VULCAN - Vacuum Ultraviolet Laboratory for detectors Characterization And integratioN

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The EUV/FUV spectral region contains essential information for many astrophysical topics, ranging from planetary atmospheres to the large-scale structure of the Universe. However, this region presents significant technological challenges, particularly regarding the development of suitable detectors. In this context, at IASF-Milan, in collaboration with the Politecnico di Milano, CNR-IFN, and the University of Padua, we are developing innovative photon-counting detectors with high dynamic range, high spatial and temporal resolution, solar-blind capabilities, stable and compact designs (for further details, please refer to the poster 'Wide dynamic range UV photon counting detectors based on MCPs readout with custom-developed ASIC' in the 'New Technologies' session). To support this research activity, we are setting up a dedicated laboratory for integration (equipped with an ISO5 area), testing, and UV characterization in vacuum and fully automated mode. The implementation of the latter will be made possible thanks to the funding obtained from the INAF call for the enhancement of space laboratories.

Total area: 110 m²

Includes:

- Clean room equipped with an ISO 5 zone
- Fully darkenable area for optical testing
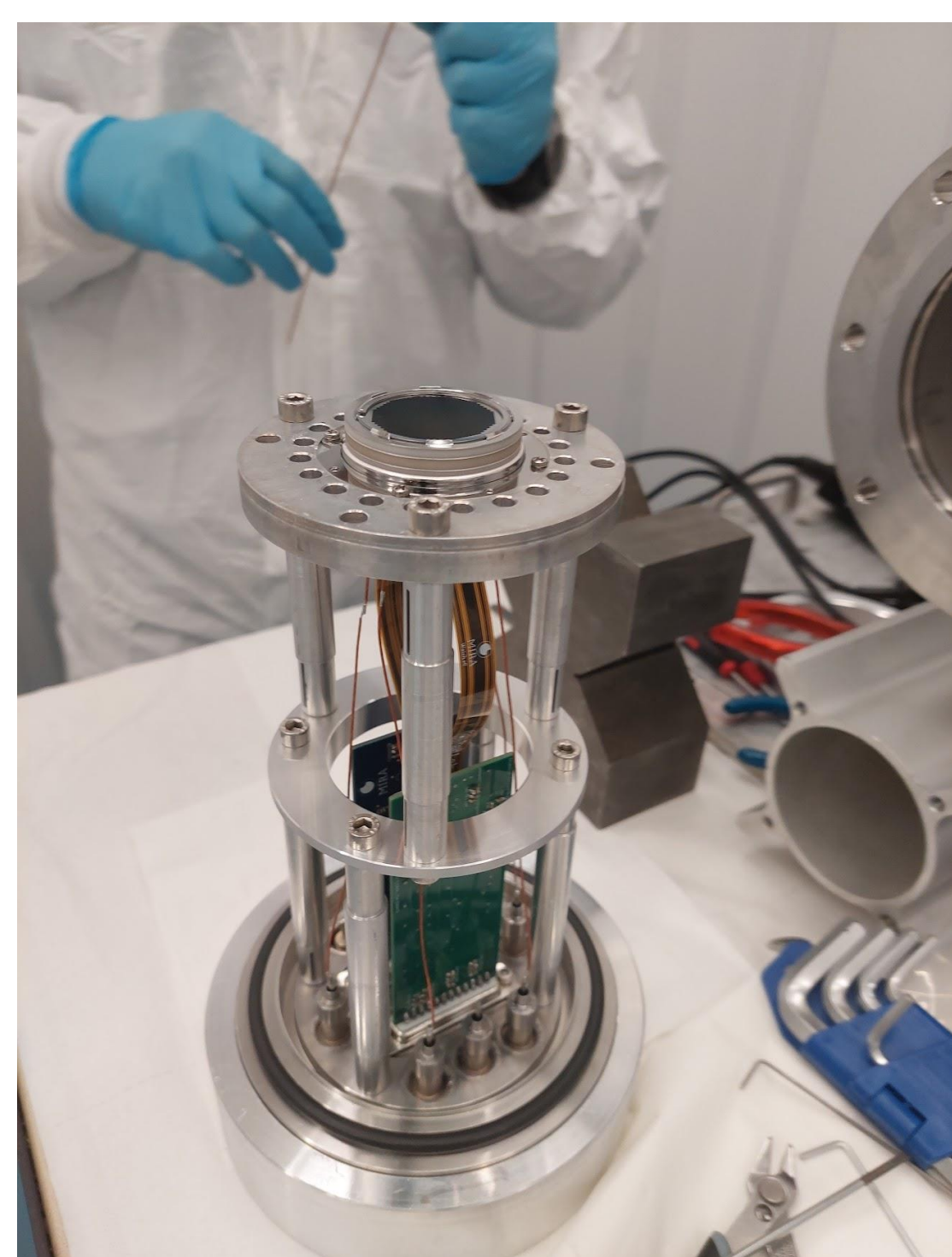- Multipurpose area for mechanical and electronic assembly

