Lab and Facilities at OATo

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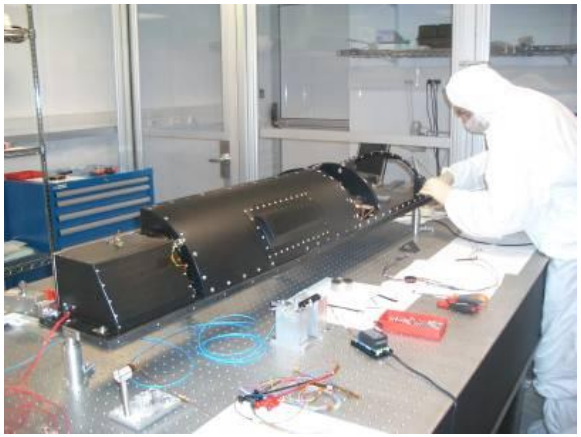
INAF – Osservatorio Astrofisico di Torino

22 June 2022

People involved from INAF: Silvano Fineschi, Gianalfredo Nicolini, Gerardo Capobianco, Giuseppe Massone, Federico Landini, Valeria Caracci, Luca Zangrilli

Inner OATo facilities

- **Optics Laboratory with an ISO 7 clean room (Gerardo Capobianco)**



- **Electronics Laboratory (Leonardo Corcione)**
- **Machine Shop (Valeria Caracci)**

Optical Payload System Facility - OPSys

people involved and contacts

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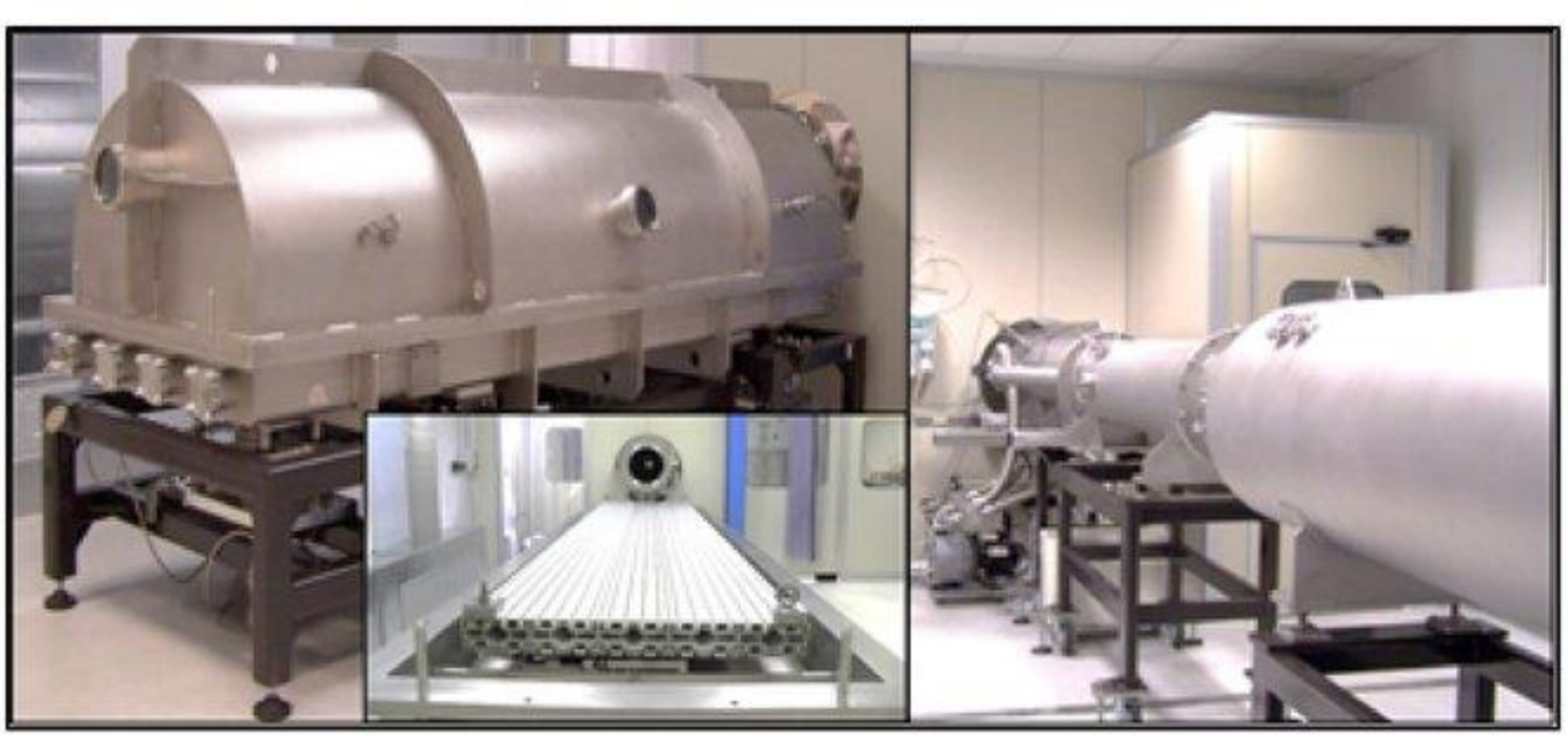
Optical Payload System Facility (OPSys)

