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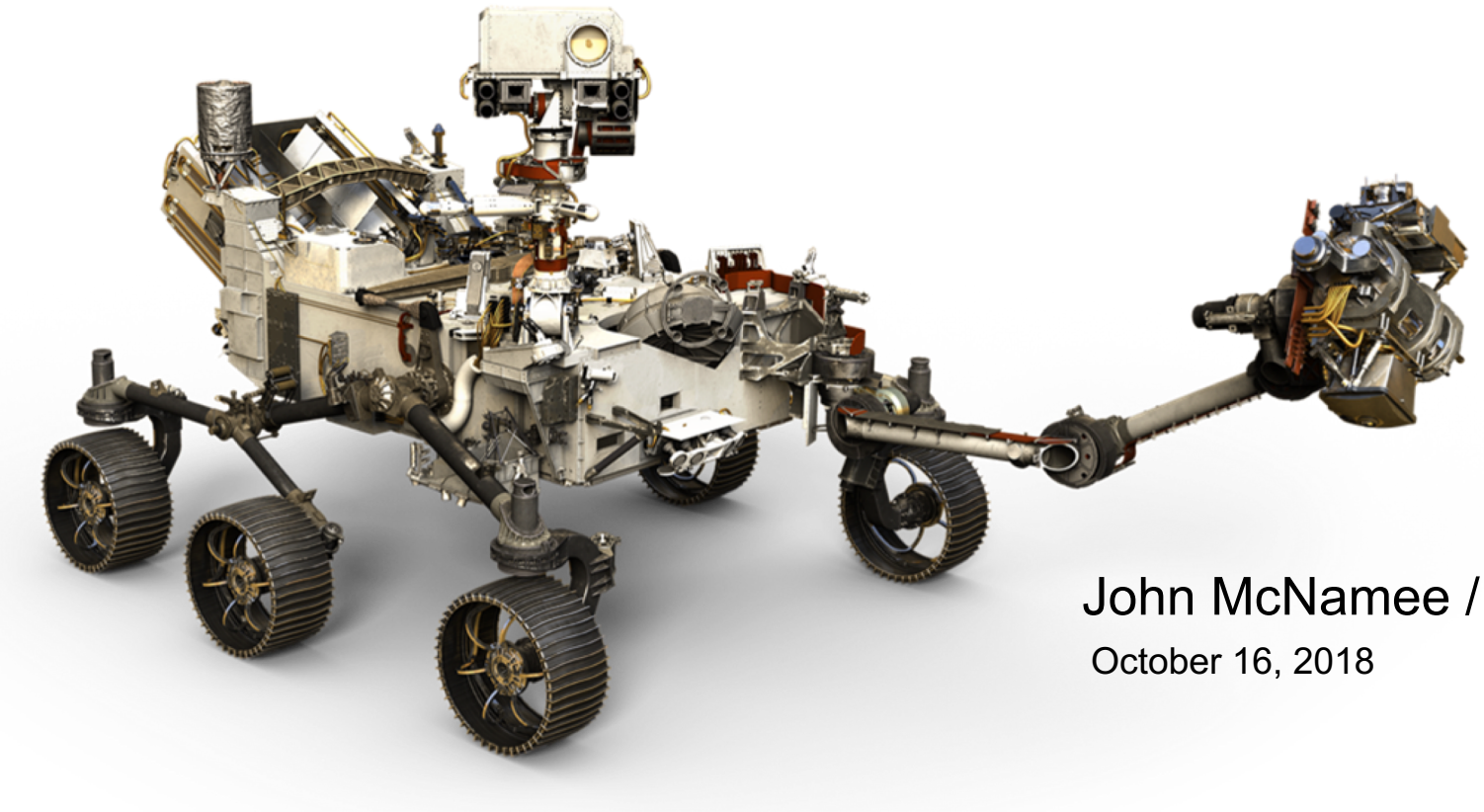
Mars 2020 Project Status



John McNamee / Matt Wallace

October 16, 2018

MARS 2020 PROJECT

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Project Overview

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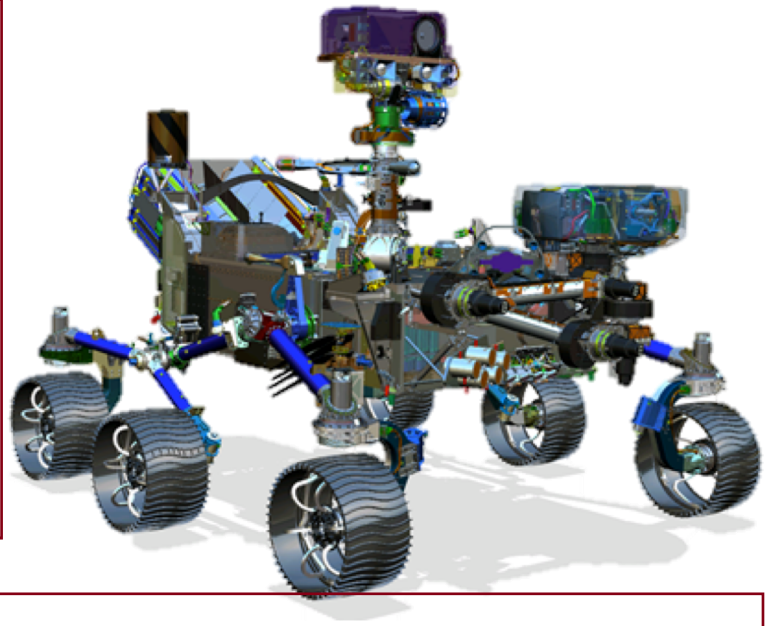
Salient Features

- *Category: 1*
- *Risk Class: A-tailored*
- *Directed, JPL in-house implementation*
- *High heritage MSL design*
- *Modifications only as necessary to accommodate new payload and Sampling / Caching System (SCS)*
- *Planetary Protection Category V Restricted Earth Return per Level 1 Requirements*



Science

- *Assess past habitability of an astrobiologically relevant ancient environment on Mars*
- *Assess biosignature preservation potential with the environment and search for biosignatures*
- *Assemble cached samples for possible future return to Earth*

Technology

- *Advance technologies with applications to future human and robotic explorations objectives*

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Mission Overview

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LAUNCH

- Atlas V 541 vehicle
- Launch Readiness Date: July 2020
- Launch window: July/August 2020

CRUISE/APPROACH

- ~7 month cruise
- Arrive Feb 2021

ENTRY, DESCENT & LANDING

- MSL EDL system (+ Range Trigger and Terrain Relative Navigation): guided entry and powered descent / Sky Crane
- 16 x 14 km landing ellipse (range trigger baselined)
- Access to landing sites ±30° latitude, ≤ -0.5 km elevation
- Curiosity-class Rover

SURFACE MISSION

- 20 km traverse distance capability
- Enhanced surface productivity
- Qualified to 1.5 Martian year lifetime
- Seeking signs of past life
- Returnable cache of samples
- Prepare for human exploration of Mars

