

AGENCY

First test campaigns completed at the new CubeSat Support Facility

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ESA / Education / CubeSats - Fly Your Satellite!

ESA Academy is proud to announce that the new CubeSat Support Facility (CSF) is now open and has successfully completed its first test campaigns. Its purpose: offer training and test facilities for university students that are part, or aiming to be part, of ESA's educational CubeSat initiatives such as [Fly Your Satellite!](#)

The CSF is an assembly integration and testing facility for CubeSats, located at the [ESA Education Training Centre](#), based at the [ESEC-Galaxia facility in Redu](#), Belgium. It is state of the art, designed and equipped according to industry quality standards.

The CSF boasts a cleanroom, along with the necessary equipment to perform integration activities and environmental tests on CubeSats and their subsystems – including complex and specialised equipment not often found in universities. With this new facility, the ESA Education Programme is now able to provide CubeSat projects with end-to-end support, and to offer opportunities to participate in CubeSat projects to a large number of universities. This will all contribute to helping students gain knowledge and experience in satellite engineering and space project management.

Two main pieces of equipment will be particularly useful to students using the facilities:

1. A Thermal Vacuum Chamber, to recreate the vacuum and temperature conditions that CubeSats will experience in space, with temperatures varying from extreme heat to extreme cold. This is an essential test to ensure that satellites can survive the harsh conditions of space.
2. A 20 kN Electrodynamic Shaker system, to perform vibration tests on CubeSats. This essentially mimics the violent vibrations that a satellite would experience during launch.

The CSF will primarily be used by teams participating in ESA Academy's Fly Your Satellite! CubeSat Programme, but in the near future there will be additional innovative courses offered to help university students to learn about environmental testing with hands-on activities and lectures from experts.

Putting CubeSats to the test

During December, the CSF was put to good use with three full weeks of environmental test campaigns with student teams participating in the [Fly Your Satellite! Programme](#).

— The EIRSAT-1 team analyzes the results of the vibration tests carried out on the shaker

The [UoS³](#) team (University of Southampton, UK) and the [EIRSAT-1](#) team (University College Dublin, Ireland) performed thermal vacuum tests on their in-house developed Antenna Deployment Mechanisms. Both teams successfully demonstrated the ability of their mechanisms to deploy the antennas after being exposed to thermal cycling and vacuum. The teams moreover obtained critical information about functionality in extreme cold, which will help them to make further improvements to their designs. Additionally, the EIRSAT-1 Antenna Deployment Mechanism underwent vibration testing, followed by a successful deployment test.

The last week before Christmas, the [³CAT-4](#) team from the Polytechnic University of Catalonia started the tests of their Nadir Antenna Deployment Mechanism in the thermal vacuum chamber.

"Testing a piece of our flight hardware at the new thermal vacuum facilities at ESEC was a very valuable experience and there were many lessons to be learnt," said Philip Hawkins, one of the participating students from the UoS³ team. "The opportunity was definitely a great contribution to the project as well as professional development of the team members involved."

During the tests, the students could liaise directly with ESA experts from the [ESTEC Test Centre](#) and the Mechanical Systems Laboratory, who travelled to ESEC-Galaxia to help with the preparation and execution of these test campaigns. Students were able to learn first-hand