



making space a global endeavour

SPACE | AERONAUTICS | INDUSTRY | LRF
CORPORATE PRESENTATION

ACTIVITY SECTORS

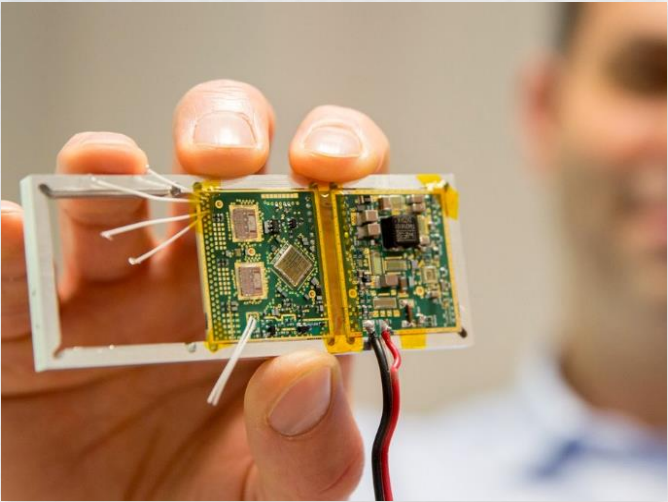
SPACE



KEY CLIENTS



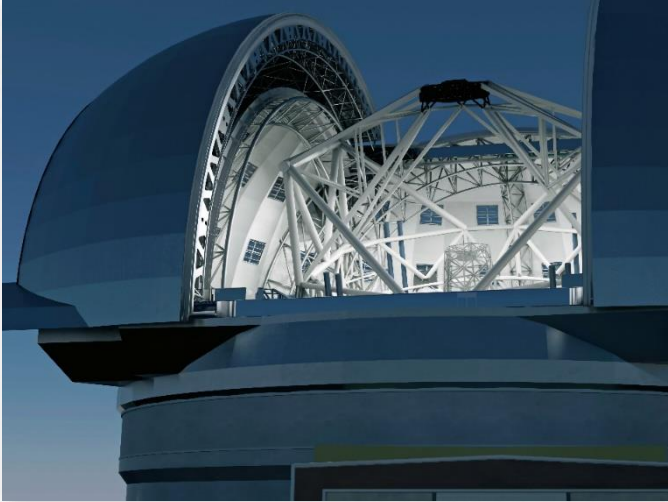
INNOVATION



KEY CLIENTS



LRF



KEY CLIENTS



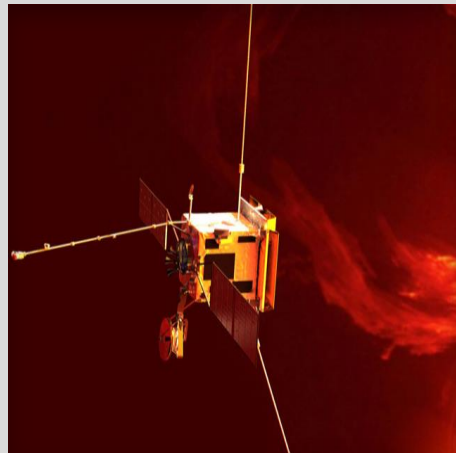
INDUSTRY



KEY CLIENTS



SPACE: TRACK RECORD SCIENCE



Solar Orbiter

Feedthroughs
MAG Boom
STMs



BepiColombo

MSASI (MMO)
MGA Boom (MPO)



EUCLID

SVM MGSE
TT&C EGSE
FGS EU STM



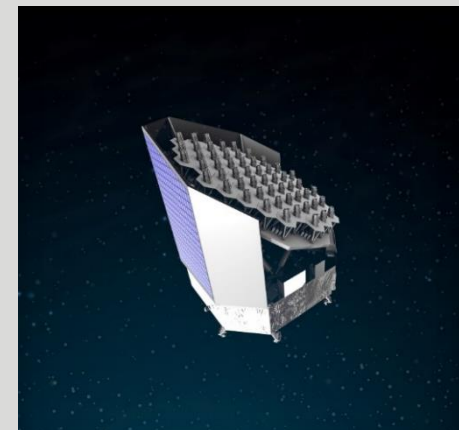
ExoMars 2018

BEMA ADE EGSE
ETM/ATB GSE
CM Solar Array MGSE
CM i-beams



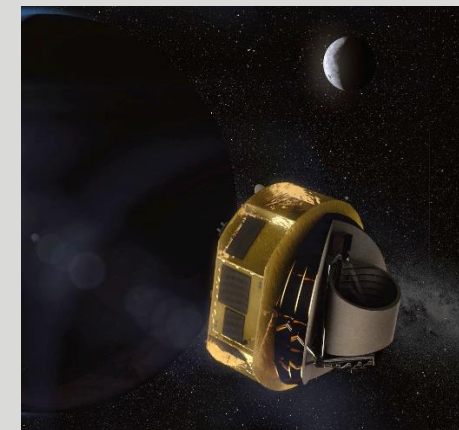
JUICE

MGAMA
RADEM / JMU (Qualif.)