M2020 approach heavily leverages MSL in order to reduce cost and control risk

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Top Level Schedule

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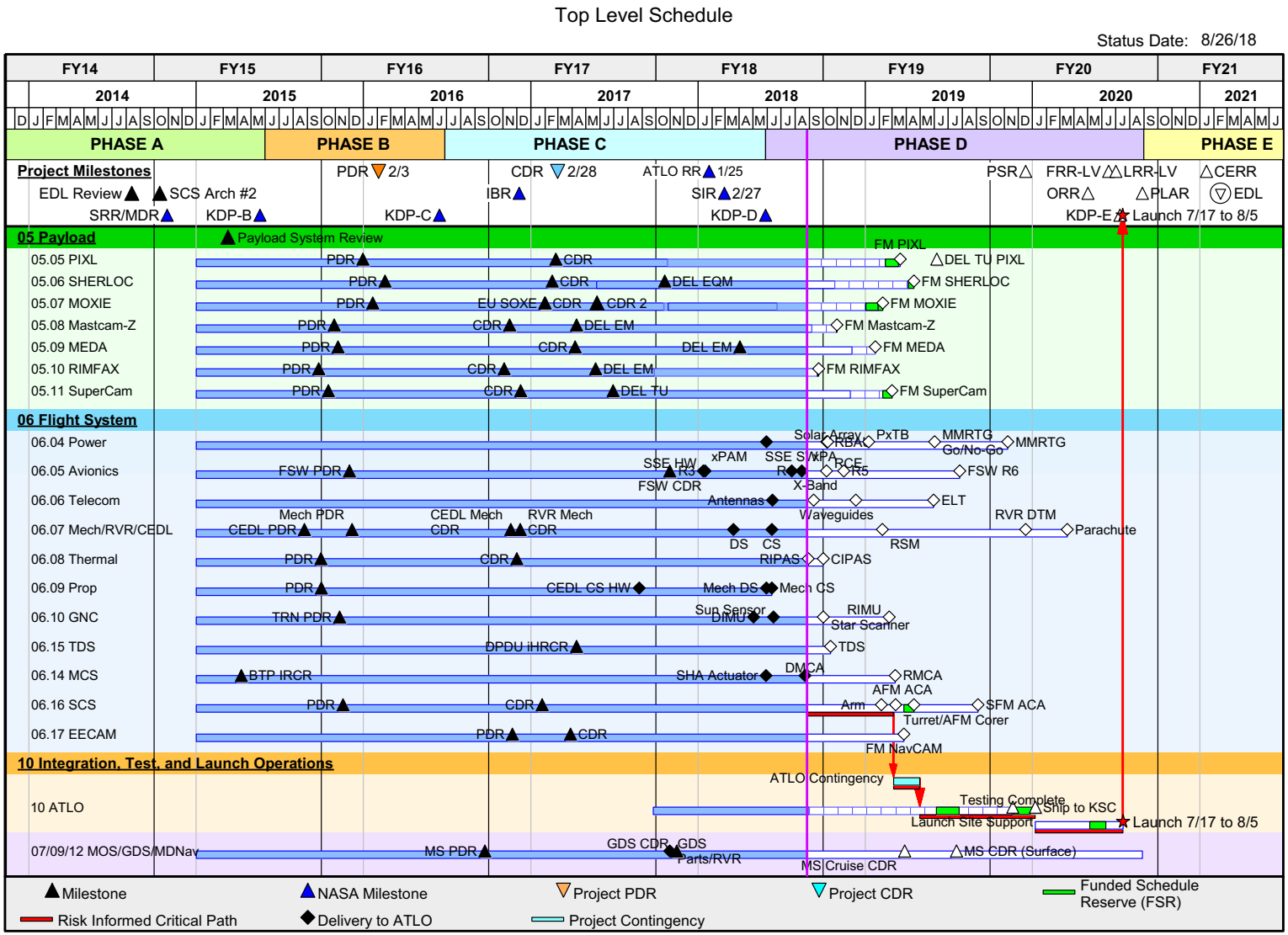

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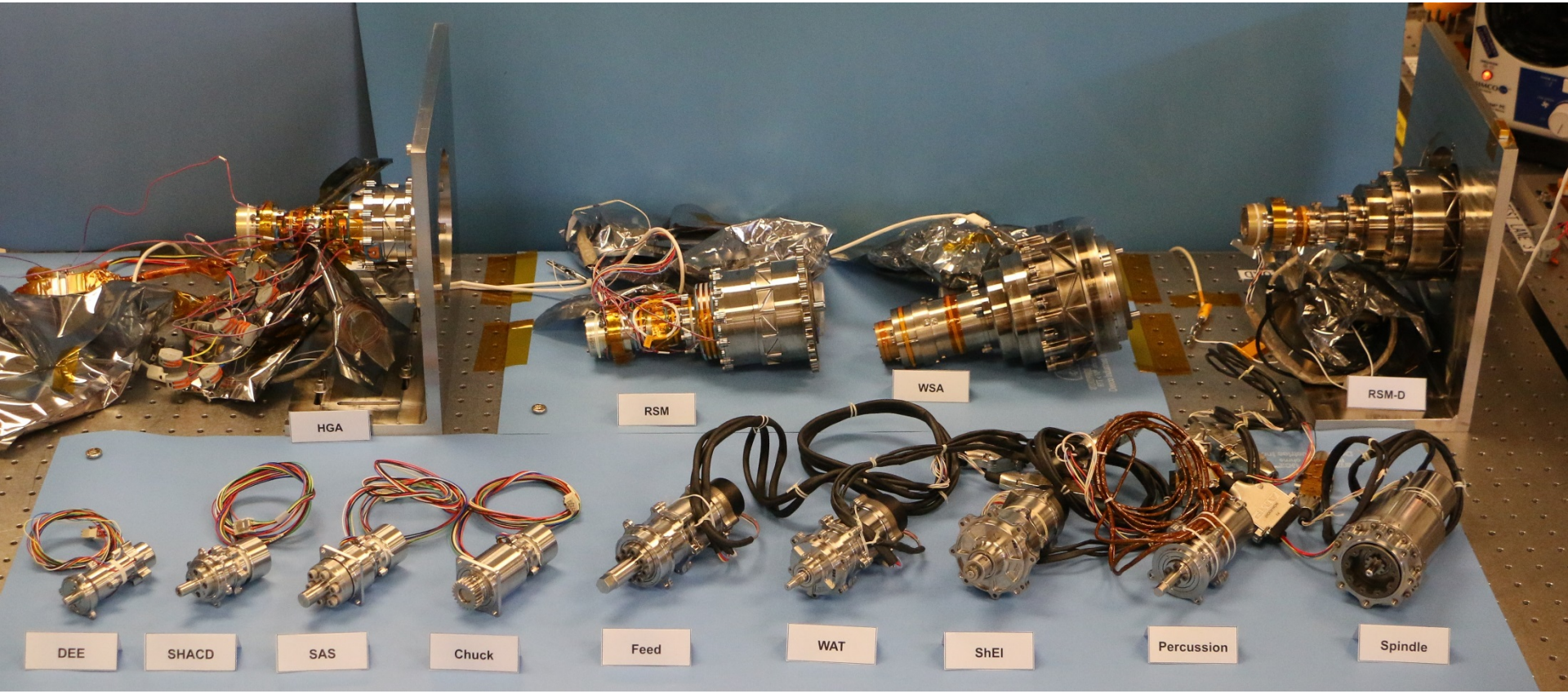
Flight Actuators



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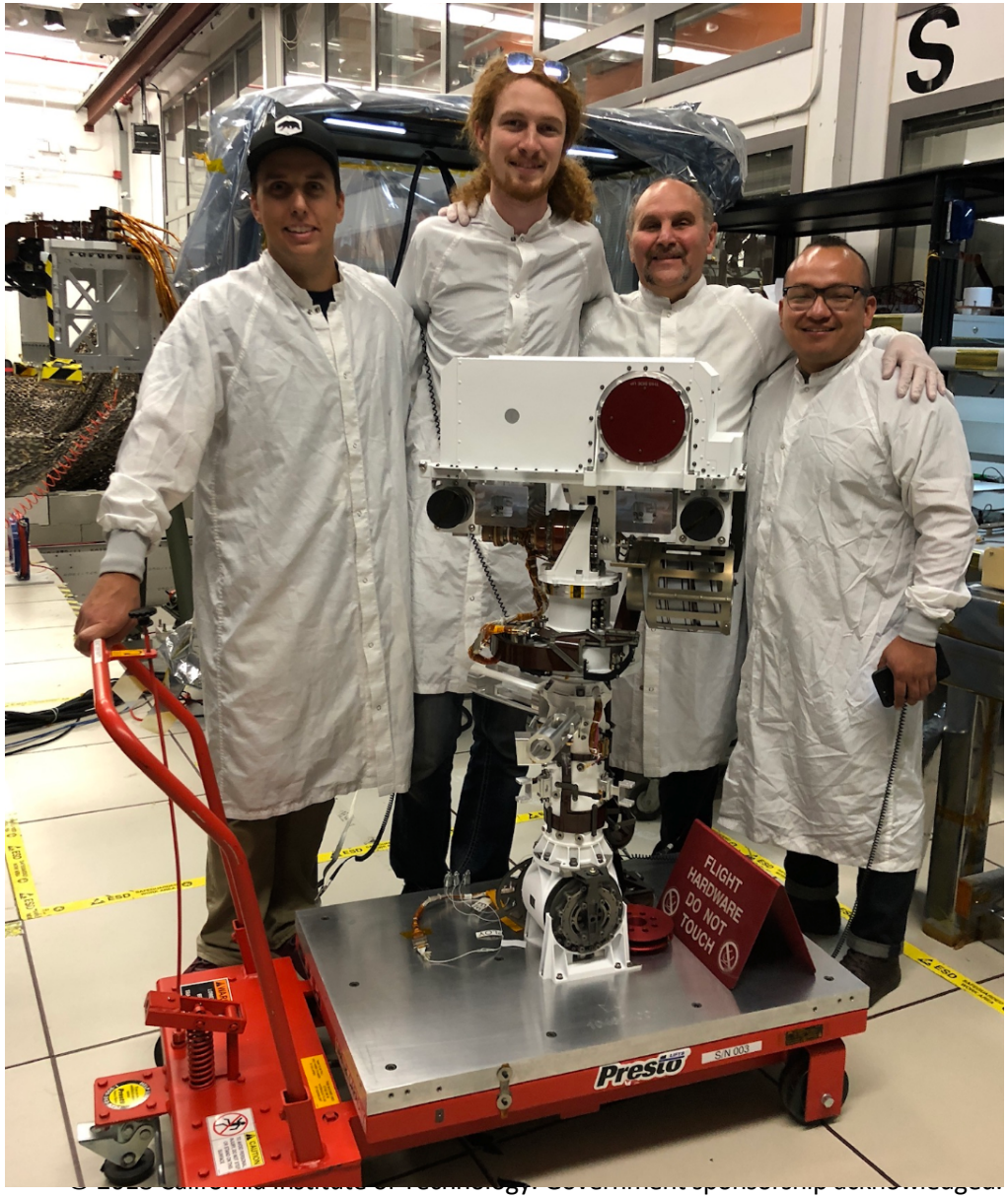
DTM Remote Sensing Mast



