

USKA Sektion Bern

Vortrag HB9WDF, Michael Lipp

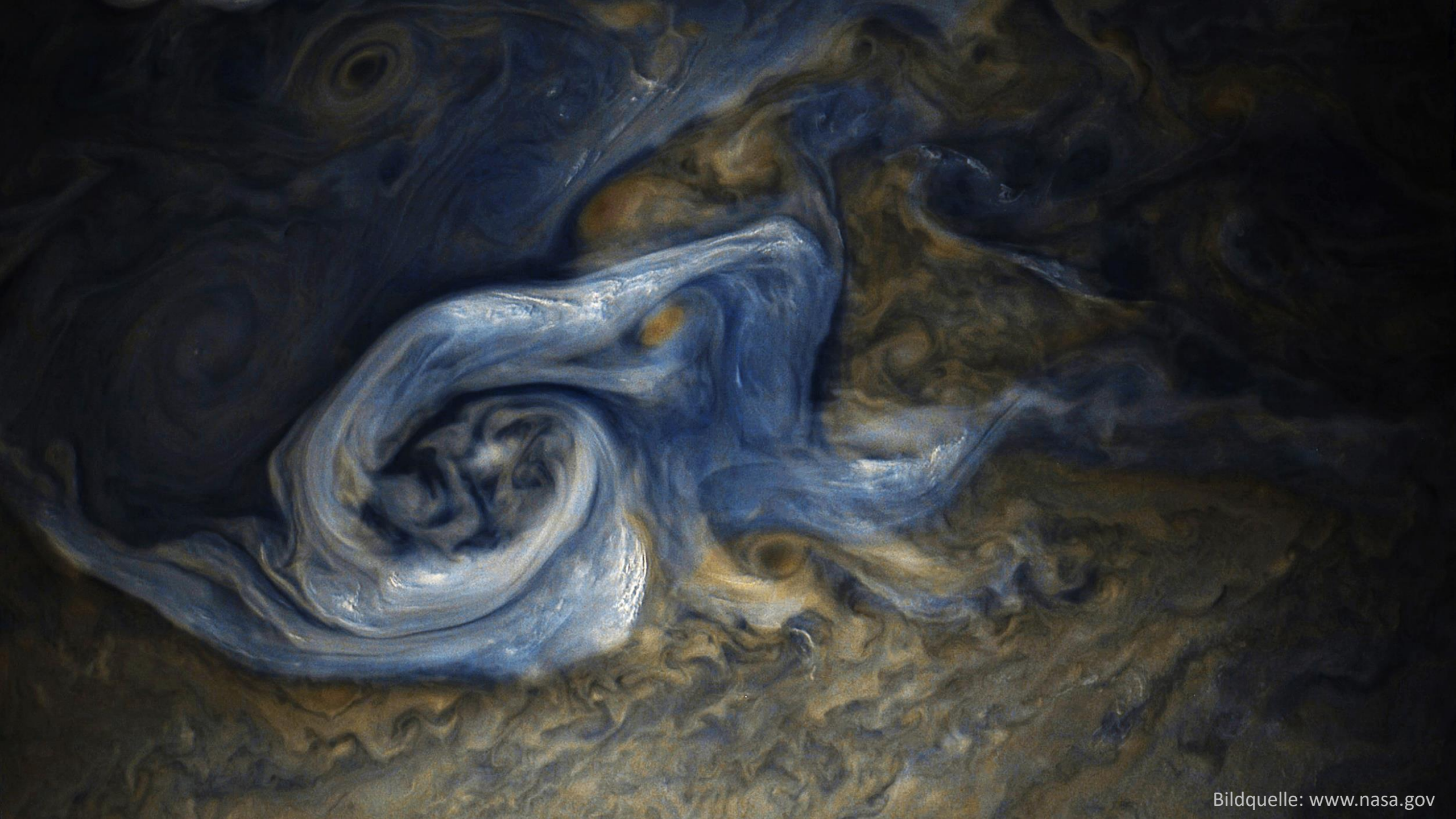
AMSAT 2.0

Die neue Satelliten- Generation

Swiss

AMSAT

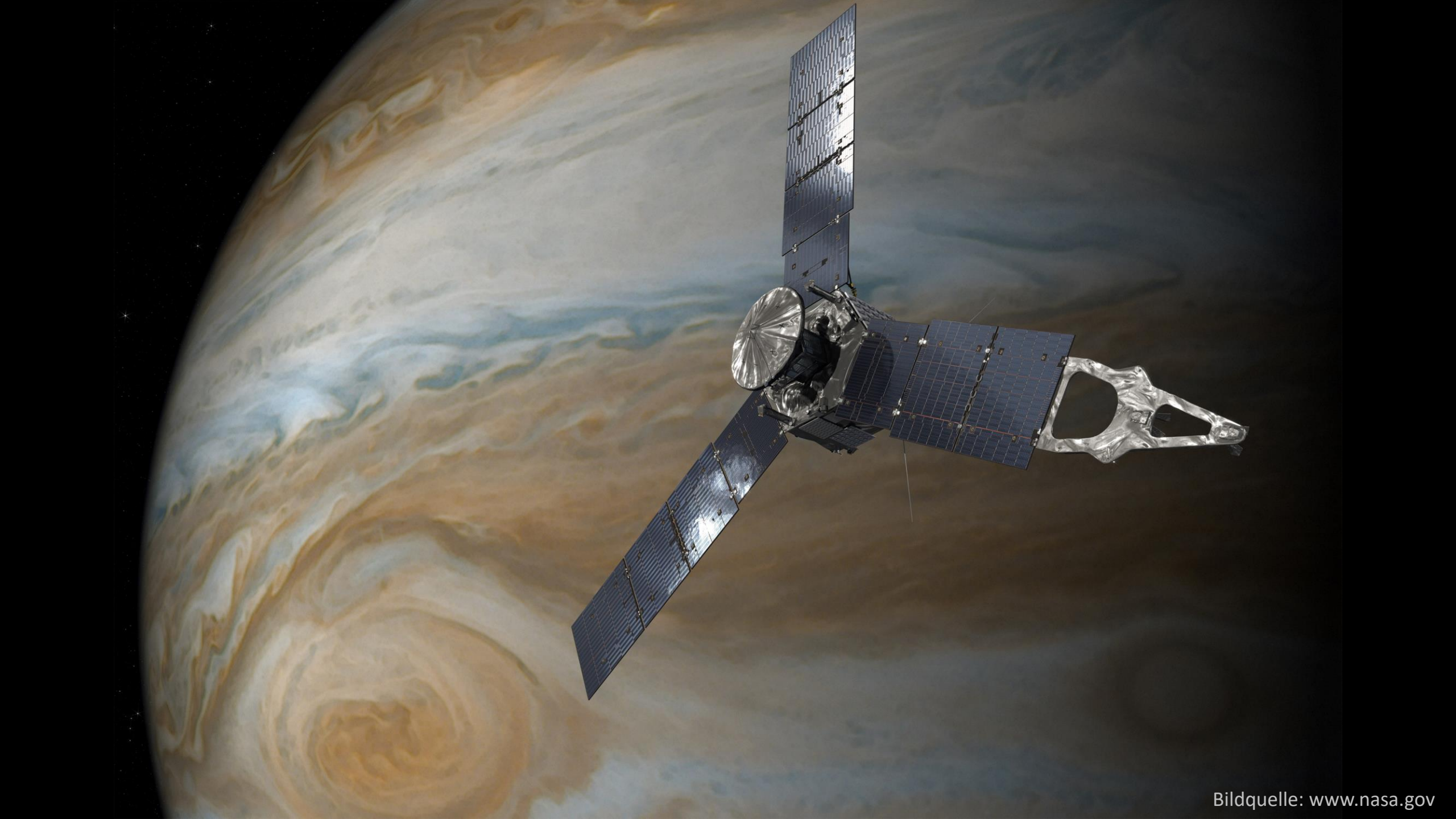


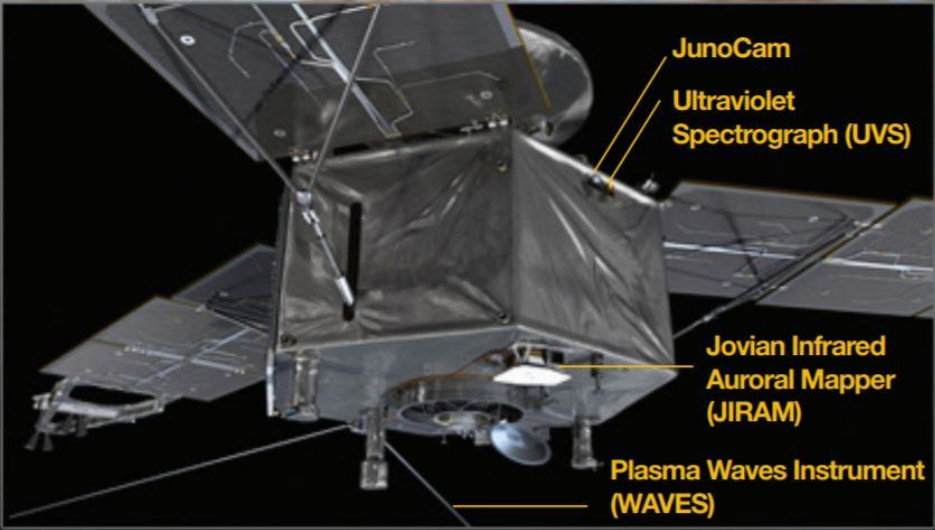












SPACECRAFT DIMENSIONS

Diameter: 66 feet (20 meters)
 Height: 15 feet (4.5 meters)



Juno's Science Instruments

Gravity Science and Magnetometers
 Study Jupiter's deep structure by mapping the planet's gravity field and magnetic field

Microwave Radiometer
 Probe Jupiter's deep atmosphere and measure how much water (and hence oxygen) is there

