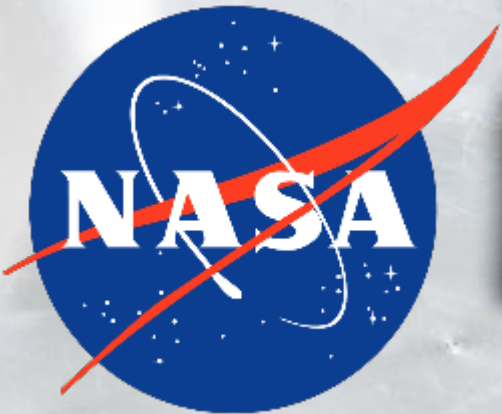


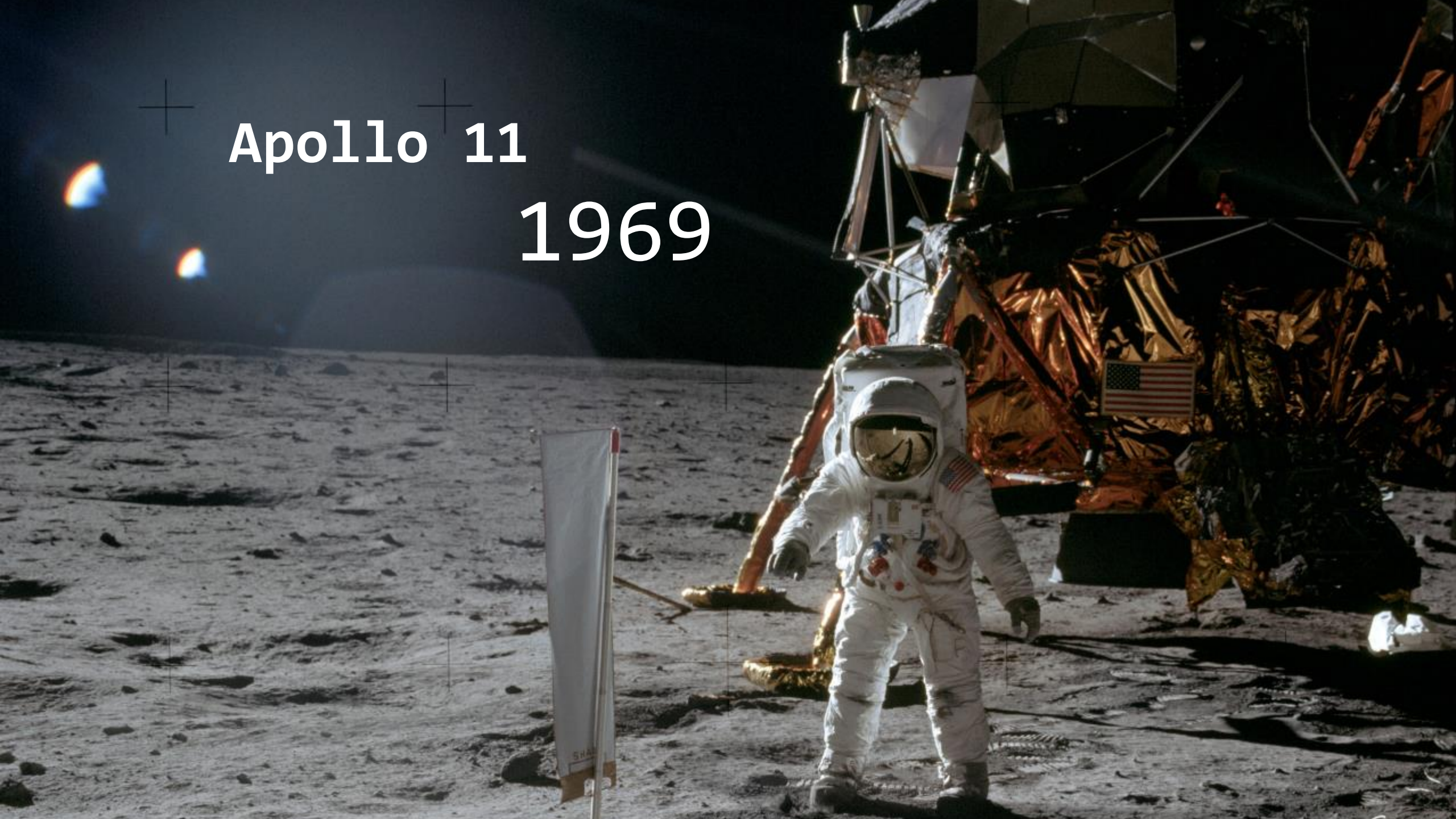
# A History of Commercial Standards and Wireless Networks in Human Spaceflight