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Mobility

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Sampling System: EM Robotic Arm

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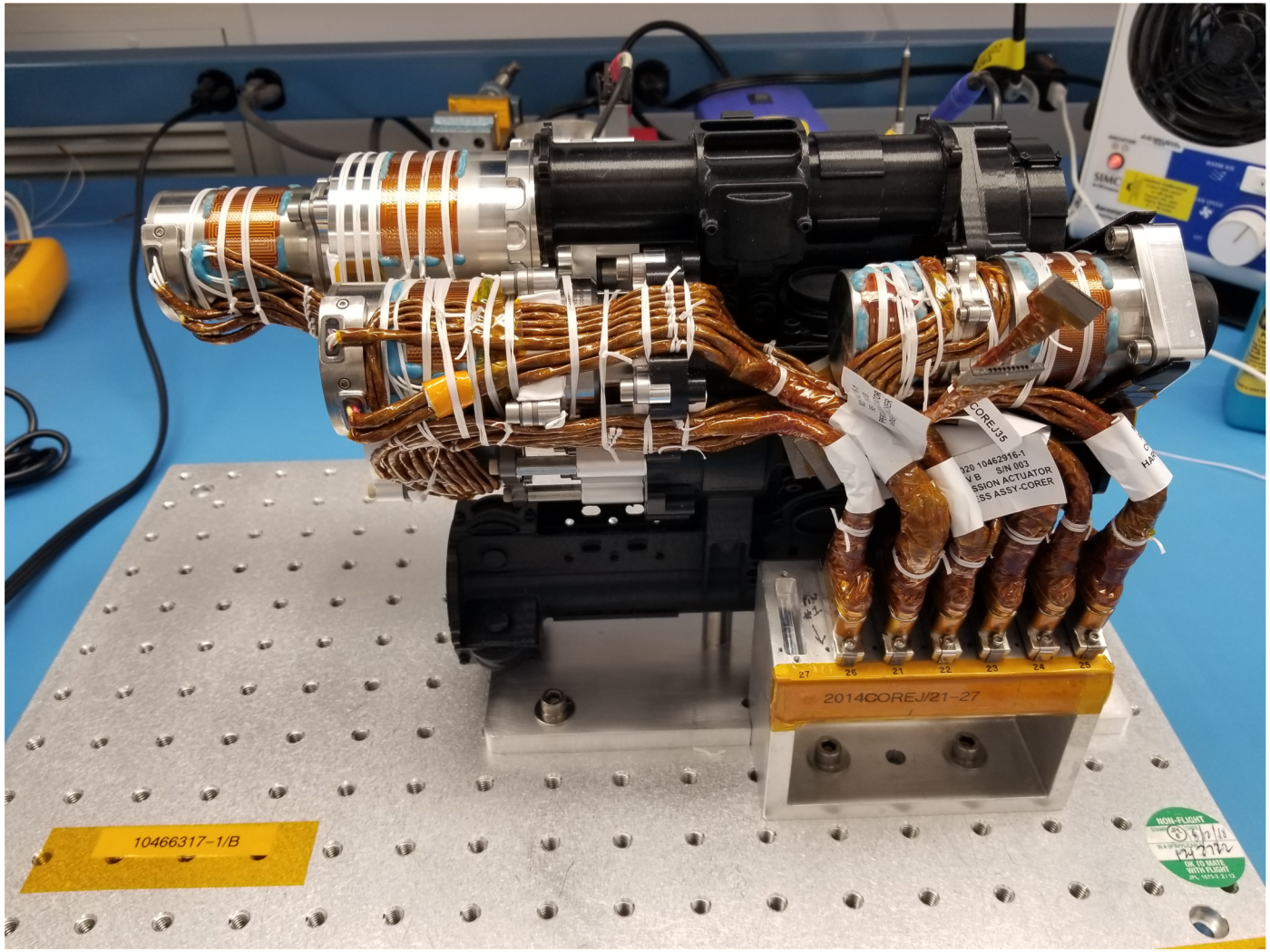
Sampling System: Flight Corer



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Sampling System: Flight Turret

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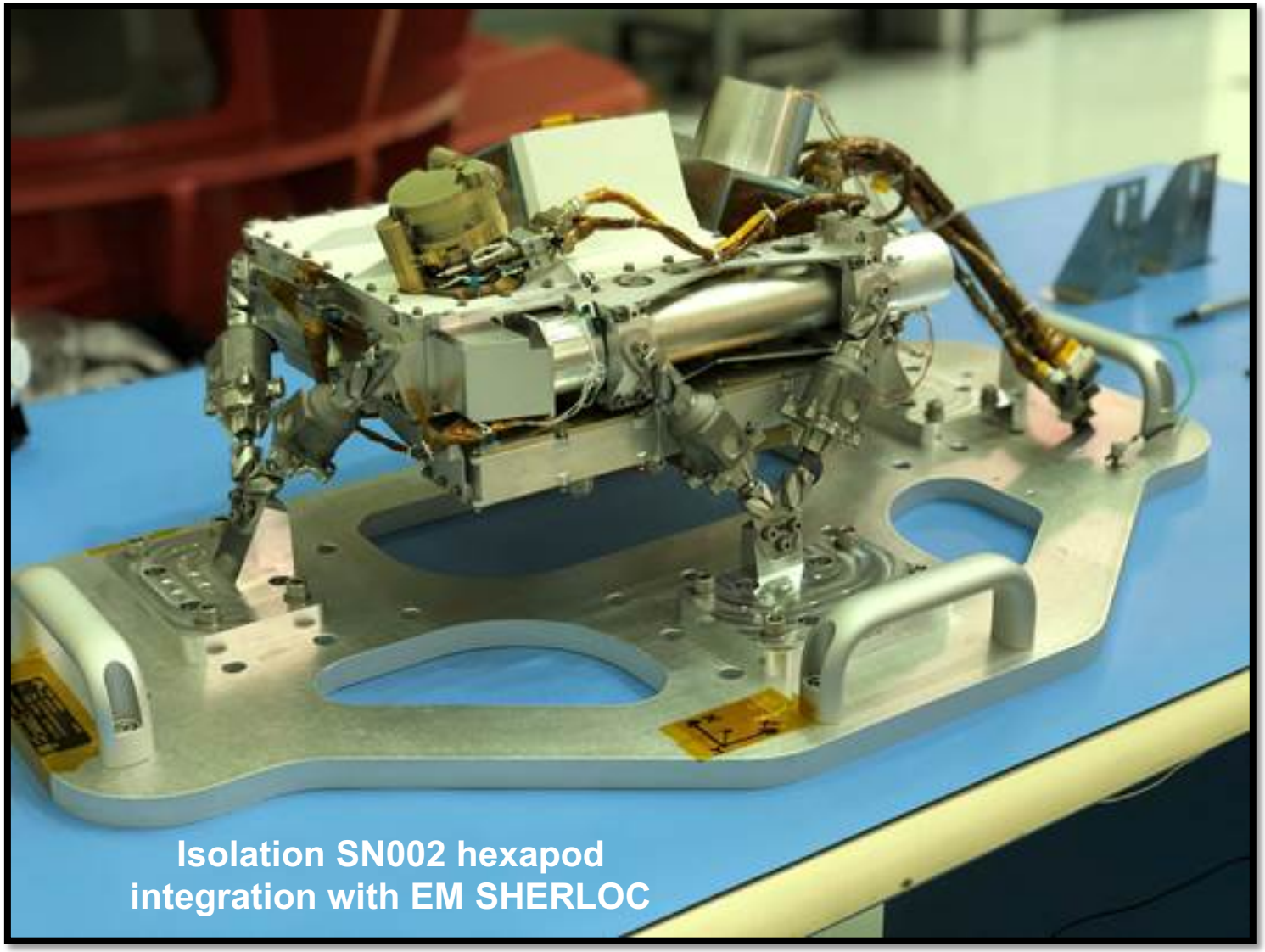