JEDI, JADE and Waves
 Sample electric fields, plasma waves and particles around Jupiter to determine how the magnetic field is connected to the atmosphere, and especially the auroras (northern and southern lights)

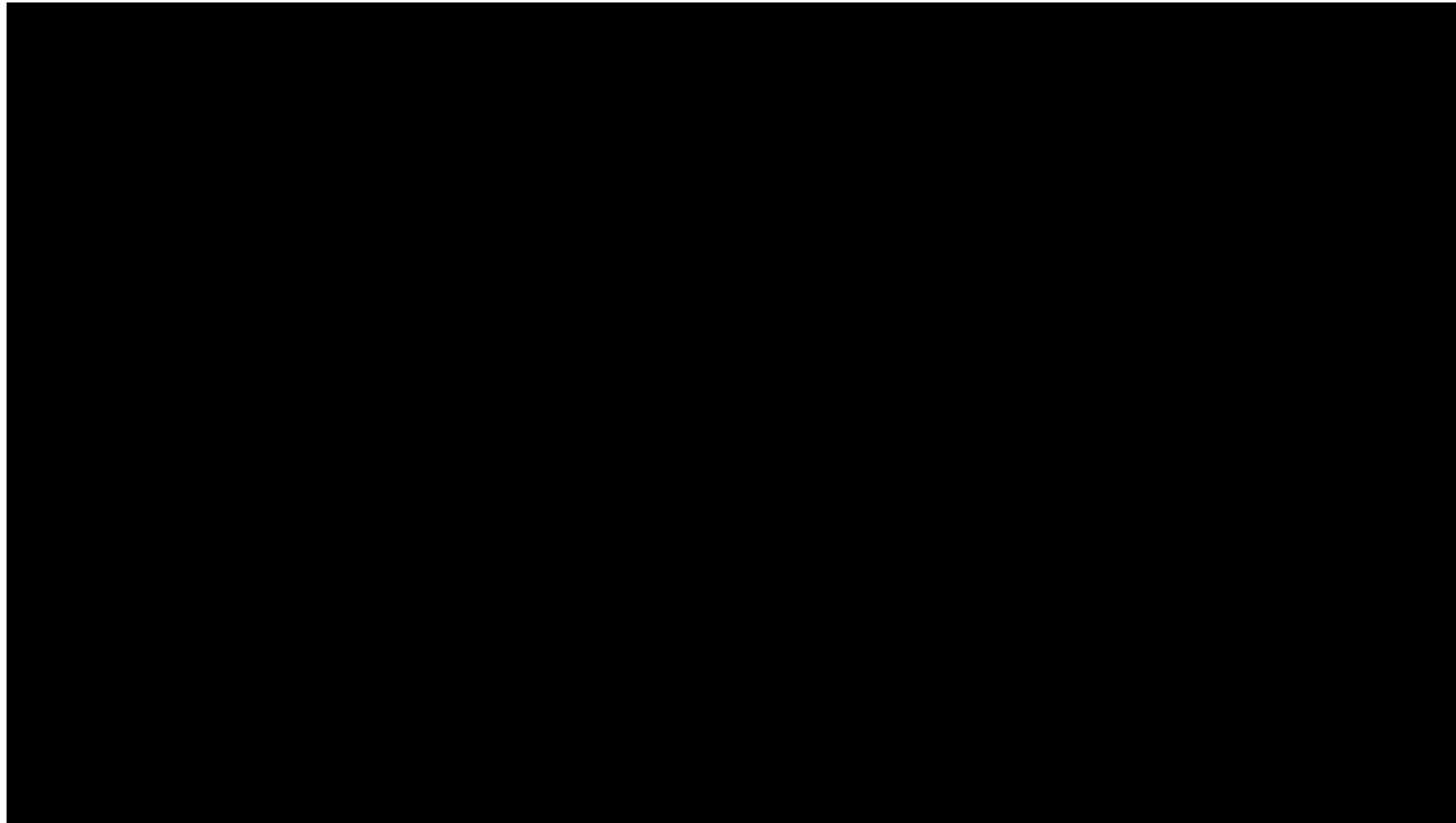
UVS and JIRAM
 Using ultraviolet and infrared cameras, take images of the atmosphere and auroras, including chemical fingerprints of the gases present

JunoCam
 Take spectacular close-up, color images

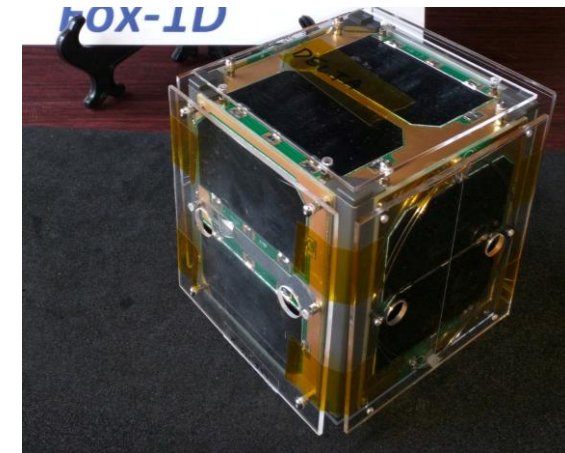
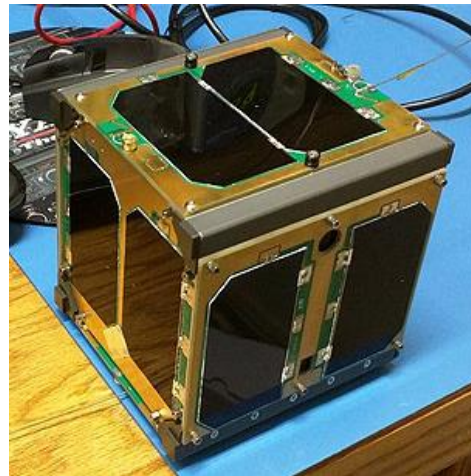
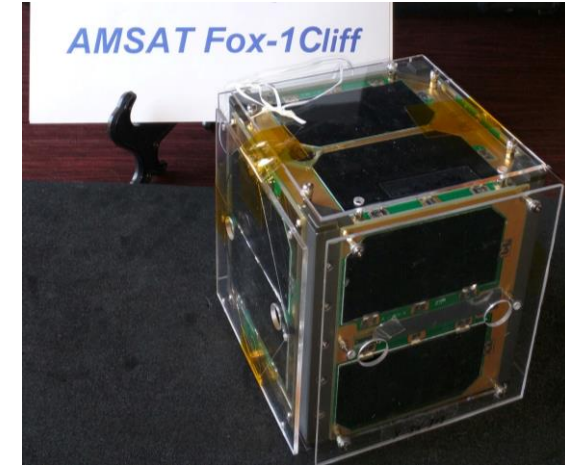
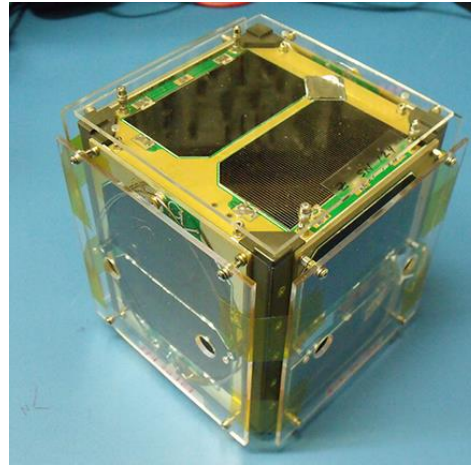
JUNO Wave Experiment Frequenzen

- High Frequency Receiver^[6]
 - High Frequency Receiver ~100 kHz - 40 MHz (Spectrum (High) and Waveform (Low))^[6]
 - High Frequency Waveform Receiver^[6]
 - Baseband receiver includes:^[6]
 - [variable-gain amplifier](#)^[6]
 - 100 Hz to 3 MHz [band-pass filter](#)^[6]
 - 12-bit [analog-to-digital converter](#)^[6]
 - Double [sideband](#) heterodyne receiver for 3 to 40 MHz (swept frequency receiver)^[6]
- Low Frequency Receiver^[6]
 - High, Low Frequency Receiver ~10 kHz - 150 kHz (E waveform)^[6]
 - Low, Low Frequency Receiver ~50 Hz - 20 kHz (E and B waveform)