Chatwin Lansdowne NASA-JSC



Apollo 11

1969



Apollo  
1975

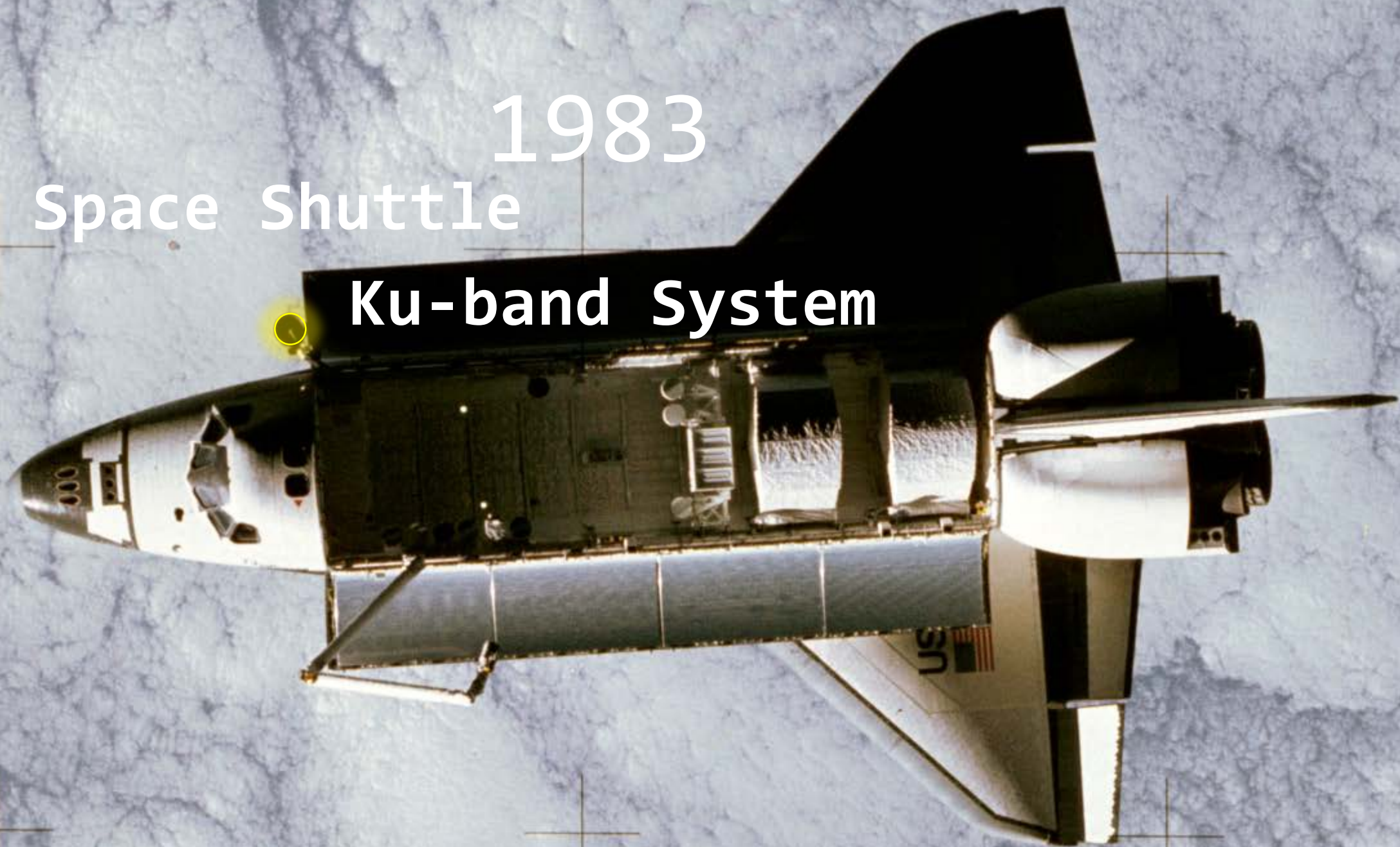
СОЮЗ



1983

Space Shuttle

Ku-band System



# Challenger Deploys Tracking and Data Relay Satellite



# 1996 Space Shuttle Video Teleconference





Shuttle - Mir  
1997

2001



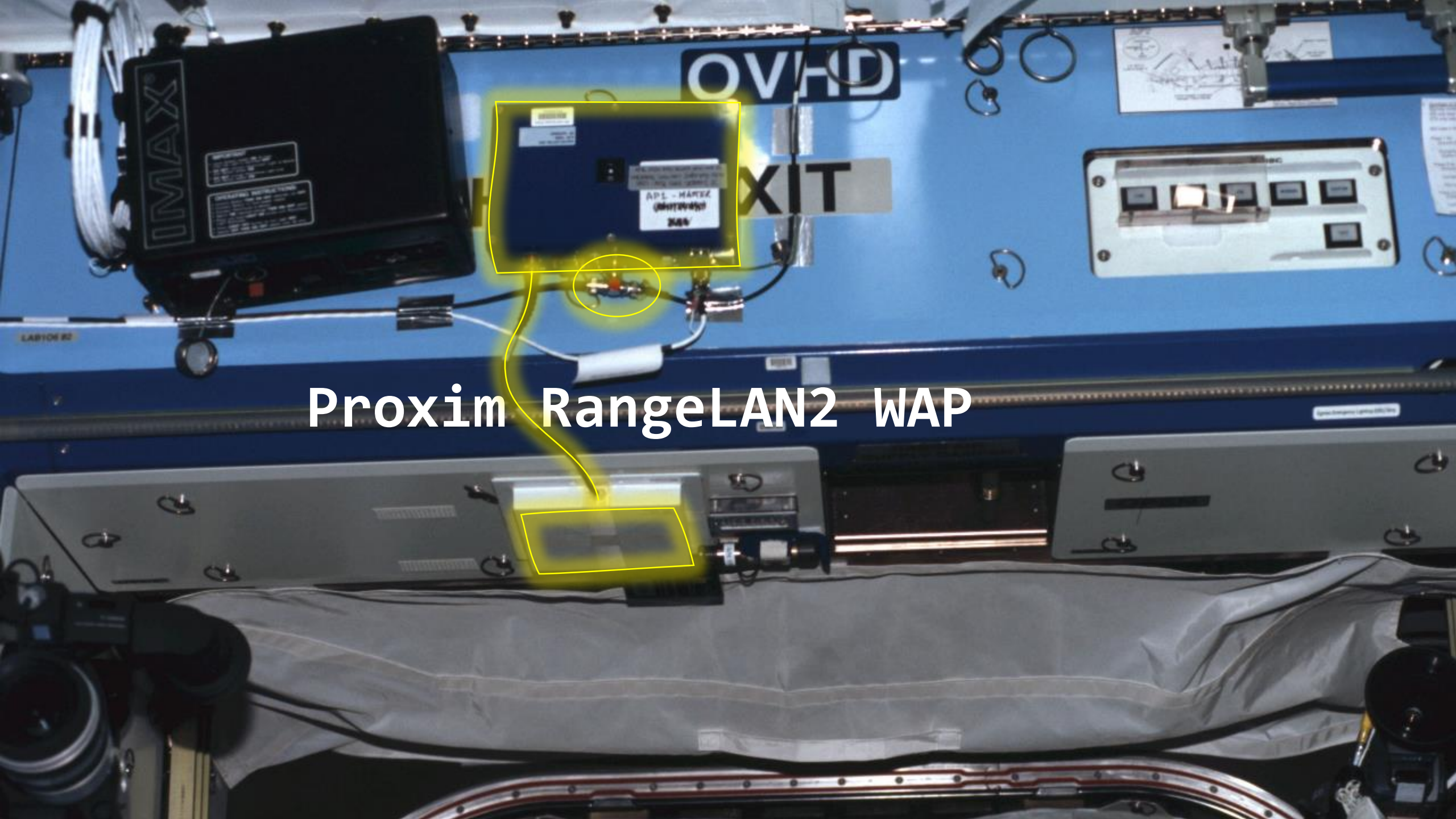


# International Space Station

2001

Cisco Softphone





OVHD

EXIT

APL - HARTZ  
(OUTSIDE)  
3A5

Proxim RangeLAN2 WAP

IMAX

OPERATIONAL INSTRUCTIONS



LAB106 B2

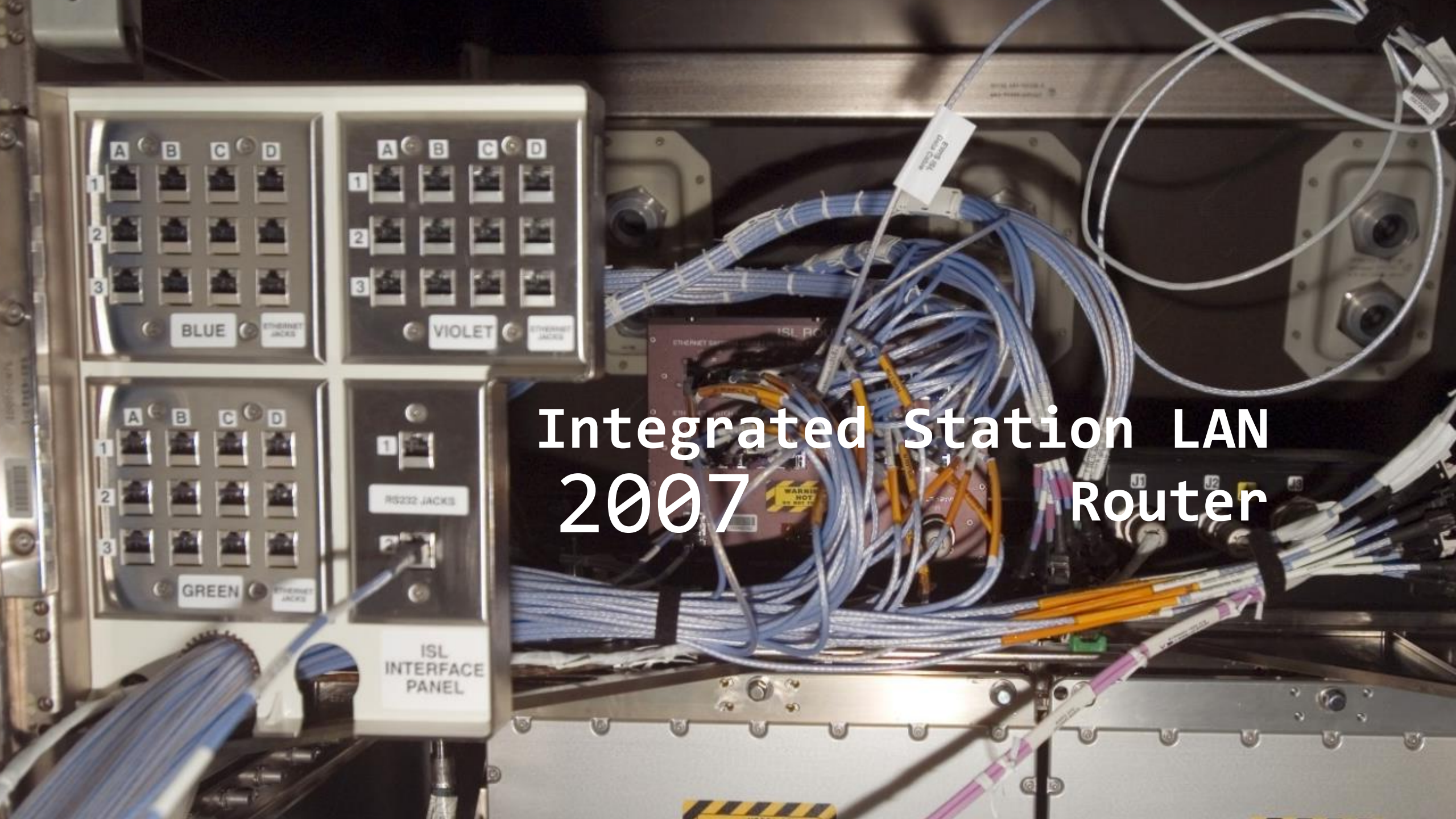


HHP Dolphins

A man wearing glasses and a dark blue shirt is shown in profile, focused on a handheld PDA device. He is in a space station environment, with various scientific instruments and equipment visible in the background. The PDA is a rugged, handheld device with a screen and a trackball. The background shows a complex array of white panels with dials, gauges, and labels, including one that reads "HRF GMAP ANALYSIS MODULE". The lighting is somewhat dim, with a