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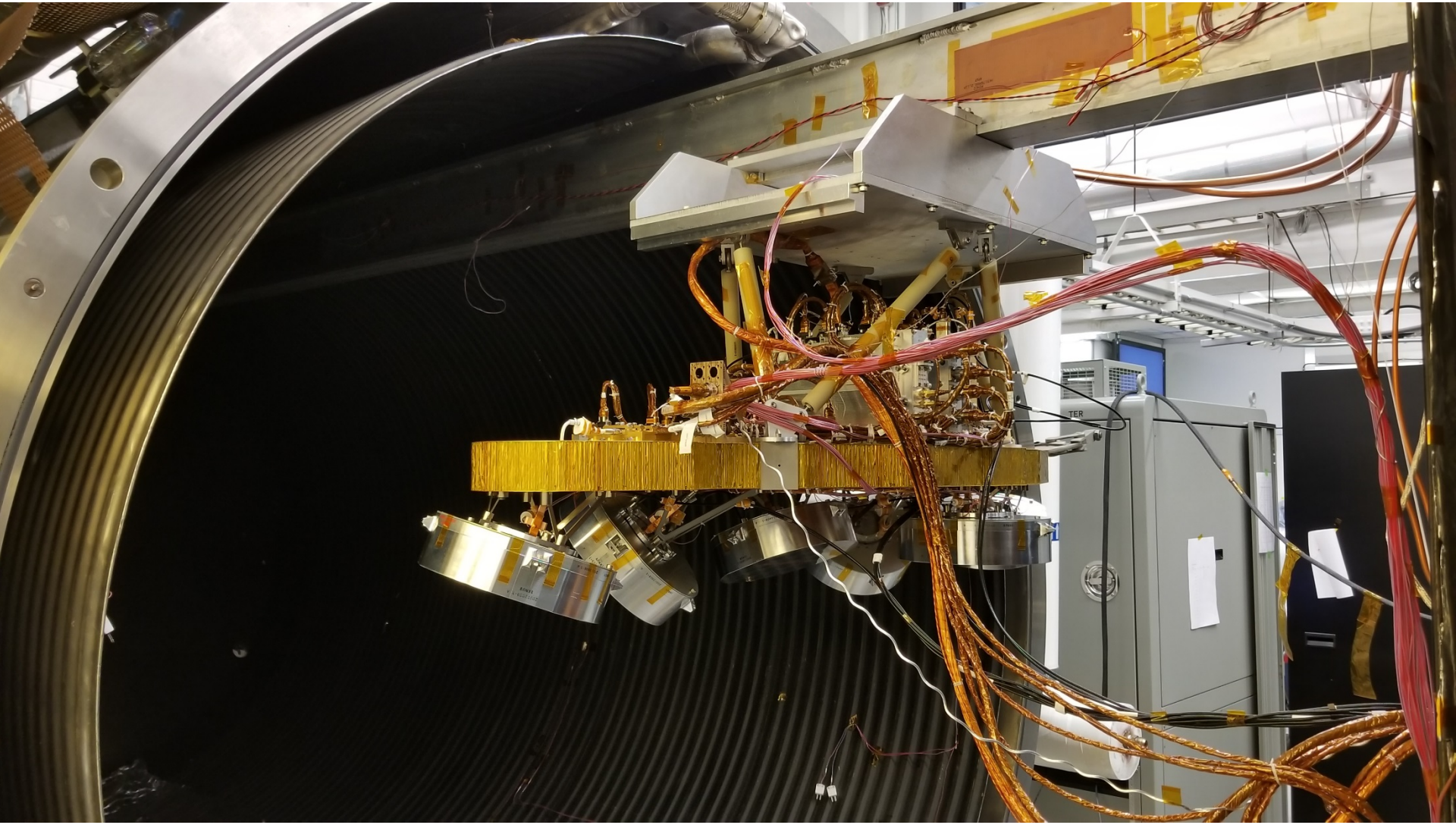
Landing Radar



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Terrain Relative Navigation / Fast Traverse

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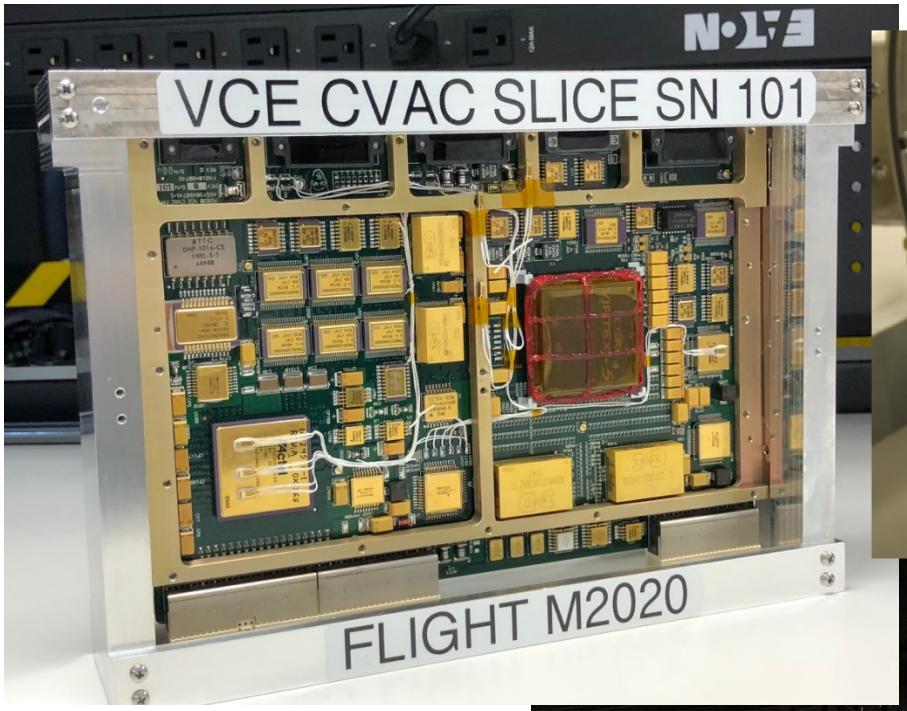

