AMOS delivered hardware to test the European EUCLID 1.2m diameter space telescope under vacuum

After having delivered the EUCLID mirrors to Airbus Defense and Space and the collimator to be used for testing the satellite, AMOS delivered a thermal tent, supporting hardware and special cranes that will allow to handle and cool down the 600 MEUR EUCLID telescope inside the 5m-diameter vacuum chamber in the Centre Spatial de Liège (CSL).

EUCLID is a space telescope designed to study the Dark Universe. It will map the 3D distribution of two billion galaxies distributed over most of the sky and the dark matter associated with them. It is one of the flagship missions of ESA. EUCLID should be launched in the second half of 2022 from the Guiana Space Center in Kourou.

The EUCLID telescope will be tested by CSL under the vacuum and conditions of space. The telescope has been integrated and completed by Airbus and will soon be tested at CSL. The complexity of the test is that the telescope has to be cooled down to -173°C and tested under those conditions. To achieve such low temperature, the telescope is enveloped by a thermal tent – a set of metal panels in which liquid nitrogen and liquid helium are circulating. Some of those panels will be cooled down to -253°C to reach the proper telescope temperatures.

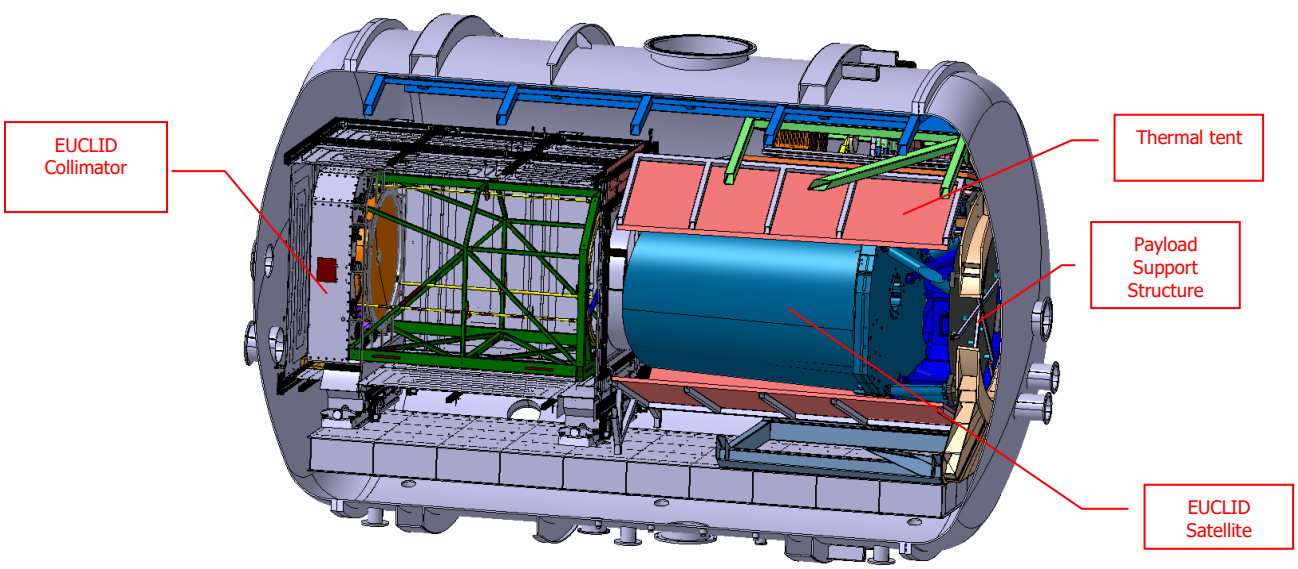
The process to place the thermal tent around the telescope is complex. A special crane is used to affix the telescope vertically on a dedicated carriage. The thermal tent is then slid around the telescope. The carriage then moves the telescope and tent to a horizontal position and the whole is fixed on the optical bench, which is then slid into the chamber. All those delicate operations have to be executed with very sensitive hardware weighting more than two tons.

While this Mechanical Ground Support Equipment (MGSE) has no optic inside, it shall allow positioning the tent with a high accuracy and a high reliability: the space allowed between the telescope and the tent panels is very limited. The tent needs to slide with precision around the telescope. Reliability is key. Any contact between the telescope and the tent may create damage to the telescope and set back the mission by several months. In the same way, such unwanted contact could also damage the tent or create frigorific liquid leaks and hamper the proper start of the tests.

The hardware was delivered in September 2020 to CSL, 15 months after the start of the project. The successful acceptance of the hardware by CSL and Airbus occurred in November 2020. AMOS is proud to have contributed again to the EUCLID mission by providing this custom test equipment. As Philippe Gilson, CEO of AMOS said, “AMOS is mostly known for its optical or optomechanical systems. However, our expertise expands also in the field of MGSE, so that our customers can reliably cool and test complex hardware in challenging conditions. This is applicable in the field of space applications, but also in other applications or industries. It is thanks to the skills of our engineers, technicians and workers that we can achieve this level of quality even in challenging conditions”.