JUNO Flybe Kalibirierung Wave Experimet



Das AMSAT-NA Fox Projekt



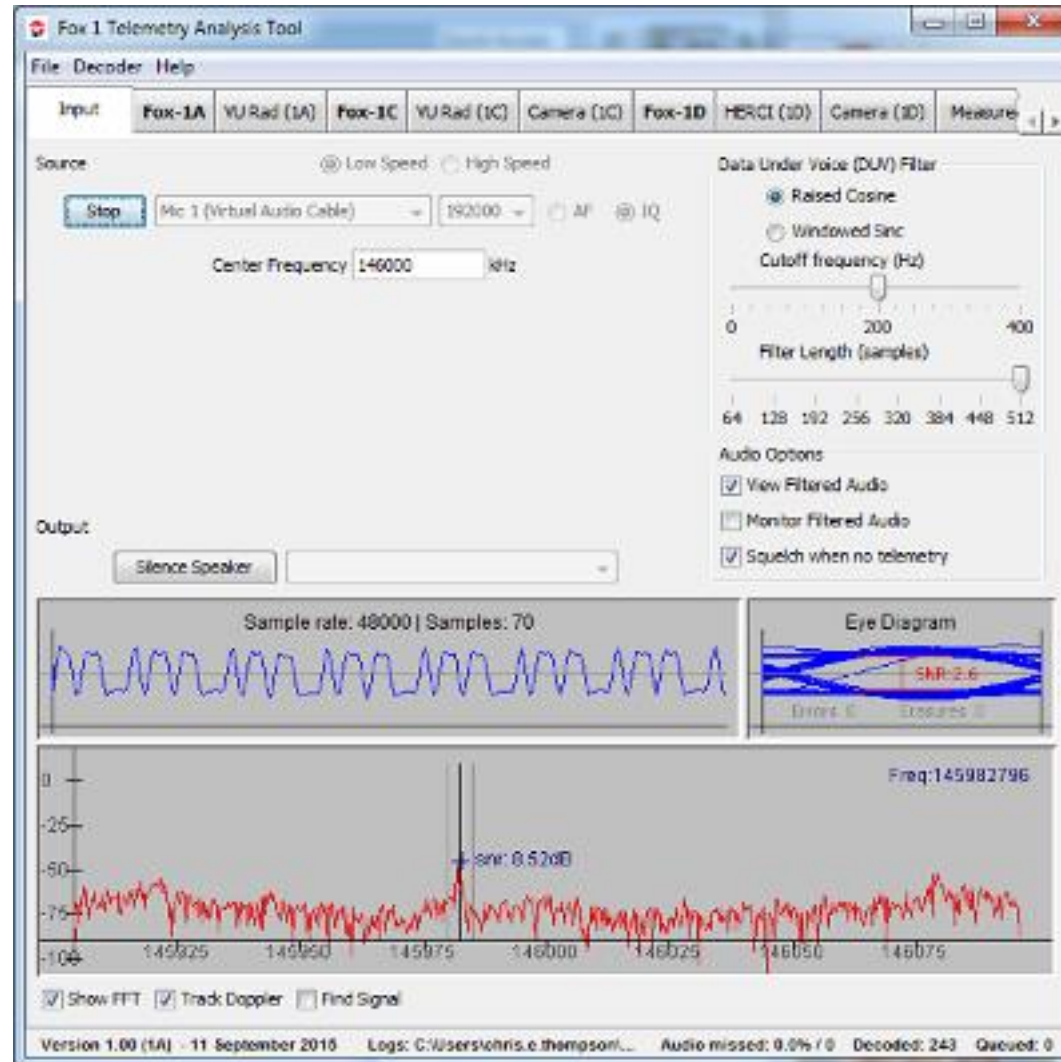
FOX-Projekt

Grund-Spezifikationen



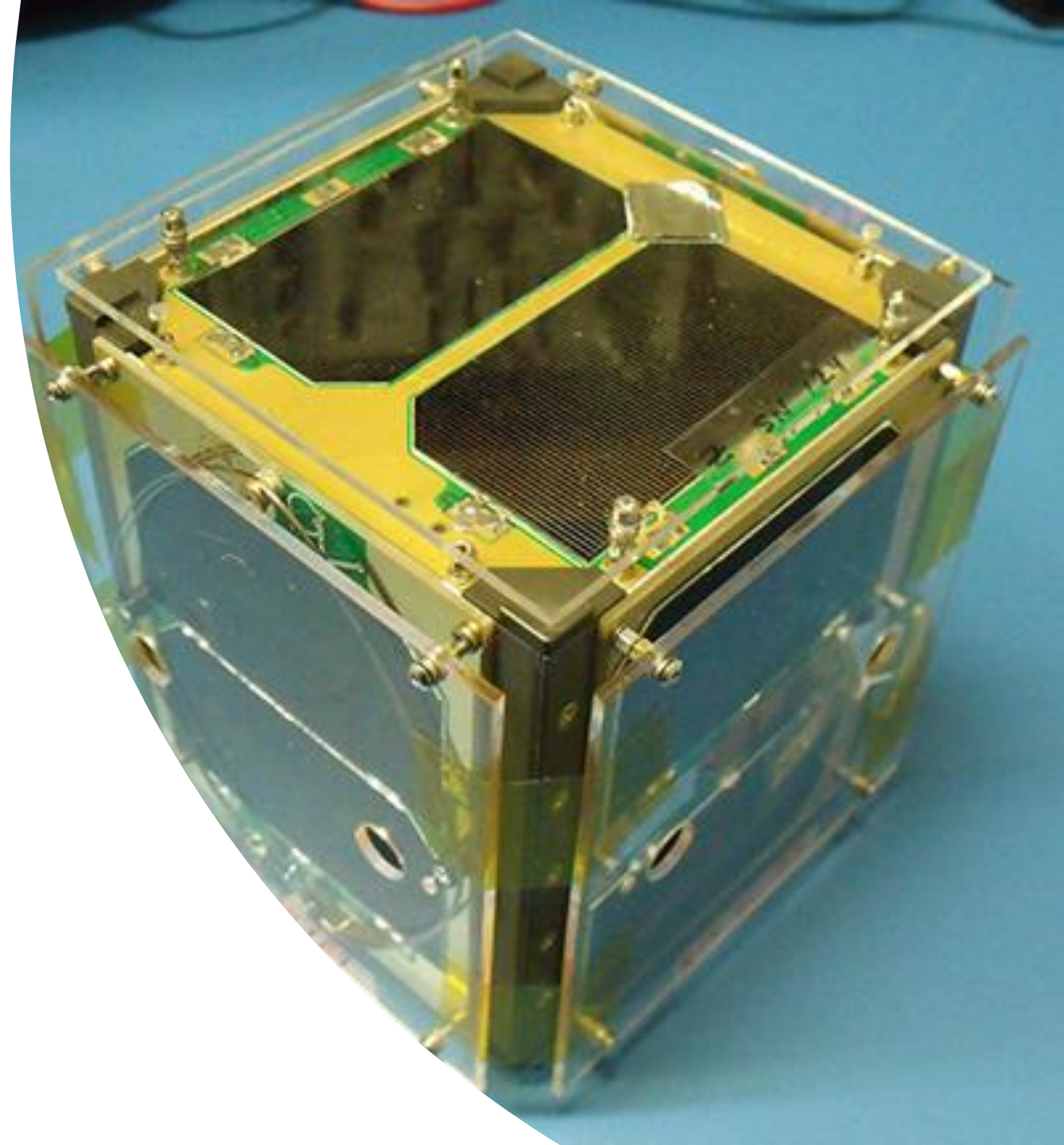
- Space Frame Structure: Standard 1U (One Unit) CubeSat.
- Space Frame Size: 10 cm X 10 cm X 10 cm.
- Mass: Approximately 1.33 kg
- Orbit: Nominal 600- 800 km, circular, depending on launcher.
- RF: [Fox-1A,B,C,D]: 500 mW EIRP, U/V (Mode B). Deployable antennas. FM only.
- [Fox-1E (RadFXSat2)]: V/U (Mode J), 30kHz linear transponder.
- Fox-1 Electronics: Simple IHU.
- Power source: Fixed Solar Arrays.
- Batteries: NiCad

Fox Projekt Telemetrie-Software



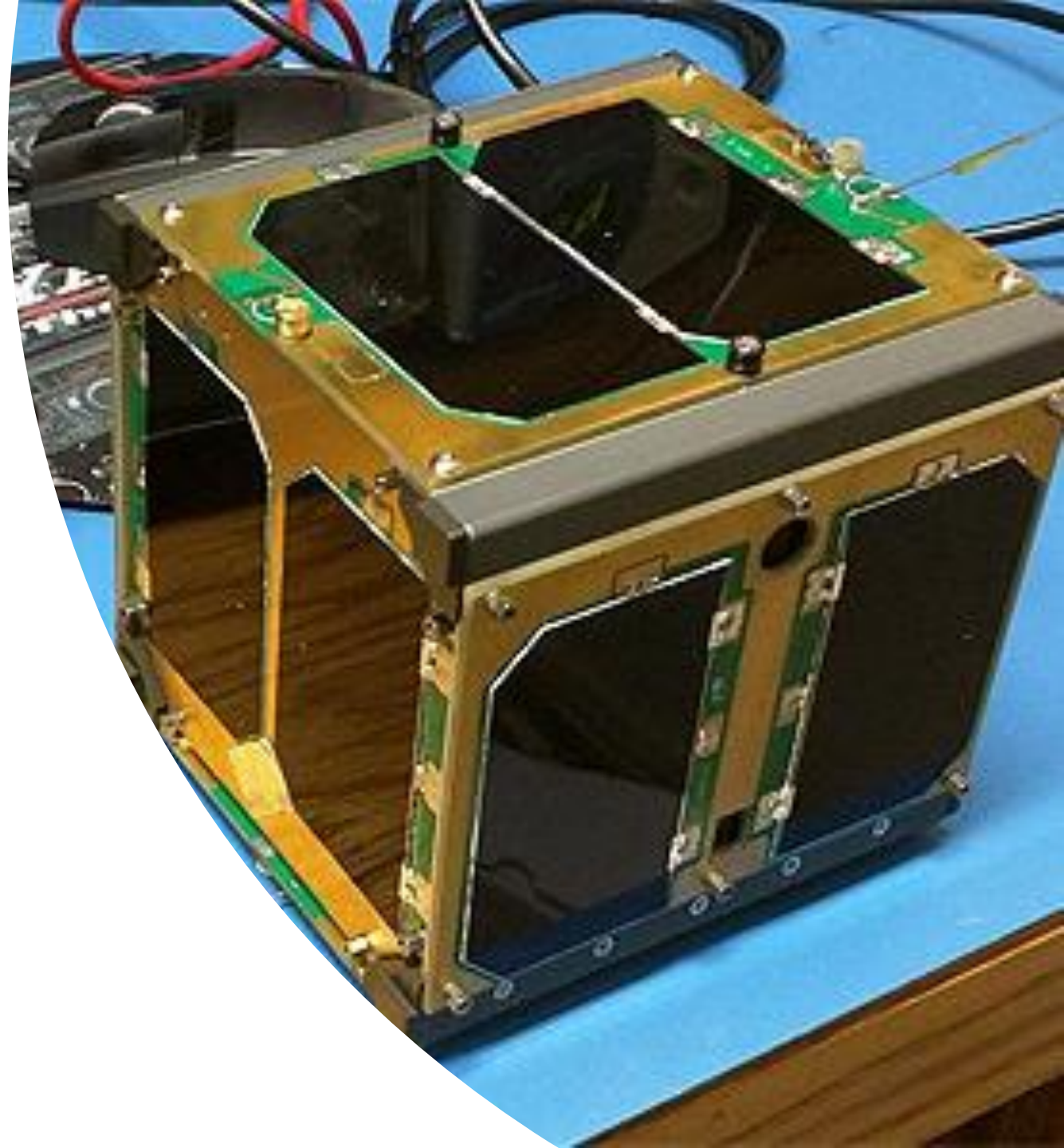
FOX 1A – AO-85

- Startdatum: 08.10.2015
- Orbit: 518x810km
- Inklination: 64,8 Grad
- Umlaufzeit 97,6 Minuten
- Transponder U/V 800mW
- Uplink: 435.172 (67.0 Hz Subaudio)
- Downlink: 145.980



