

Media release, 05 April 2018

Space telescope CHEOPS leaves the University of Bern

Construction of the space telescope CHEOPS is finished. The engineers from the Center for Space and Habitability (CSH) at the University of Bern will package the instrument this week and send it to Madrid, where it will be integrated on the satellite platform. CHEOPS (CHaracterising ExOPlanet Satellite) is to be ready to launch in early 2019 and will observe how exoplanets in other solar systems pass in front of their host star – assisting in the search of potentially habitable planets.

The specially designed transport case is ready and waiting in the building for Exact Sciences of the University of Bern. In the next few days, the CHEOPS team will load the space telescope in the cleanroom into the transport container, where it is well protected against shock, moisture and dirt. A truck will then transport the precious cargo to Madrid. The company "Airbus Defense and Space - Spain" built the satellite platform that supports the telescope and enables it to operate in space. In the upcoming weeks the instrument will be integrated and the satellite will be tested.

The space telescope will observe stars in our cosmic neighbourhood that are known to be orbited by exoplanets. CHEOPS measures the brightness of the stars. This decreases slightly when an exoplanet passes in front of its host star. The size of the exoplanet can be determined by the decrease in brightness during such a transit. "The instrument must be able to measure with extreme precision. This was the major design challenge," says Willy Benz, professor of Astrophysics at the University of Bern and Principal Investigator of the CHEOPS mission, which Switzerland is carrying out together with the European Space Agency (ESA). "We think that we meet the requirements, otherwise we would not be flying," says Christopher Broeg, project manager of the CHEOPS mission.

Components from different countries

Institutes from eleven European nations are involved in the CHEOPS mission. The structure was designed and manufactured in Switzerland, the optics as well as the flight software and other components originate from international partner institutions. At the University of Bern, the various parts were assembled in the cleanroom and the telescope was subjected to vibrations on the shaker, similar to those vibrations it will have to withstand at the start. "We were relieved when the mirror and its adhesive bonding passed the vibration test," remembers Christopher Broeg, thinking back on the particularly delicate test phase.

The team was put under tremendous time pressure. CHEOPS is ESA's so-called first small 'S-class mission'. It must be implemented within a few years and cannot cost ESA more than 50 million euro. Switzerland pays around 30 million euro, while the remaining partners pay about 20 million euro. "We are proud that we were able to stick to the budget in the end, which cannot always be taken for granted in such projects," says Willy Benz. In order not to delay the project too much, the engineers had to carry out different jobs in parallel instead of following the initially planned sequence. This meant that the load-bearing structure had to be determined even before one knew exactly how the mirror was to be mounted. This was particularly tricky because the position of the main and secondary mirrors must remain stable, even if the temperature changes in orbit. The tests finally showed that the construction works. "We are even more stable than we first thought," says Christopher Broeg happily.

In the last few weeks, the engineers calibrated the instrument and tested the software. Following its integration in Madrid, the satellite will be tested at several locations in Europe before being sent to Kourou, ESA's space station in French Guiana. It will return one last time to Switzerland in order to pass another vibration test. By early 2019, CHEOPS should be ready to launch. A Soyuz rocket will launch it together with a larger Italian radar satellite into a 700-kilometer orbit. "I'm looking forward to seeing CHEOPS in space and getting the first data," says Willy Benz.

Contact:

Prof. Dr. Willy Benz

Center for Space and Habitability (CSH), and Physics Institute, University of Bern

Phone: +41 31 631 44 03

willy.benz@space.unibe.ch