The Optical Payload System (OPSys) is an INAF (italian National Institute for Astrophysics) facility hosted by Aerospace Logistics Technology Engineering Company (ALTEC SpA) in Turin, Italy.



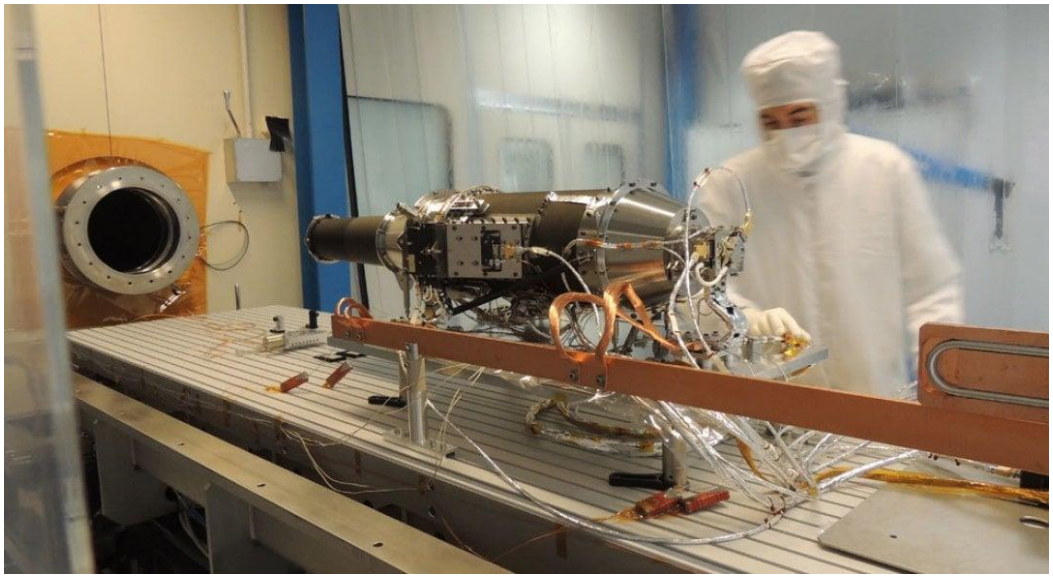
Optical Payload System Facility (OPSys)

The facility is composed by:

- three clean rooms having different cleanliness levels;
- a thermo-vacuum chamber (SPOCC, Space Optics calibration Chamber) with a motorized optical bench and several light sources covering the range from the extreme ultraviolet to the red light wavelengths.