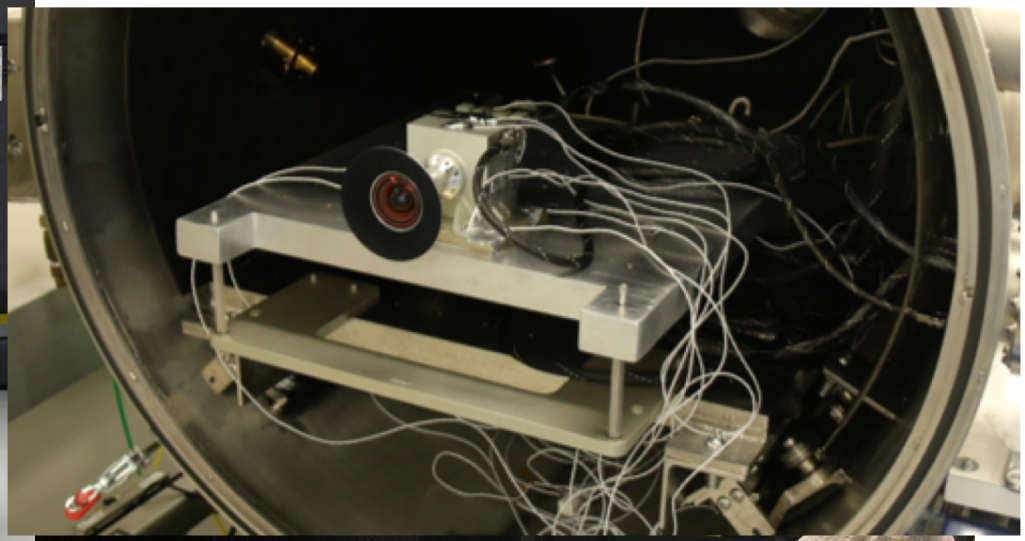

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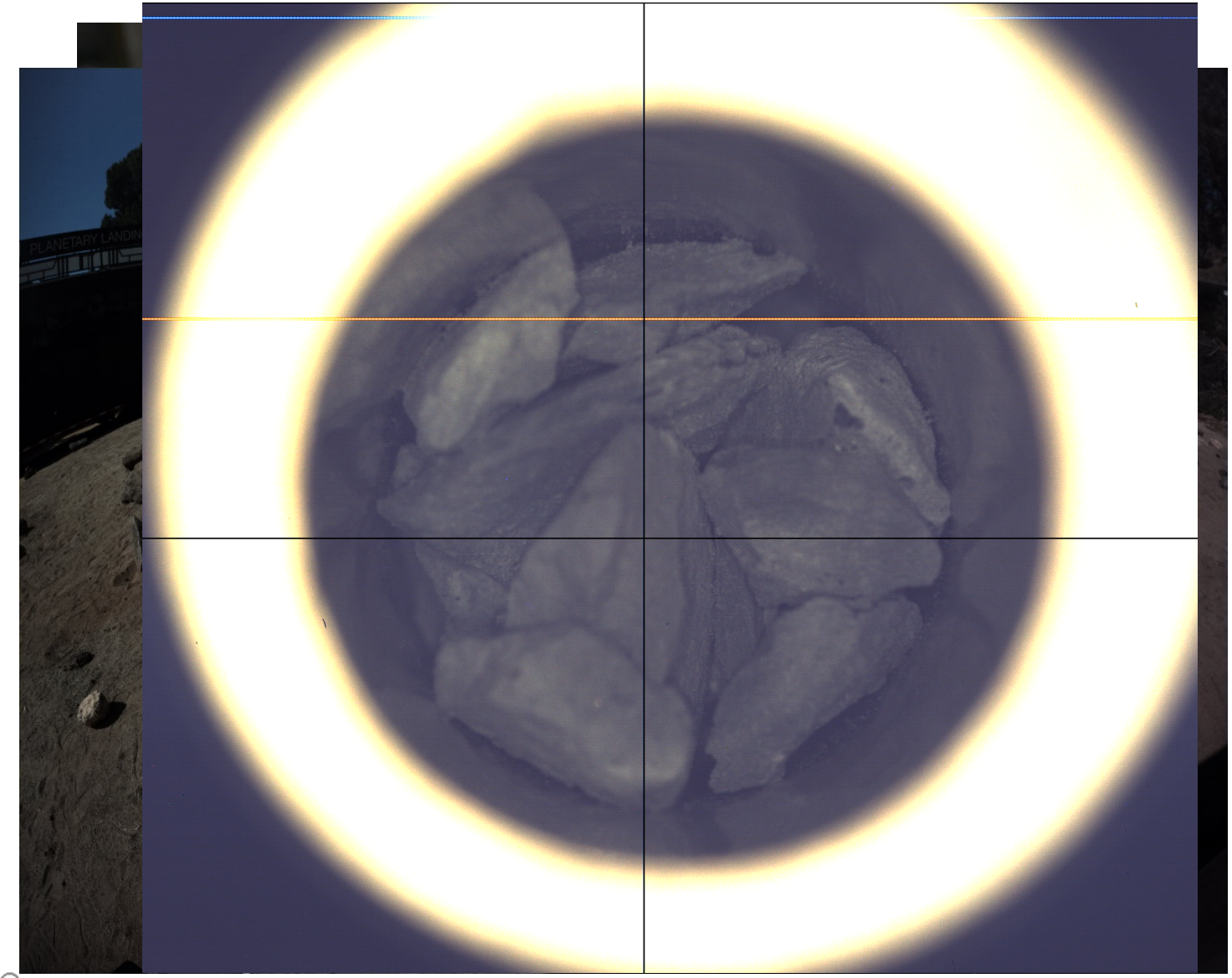
Engineering Cameras



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Mastcam-Z, MEDA, MOXIE, RIMFAX Pictures

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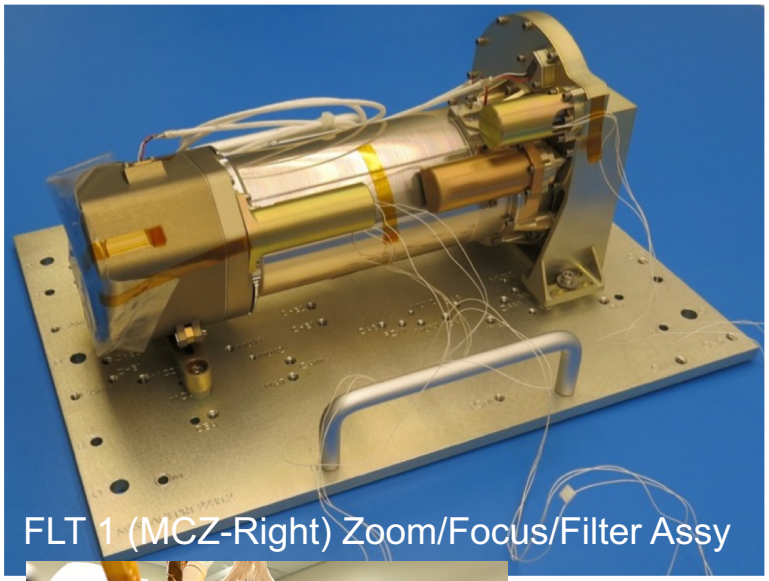
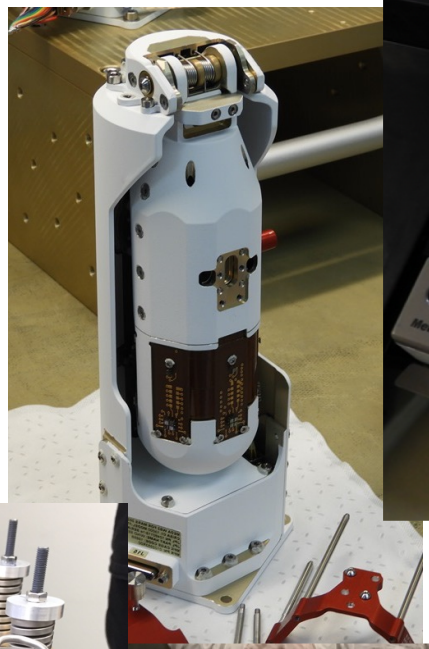
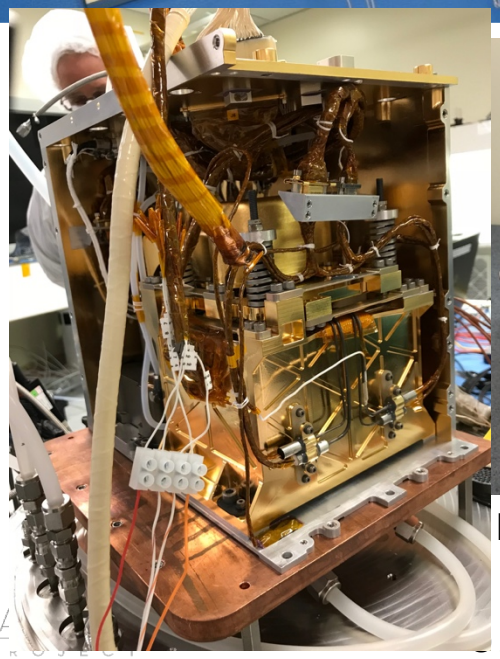
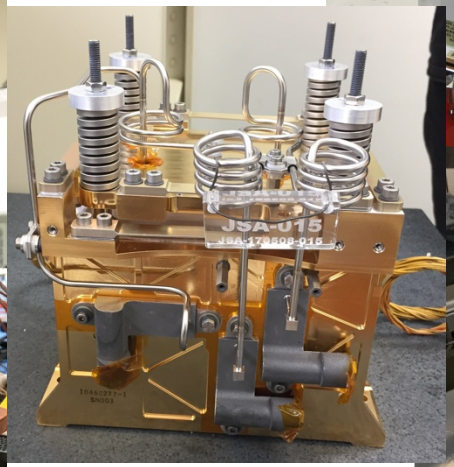