PLATO

OBA Parts
CTCS EGSE
SVM STR Mach. Parts



ARIEL

Telescope Baffle



LAGRANGE

Shutters
Lens Barrel Assy
Radiators

SPACE: TRACK RECORD EO



Sentinel-4

UVN Aperture Cover MGSE;
UVN Aperture Cover EGSE



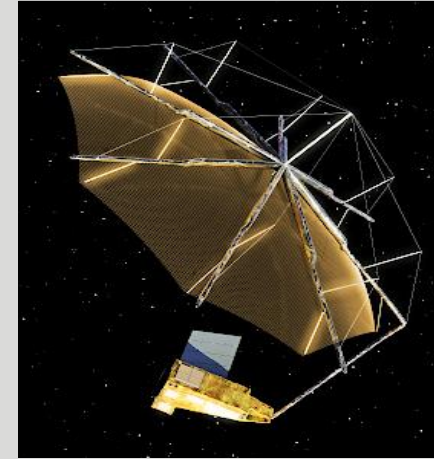
Sentinel-3

Solar Array MGSE



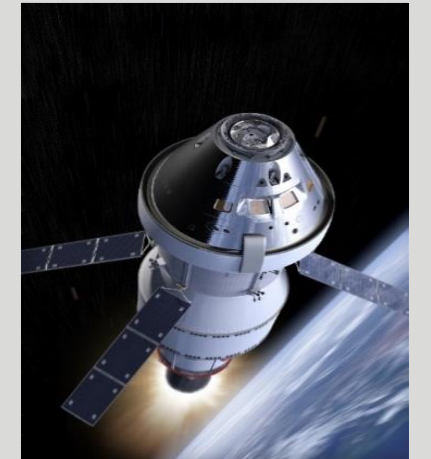
SEOSAT

UVAS Telescope Assembly;
UVAS Electronics Assembly



Biomass

Assembly MGSE
Balance Masses



ORION MPCV

TCU STA



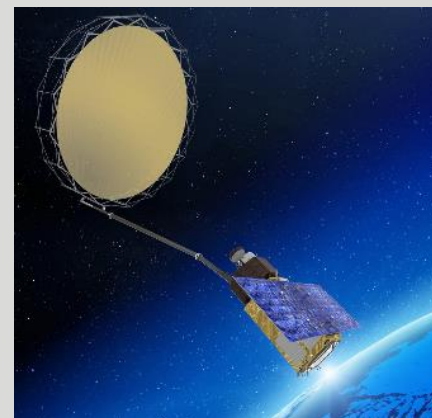
MetOp-SG

SCA SAS Structure;
SG PCDU STM



NEOSAT

Primary
Module MGSE



HPCM

CIMR MFA
CHIME (TBD)
LSTM Tert Struts + Brkt Mfg



ONEWEB

Flight Structural Bracketry



AWS

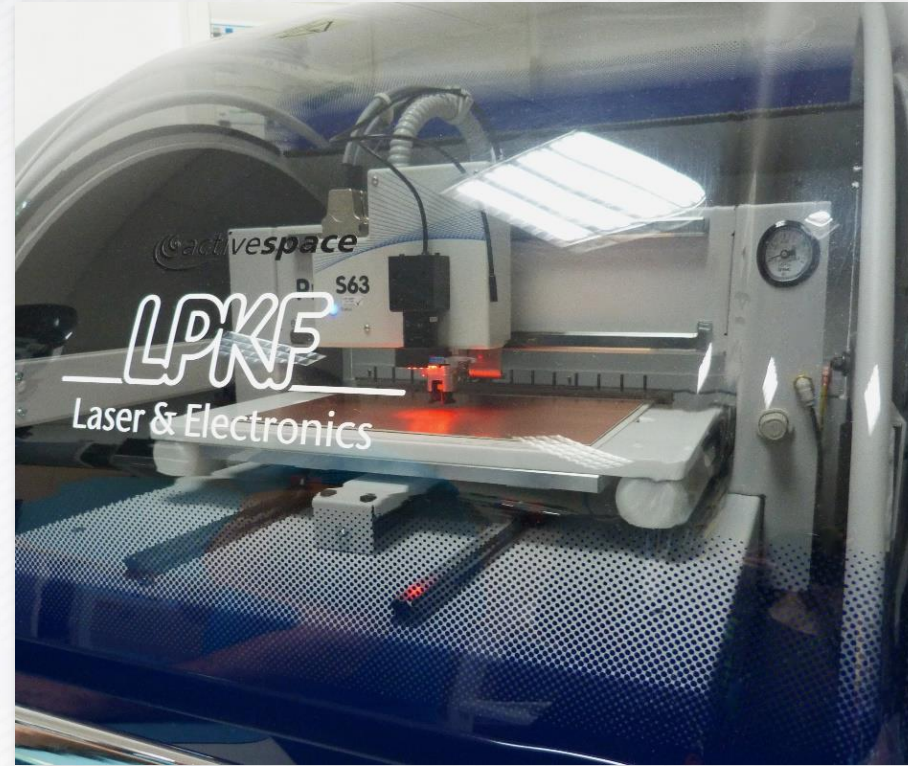
Flight Platform Structure
MGSE

CAPABILITIES



Mechanics

Design, Manufacturing,
Prototyping, Assembly, Testing



Electronics

Design, Manufacturing,
Prototyping, Assembly, Testing



Environmental testing

Manufacturing, Prototyping,
Assembly, Testing

CAPABILITIES: MECHANICS

Mechanical Design

- CAD/CAE (Catia, SolidEdge)
- FEM (Nastran, ANSYS)
- Thermal (ESATAN)
- CFD (ANSYS)

Manufacturing & Prototyping

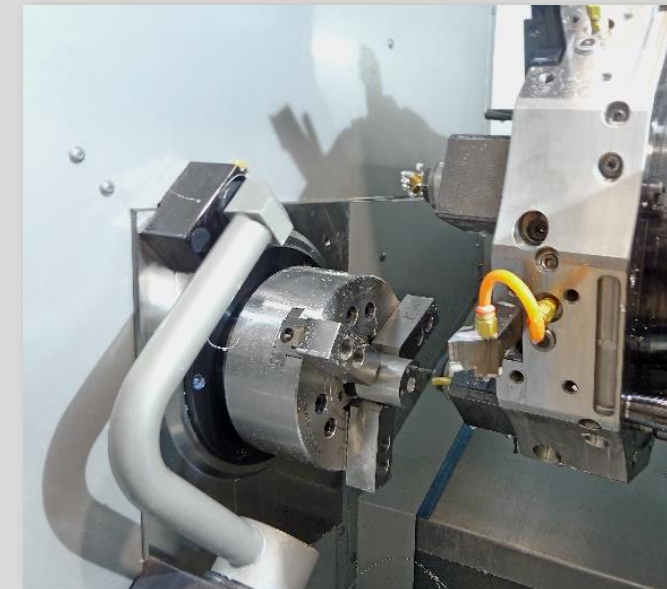
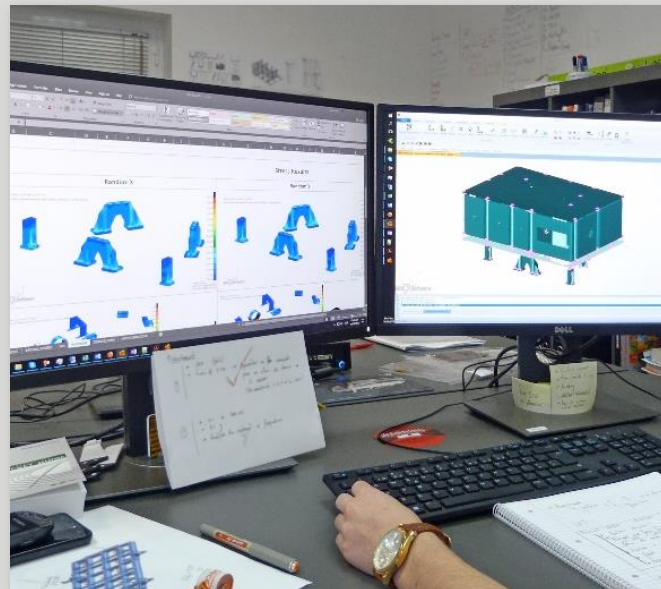
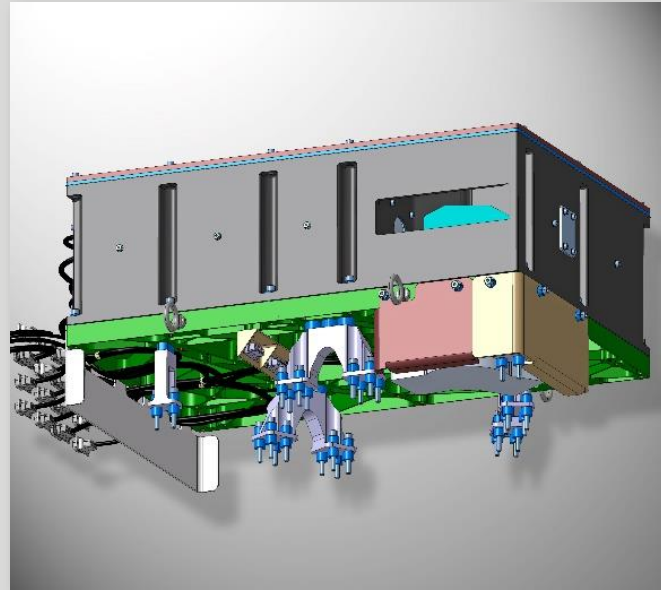
- 5 axis Mill CNC
- 3 axis Minimill CNC
- Lathe CNC
- Surface treatments
- ABS 3D printing

