orbit Plane

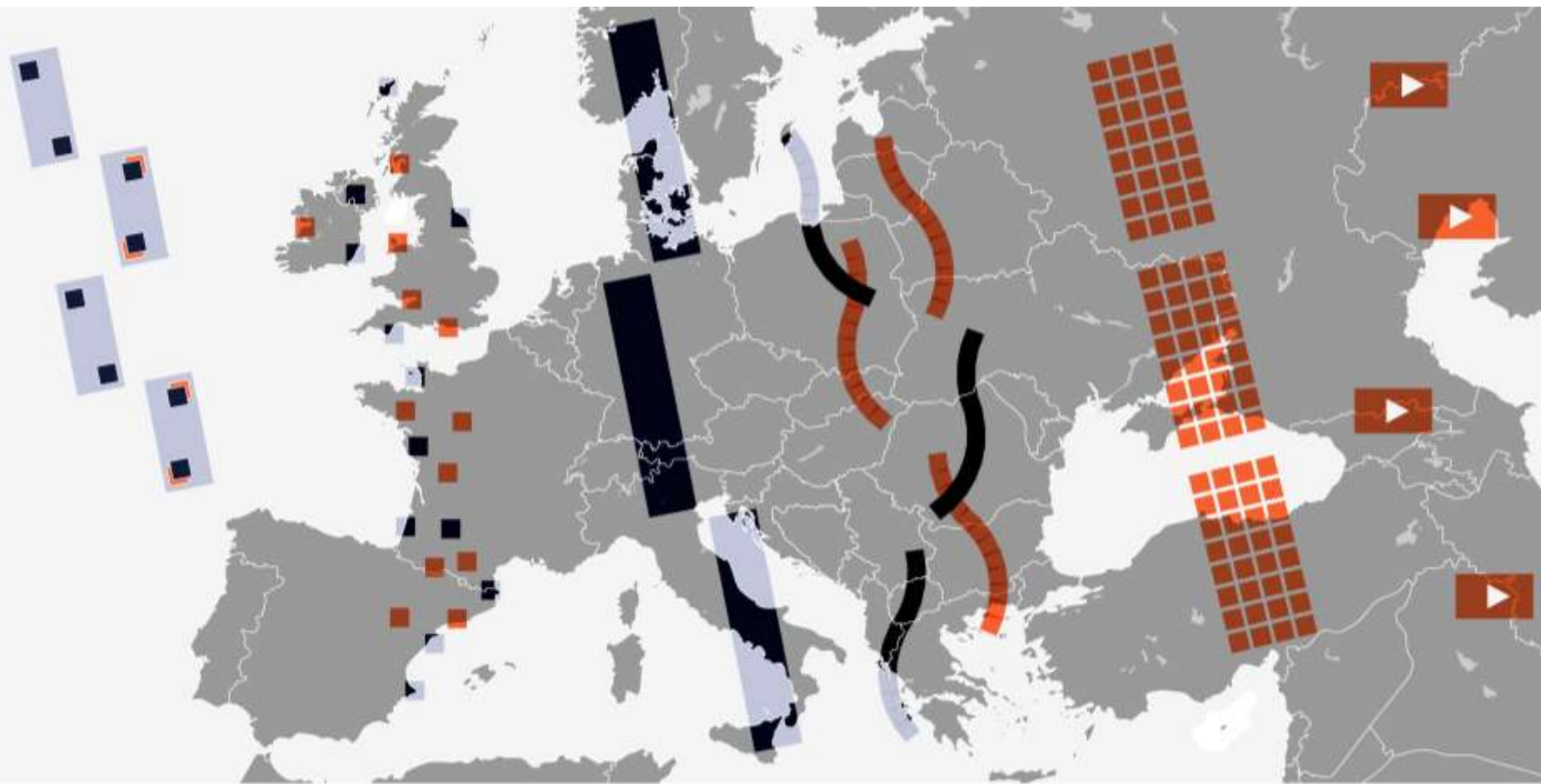




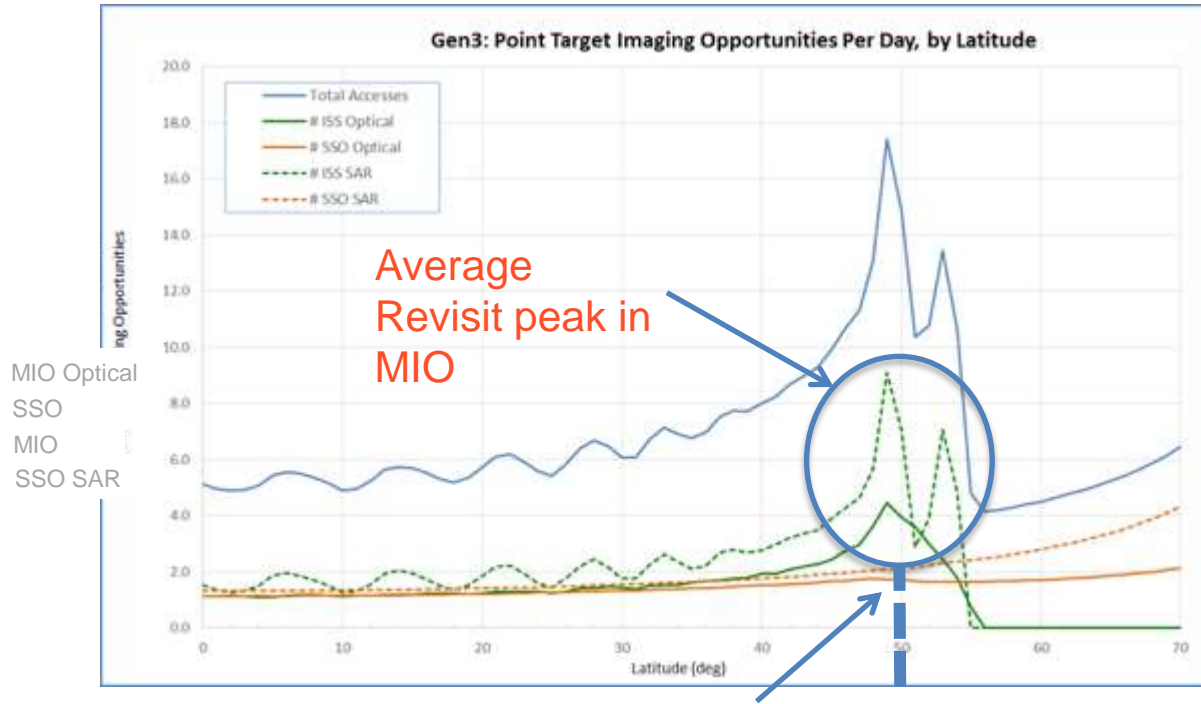
urthecast

See the planet. Open the world.

The Urthecast Constellation



Revisit Capability – Daily Averages

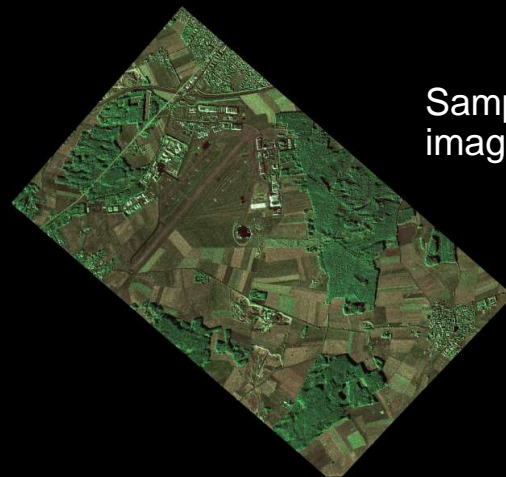


Latitude for peak revisit can be adjusted by changing the orbit inclination

The OptiSAR™ Image Product

An 'information product' that looks like an optical image:

- Derived entirely from the SAR data
- Anyone can interpret it
- Available every day: rain or shine, day or night
- Deep information content
- Uses proprietary SAR processor that's 'trained' by the optical data



Sample OptiSAR™
image product

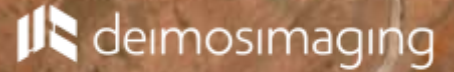
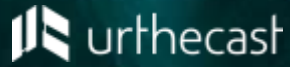


Hi-Res optical image





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Questions

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