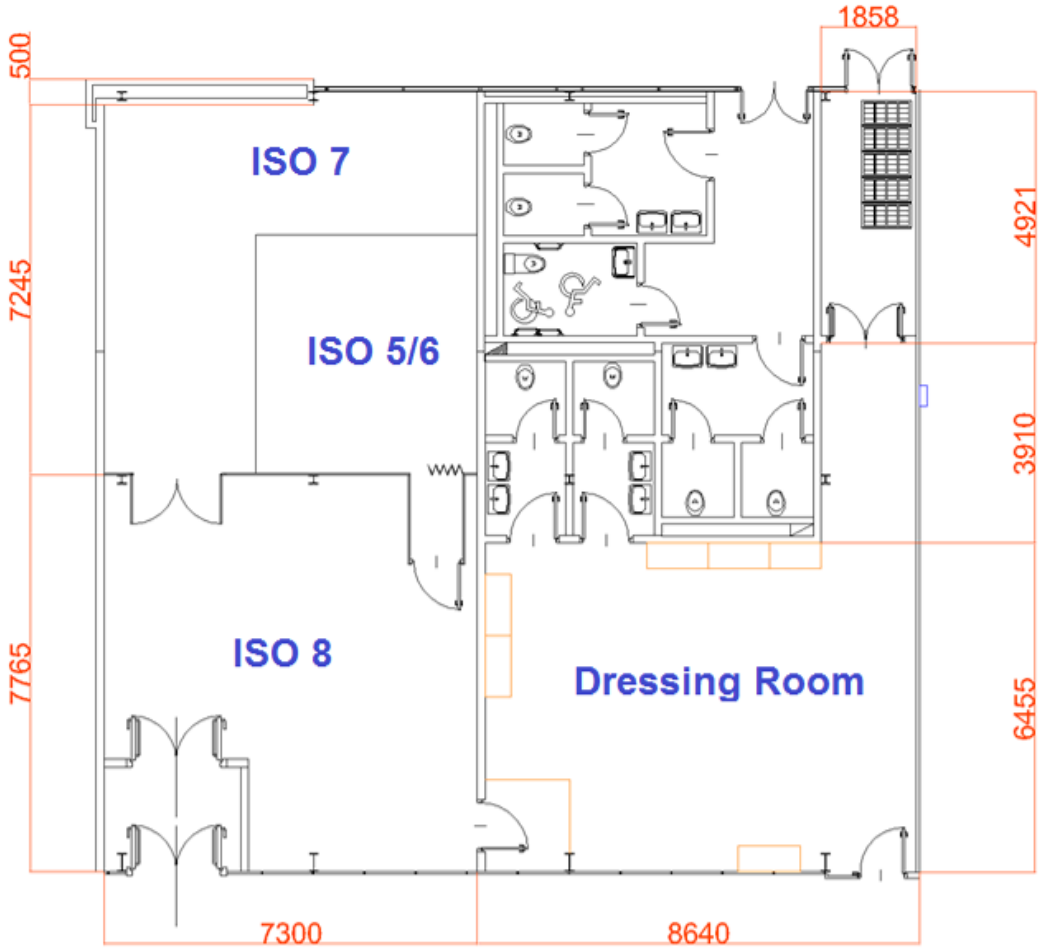
Optical Payload System Facility (OPSys)

The SPOCC has been designed having in mind the very stringent requirements of the calibration of solar coronagraphs and the suppression of the stray-light. The facility hosted the calibration campaigns of different instrument: SolarOrbiter/Metis, ASPIICS, Antarcticor, … CorMag and CODEX in the forthcoming months.



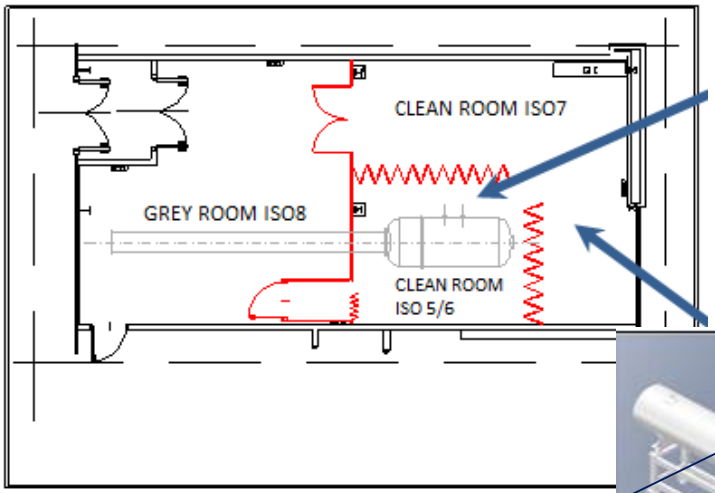
Metis coronagraph during the alignment test on the SPOCC optical bench

