X-band Satellite Transmitter & Mobile Ground Station Solution

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NEMO-HD satellite

70 kg > satellite for earth monitoring and observation.

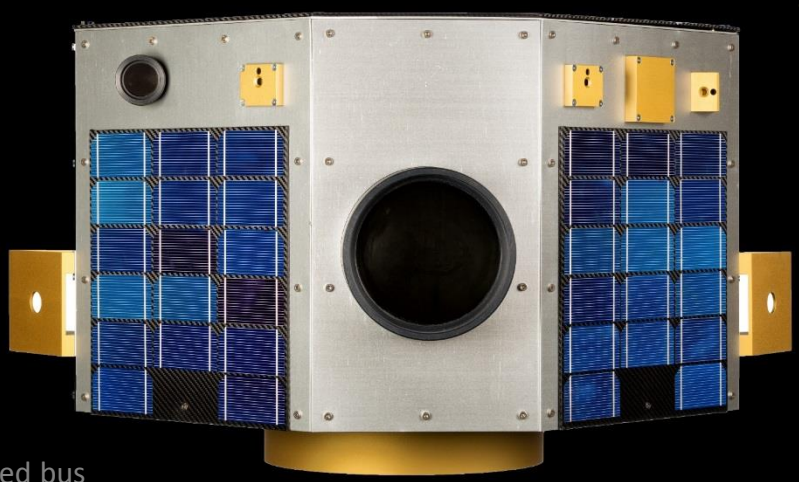
2.8 m gsd from a reference altitude of 600 km

four spectral channels

(420–520 nm, 535–607 nm, 634–686 nm, and 750–960 nm).

high-definition video at 1920 by 1080 pixels.

real-time imaging and video streaming over slovenia



three-axis stabilized bus

50 mbps x-band downlink

279.4 gb of on-board storage,

power system generating 55 w

300 wh li-ion battery.

UTIAS SFL

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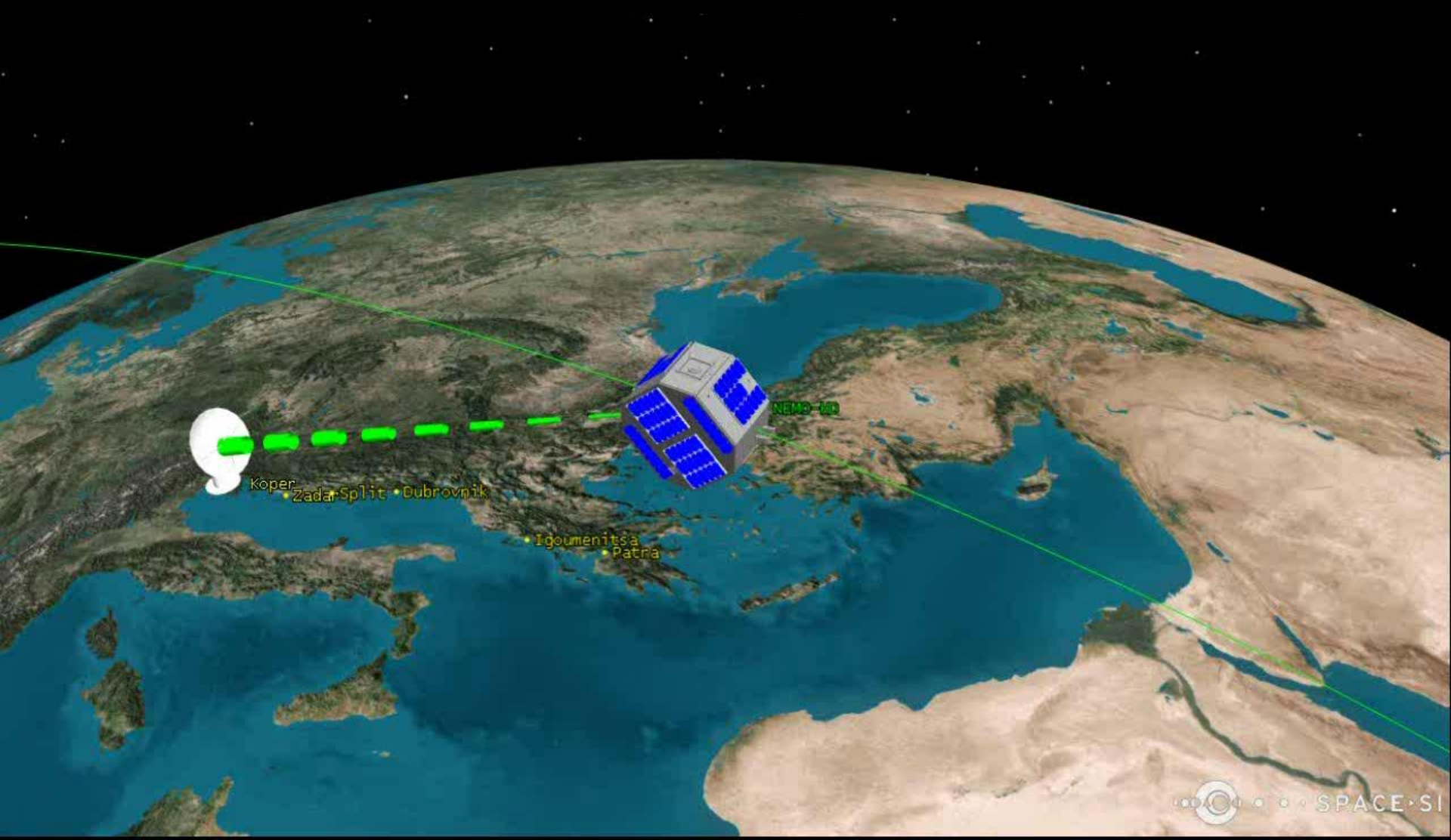
NEMO-HD satellite