FLT 1 (MCZ-Right) Zoom/Focus/Filter Assy

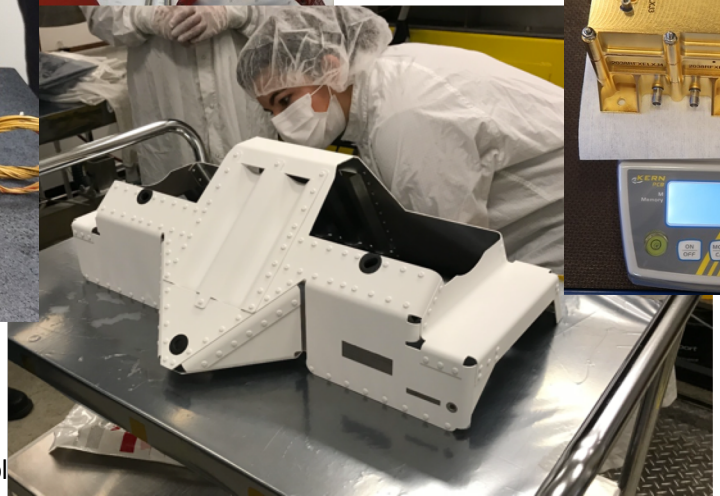
MEDA PFM ICU
& Wind Sensor 2 FM







MOXIE EM SOXE and
EM assembly (left)



RIMFAX FM
electronics &
antenna

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PIXL, SHERLOC, SuperCam Pictures

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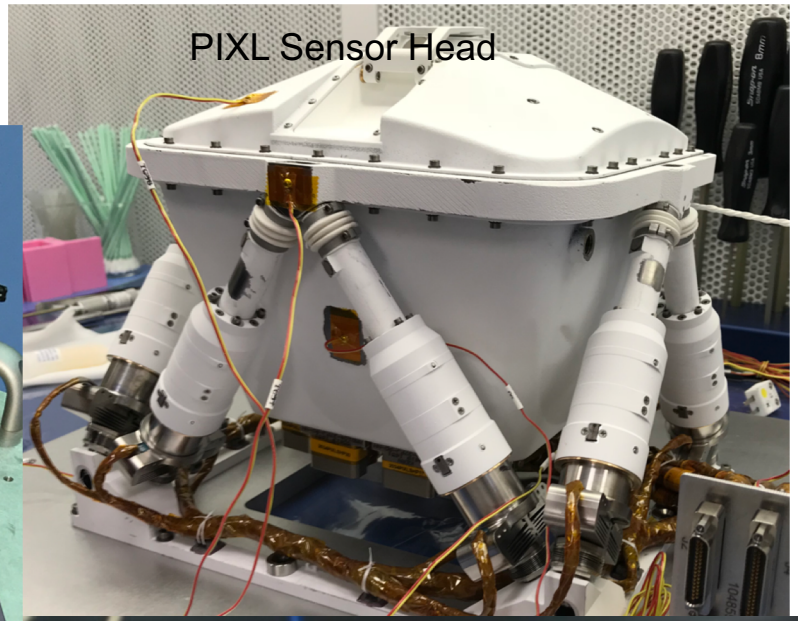

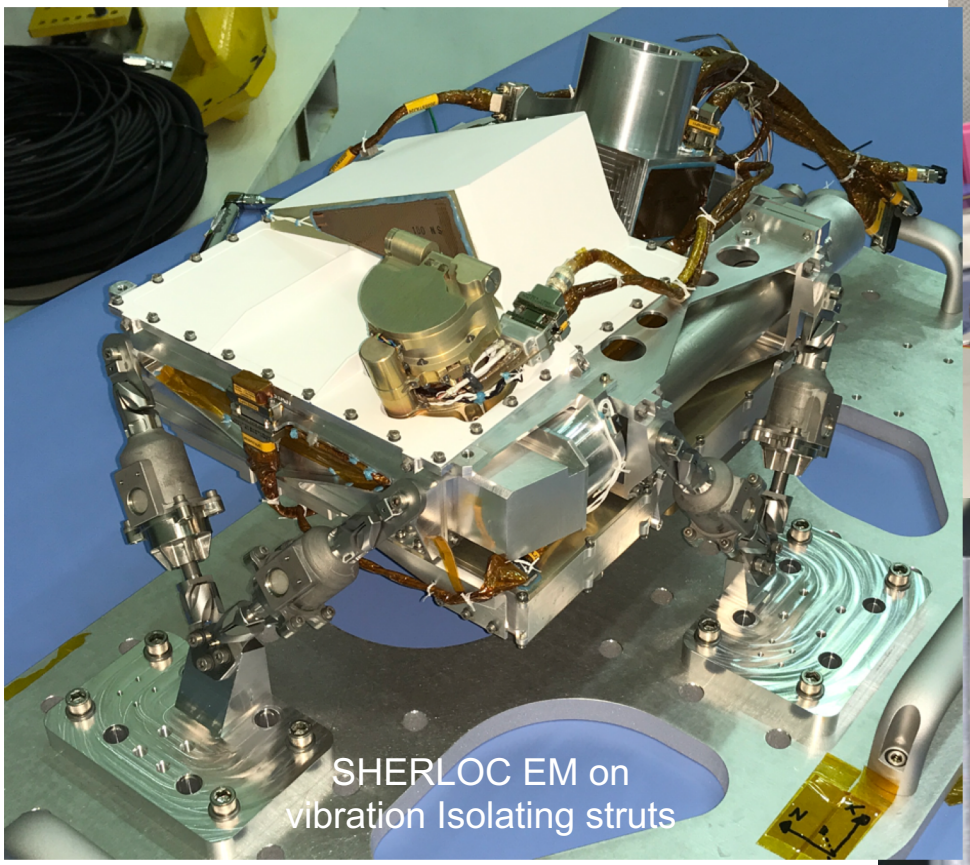

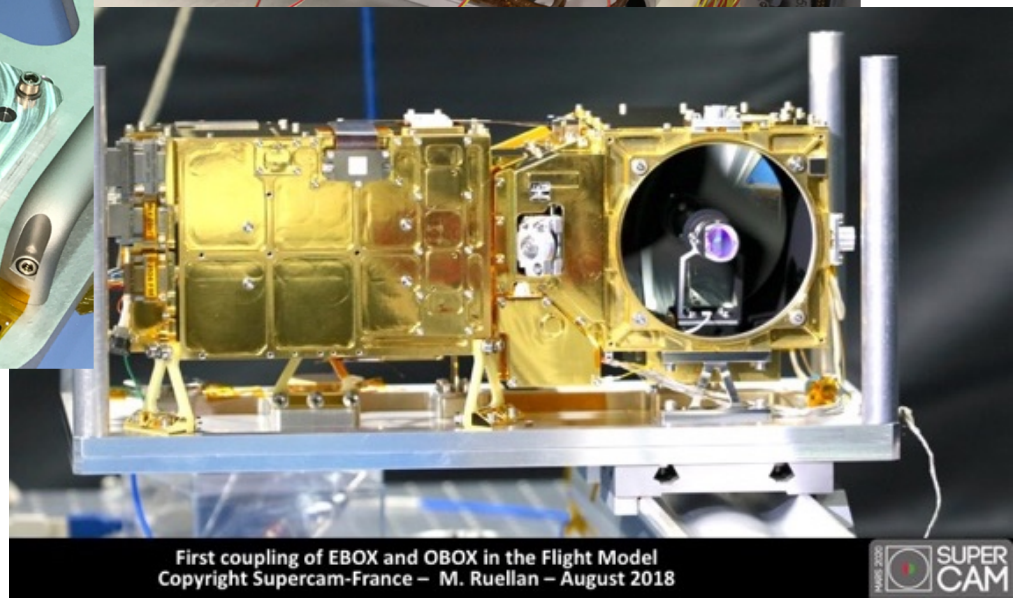

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Rover Chassis Integration in ATLO

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Internal Chassis Integration