bright light source visible through a window or opening in the background. The overall scene conveys a sense of advanced technology and scientific research in a space environment.

**Vadem Clio  
Wireless PDA**

# Integrated Station LAN 2007 Router



2008 IEEE 802.11b/g WAP

← To COL



# IBM A31p ThinkPad



HRF E/W/R  
esa

WARNING  
RISK OF FIRE

DRAWER 01  
DRAWER 02  
DRAWER 03  
DRAWER 04  
DRAWER 05  
DRAWER 06  
DRAWER 07  
DRAWER 08  
DRAWER 09  
DRAWER 10

PAYLOAD  
SAFE  
POWER  
POWER



VOLUME  
VISION  
MAGNIFY  
SMOKE INDICATION  
PPE ACCESS

GAS DELIVERY SYSTEM (GDS)  
TANK 1  
TANK 2  
TANK 3  
TANK 4  
TANK 5  
GAUGE GUIDE  
HRF RACK ACOUSTIC CLOSEOUT

REFRIGERATED CENTRIFUGE  
CONTENTS  
IN MOTOR (1)  
IN 2-TANK ADAPTER (2)  
IN 1-TANK ADAPTER (2)  
IN 2-TANK ADAPTER (2)  
IN 2-TANK ADAPTER (2)  
IN MOTOR (1)  
SPARE & RELEASE TOOL (1)  
GDS SEAL (1)  
IN 2-TANK ADAPTER (2)  
ADDITIONAL AFTER ACCIDENT STOPPING  
CENTRIFUGE LAUNCH SPINNER (1)  
COMPRESSOR SCREWS (4)  
POWER  
ON