Assembly

- Cleanroom assembly, Ultra sound cleaning, Plasma cleaning

Testing

- Dimensional control, FARO Arm, Laser tracker, Metrologic instruments.



CAPABILITIES: ELECTRONICS

Design

- Analog, digital, and power electronics
Embedded SW, RTOS
- VHDL, LabVIEW

Manufacturing & Prototyping

- Electrical Ground Support Equipment
- Flight level Harnesses
- PCB Manufacturing (etching and machining)
- PCB Assembly

Assembly

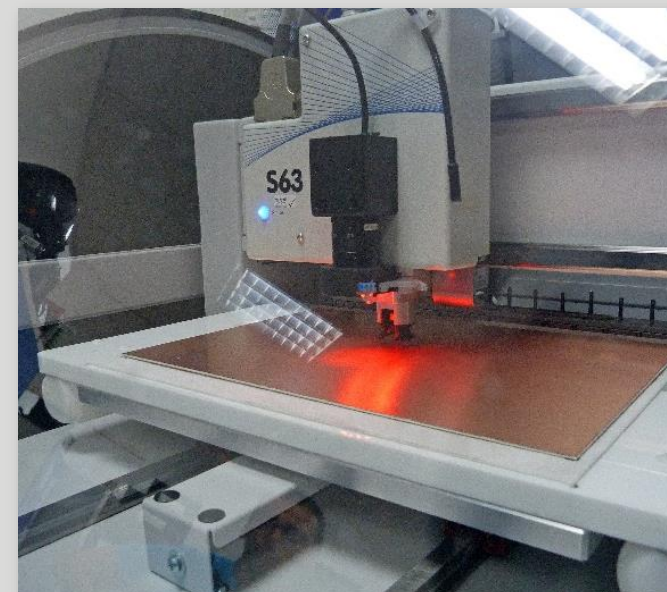
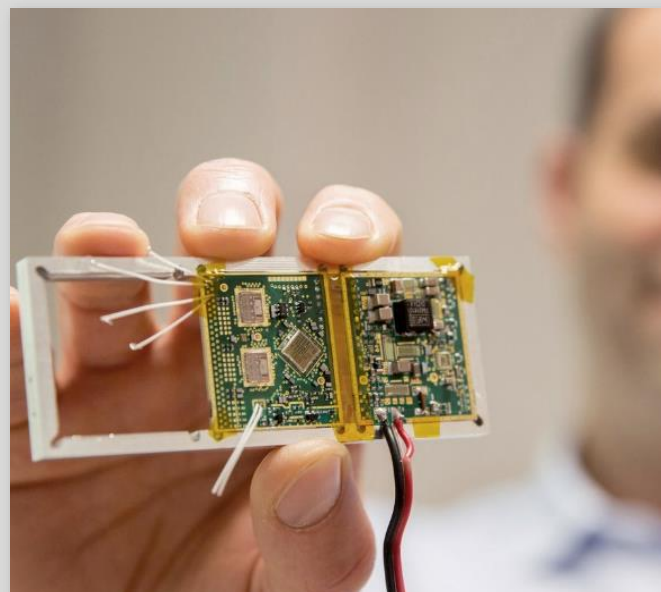
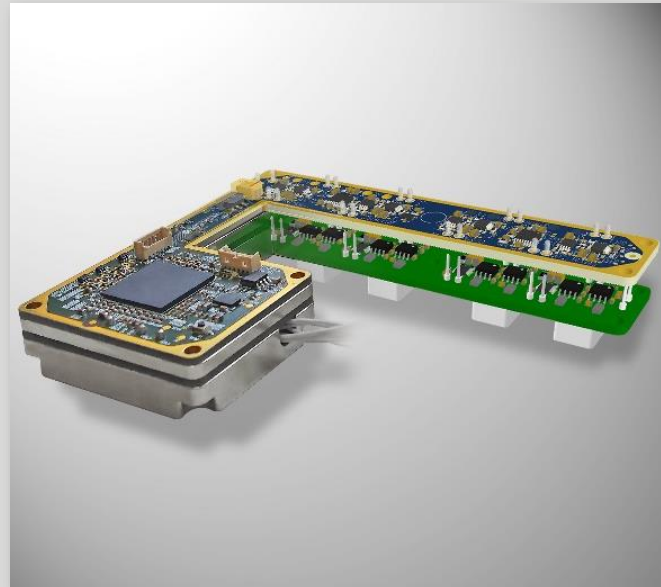
- Electrical Ground Support Equipment
- PCB Integration

Testing

- Tensile testing
- Harness Testing
- RF spectrum analyser, VNA

Certification

- Crimping ECSS-Q-ST-70-26
- Soldering ECSS-Q-ST-70-08
- SMD ECSS-Q-ST-70-38



CAPABILITIES: ENVIRONMENTAL TESTING

Cleanroom

- ISO 7;
- Dimensions [cm]: 873 x 810 (L x W);
- Temperature: $23 \pm 2^{\circ}\text{C}$;
- Relative Humidity: $55 \pm 10\%$;
- TelStar Laminar ISO 4.

Activities: assembly of parts, dimensional control of parts, hardware cleaning, electronics soldering, manufacturing of electrical harnesses, electrical assemblies, PCB assembly.



Thermal Vacuum Chamber

- ISO 7;
- Feedthroughs: 3 Sub-D 25
- Data acquisition: 40 Channels

Thermal cycling tests of space materials and hardware between 200 K and 473 K in vacuum environment ($< 1 \times 10^{-5}$ mbar) with a temperature change rate up to 2 K/min.