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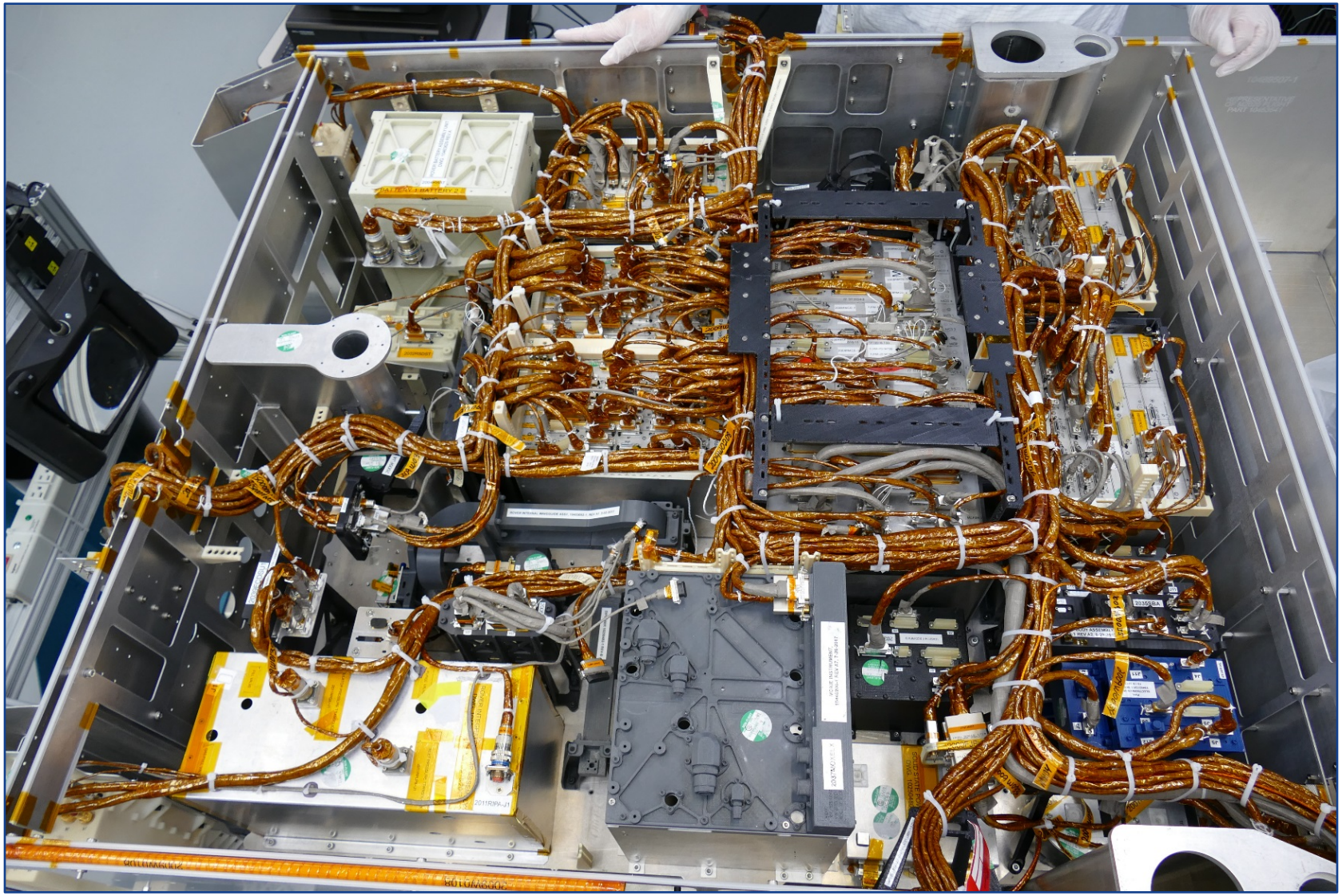

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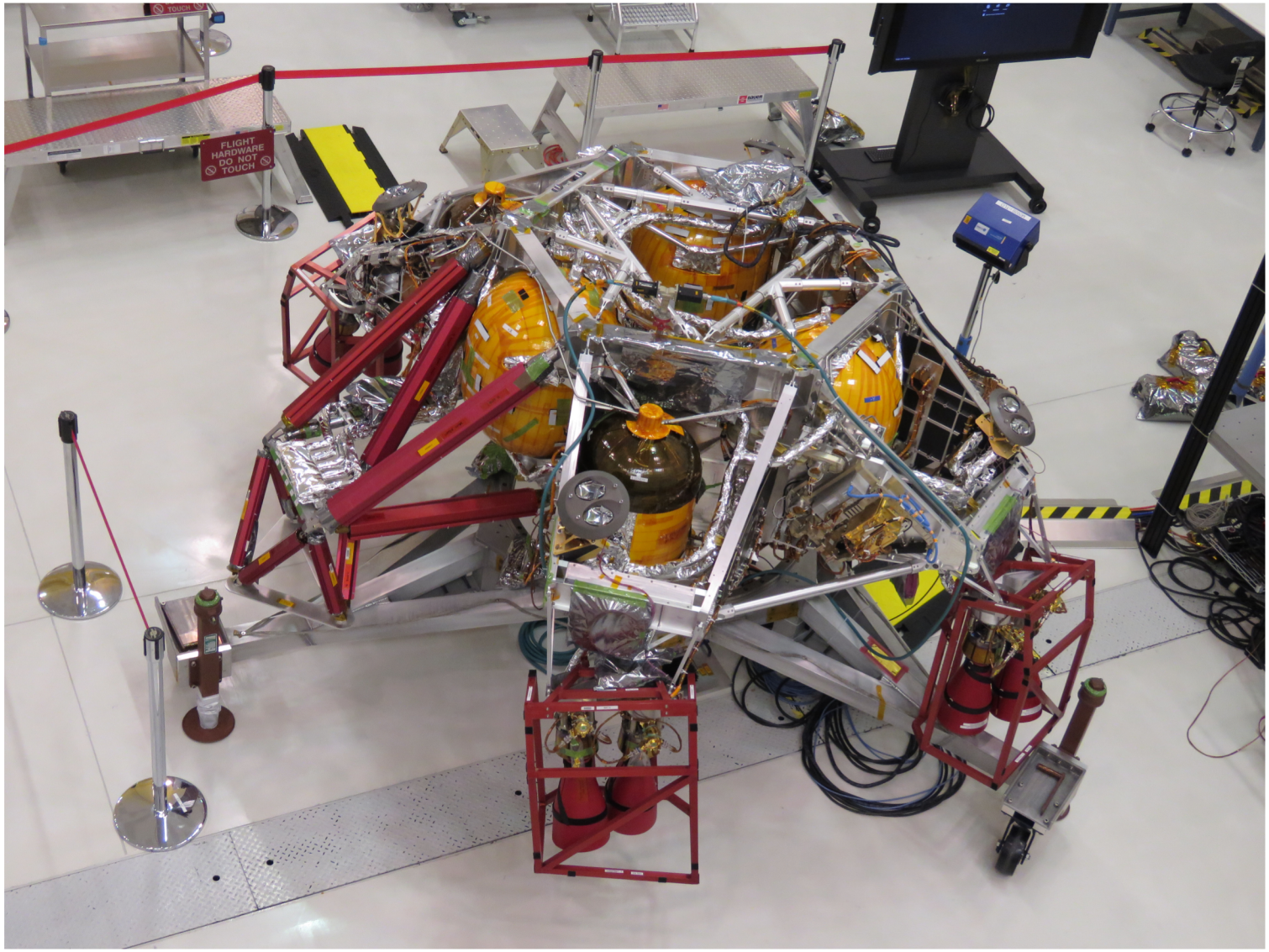
Flight Descent Stage