Optical Payload System Facility (OPSys) Overview:

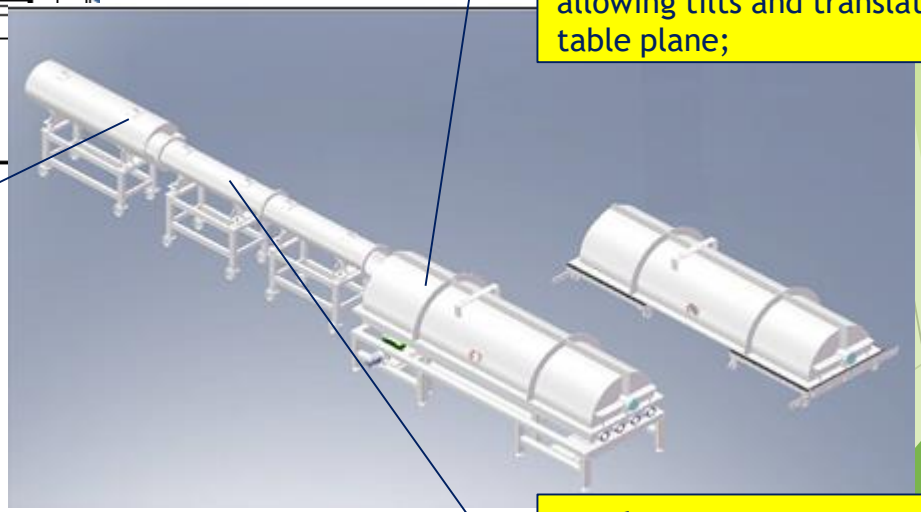


Space Optics Calibration Chamber (SPOCC) Overview:

Useful volume to accomodate units to be tested: 900 x 3500 x 650 mm^3



Test section, consisting of a cylindrical chamber made of two semi-circular halves split along the chamber longitudinal axis. The overall dimensions are 1080×880×4000 mm^3. The top half can be removed to access the optical bench inside the bottom half. The test section is equipped with an optical table with 4 stepper motor allowing tilts and translations on the table plane;



Sun-simulator section, consisting of a 2550-mm long and 400-mm diameter tube connected to another tube of 2050-mm length and 600-mm diameter. The latter tube hosts the source and the optics of the sun-simulator.

Pipeline section, consisting of two cylindrical tubes with a length of 1850 mm each, hosting all the junctions for the pumping system. The tubes diameter is 400 mm;

Provided with a Vacuum System able to reach 10^{-6} mbar

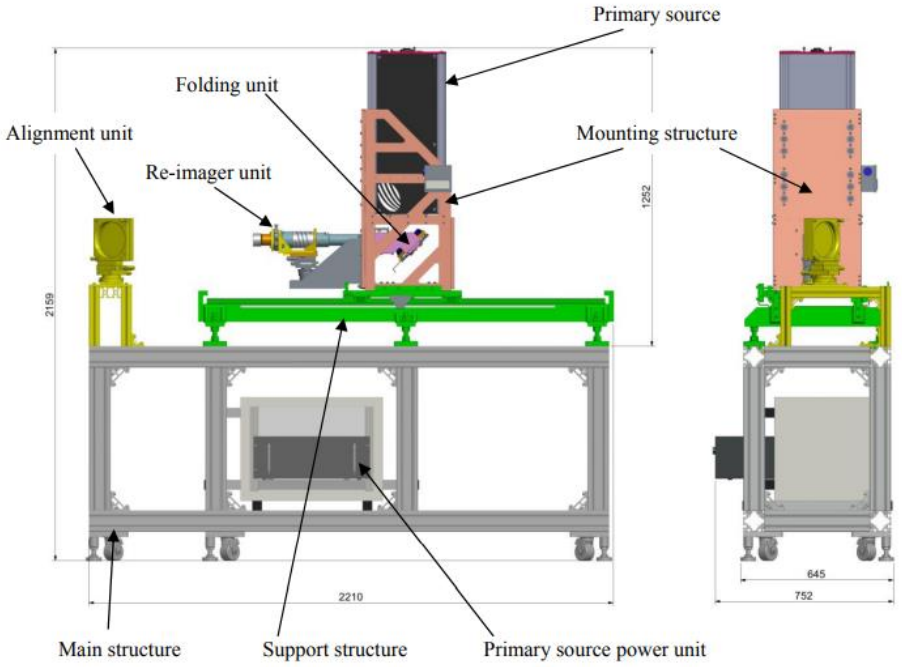
Space Optics Calibration Chamber (SPOCC) Overview:

Space Optics Calibration Chamber offers services in the following contexts:

- pre-flight qualifications or generic items (on-board computers, data handling, flight items, etc..) where is requested Thermal-Vacuum environment;
- pre-flight qualifications of scientific instruments and sensors, optical pointing devices, solar panels that have valence optical alignment and problems of solar flux;
- calibration and testing scientific optical instruments

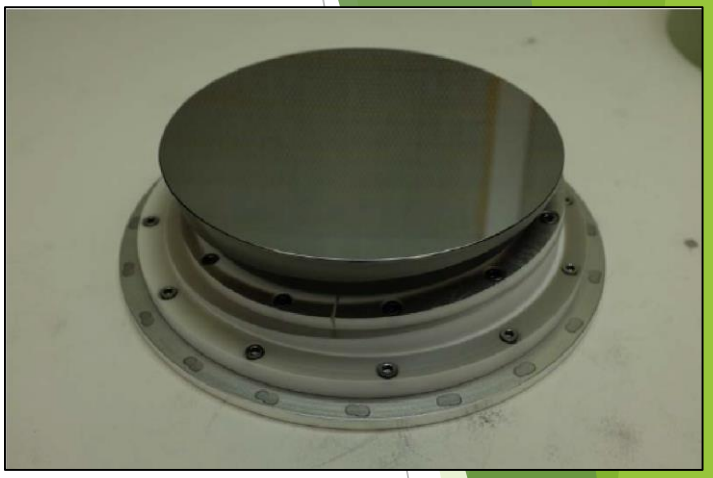
OPSys Light Sources

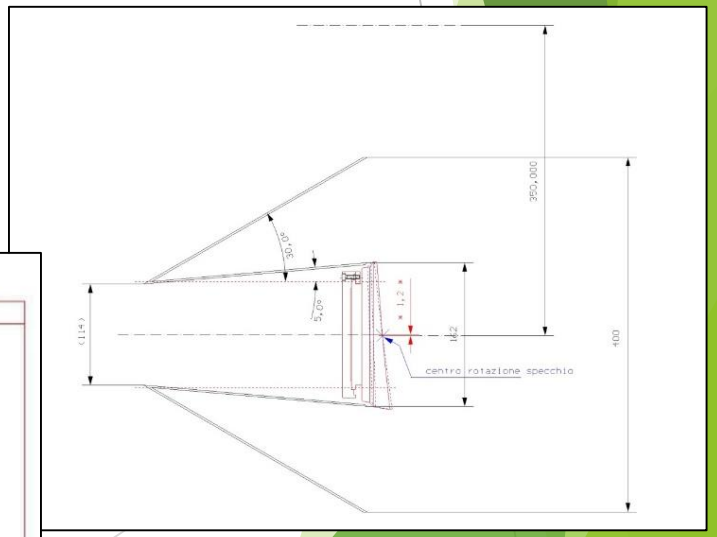
- ISVL: visible light source, to simulate the Sun disk
- VUV Lyman Alpha source: to simulate the Sun coronal UV radiation at the H Lyman-α
- Hollow cathode Source: simulate Sun emissions in the extreme ultraviolet He II Ly α (30.4 nm).
- Monochromator VUV + Grating



OPSys Additional Items (METIS dedicated) :

- Collimator Mirror
  - ✓ The SPOCC includes a collimating/focusing optical system that can simulate a collimated beam with the sun divergence at the Earth – Sun distance (i.e. 1 A.U.) or a focused beam with sun divergences corresponding to closer distances to the Sun (Solar Orbiter takes METIS closer to the Sun, up to 0.5-0.3 A.U.)
  - ✓ The collimator is a 350-mm, off-axis parabolic mirror of 165 mm diameter and a 4000 mm curvature radius.
- Light Trap





Collimator Mirror + Light Trap