Shaker

- ISO 5
- Slip Table for 3 axes and increased flexibility
- Total Force: 22 kN; frequency range: 5 – 3000 Hz
- Half sine peak shock force: 44 kN
- Sinusoidal, random vibrations, shock loads
- Fatigue and long duty cycles

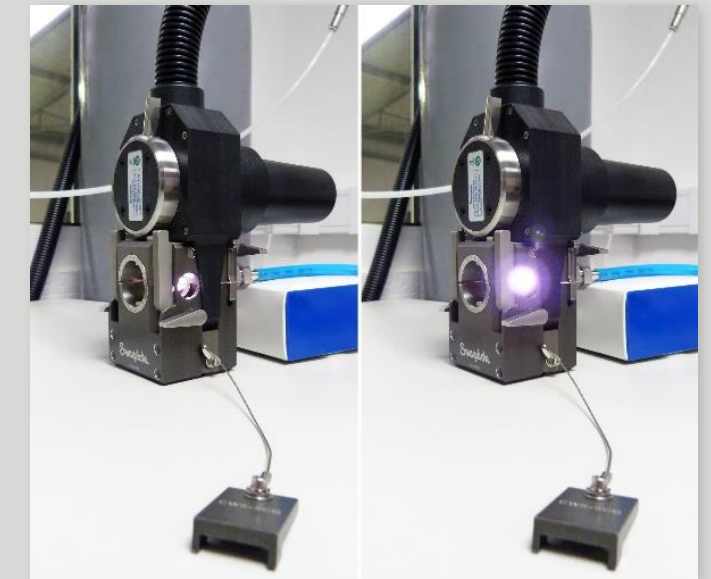
Vibration testing services for small/medium size hardware for space applications, with requirements applicable to other industries



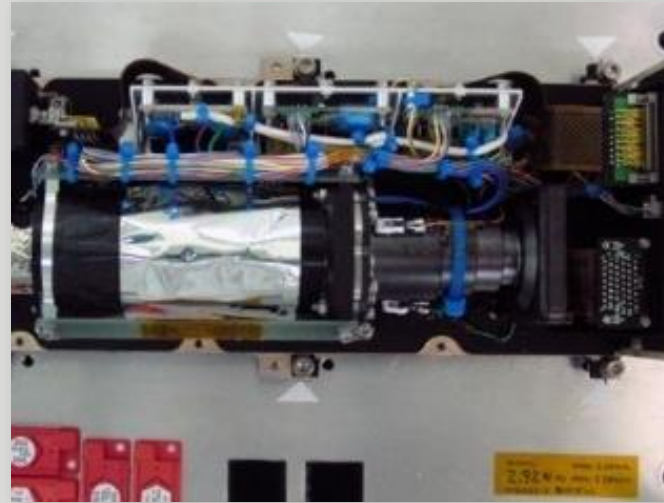
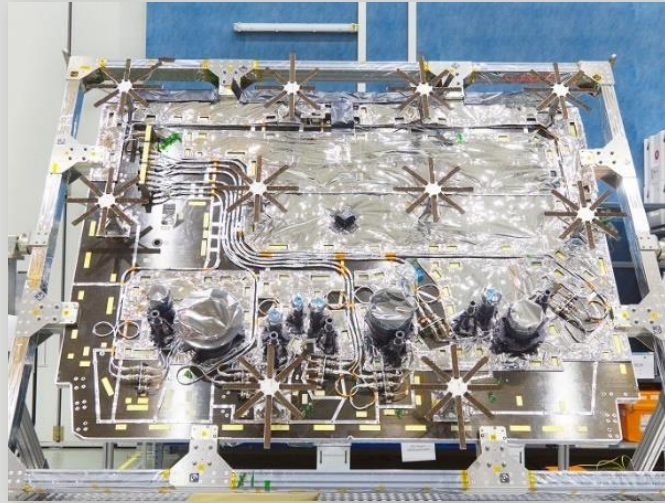
TIG Orbital Welding

TIG Orbital Welding of stainless steel tubes

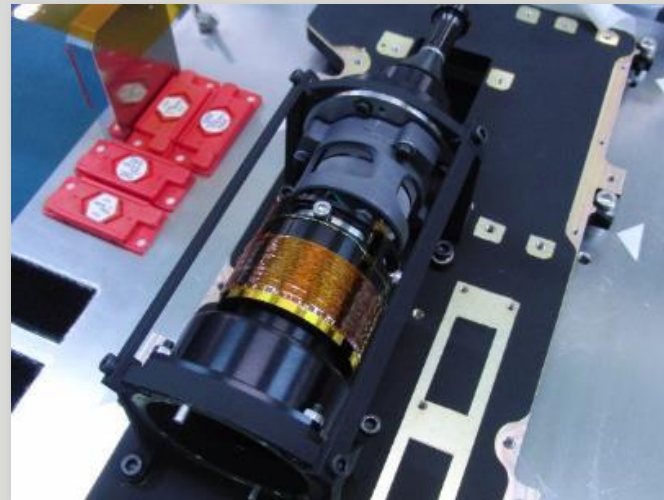
- Diameters: 1/8", 1/4", 1/2", 6 mm;
- Helium leak testing.