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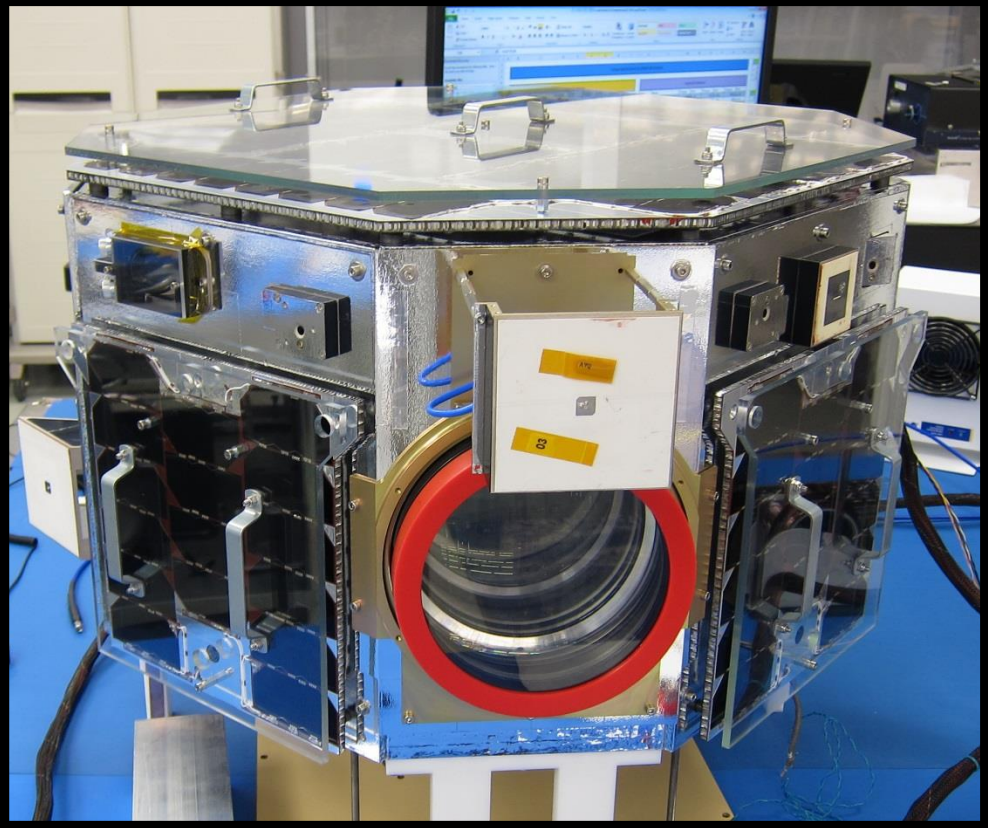