FOX 1B RadFxSAT AO-91

- Stardatum: 23.11.2017
- Orbit: 460 x 826km
- Inklination: 97,7 Grad
- Umlaufzeit 97,4 Minuten
- Transponder U/V 800mW
- Uplink: 435.250 (67.0 Hz Subaudio)
- Downlink: 145.960



Fox 1Cliff

Noch nicht im Orbit

- Startdatum: tbd
- Orbit: tbd
- Inklination: tbd
- Umlaufzeit tbd
- Transponder U/V und L/V 800mW
- Uplink: 70cm und 23cm
- Downlink: 2m

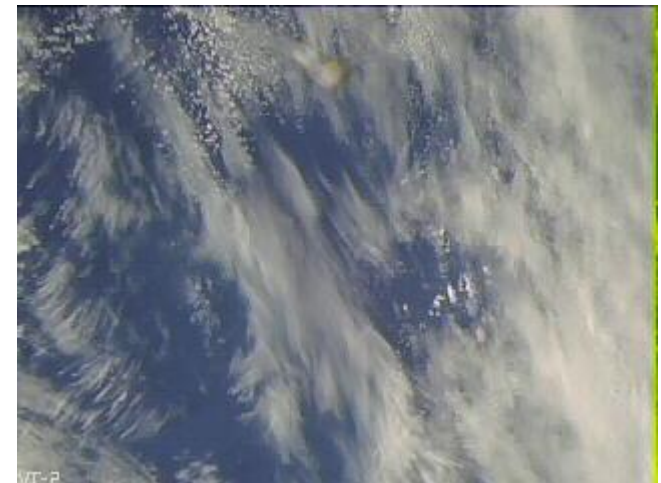


FOX 1D AO-92

- Startdatum: 12.01.2018
- Orbit: 500 x 511 km
- Inklination: 97,6 Grad
- Umlaufzeit 94,6 Minuten
- Transponder U/V und L/V 400-800mW
- Uplink: 435.350 (67.0 Hz Subaudio)
1267.350 (67.0 Hz Subaudio)
- Downlink: 145.880



FOX 1D / AO-92 Kamera Virginia Tech



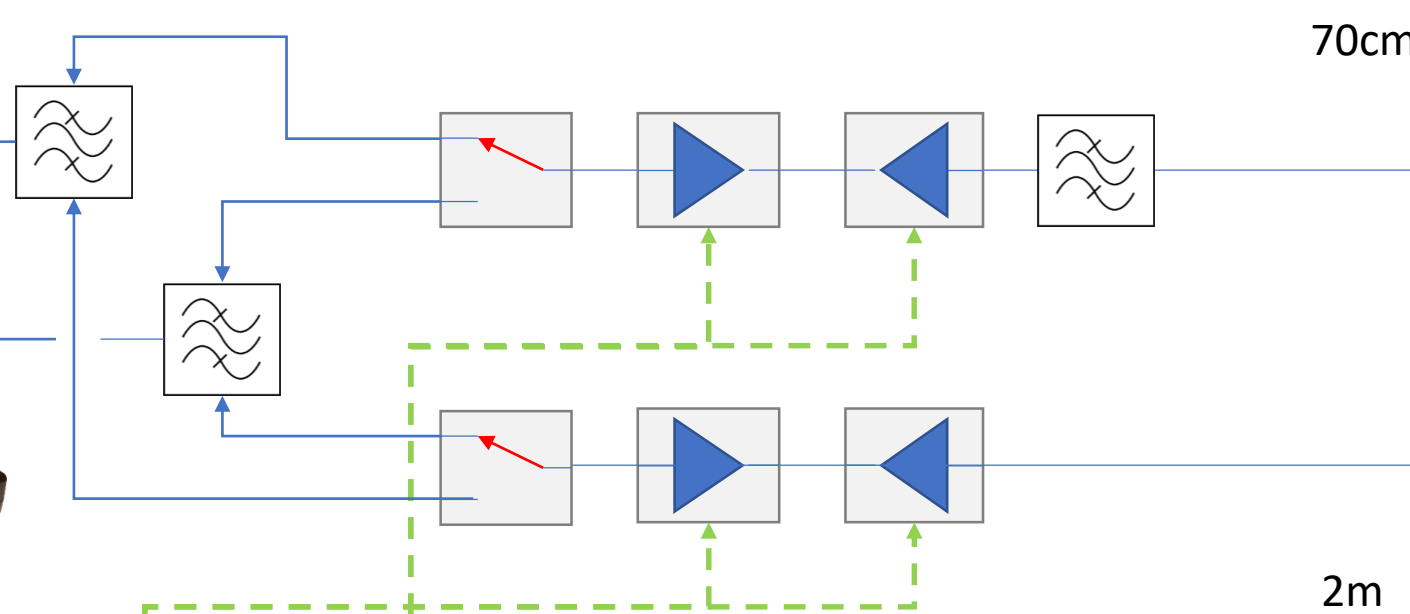
QSO über FOX-Satelliten Equipment



Es ist kinderleicht...



Stationskonzept Voll-Duplex



PTT



Fox 1E RadFXSat-2

- Startdatum: tbd
- Orbit: tbd
- Inklination: tbd
- Umlaufzeit tbd
- Transponder: Linear V/U 30kHz
- Uplink: 70cm und 23cm
- Downlink: 2m



Paul Stoetzer

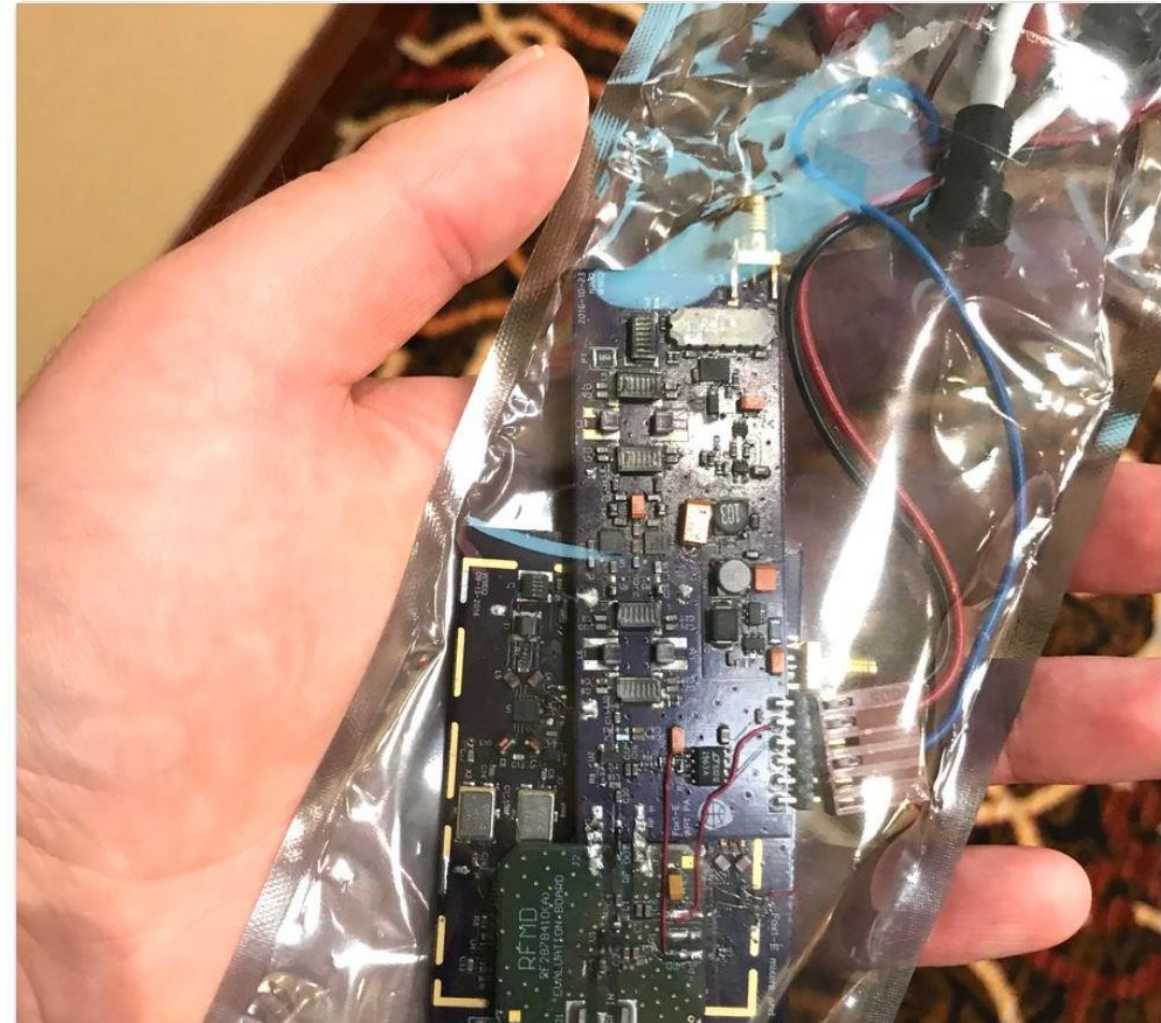
@PRStoetzer

Folge ich



Holding the [@AMSAT](#) Fox-1E prototype linear transponder board at the AMSAT Board of Directors meeting.