SPACE: FLIGHT HARDWARE



Solar Orbiter/ Feedthroughs
MTD, STM, EQM, FM



BepiColombo (MMO)/ MSASI
STM, EQM, FM

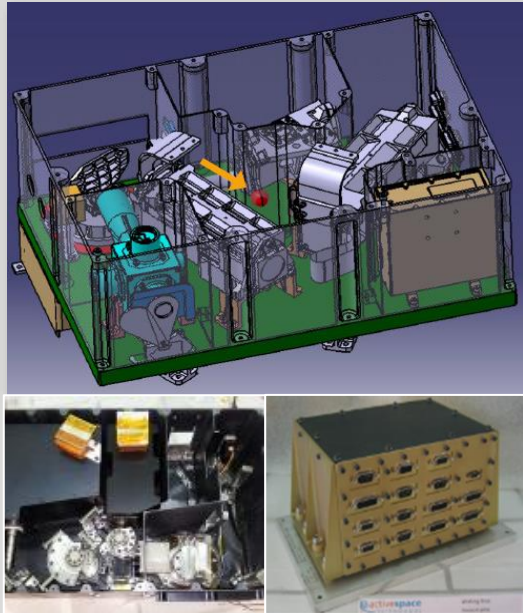


Solar Orbiter/ MAG Boom
EQM, FM



BepiColombo/ MAG Boom
EQM, PFM, FM

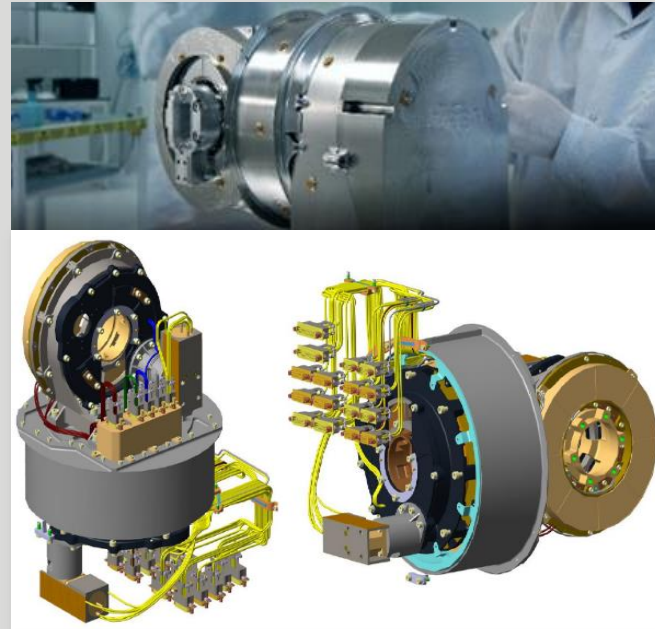
SPACE: FLIGHT HARDWARE



SEOSAT / UVAS
EQM, FM



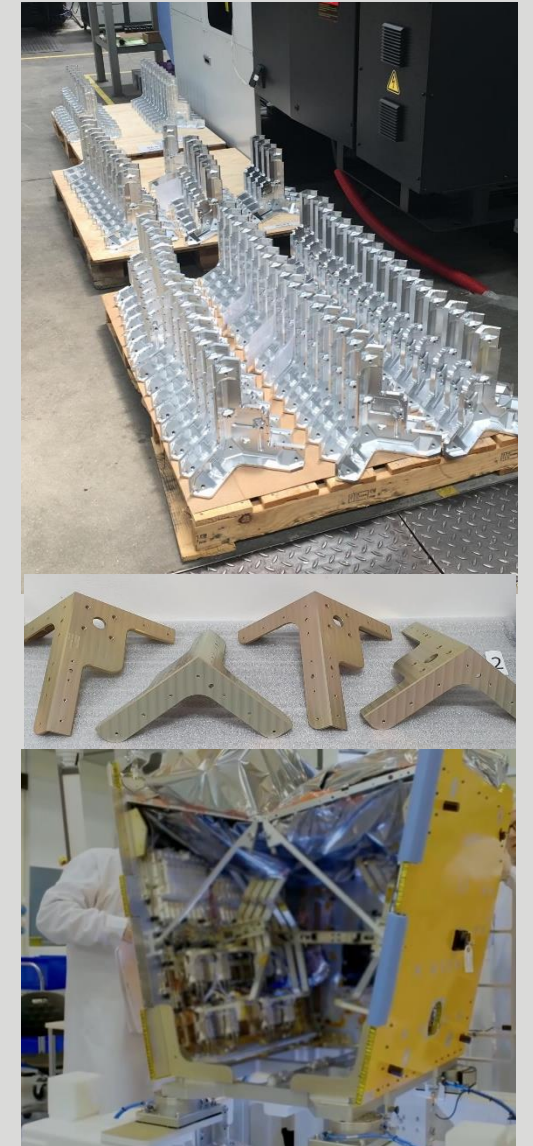
ExoMars / i-Beam
EQM, PFM, FM



JUICE / MGAMA
LTM, PFM



PLATO / OBA
EQM, PFM, FM



ONEWEB / Bracketry
FM

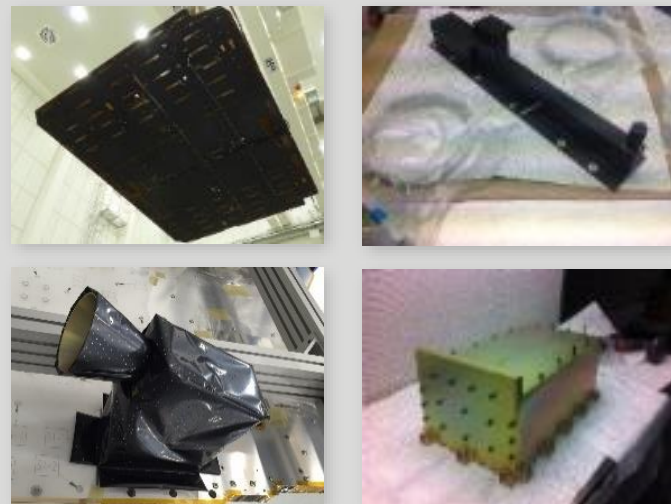
SPACE: STMs



SEOSAT/ UVAS
SQM



Orion MPVC/ TCU