CAUTION  
VISUALLY VERIFY MOTOR IS STOPPED  
BEFORE OPENING DOOR

# RFID Readers



BCR/RFID Scanner  
P/N SEG33122504-301  
S/N 1004  
NGR0002AJ

120VDC Power Supply  
P/N SEG33116412-301  
S/N 1426

US DC Power Cable, 10ft  
P/N SEG331292280-309  
S/N 50153  
POC-10762J

To NOD 3

ELECTRONIC DEVICE  
HANDLE WITH CARE  
POC-10762J Class 2

ELECTRONIC DEVICE  
HANDLE WITH CARE  
POC-10762J Class 2

LOT NO. 12-10





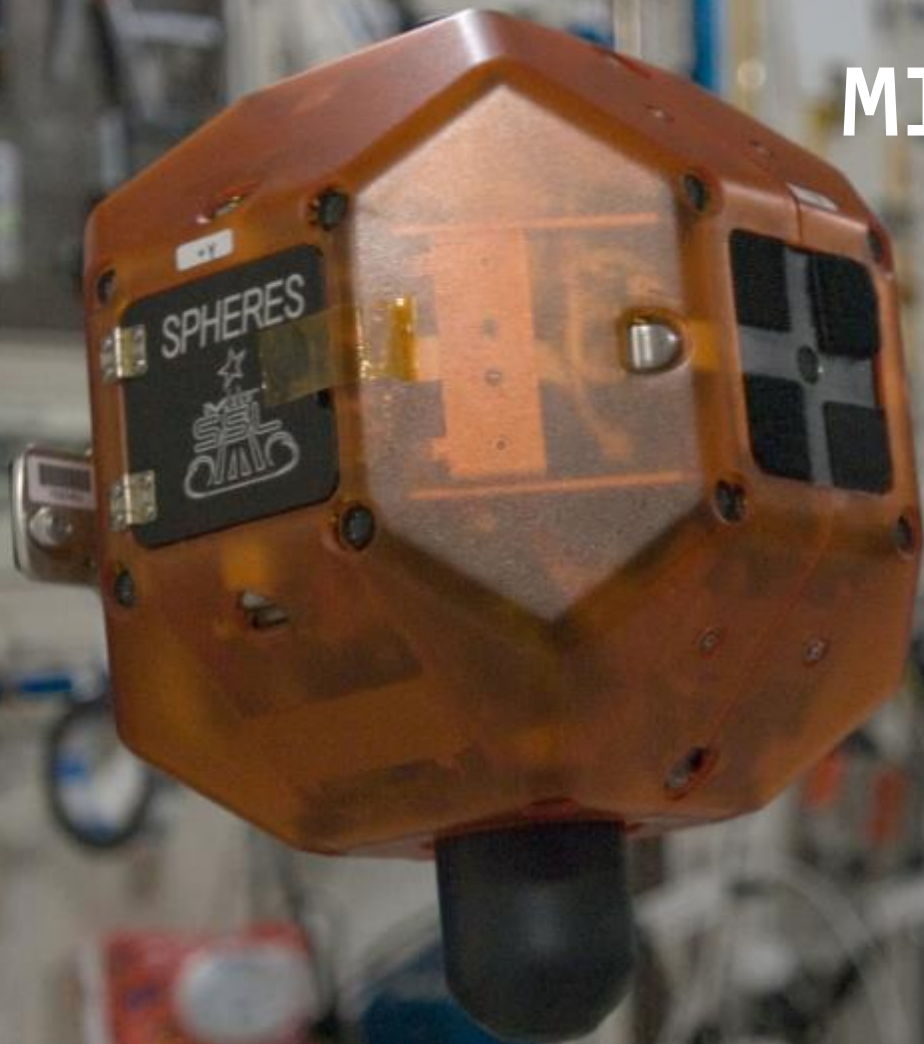
2008 Treadmill-2

# Advanced 2009 Resistive Exercise Device



2011

MIT SPHERES





iPhone 4

2012

IEEE 802.11a/b/g/n WAP





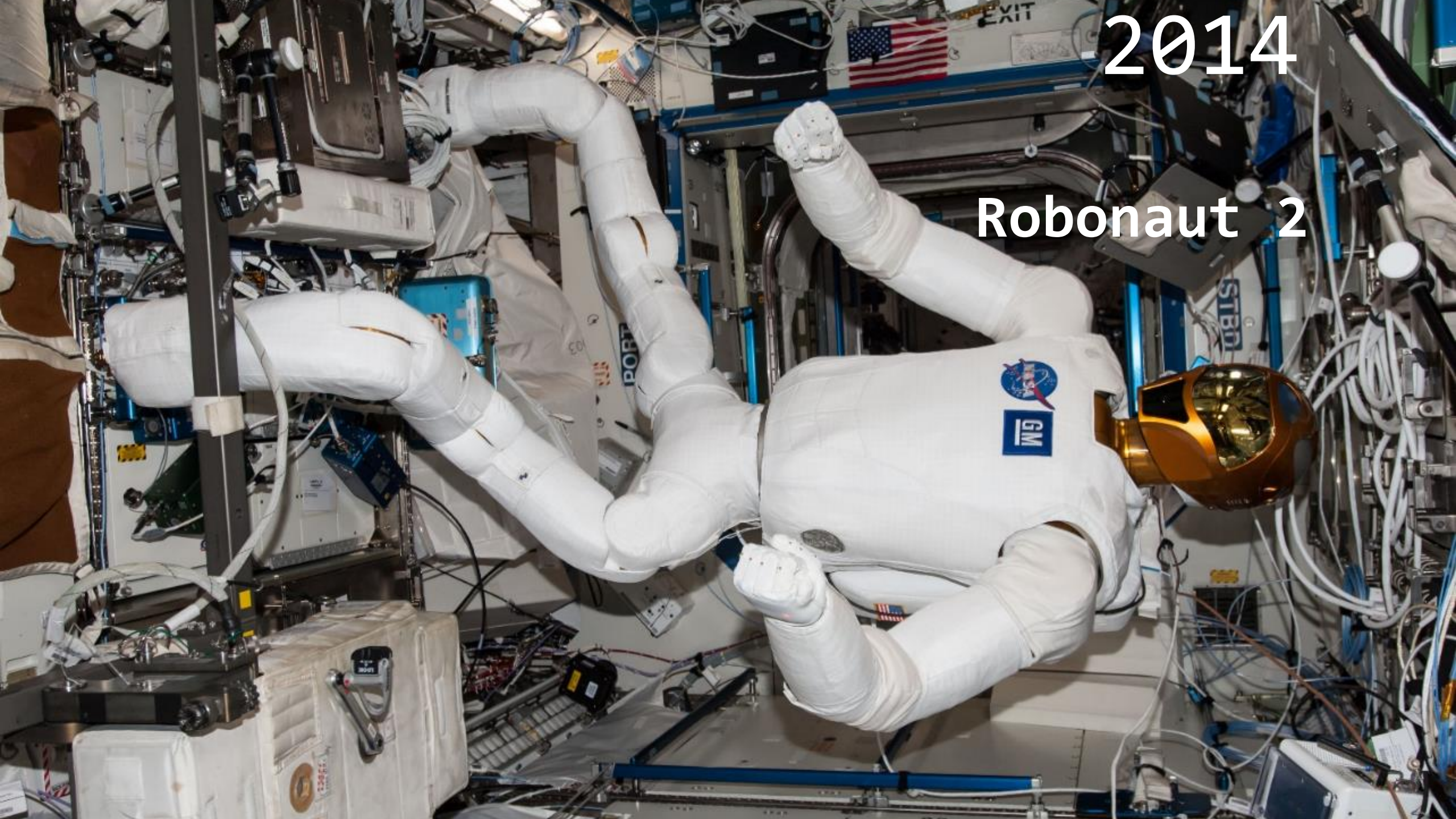
2013  
iPad Air



GoPro  
camera

2014

Robonaut 2





# 2016 External Wireless



External High Definition Camera





**NanoRacks External Platform**

# NanoRacks Plate Reader







2017

Mobile Procedure Viewer



**GbE Edge Router**

N2  
MADIR  
VOK

1173

# Astro Pi



EMERGENCY USE  
FIRE PORT  
COL 1A3 HQ

PANEL (FSP)

ACCESS PANEL

VIDEO UNIT

VIDEO UNIT

VIDEO UNIT

VIDEO UNIT

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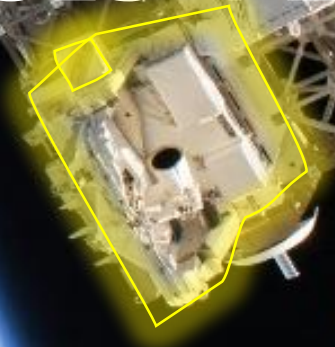
VIDEO UNIT