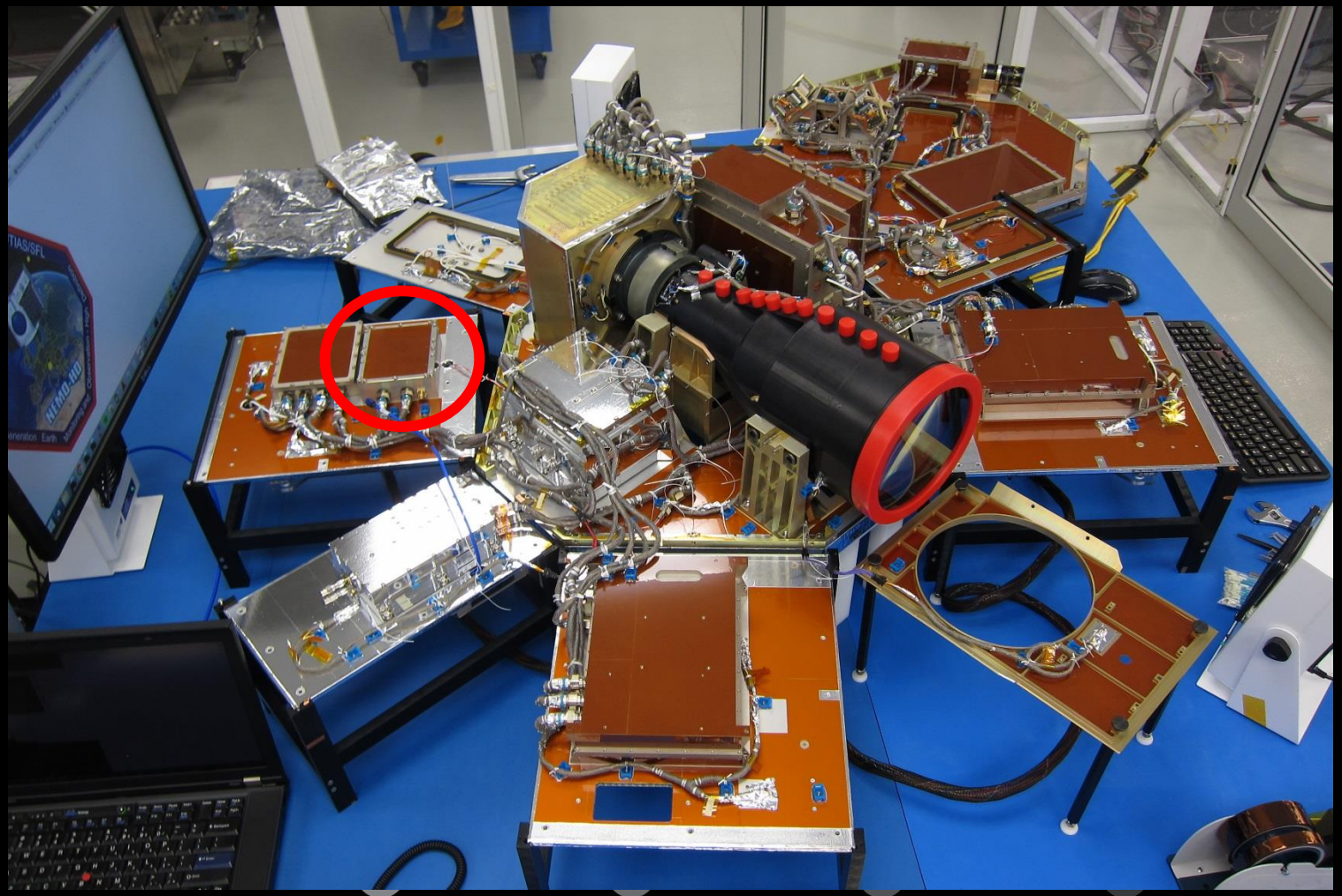
NEMO-HD satellite