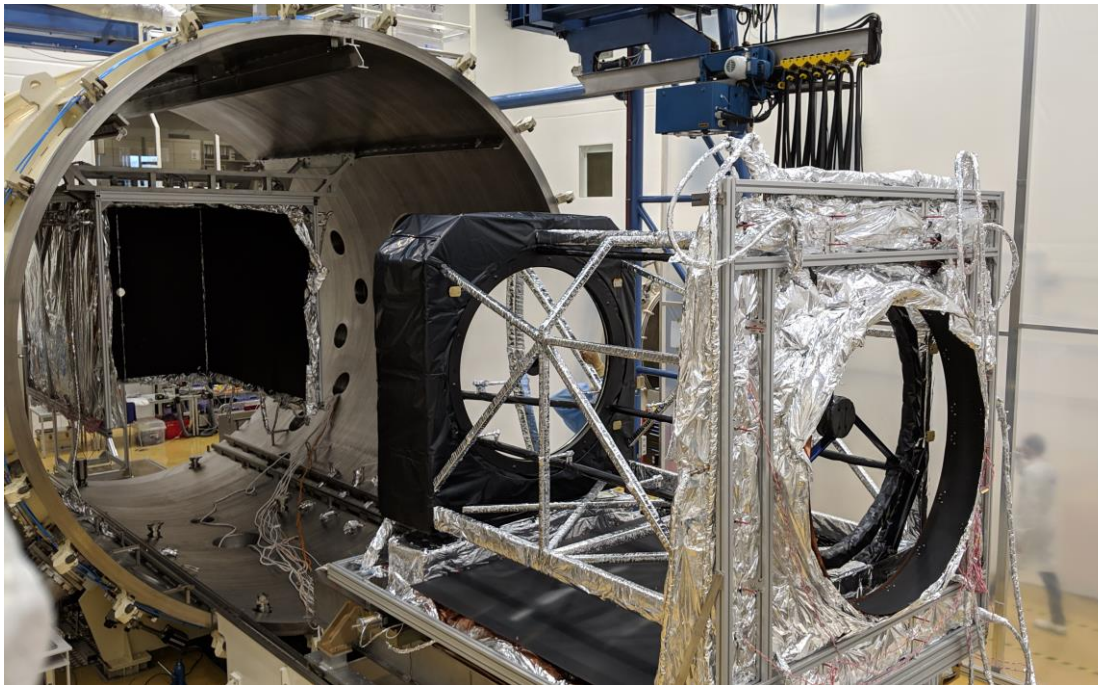
More precisely, AMOS delivered:

- The Payload Support Structure interfacing and supporting the Payload Module (EUCLID satellite)
- The thermal tent around the Payload Module
- The lift truck supporting the thermal tent



Set up configuration overview. The vessel is 5m in diameter and 7 m in length

Tests at AMOS of the thermal tent and PSS integrated on Airbus DS trolley



EUCLID collimator in front of the test chamber during preliminary tests

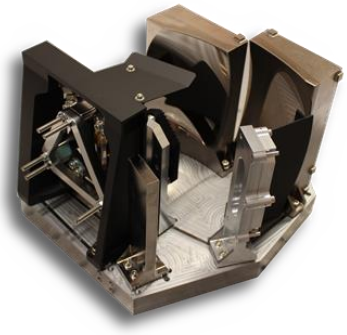
Lift truck structure integrated in Focal 5 vessel

Press Release

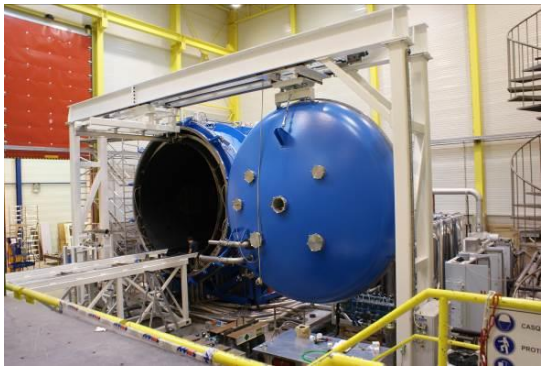
AMOS in a few words

Located in Belgium, AMOS has been designing and building high-precision optical and mechanical equipment for more than 35 years. Its main achievements are professional telescopes, space optical systems, test equipment for space instruments, and high-precision mechanical equipment. It employs more than 100 employees highly skilled in advanced technologies and offers services to the space industry, to the professional astronomy sector, to scientific laboratories and to industry.

AMOS has customers in Europe (ESA, ESO, AIRBUS DEFENCE & SPACE, THALES ALENIA SPACE, OHB), in United States (AURA), in India (ISRO, PRL, ARIES), and has more recently expanded its business in countries like China, Turkey and Russia.



Spectrometer of the ELOIS hyperspectral camera



Thermal-vacuum Test Facility for VSSC (ISRO)

ATS (Auxiliary Telescope Systems),
"mobile" telescopes of the VLTi in Chile (Cerro Paranal)

More info: https://www.amos.be
On the EUCLID mission:
https://www.esa.int/Science_Exploration/Space_Science/Euclid_overview
https://www.euclid-ec.org/
https://www.esa.int/Science_Exploration/Space_Science/The_Euclid_space_telescope_is_coming_together
ON CSL and FOCAL-5 chamber:
https://www.csl.uliege.be/cms/c_10241774/en/csl
https://www.csl.uliege.be/cms/c_10308364/en/csl-focal-5

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