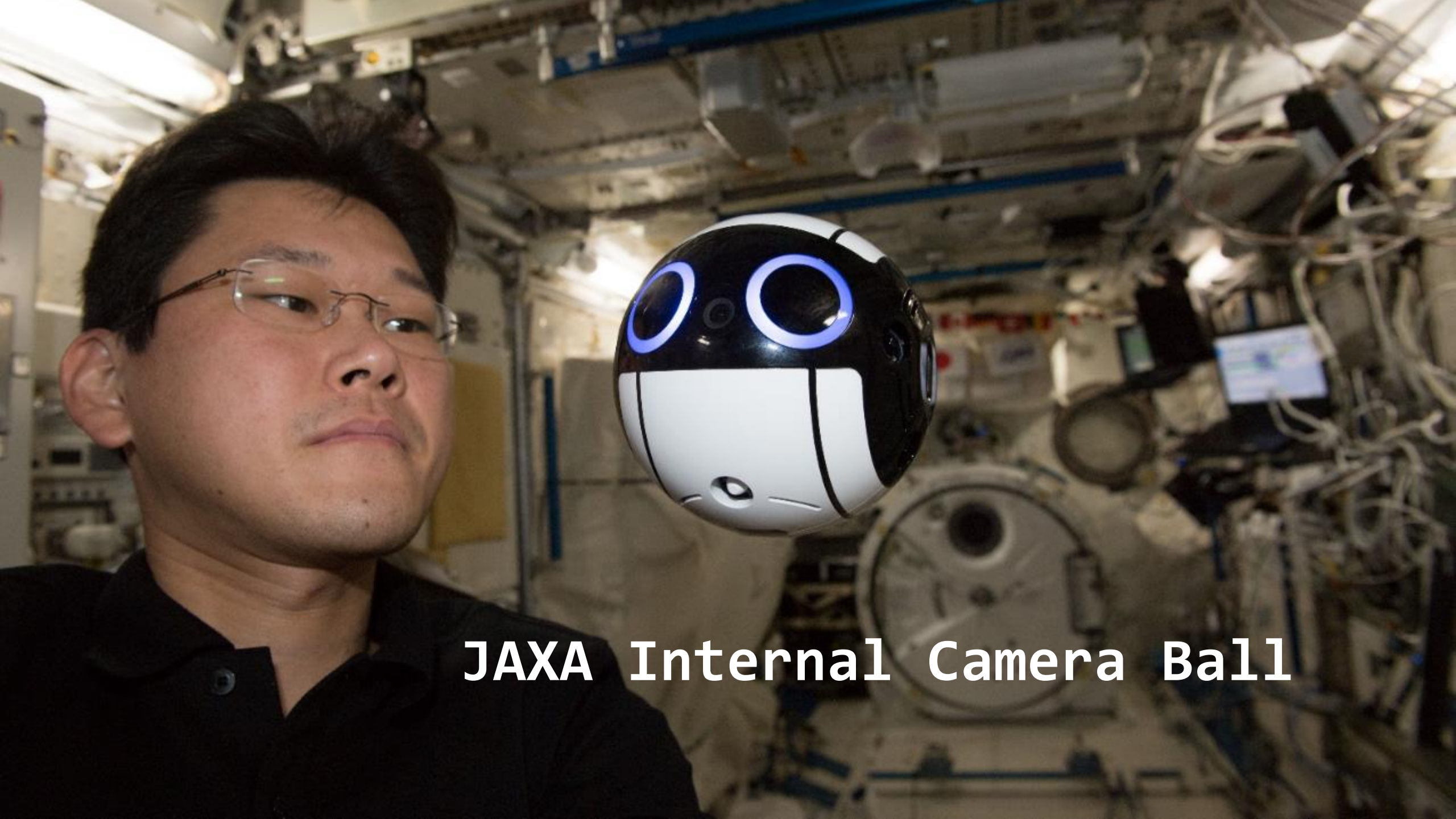




**External Wireless  
US Lab Nadir Antennas**

MUSES Platform



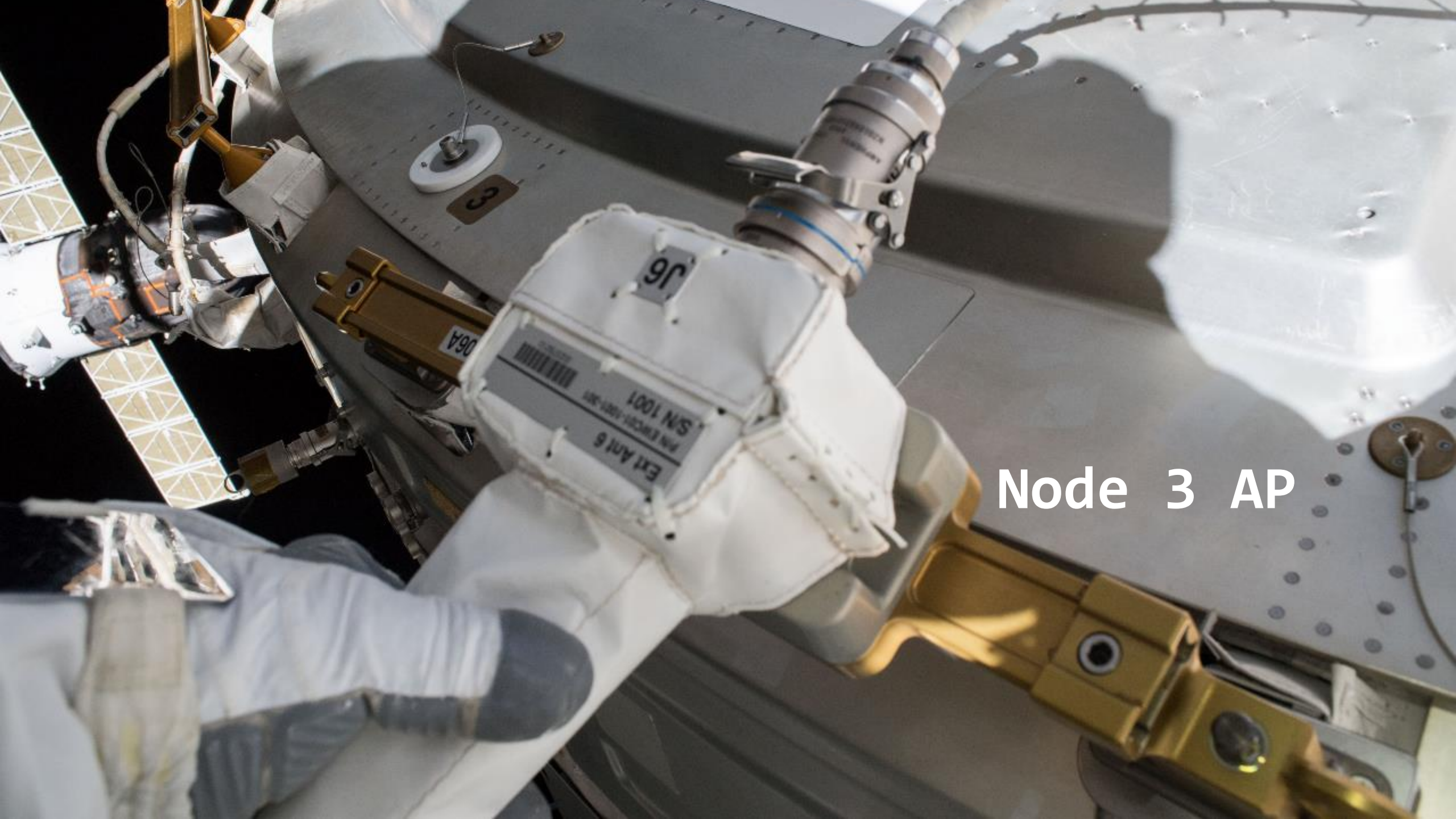


**JAXA Internal Camera Ball**

2018



EcoSTRESS



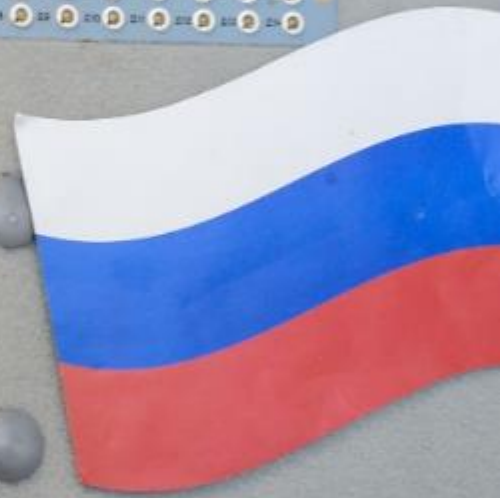
Node 3 AP

A black and white photograph of a SpaceX Dragon spacecraft docked to the International Space Station. The Dragon is oriented vertically, with its nose pointing upwards. The station's complex structure is visible in the background. Two yellow annotations are present: a yellow outline of a component on the upper part of the Dragon and a yellow square on the side of the nose cone. The text "Docking Corridor" is overlaid in white in the center of the image. The ESA logo is visible on the left side of the station structure.

