

AMOS signs a contract with MICOS for the PROBA-3 mission

AMOS has been awarded by MICOS (Switzerland) a contract to deliver a critical equipment for PROBA-3, an upcoming mission of the European Space Agency (ESA).

PROBA-3 has a double aim : technology demonstration as well as the study the solar corona. One of the main challenges in observing the Sun's corona is to protect the optical instruments from the direct glare of our star. If exposed directly to the Sun, the sensitive detectors would simply be burned. To avoid this, scientists have invented an instrument called a "coronagraph" which mimics a solar eclipse (the natural phenomenon which happens when the moon hides the Sun from our sight, enabling observers on Earth to observe the Sun corona with the naked eye during a few minutes).

However, two main phenomena are affecting observations during solar eclipses : diffusion of the light in the Earth's atmosphere, and parasitic light reaching the instrument. PROBA-3 aims at avoiding these drawbacks by creating a giant coronagraph in space, using two spacecrafts flying in formation. When perfectly aligned with the Sun, one spacecraft (the "occulter") will hide the Sun from the second one which carries the scientific instruments.

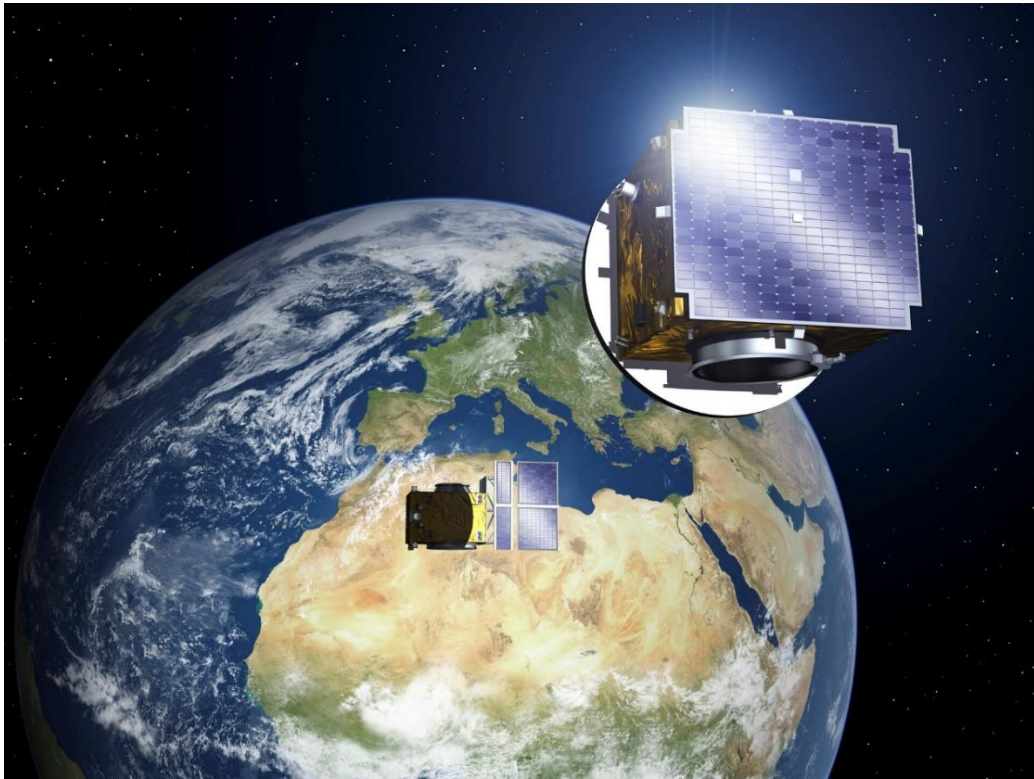
Precise formation flying (FF) has so far never been achieved in an ESA mission. This is where PROBA-3 comes in action : it will validate the technologies needed to allow two spacecrafts to fly together with a very tight control of their relative position, as if they were connected by a rigid frame.

One of the critical equipment used for formation flying is the Fine Lateral and Longitudinal Sensor (FLLS). It measures the lateral and longitudinal displacement of the two spacecrafts respective to each other with a sub-millimeter precision. The main part of the FLLS is located on the occulter spacecraft and is based on two main parts: the laser electronics and the Optical Head Unit (OHU) designed and manufactured by AMOS. The OHU encompasses the laser and the optics needed to send a signal and receive it back after reflection on the other spacecraft. It must be able to measure the spacecraft position within 300 microns (millionth of a meter) when the two spacecrafts are flying at a distance up to 250 m. This precision is equivalent to measuring the thickness of a sheet of paper on the ground from the top of the Eiffel tower.