Very agile: Slew rate > 1,5 deg/sec

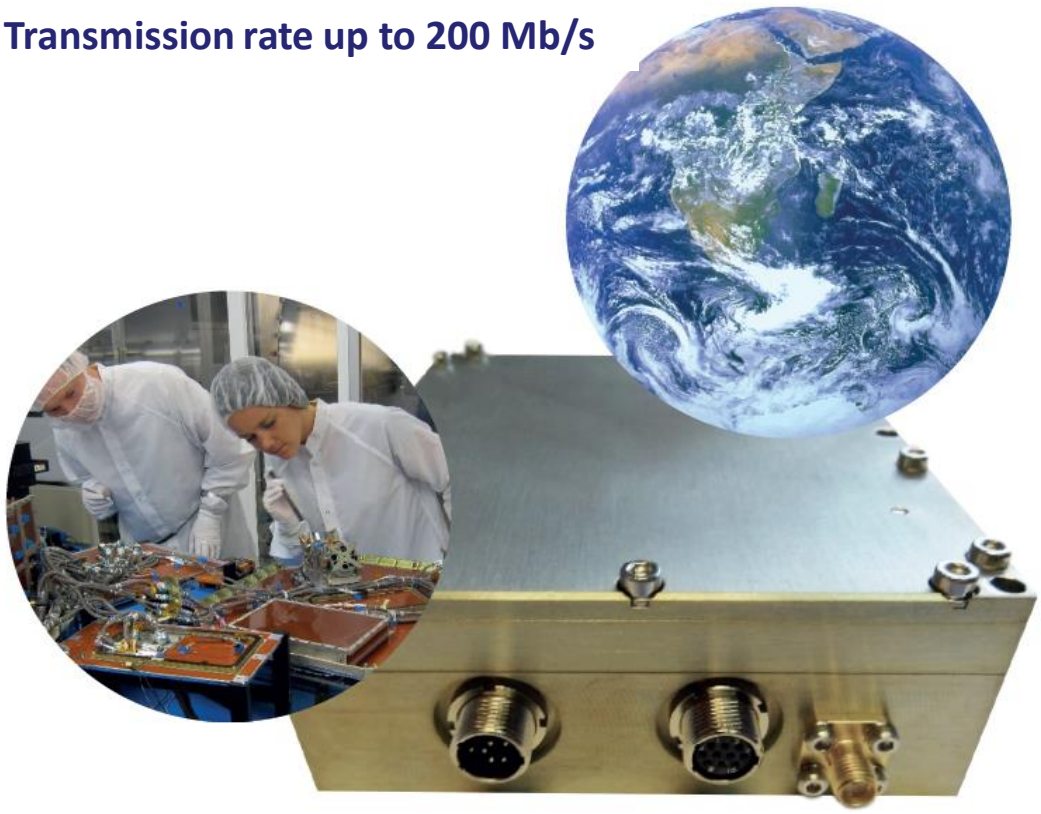
NEMO-HD > 90 deg/min
THESEUS > 10 deg/min

