

AGENCY

OSCAR-QUBE student experiment one step closer to the International Space Station

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From 6 to 8 April 2021, the OSCAR-QUBE student team visited the CubeSat Support Facility, at ESEC, in Belgium, for the vibration test campaign of their ICE Cube experiment, one of the milestones of their participation in ESA Academy's Orbit Your Thesis! programme.

This programme gives Master's students and PhD candidates the exciting opportunity to fly a scientific experiment of their own design in microgravity conditions on board the International Space Station. In April 2020, the OSCAR-QUBE team, 16 students from Hasselt University in Belgium, were selected to participate. Their goal is to develop a new generation of magnetic field sensors based on quantum working principles, whereby a defect in the crystalline lattice of a diamond can be exploited as a magnetic field probe. Orbit Your Thesis! is supporting them in the development and testing of their experiment, with the aim of launching it to the International Space Station. Once there, it will be integrated into the ICE Cubes Facility, where it will remain for 4 months to conduct its science.

— The soft wrap prevents scratches to the anodized panels

Before the experiment can be launched, it has to be thoroughly tested on the ground to ensure that it will survive the harsh vibrations produced by the rocket carrying it into

orbit, and will safely reach the International Space Station. This is a major milestone for any space object built on Earth, from small ICE Cubes to large spacecraft. In order to conduct the tests, two students from the OSCAR-QUBE team travelled to the CubeSat Support Facility, in Belgium, to make use of the 20kN shaker for a vibration test campaign.

During these three days, the OSCAR-QUBE experiment was installed in a custom test set-up prepared by the student team. The experiment was then submitted to three random vibration tests -one in each axis. The test was set up with levels carefully crafted to ensure that the QUBE endured very similar vibrations to those that it will experience when packaged in the cargo ship that will take it, along with astronaut supplies and other science experiments, on its journey to the International Space Station on board the Space X CRS vehicle.

— Pre-vibration functional checks

— OSCAR-QUBE mounted on the shaker, ready for testing

This was the team's first ever vibration test, so they were carefully supported throughout the preparation and execution by ESA Education staff. The students adjusted admirably to performing lab work in the current environment of restrictions imposed by COVID prevention measures. Strict social distancing added a twist