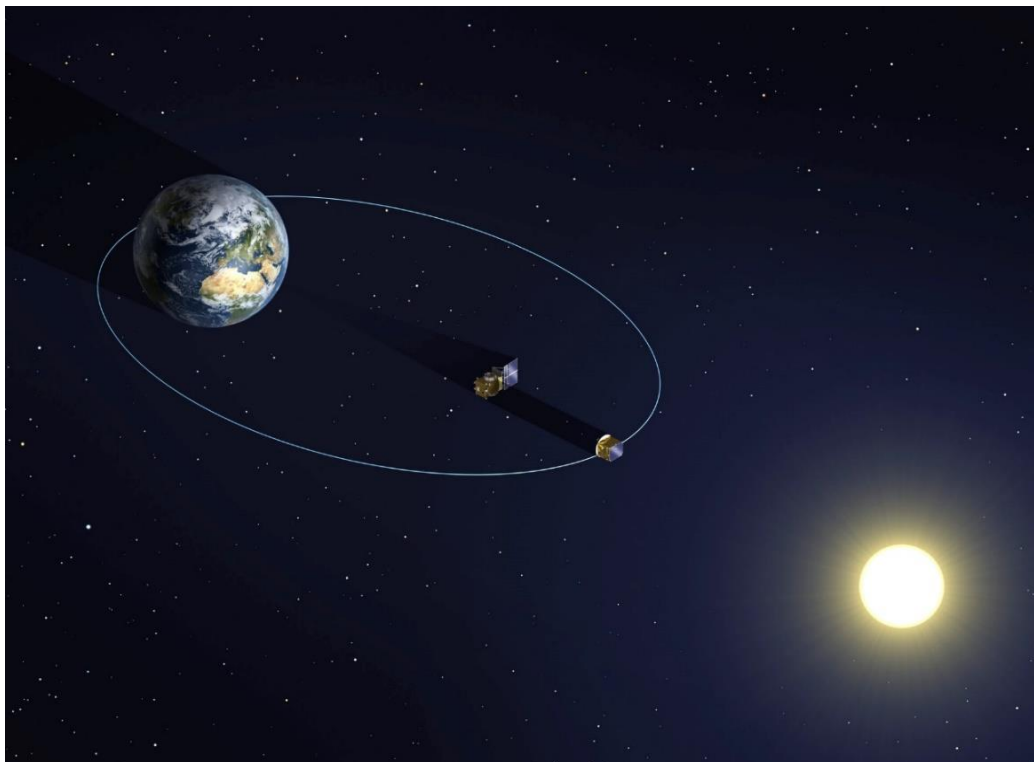
Beside the fact that the design is very compact, the main challenge for the OHU is that it is made of a new Aluminum alloy (AlSi) which minimizes the thermal distortion of the instrument, in order to meet the stringent optical requirements and hence guarantee the performance of the mission.

"This is an exciting project. ESA and MICOS came to AMOS because they know the capability of our teams to design and manufacture complex systems meeting tight specifications. We are delighted to be part of this mission that will enable a better understanding of the Sun, and will contribute to pave the way towards more ambitious scientific missions such as the giant Gravitational Wave Detector, LISA", said Philippe Gilson, CEO of AMOS.

Proba-3 is planned to be launched from India with a PSLV-XL launcher in 2023.



The two Proba-3 spacecraft in formation between the Earth and the Sun. (Credits: ESA)



The two Proba-3 spacecraft in formation between the Earth and the Sun. (Credits: ESA)

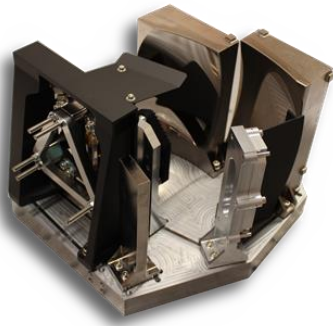


Proba-3 occulter in front of the Sun, as seen from the other spacecraft (Credits: ESA)

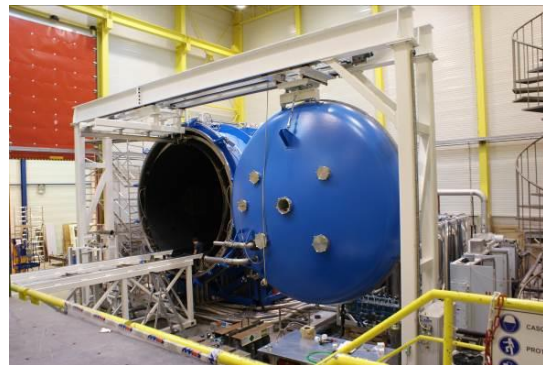
AMOS in a few words

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, MRO), 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:

www.amos.be

<https://www.linkedin.com/company/amos/>

More on PROBA-3:

http://www.esa.int/Enabling_Support/Space_Engineering_Technology/Proba_Missions/Proba-3_set_the_controls_for_the_verge_of_the_Sun

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