STA



Solar Orbiter/ STM
STM



EUCLID / FGS EU
STM

SPACE: MGSE



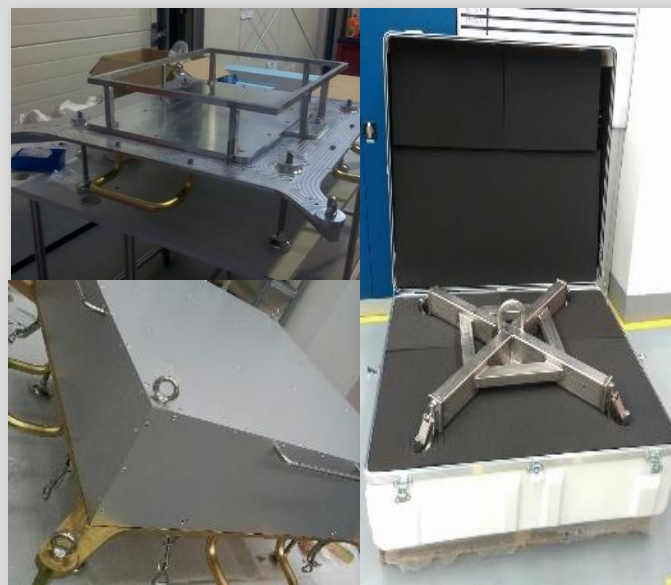
Sentinel-3/Solar Panels

Container; Trolleys; Hoisting



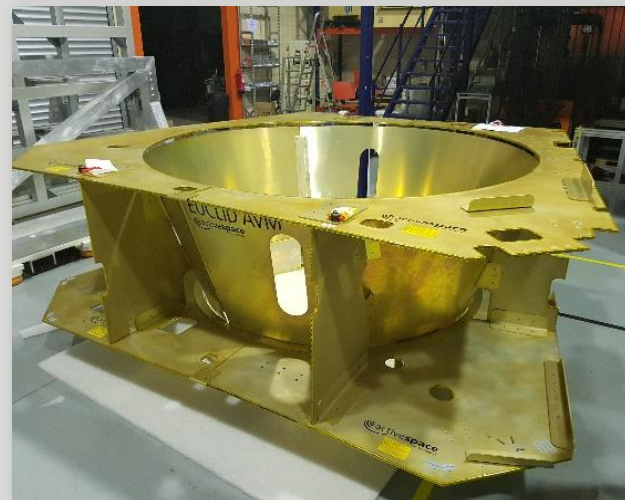
ExoMars/CM Solar Panels

Container; Trolleys; Vibration Tool



Sentinel-4/ UVN Aperture

MGSE/ EGSE



EUCLID/ SVM

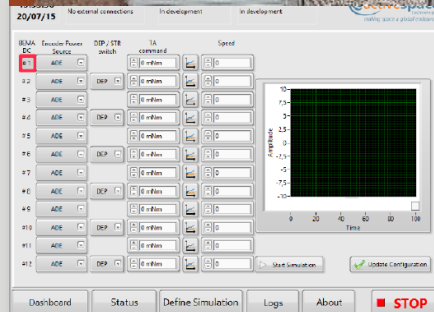
Assembly Tool; Avionics Module



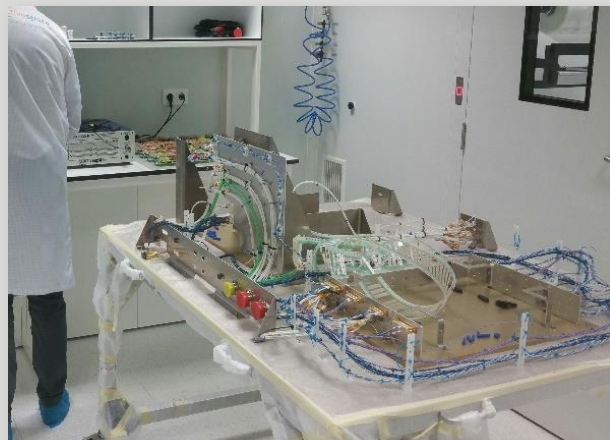
Biomass

BIT / BIJ

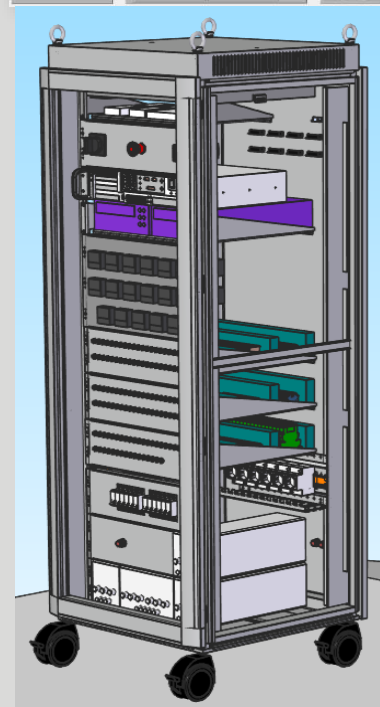
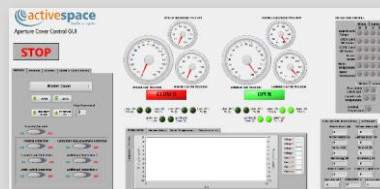
SPACE: EGSE