Original (Englisch) übersetzen



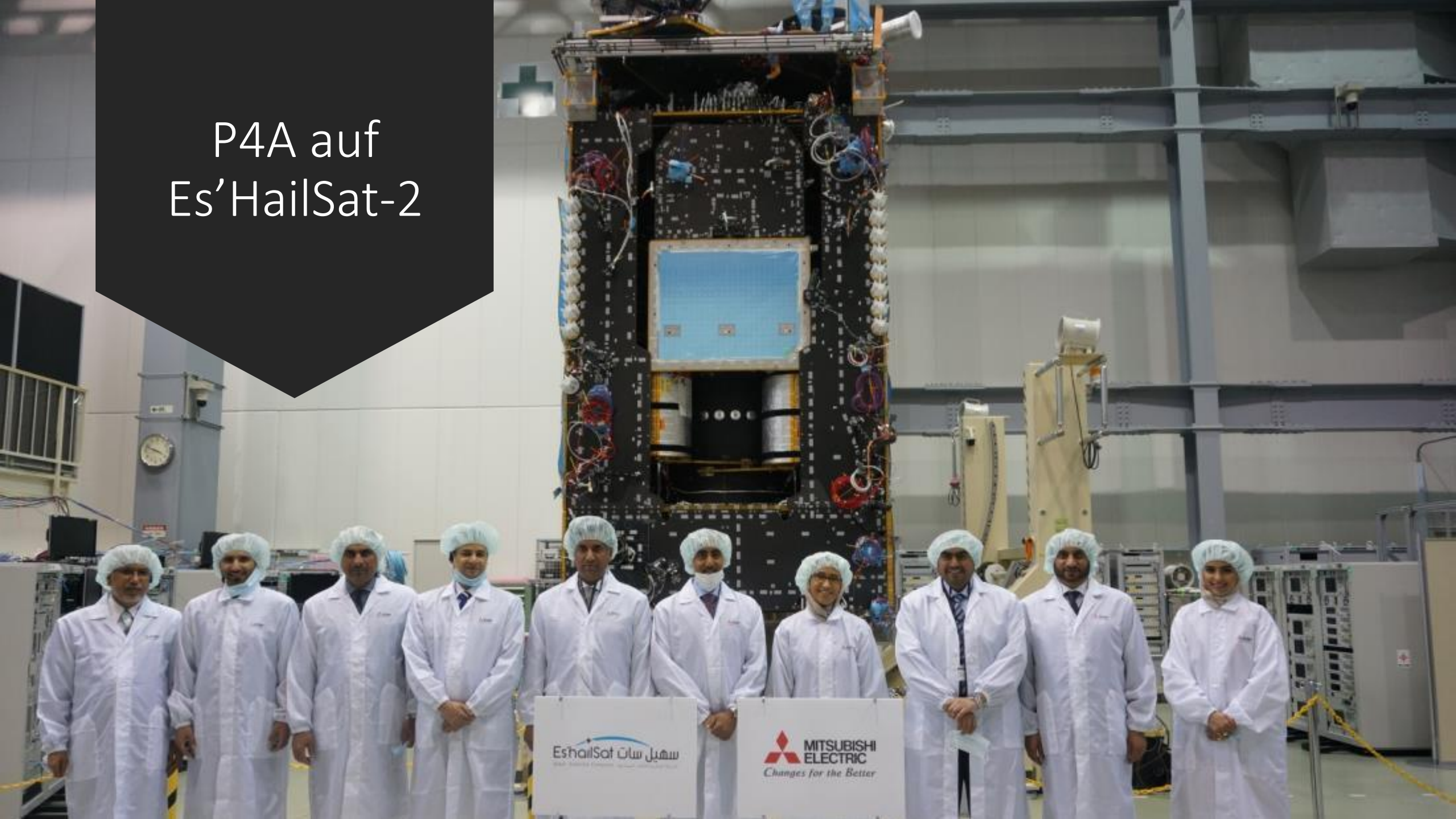
FOX 2 GOLF TEE

- GOLF steht für Greater Orbit Larger Foodprint
- TEE steht für Technology Evaluation Environment und ist das erste Projekt der Golf Serie