X-band transmitter



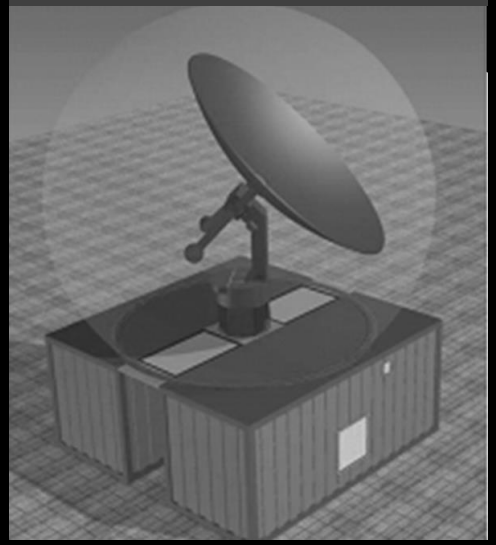
X-band transmitter

Transmission rate up to 200 Mb/s

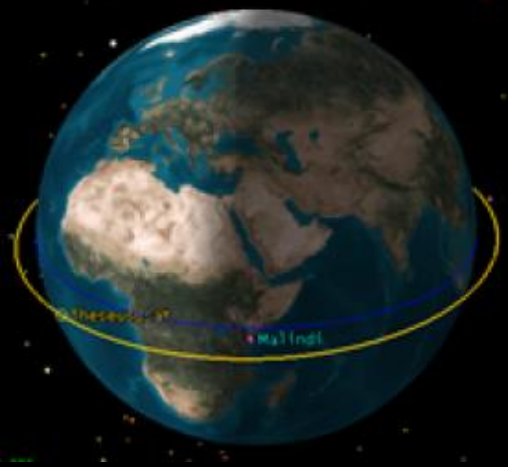


Power consumption:	typ. 10 W @Cubesat < 20 W @Microsat
Frequency:	8.0 – 8.4 GHz
Output RF power:	1-2 W @Cubesat 2-3 W @Microsat
Data rate:	up to 200 Mbit/s
Modulation type:	O-QPSK
RF carrier phase noise:	typ. -90 dBc/Hz
Harmonic rejection:	> 60 dBc
Frequency stability:	< 5 ppm
PA power efficiency:	> 30 %
Input VBUS voltage:	9-36 Vdc
Forward error correction:	CCSDS convolutional (option)
Data encoding:	Differential (option)
In-flight freq. adjustment:	Yes
Mass:	400 g @Cubesat 600 g @Microsat

Mobile S/X/Ka band Groundstation



X-band transmitter for small satellites



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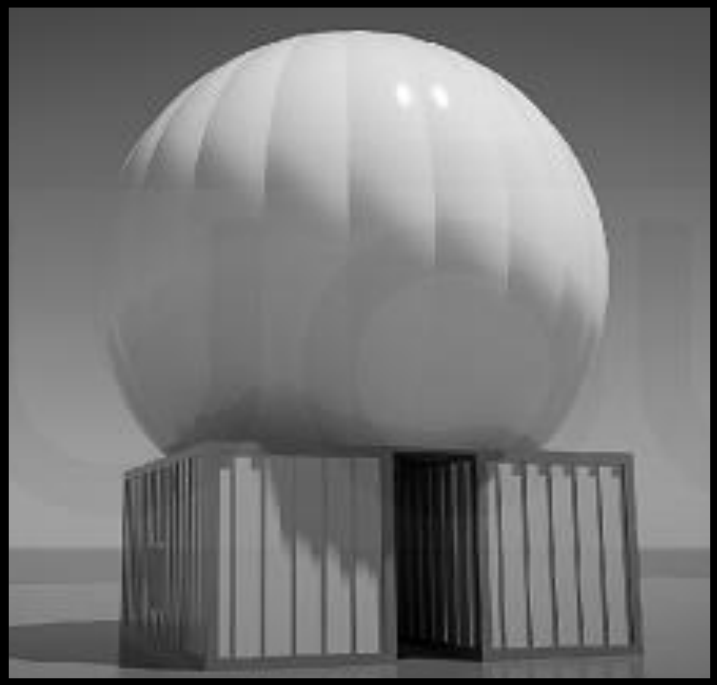
Mobile S/X/Ka band Groundstation