# Docking Corridor

SPACEX ENCODER 1  
2019-08-03 10:44:36:04

# Photobioreactor



# Suit Data Recorder 2019

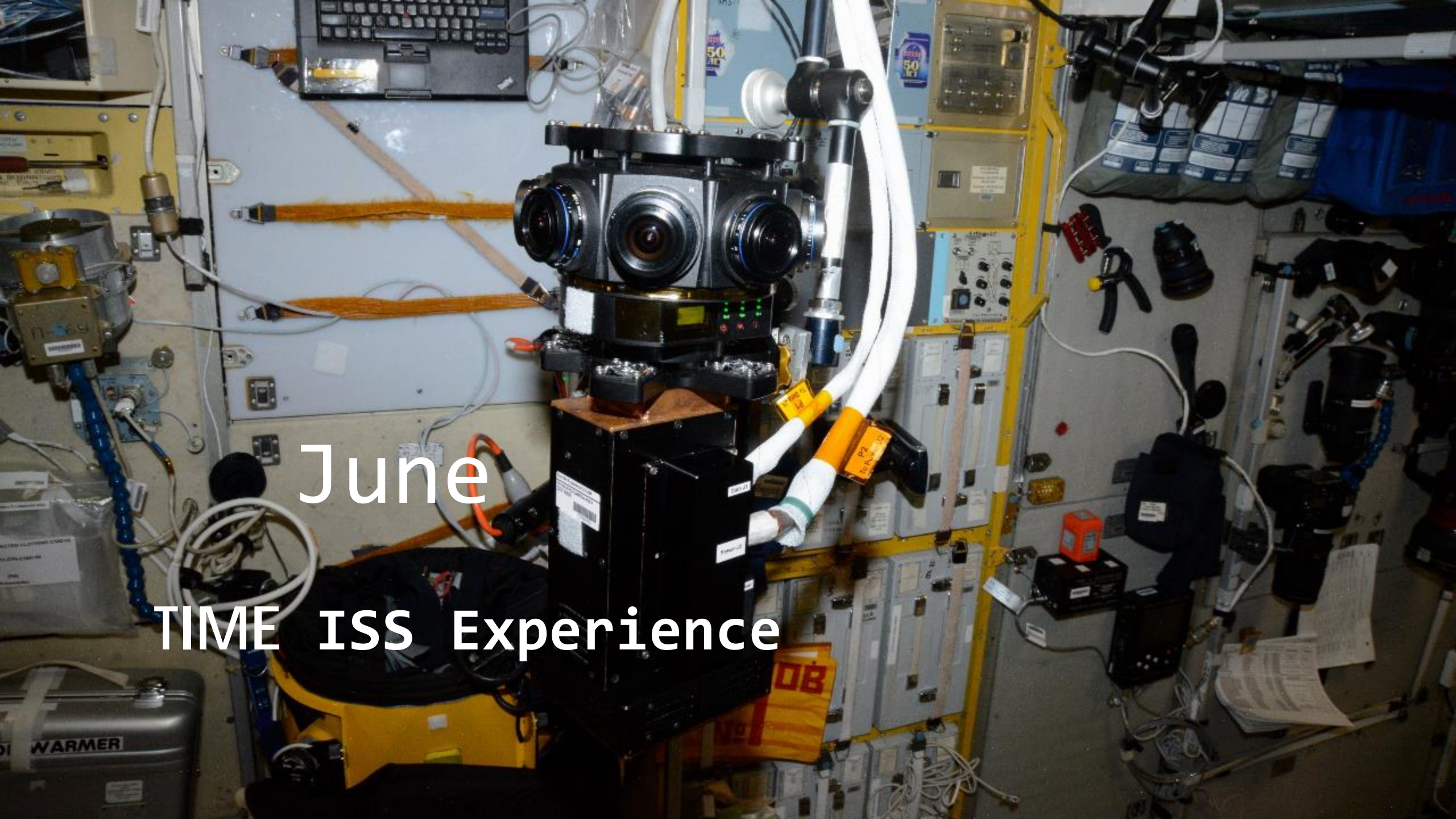




April

Astrobbee





June

TIME ISS Experience

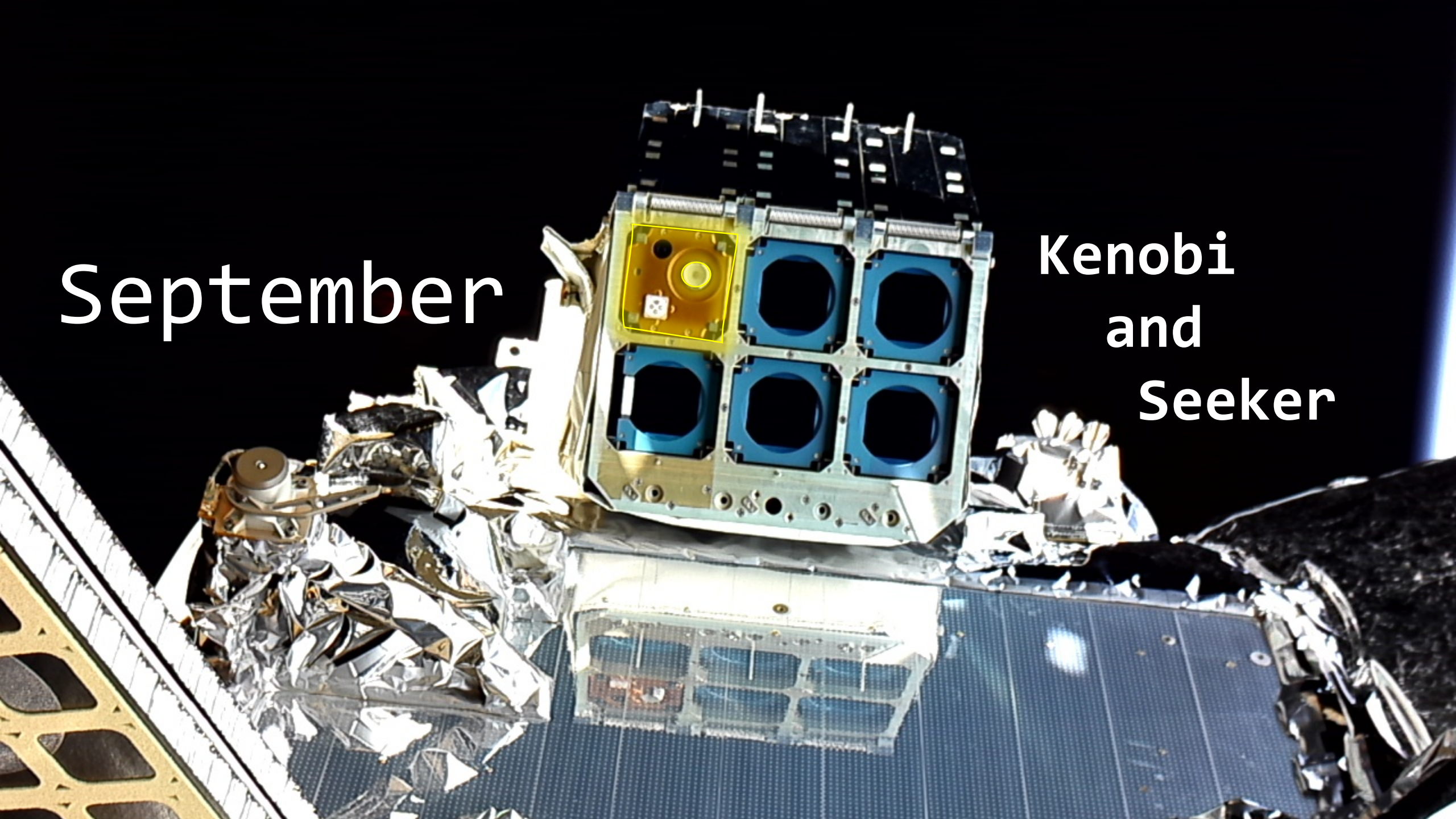