- Projektstart: November 2017
- Start Orbit: 4. Quartal 2019
- Frame: 3U



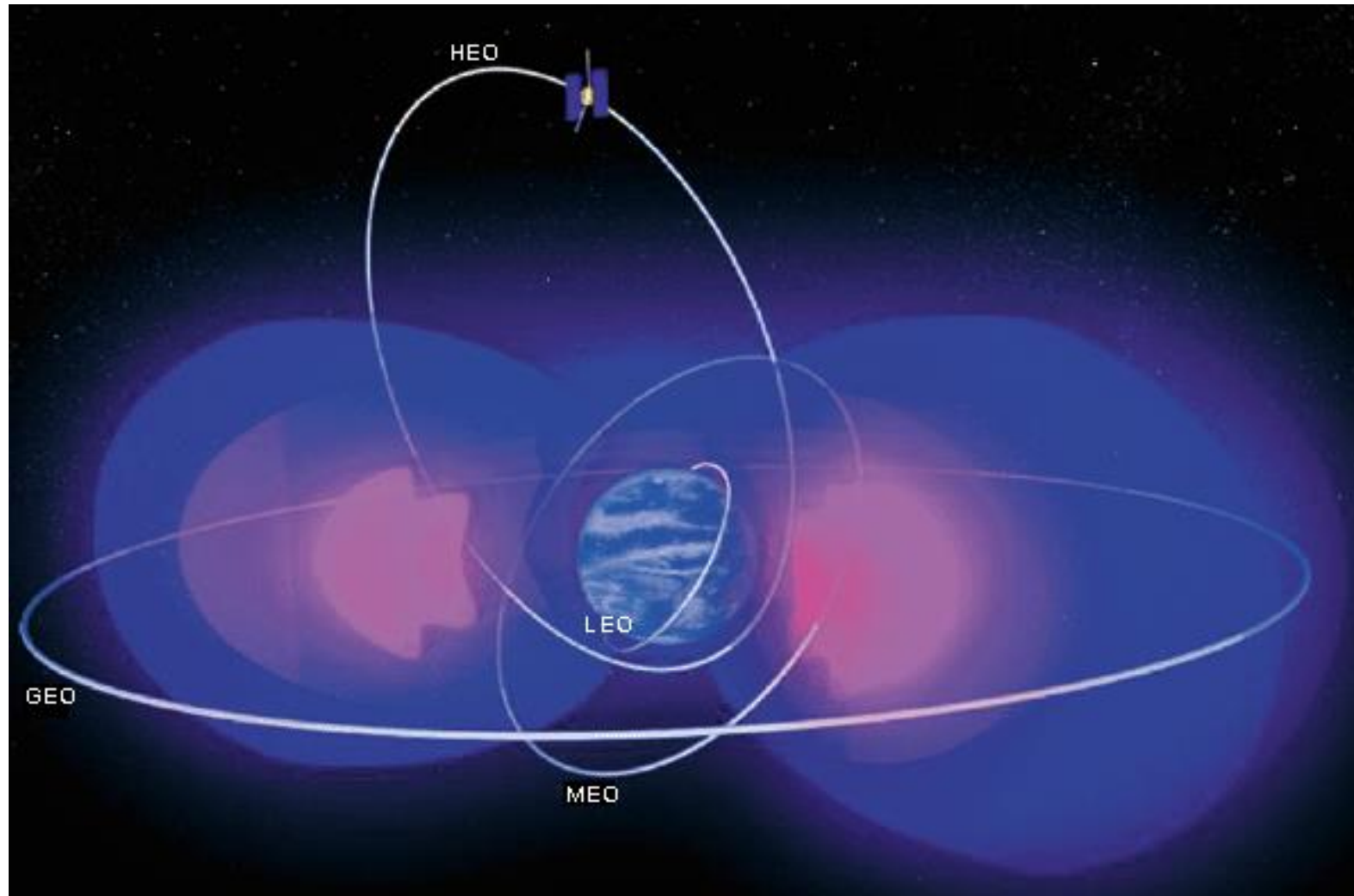
P4A auf Es'HailSat-2



Es'hailSat سات شهيل

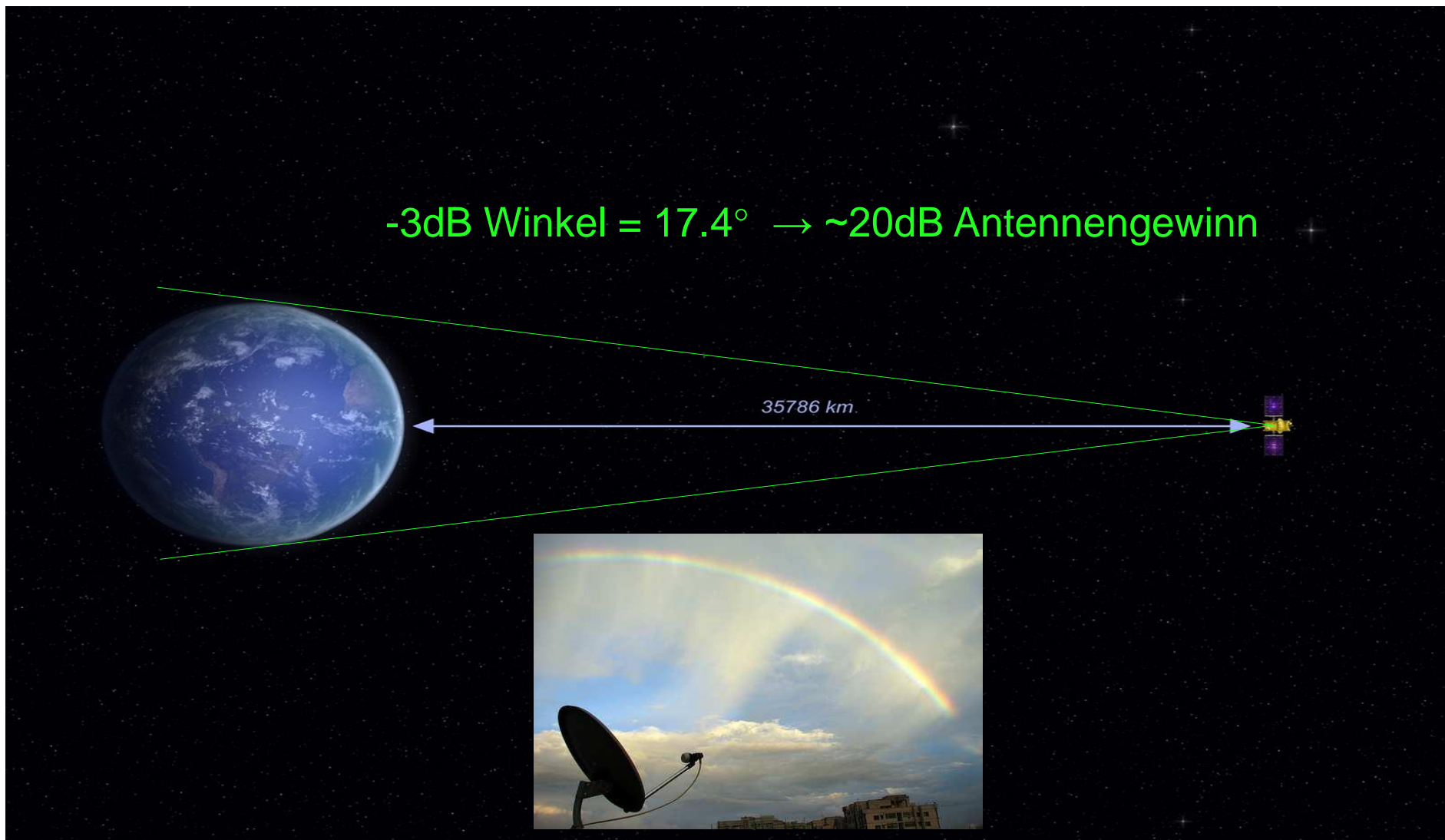
 MITSUBISHI
ELECTRIC
Changes for the Better