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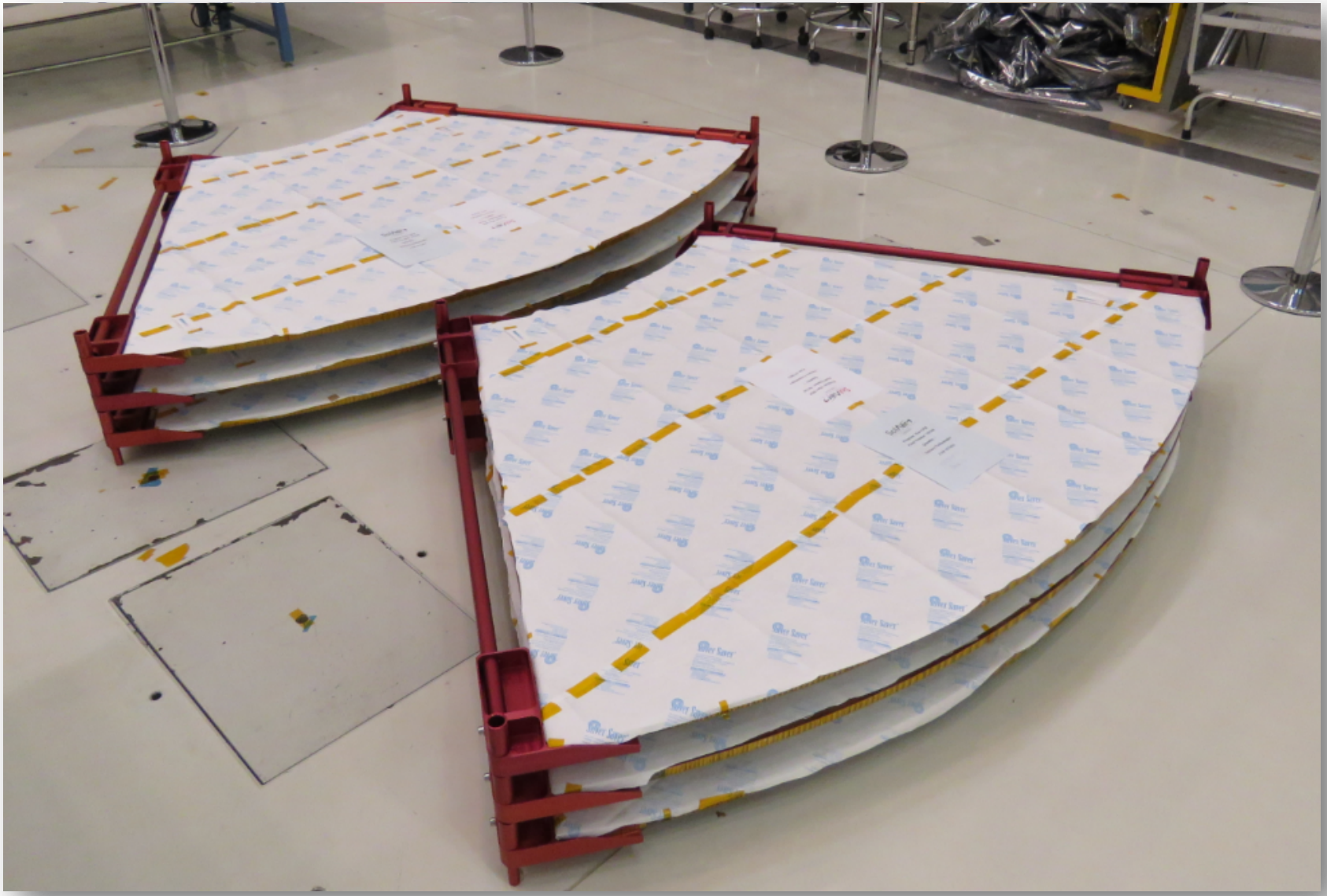
Flight Cruise Stage



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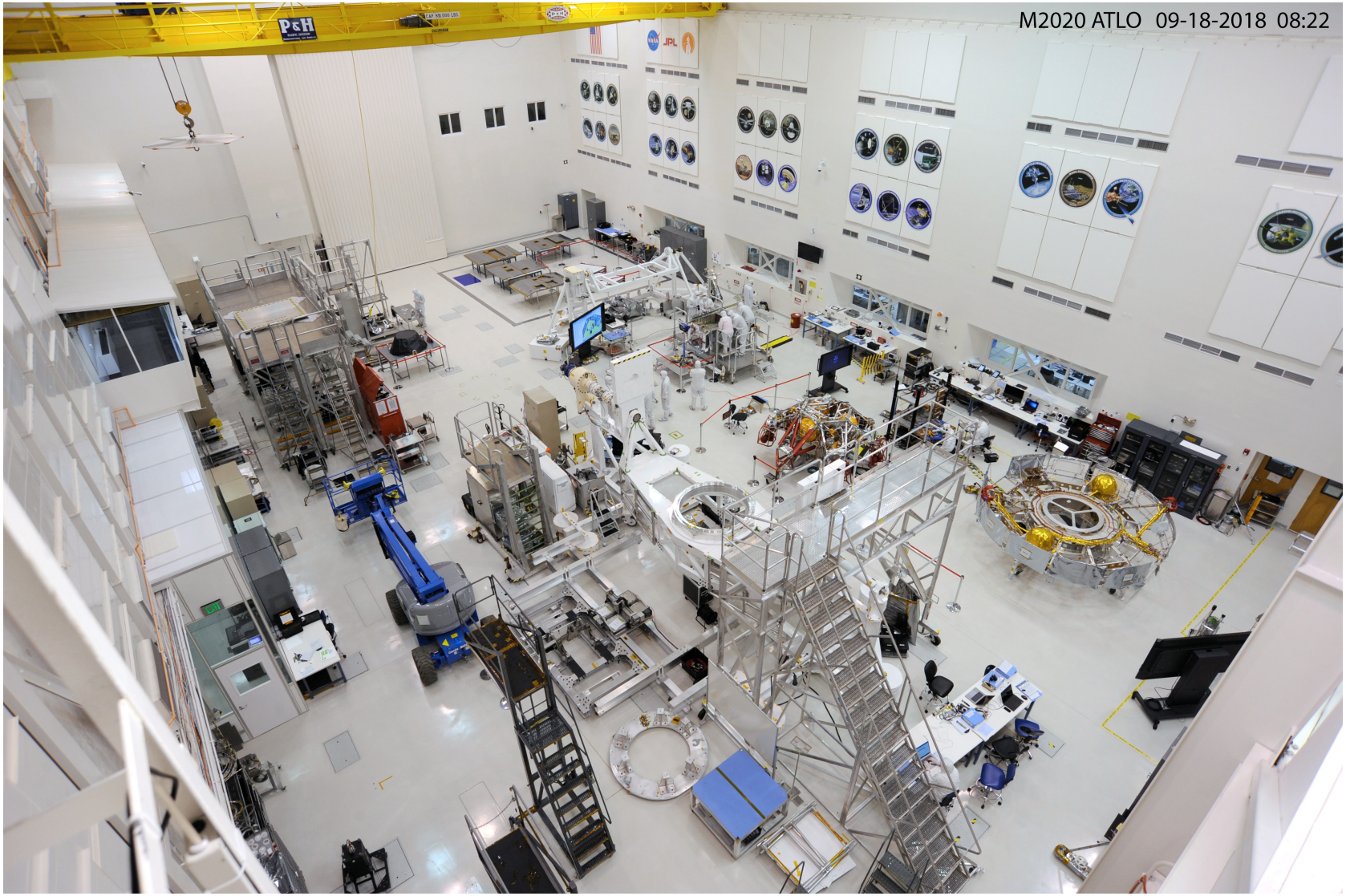
ATLO Floor



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Final Parachute Supersonic Test

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Milestones to Launch (1)

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Date	Status/Description
Jan 25, 2018	Assembly, Test, and Launch Operations Readiness Review
Feb 27-28, 2018	System Integration Review (Formal approval to proceed into system integration & test)
Apr 10, 2018	First power on of Mars 2020 flight hardware in the JPL Spacecraft Assembly Facility
Sep. 10, 2018	Landing Site Planetary Protection Review with PPO
Oct. 2 - 3, 2018	Landing Site Safety Assessment
Oct 16-18, 2018	Landing Site Workshop #3
Fall/Winter/Spring ‘18/’19	Subsystem and Instrument deliveries into ATLO (HRCR’s completed throughout 2018 and scheduled through Spring 2019 prior to deliveries)
Feb, 2019	Begin Vehicle Stack to Cruise Configuration
Apr, 2019	Cruise Configuration Thermal Vacuum Test
May, 2019	Vehicle de-stack
Sep/Oct, 2019	Surface Thermal Test

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Milestones to Launch (2)

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Date	Status/Description
Dec, 2019	Pre-Ship Review prior to vehicle shipment to KSC
Feb, 2020	Ship vehicle to KSC
Apr. 2020	Operational Readiness Review
Apr./May 2020	Key Decision Point E
May/June, 2020	Stack vehicle to launch configuration
Jun/Jul, 2020	Launch vehicle fairing encapsulation and transport to launch pad
TBD	LV Flight Readiness Review & Launch Readiness Review
Jul 17, 2020	Launch period opens

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