Portable Wireless  
HD Camera

August



September

Kenobi  
and  
Seeker



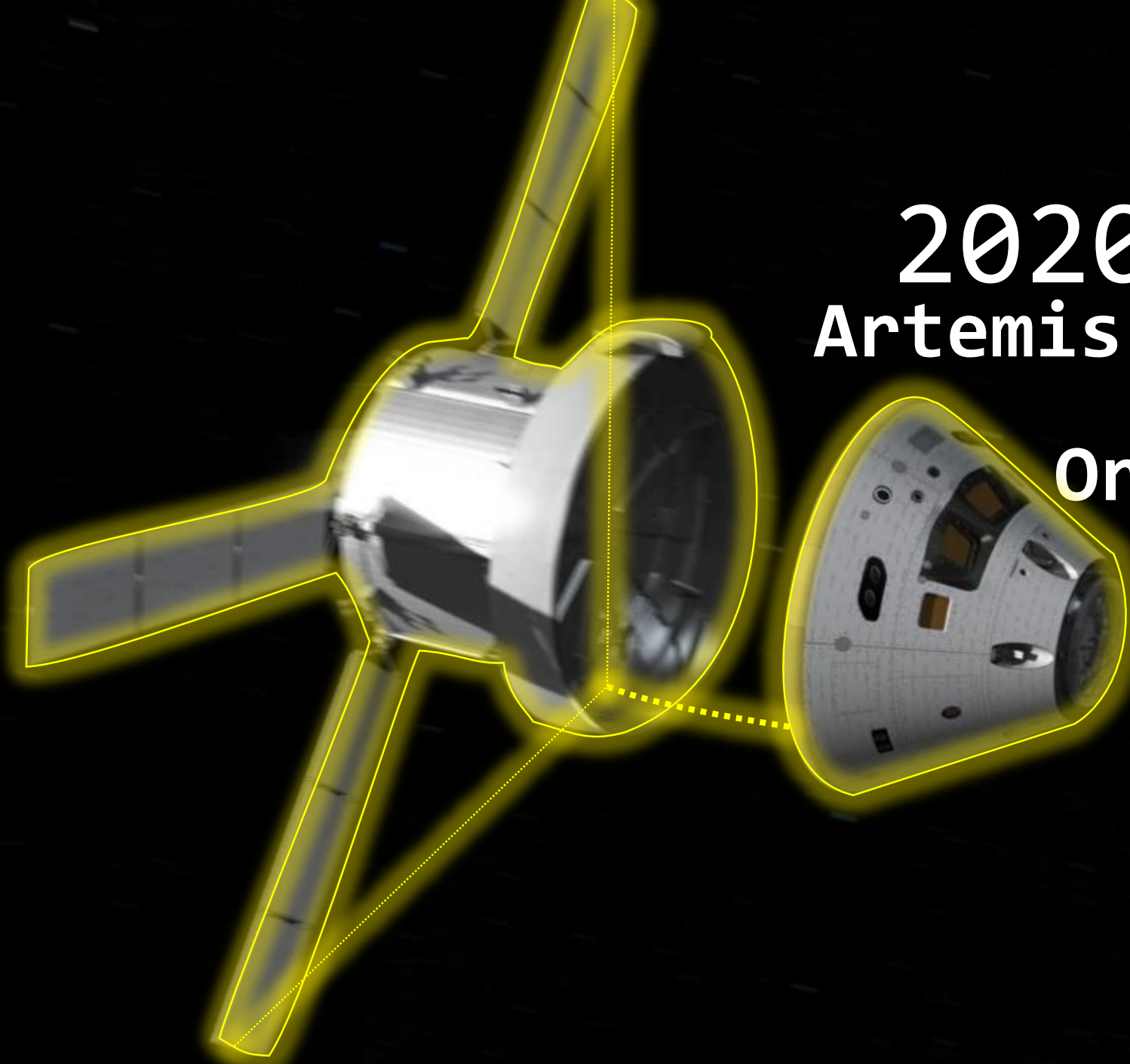


High-Definition  
EVA Camera Assembly

Coming  
Soon

2020  
Artemis 1

Orion



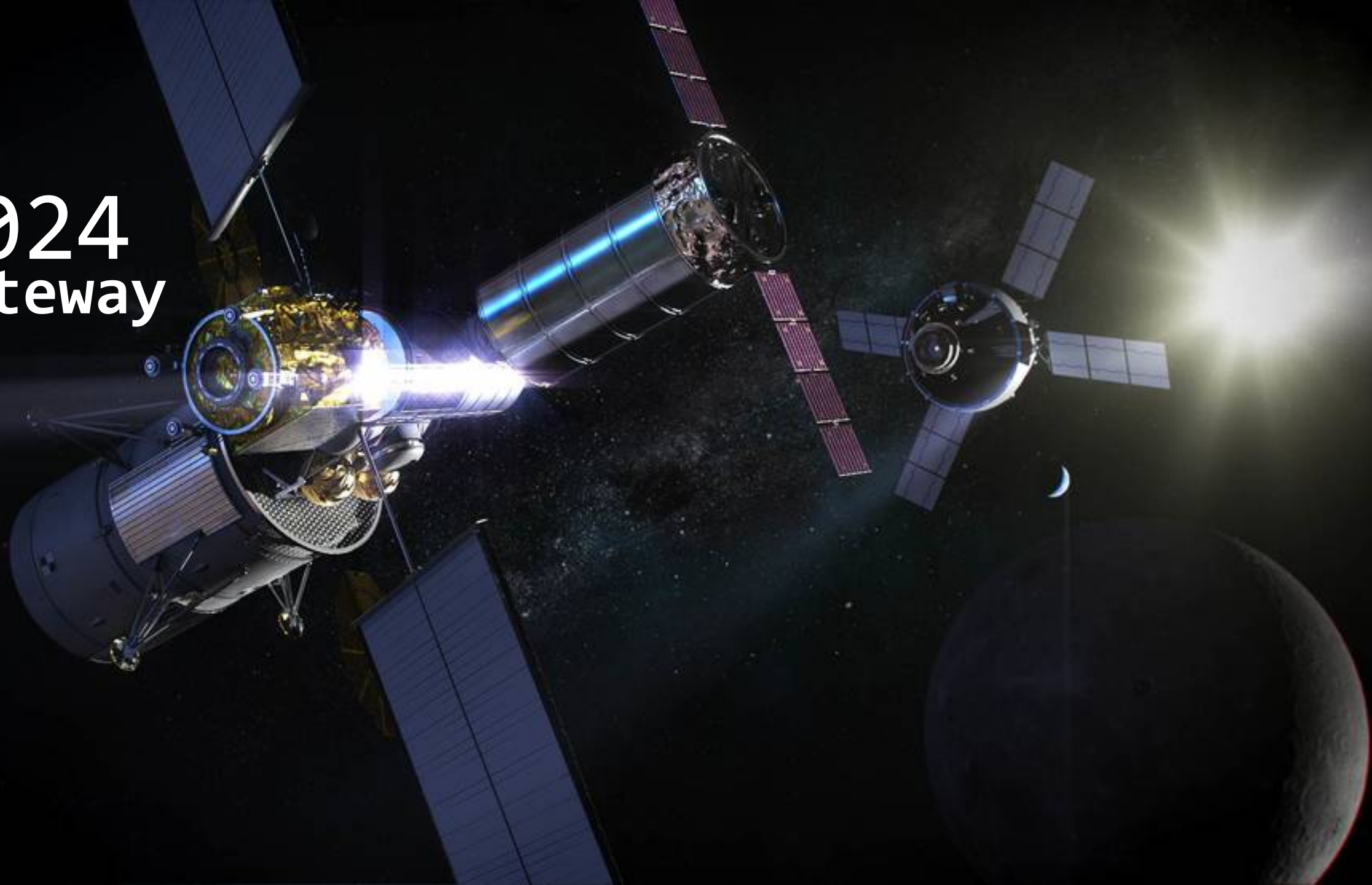