P4A auf Es'HailSat-2



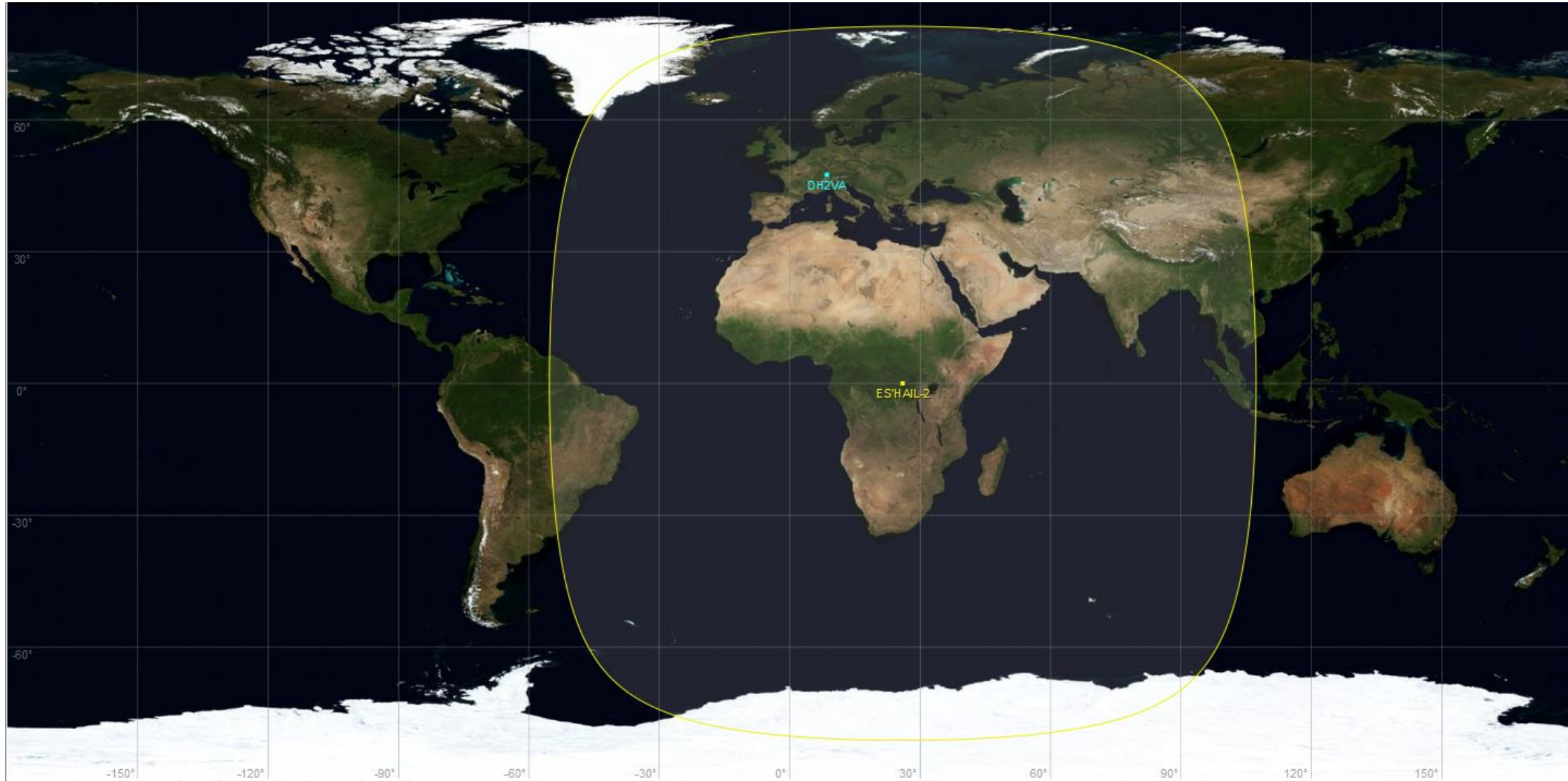
P4A auf Es'HailSat-2

-3dB Winkel = 17.4° → ~20dB Antennengewinn



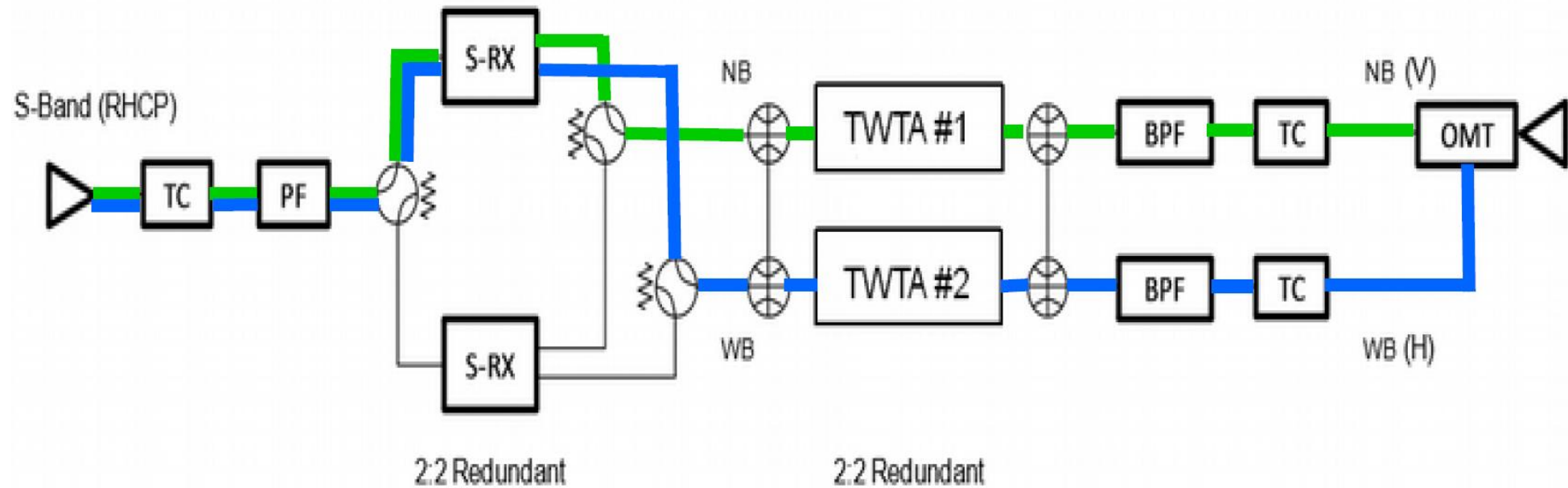
P4A auf Es'HailSat-2

Sichtbarkeit

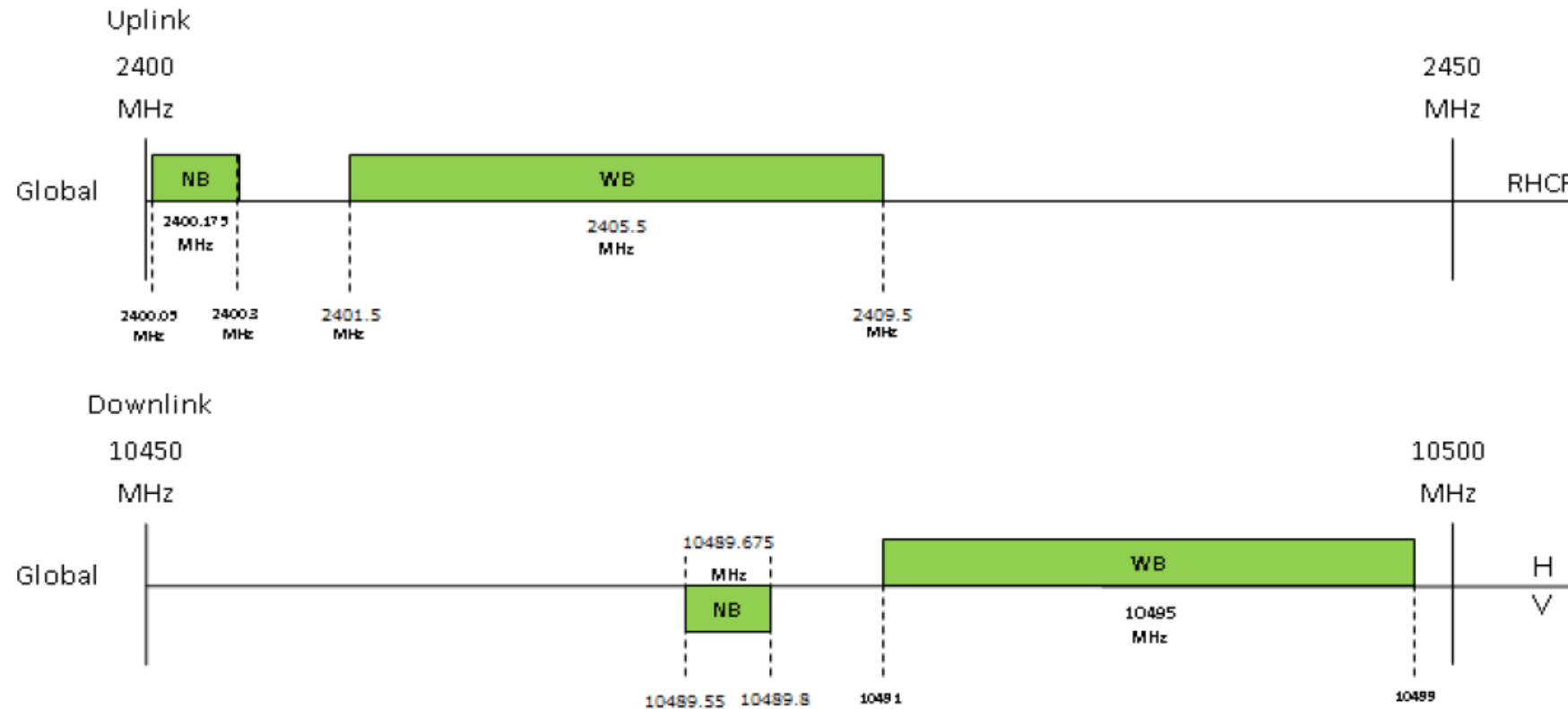


P4A auf Es'HailSat-2

Blockschaltbild Transponder



P4A auf Es'HailSat-2 Transponderplan



Xpdr	U/L FREQUENCY (MHz)				D/L FREQUENCY (MHz)				LO (MHz)	BW (MHz)
	No	Pol	Begin	Center	End	Pol	Begin	Center		
NB	RHCP	2400.05	2400.175	2400.3	V	10489.55	10489.675	10489.8	8089.5	0.25
WB	RHCP	2401.5	2405.5	2409.5	H	10491	10495	10499	8089.5	8

P4A auf Es'HailSat-2

Anforderungen Bodensegment



Setup for **SSB** communications:

RX Antenna	60-90 cm SAT-TV dish
Receiver	LNB with power injector and DVB-T dongle + SDR software (for example SDR#) OR 3 cm LNA with downconverter to 70cm
Transmitter	10W PEP in 60-90 cm dish plus upconverter from 144 MHz

Setup for **DATV** (DVB-S2) communications:

RX Antenna	60-90 cm SAT-TV dish
Receiver	modified LNB with standard satellite receiver box (DVB-S2) OR modified LNB with PCI DVB-S2 cards for PC use
Transmitter	100W PEP in 2.4m dish plus DVB-S2 modulator

P4A auf Es'HailSat-2 Module von Kuhne DB6NT



OSCAR Phase 4 Down-Converter

- X Low Noise down converter with feed horn
- X 10.4 GHz -> 432 MHz
- X No frequency drift due to TCXO
- X mountable with standard LNB peg

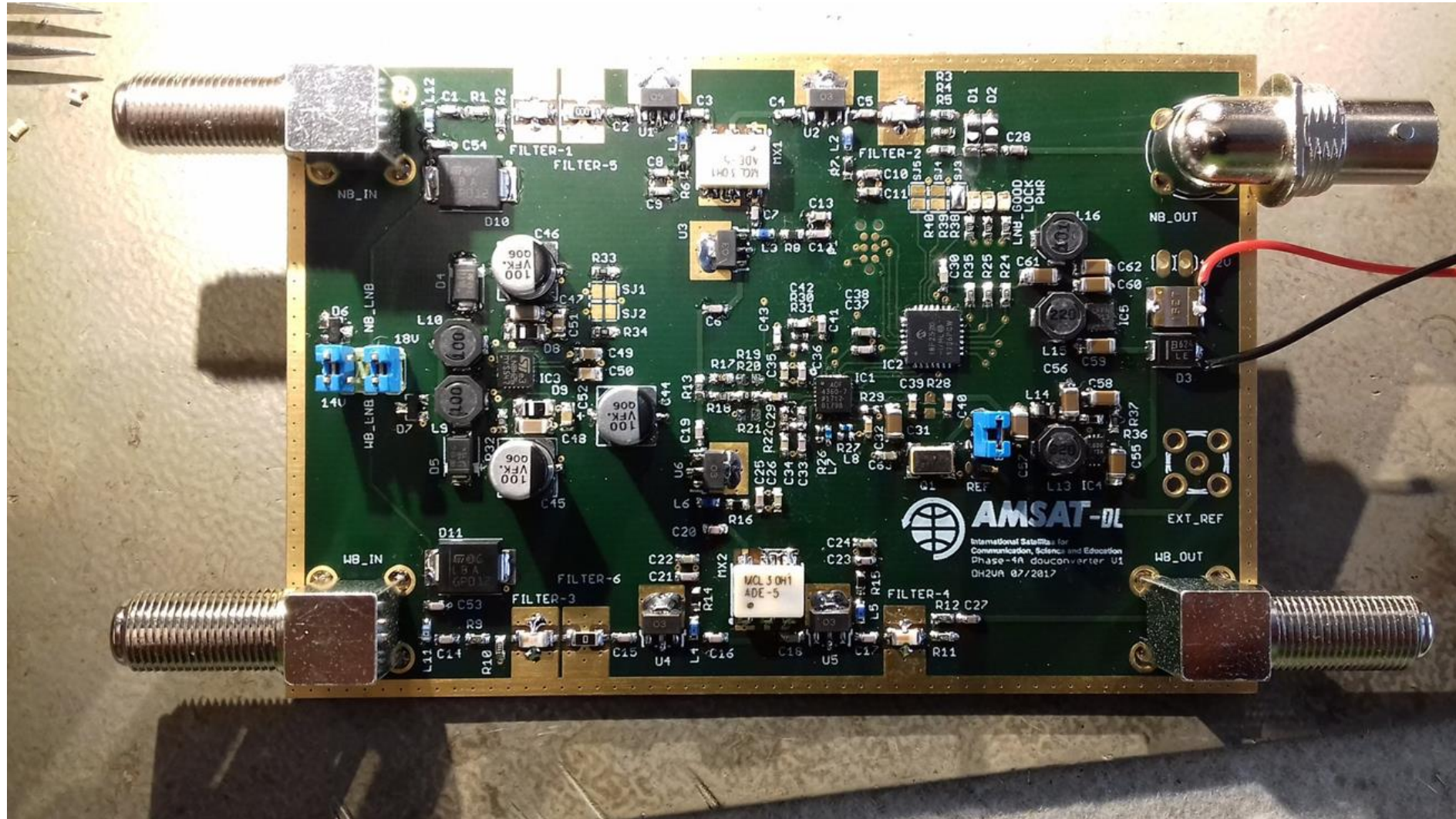


OSCAR Phase 4 UP-Converter

- X 144 MHz -> 2.4 GHz
- X 20 W output power
- X stand-alone device
- X fully remotely controllable
- X numerous protection circuits