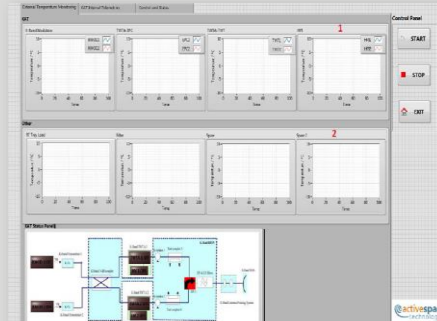
ExoMars/ BEMA ADE
EGSE



ExoMars/ Rover
Avionics Test Bench;
Electronics
Test Bench



Sentinel-4/ UVN
Aperture
MGSE/ EGSE



EUCLID/ TT&C
EGSE

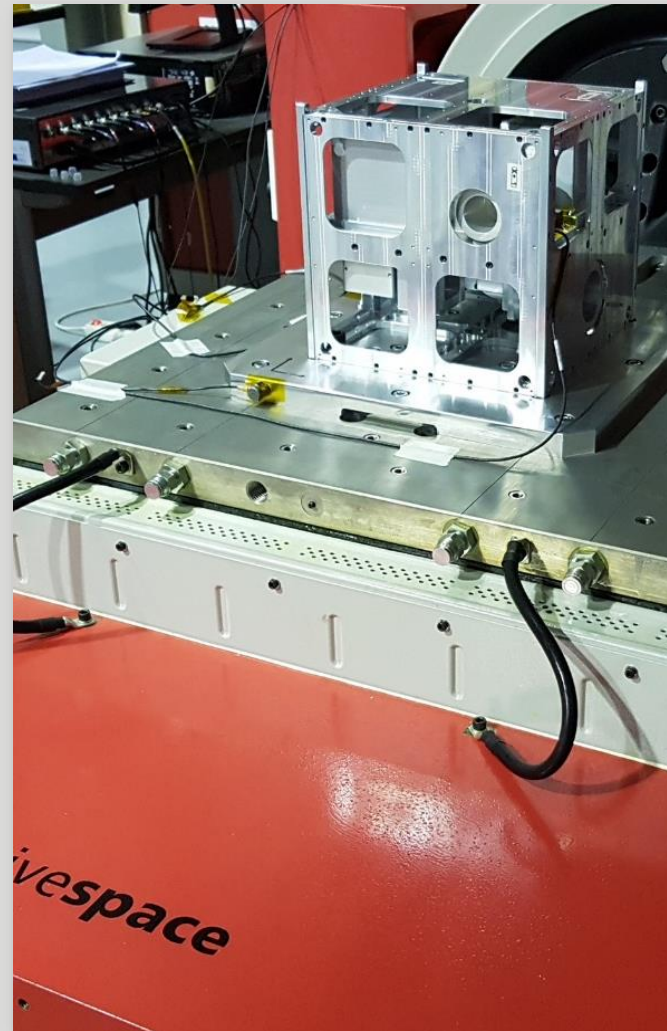


PLATO / TCS
EGSE

SPACE: ENVIRONMENTAL TESTING



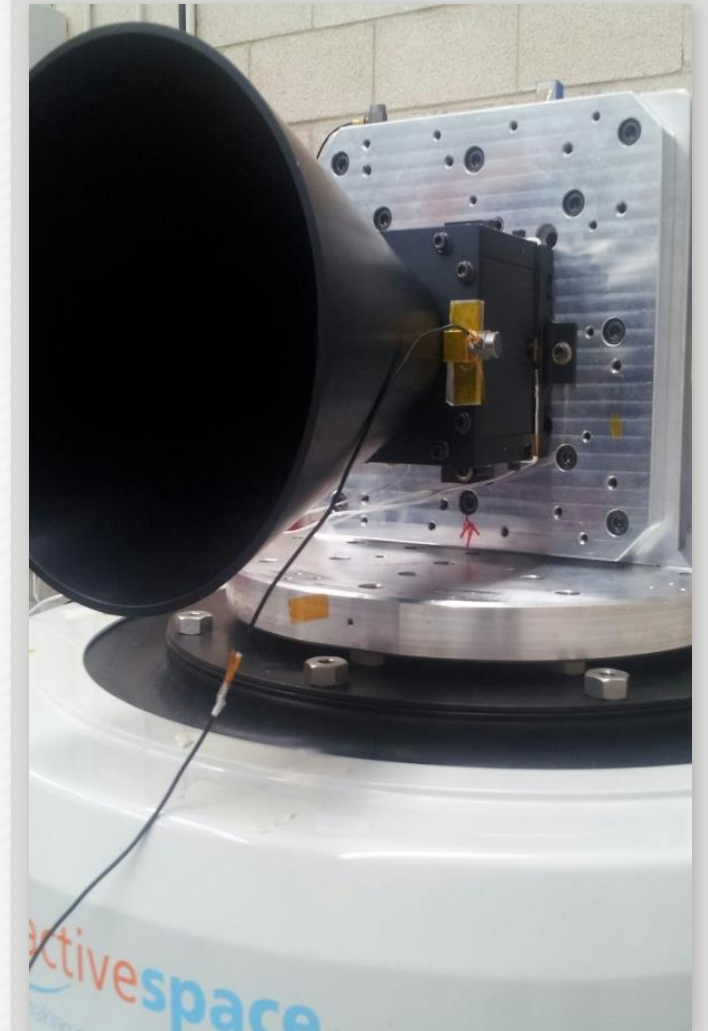
JUICE/ MGAMA
TVAC



RedShift/ Cubesat
Shaker



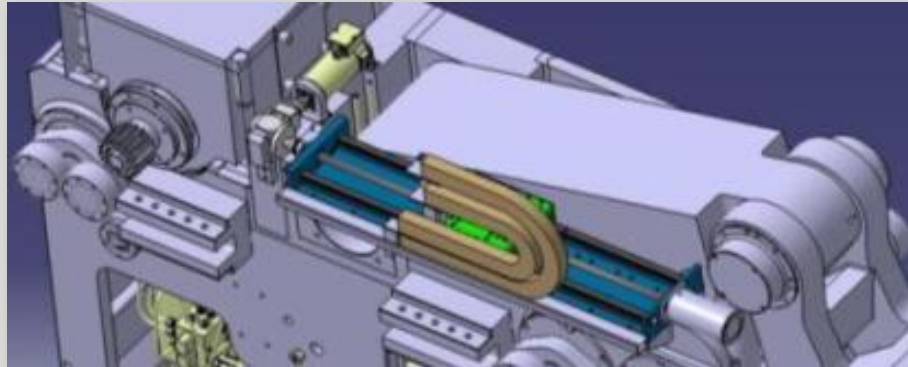
MetOp-SG/ RF Targets
TVAC



Solar Orbiter/ STMs
Shaker

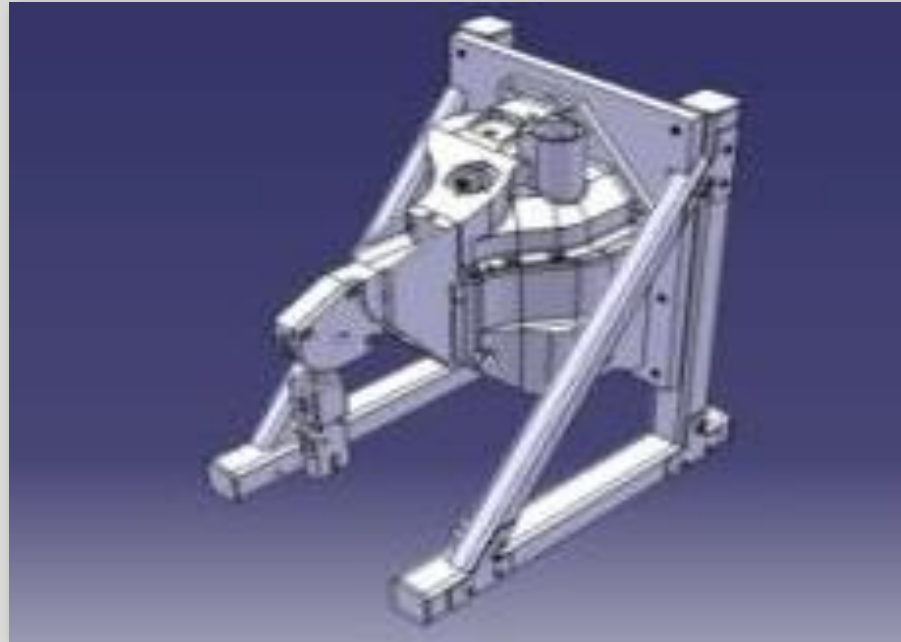
...currently working on JUICE

LARGE RESEARCH FACILITIES

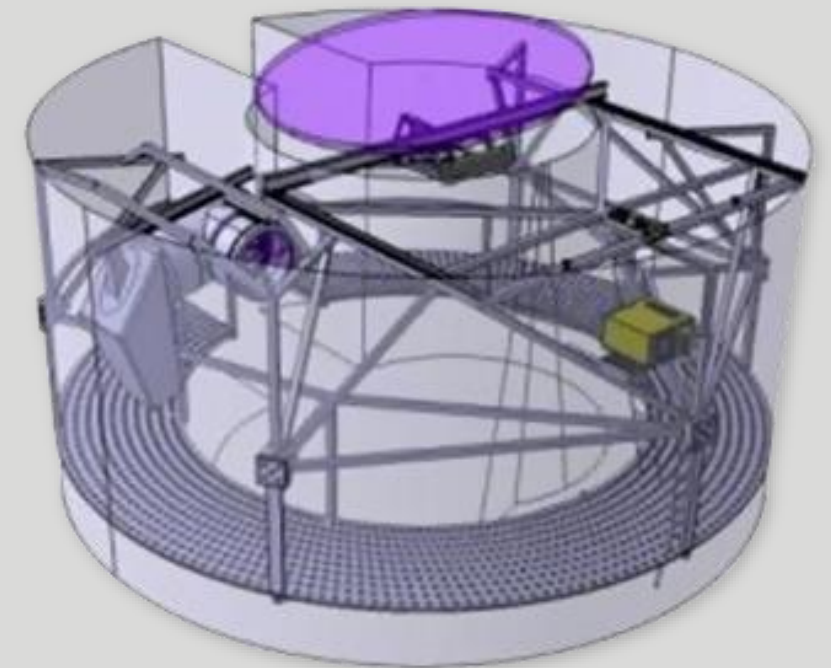


ITER/ Remote Handling

DTP2; Design accurate positioning;
Linear acc. $< \pm 5 \mu\text{m}$; Gamma rad.: 10 MGy