2021

Astrobotic  
Peregrine

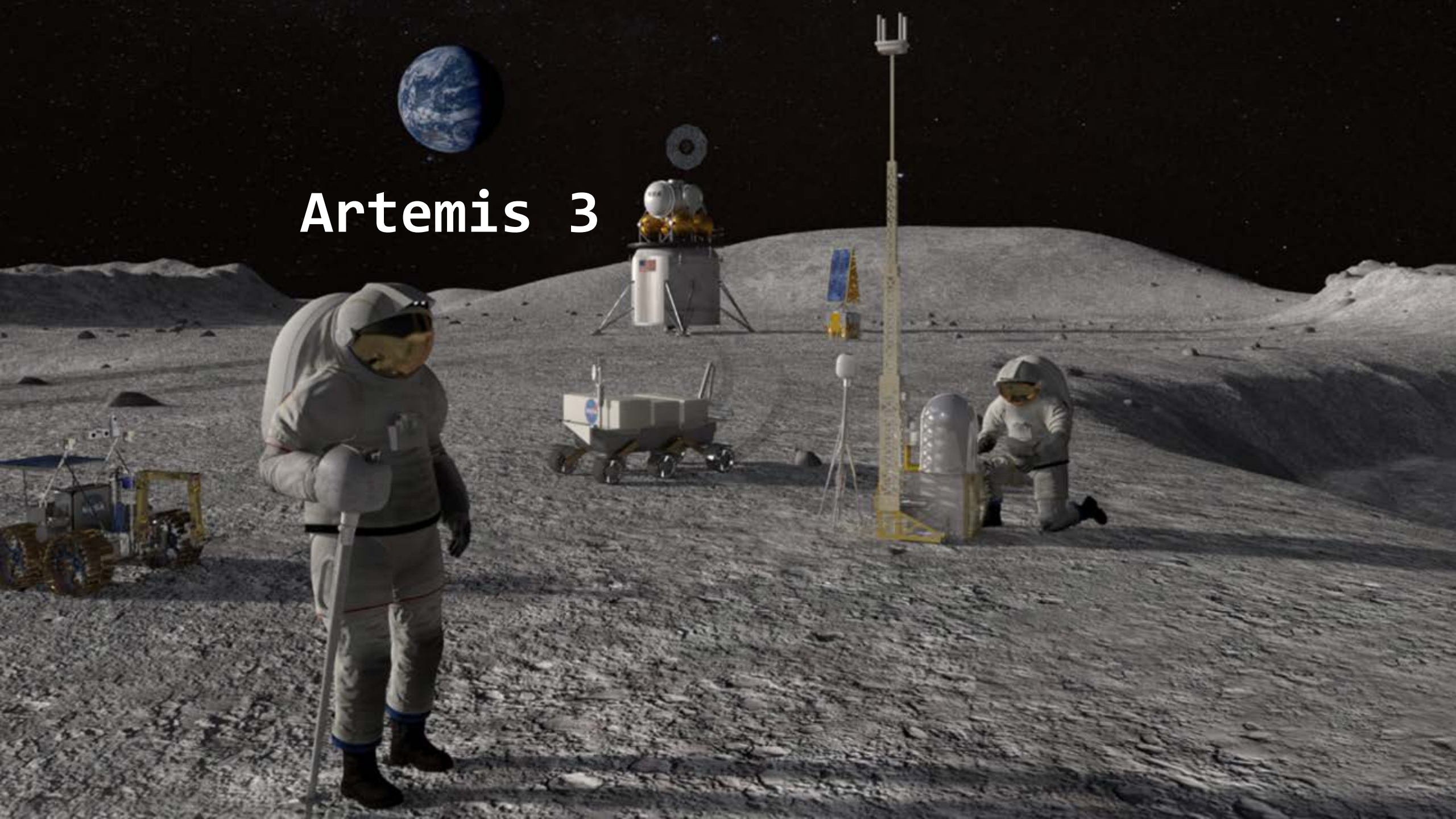
Credit: Astrobotic  
used by permission

# 2024 Gateway

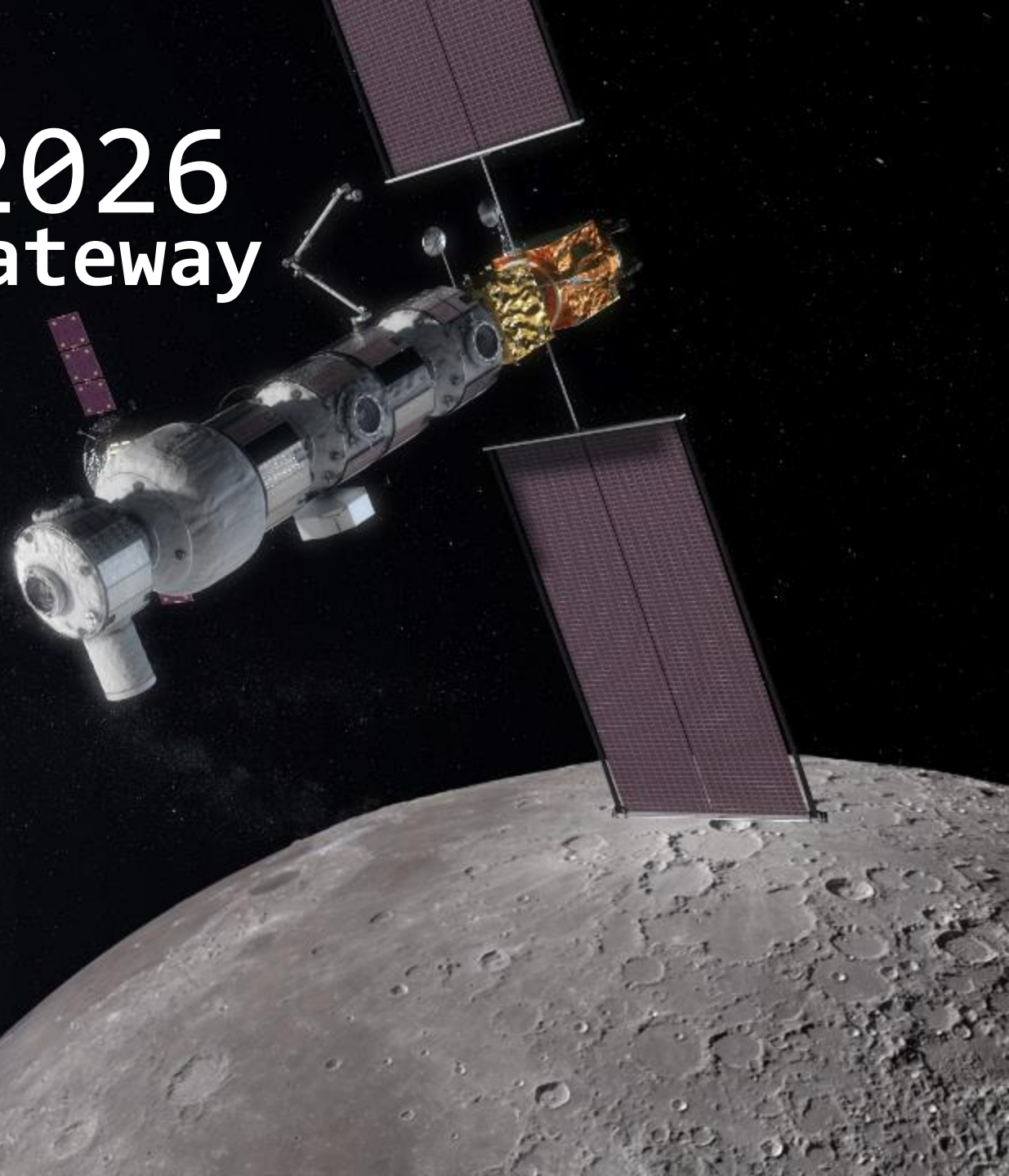




# Artemis 3



# 2026 Gateway



# 2030's Human Exploration of Mars