P4A auf Es'HailSat-2

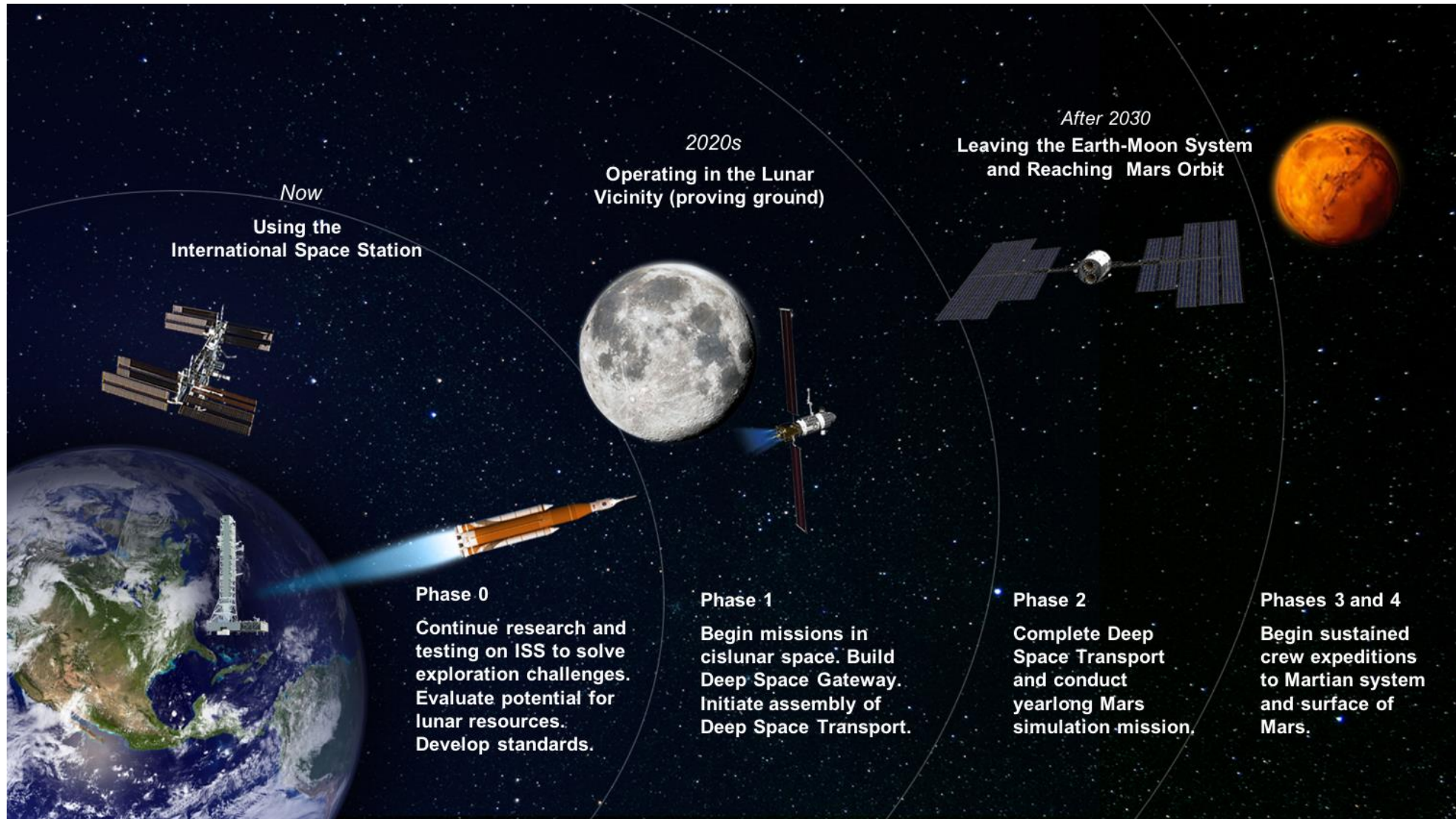
Der AMSAT-DL Konverter



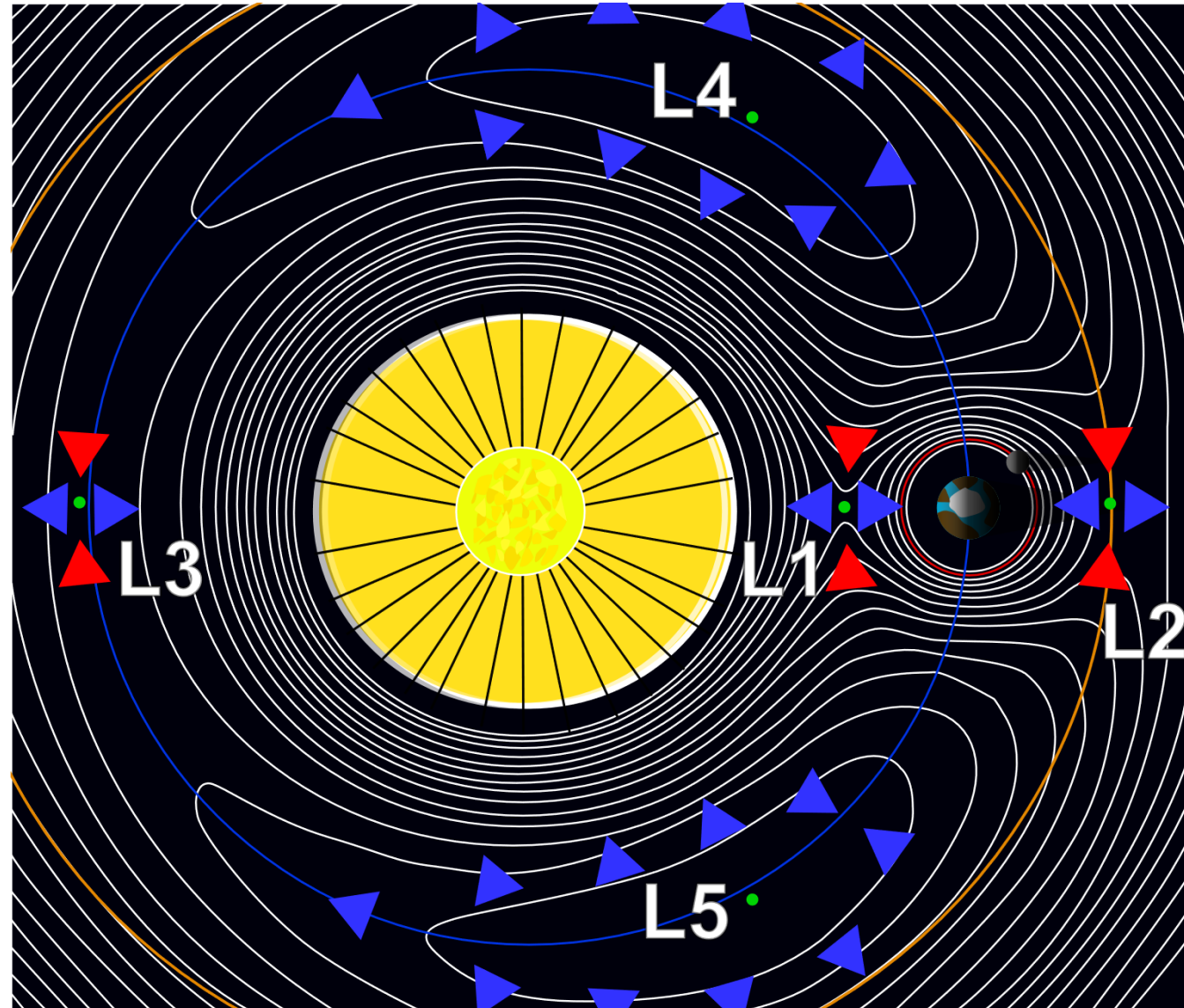
P4A auf
Es'HailSat-2
Startdatum –
tbd - 2018



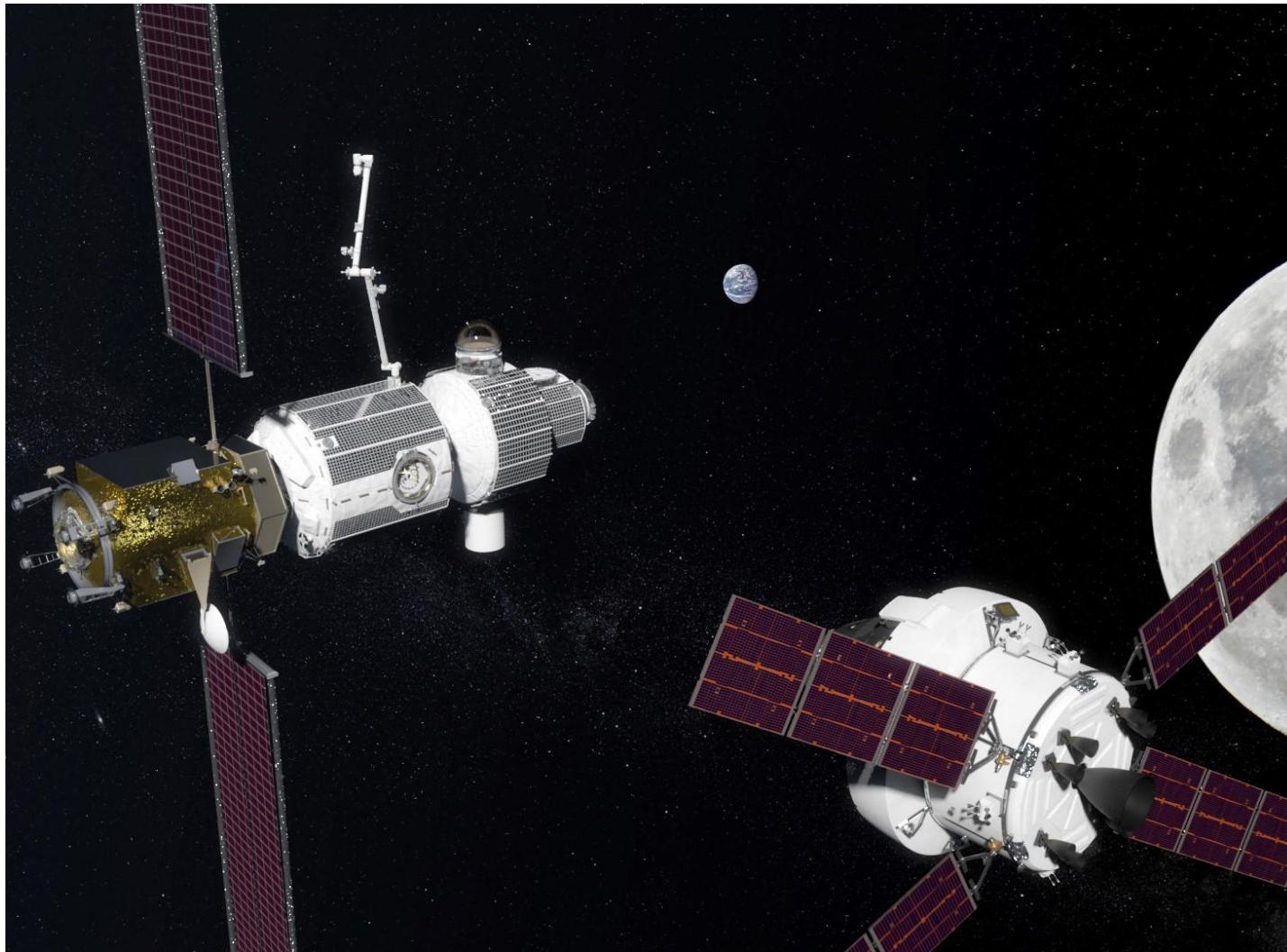
NASA Deep Space Gateway



NASA Deep Space Gateway



NASA Deep Space Gateway Projekt von AMSAT-NA/UK/DL und ARISS





Welcome on board