Mobile ground station

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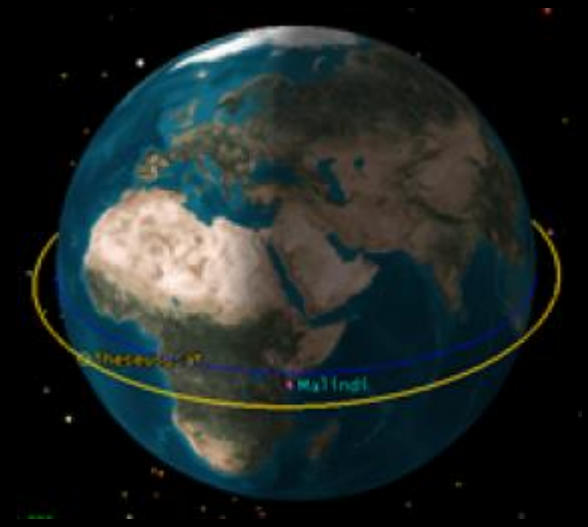
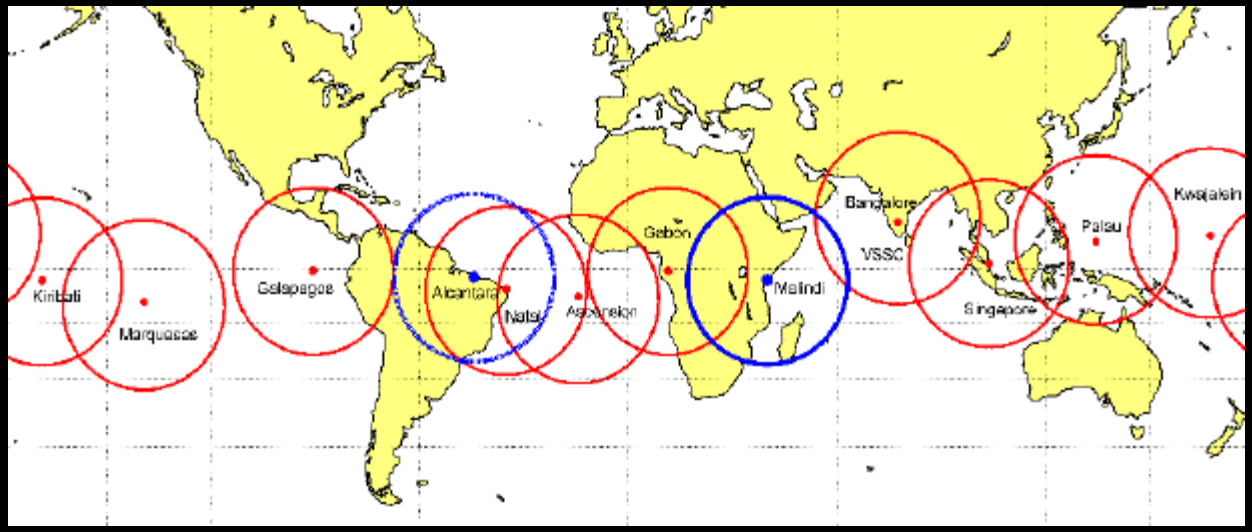
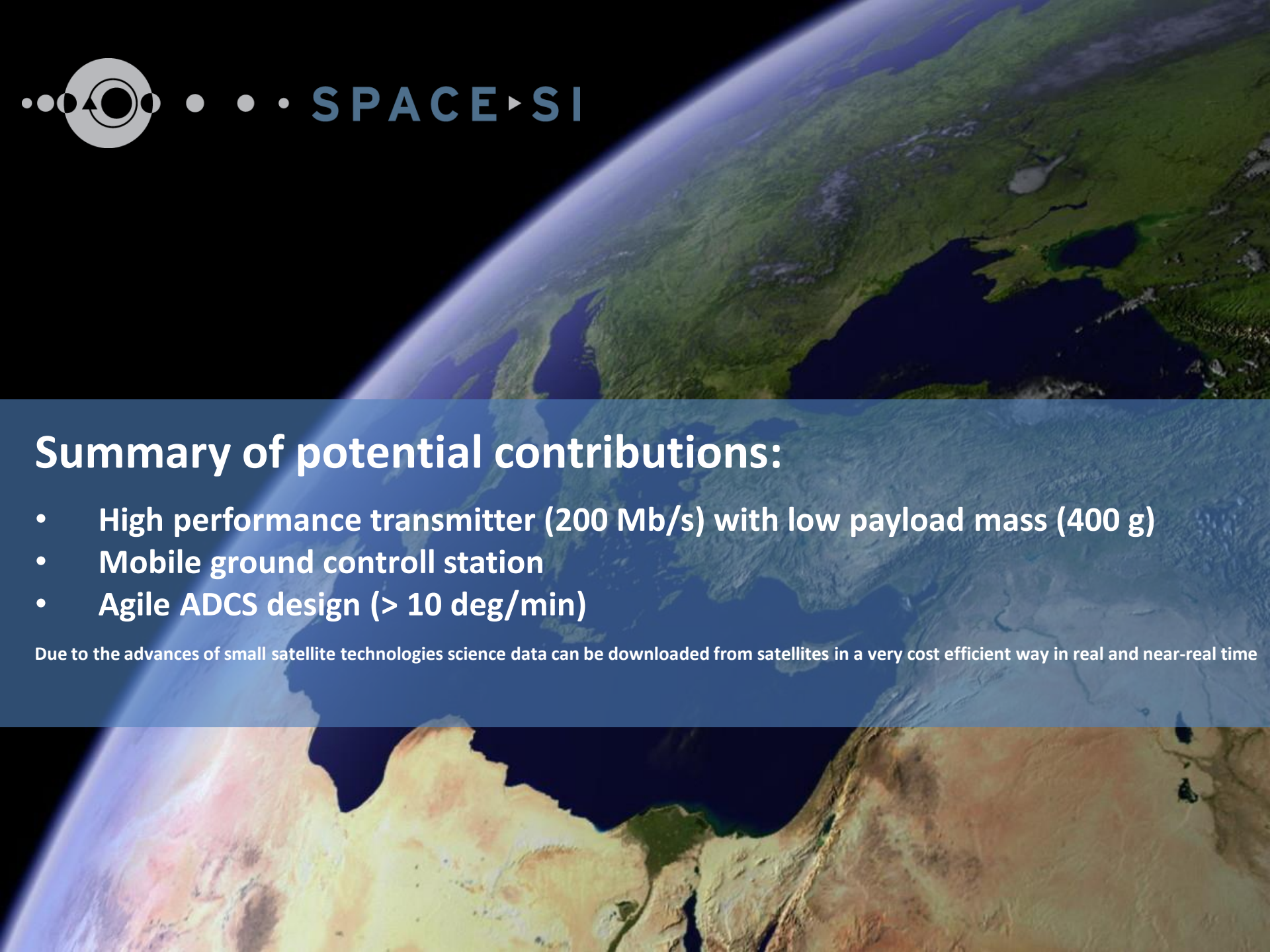
Mobile ground station

Theseus orbit



Theseus ground segment





Summary of potential contributions:

- High performance transmitter (200 Mb/s) with low payload mass (400 g)
- Mobile ground controll station
- Agile ADCS design (> 10 deg/min)

Due to the advances of small satellite technologies science data can be downloaded from satellites in a very cost efficient way in real and near-real time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