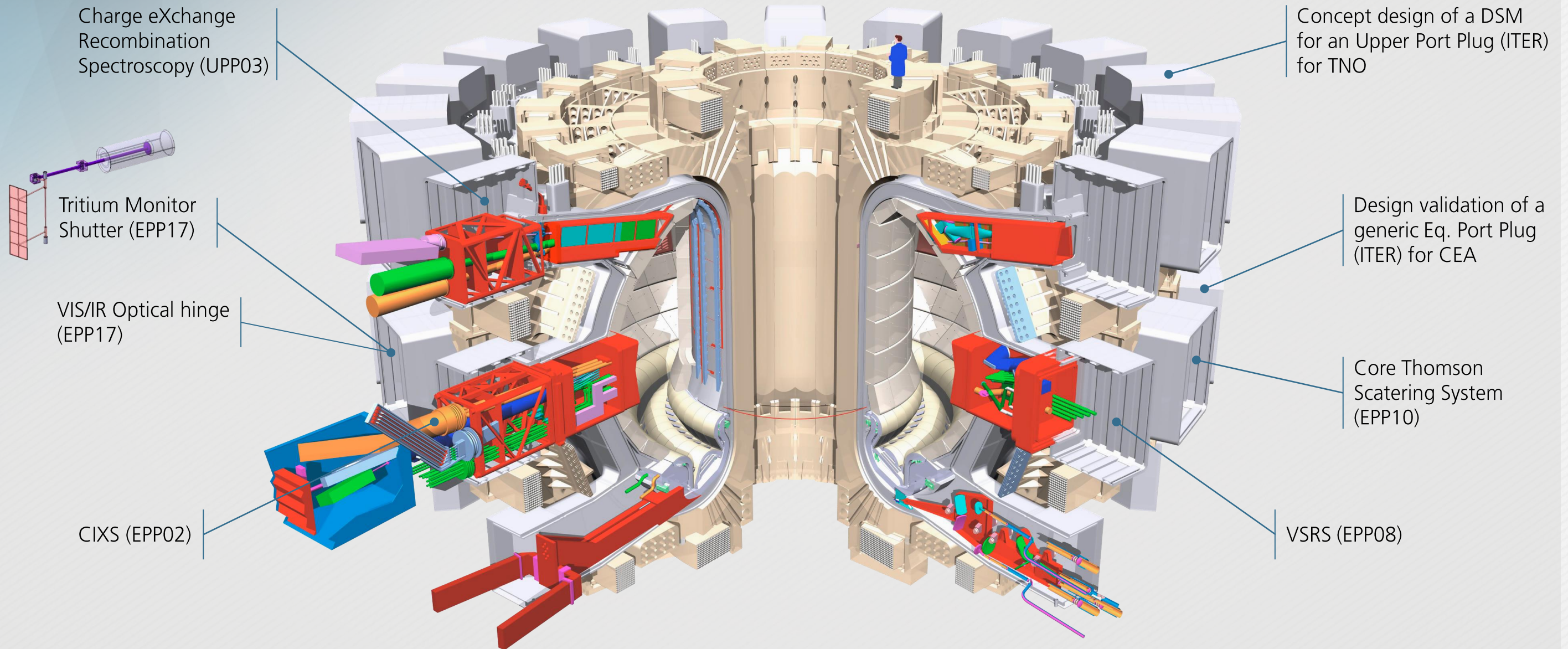


JET/100 kg Winch



ESO/ E-ELT AOCU

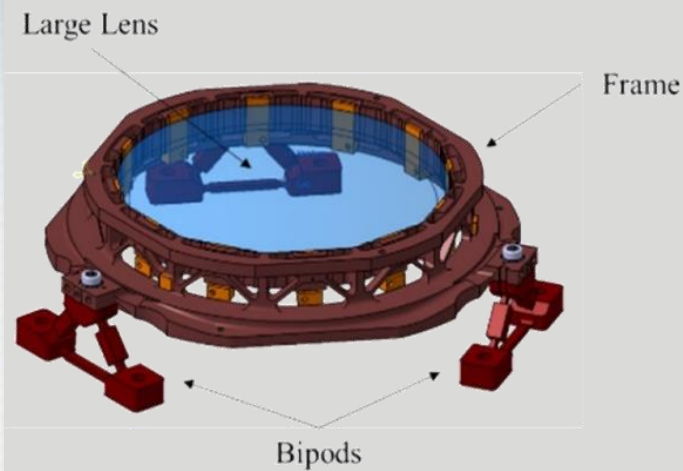
LARGE RESEARCH FACILITIES - ITER



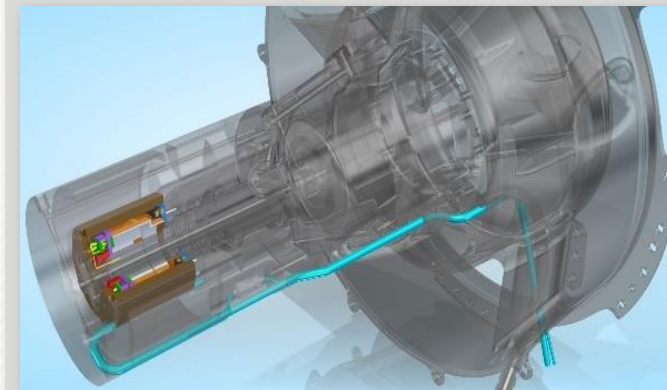
INNOVATION



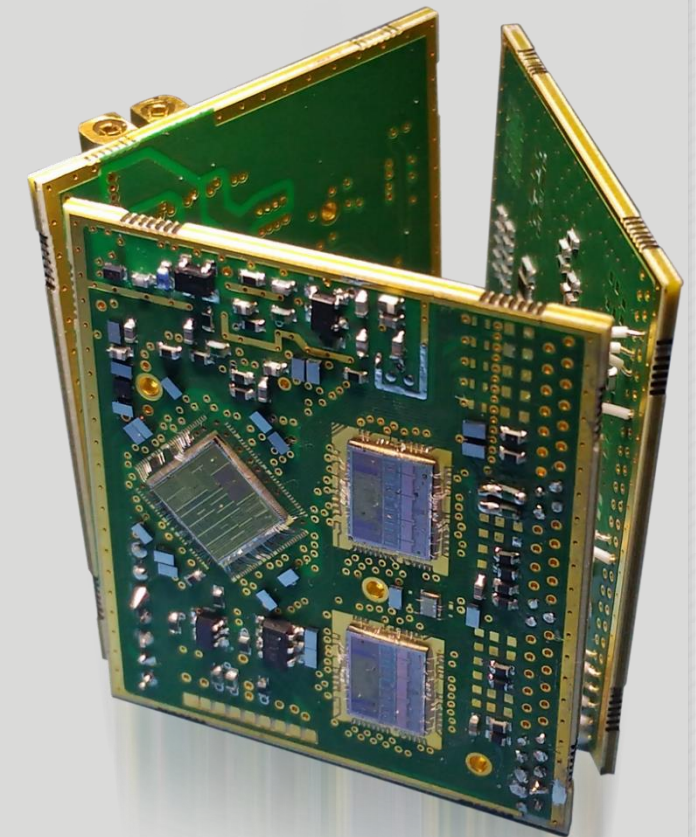
PT2020 / INFANTE
Power sub-system



PT2020 / Additive Manufacturing
Design and manufacturing
OHB



ESA ARTES
Wireless Slip Ring



TRP / ESA
Miniaturized DSP / Processor Board
for Science and Robotic Exploration



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