

# Swiss and ESA satellite CHEOPS launching soon!

CHEOPS will be launching into space on the 17th of December!

## You may be wondering: what is CHEOPS?

CHEOPS stands for *CHaracterising ExOPlanet Satellite*. Its goal is to study transits of already-known exoplanets to gain more knowledge about them.

What type of information are we looking for? Scientists want to know detailed information about planets outside our Solar System, such as the mass, planet size, and density, which will in turn help to figure out the composition of these exoplanets.

Studying exoplanet composition and their atmospheres is important especially for astrobiology. A planet's chemical composition can affect its habitability for life as we know it. Scientists usually look for biosignatures such as the presence of methane or oxygen in the planet's atmosphere, which could indicate presence of past or present life.



Artist's impression of CHEOPS. Credits: ESA / ATG medialab.

## The major contributors

CHEOPS is a collaboration between ESA and the Swiss Space Office. The mission was proposed and is now headed by Prof. Willy Benz, from the University of Bern, which houses the mission's consortium. The science operations consortium is at the University of Geneva, where they have many collaborators, such as the Swiss Space Center at EPFL.

As it is an ESA endeavour, many other European institutions are also contributing to the mission. For example, the mission operations consortium is located in Torrejón de Ardoz, Spain.

## The launch

The satellite has already been shipped to Kourou, French Guiana, where it will be launched by the ESA spaceport. CHEOPS will be hitching a ride as a secondary passenger on board a Soyuz-Fregat rocket, which will also be transporting a satellite for the Cosmo-Med satellite constellation for Italy. Apart from that, the rocket will also be taking cubesats into space. CHEOPS will be put in low-Earth orbit, 700 km above Earth.

You can tune into ESA Live TV tomorrow from 9:30-15:00 (Central European Time) to watch the livestream of the launch! [Click here for more information.](#)

## Exoplanets and their observation

Exoplanets are planets orbiting other stars, i.e. planets external to our Solar System. The first confirmed observation of an exoplanet took place in 1992, when Wolszczan and Dale Frail discovered several planets orbiting a pulsar, PSR B1257+12. In 1995, Michel Mayor and Didier Queloz made history at the university of Geneva, when they discovered the first exoplanet around a main sequence star, known by the name of 51 Pegasi b.

Recently, Michel Mayor and Didier Queloz were honored for the discovery of Pegasi 51 b with the 2019 Nobel Prize in Physics "for contributions to our understanding of the evolution of the universe and Earth's place in the cosmos", which they shared with James Peebles.

This discovery led to a rapid acceleration in the development of the field of exoplanets, especially thanks to the technological advancements that were happening simultaneously. To this day, we have catalogued around 4000 exoplanets, mostly thanks to efforts by NASA's Kepler Space Telescope. Now,

CHEOPS will allow for more detailed study, and will also help identify interesting planets that could be the targets of future satellites.

## Future exploration

As mentioned, CHEOPS will help identify certain exoplanets that could be objects of study for other satellites, such as the future James Webb telescope. The James Webb space telescope is a NASA, ESA, and Canadian Space Agency endeavour that will be sensitive to exoplanets. Its launch is planned for 2021.

ESA is also planning two other future missions specifically for exoplanet exploration. The *PLANetary Transits and Oscillations of stars* mission (Plato), and the *Atmospheric Remote-sensing Infrared Exoplanet Large-survey* mission (Ariel). These missions will be following CHEOPS and help improve our knowledge of exoplanets and their formation. As ESA says in their CHEOPS brochure, these missions “*will build on answering the fundamental question: what are the conditions for planet formation and the emergence of life?*”

*We wish the CHEOPS launch all the best and we will be eagerly awaiting any new discoveries that might arise from its data!*

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