Multipurpose area
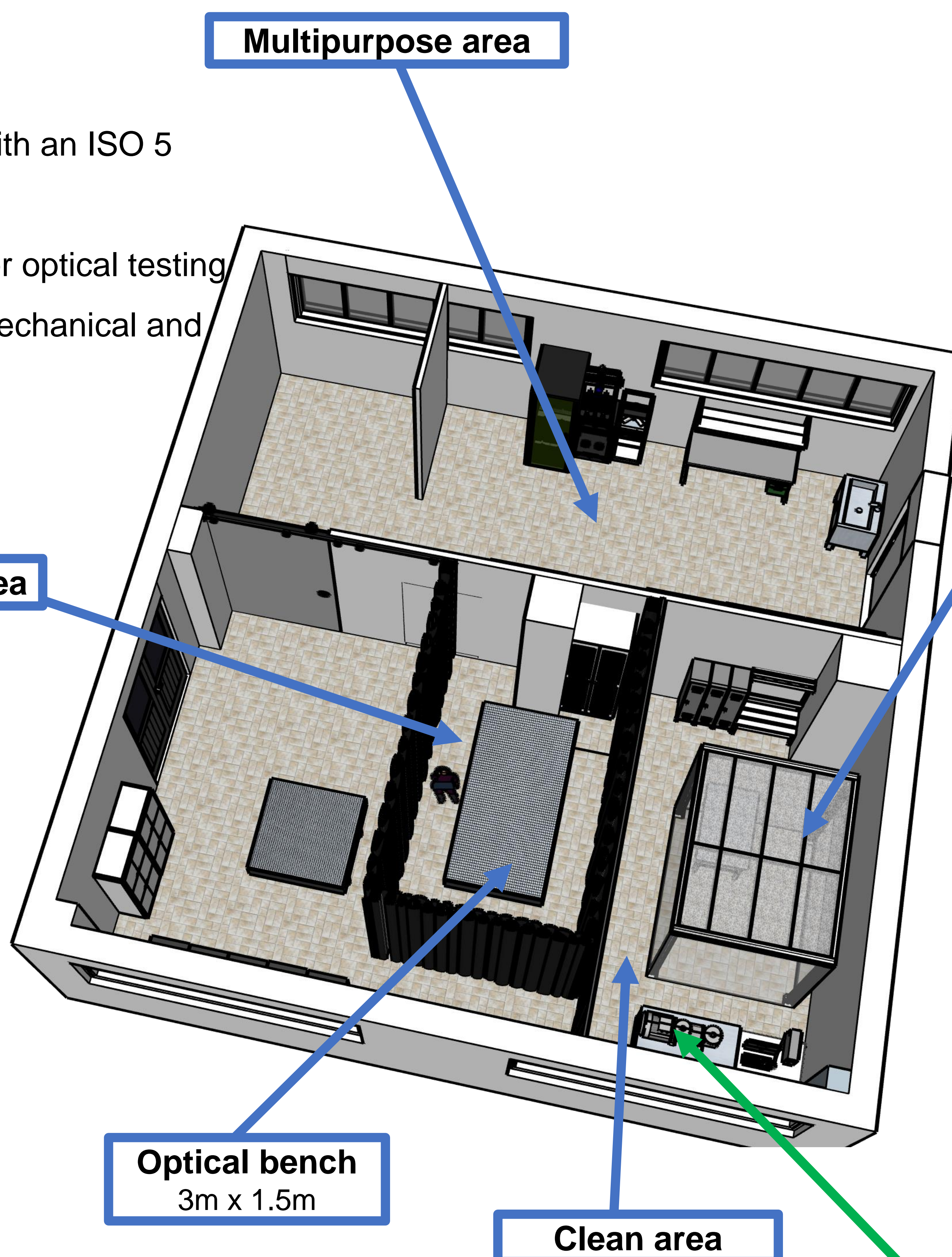
Darkenable area

Area ISO 5 with laminar flow hood
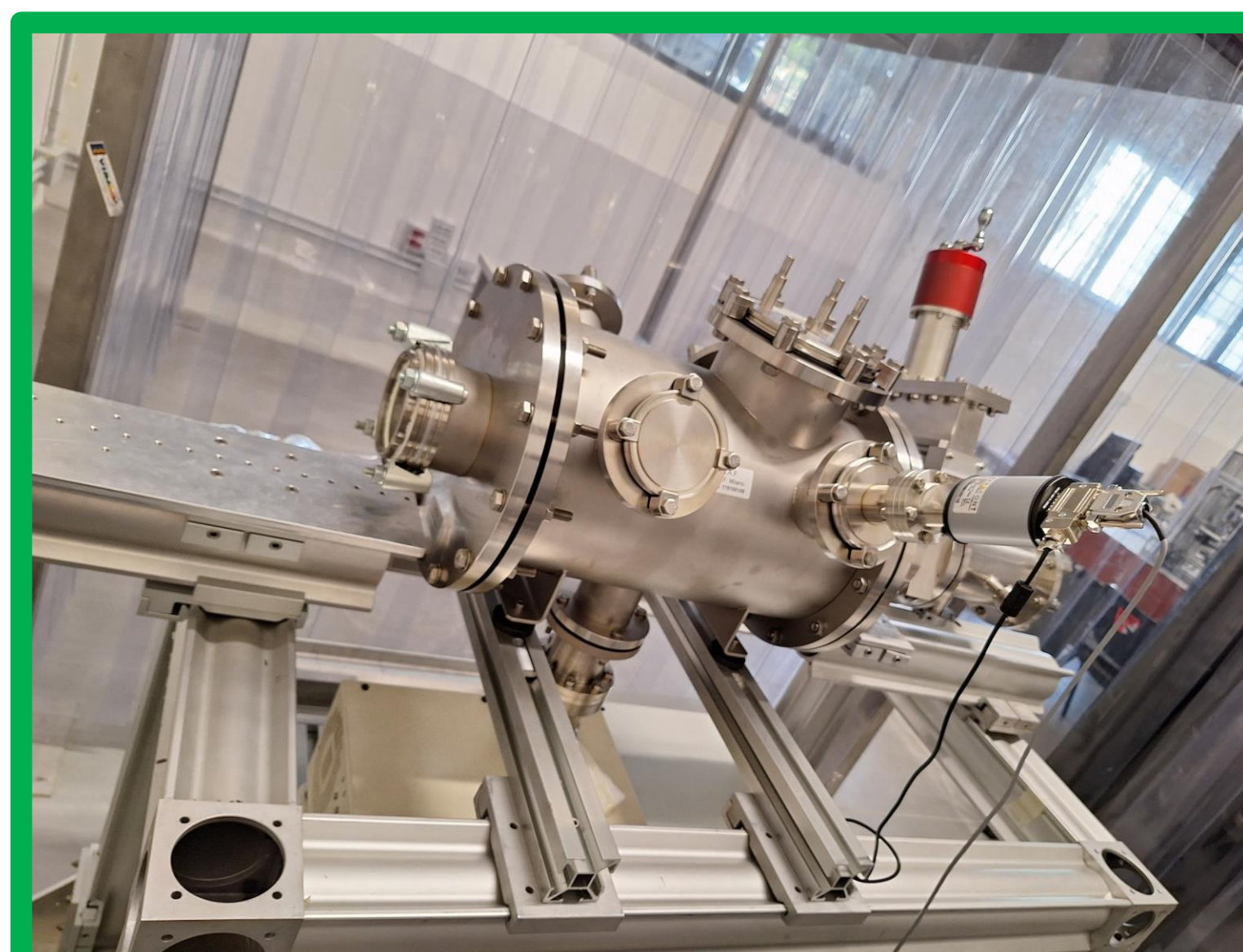Work area for detector integration:
2.2m x 2.4m

Optical bench
3m x 1.5m

Clean area

Setup for vacuum characterization

Vacuum chamber with a volume of 24 liters, capable of reaching 10^{-7} mbar, equipped with a Varian Turbo-dry 70 pumping group, including a membrane primary pump and a high-vacuum turbomolecular pump, and Pirani+Penning pressure gauges.

An additional section will be integrated to enable a series of automated measurements in the FUV range, down to 120 nm, without breaking the vacuum:

- ✓ Flat field
- ✓ Linearity and dynamic range, with both point source and extended illumination
- ✓ Spatial resolution
- ✓ Efficiency@120nmnm