**CHEOPS - CHARACTERISING EXOPLANETS**

**Suggested webcopy:**

The CHEOPS (CHaracterising ExOPlanet Satellite) spacecraft has successfully passed its final testing phase in Spain before it will be shipped to the European spaceport in French Guiana for launch later this year.

CHEOPS is a powerful telescope that will fix its gaze on exoplanets, known planets outside our Solar System, that are orbiting bright stars. The aim will be to obtain detailed information about these planets and discover which ones might have the right conditions for life.

The mission is a partnership between ESA and Switzerland with additional contributions from Austria, Belgium, France, Germany, Hungary, Italy, Portugal, Spain, Sweden, and the United Kingdom. This film contains contributions from Nicola Rando, CHEOPS Project Manager, ESA; and Kate Isaak, CHEOPS Project Scientist, ESA.

**A-ROLL**

**TAPE STARTS: 10:00:00**

**VT STARTS: 10:00:10**

10:00:10

[CHEOPS in Airbus Defence and Space clean room, Madrid]

At an Airbus clean room near Madrid, a planet hunter called CHEOPS undergoes final inspections before heading to the launch pad. Since all its elements have already been proven in flight, this a low cost, low risk mission. But it has high ambitions. CHEOPS is a mission with a single instrument - a powerful camera, or photometer, that will record the light from an exoplanet’s star. And its aim is to determine the nature of known exoplanets outside our Solar System.

10:00:46

[INSET CLIP: KATE ISAAK

CHEOPS Project Scientist, ESA]

*“We’ll be focusing on smaller planets, so Earth-sized to Neptune-sized planets which have been found by other missions, such as Kepler, to be very abundant around other stars, sunlike stars, something which is not so much the case in our own Solar System. So it’s a big question: what are these smaller planets and what are they made of? And with CHEOPS that is what we’re aiming to discover.”*

10:01:14

[ANIMATION, CREDIT: ESA]

To do this, CHEOPS will measure the variation in light, caused by an exoplanet transiting in front of the host star, to determine the planet’s size. Since we already know the planet’s mass from measurements made with other telescope, scientists combine the sizes measured by CHEOPS to work out the density, which will show whether the planet is rocky or gassy. They will then be able to learn more its composition and also its formation and evolutionary history.

10:01:46

[ANIMATION, CREDIT: ESA/ATG MediaLab]

CHEOPS will orbit 700 kilometers above the Earth in such a way that its camera will always point towards the night side. This dusk-dawn orbit will limit any sunlight or stray light from Earth disturbing its measurements - as it’s a technical challenge to obtain precise measurements of light from stars outside our Solar System.

10:02:08

[INSET CLIP: NICOLA RANDO

CHEOPS Project Manager, ESA]

*“It’s not easy and the instrument was designed to be able to perform accurately over long periods of time and the satellite was designed around the instrument to guarantee these stable conditions, as an example, stable thermal conditions. As you can see the satellite has a sunshield, protecting the instrument from the direct Sun illumination and this is very important to allow the proper thermal stabilization of the detector inside the instrument.”*

10:02:47

[STILL IMAGE; CREDIT: Credit: NASA, ESA, M. Kornmesser (artist’s impression)]

This exoplanet is one of almost 4000 that have been discovered since 1995.

10:02:54

[ANIMATION: ESA/ATG MediaLab]

CHEOPS, a partnership between ESA, Switzerland and Member States, has a long journey of discovery ahead. This mission will not only give us key information about the nature of known small exoplanets, it could identify those with the potential to host life.

[ENDS -]

10:03:10:20

**B-ROLL**

10:03:10:20 – BR\_001

# **A-Roll without logo and titles – audio split**

10:06:21:15 – BR\_002

**NICOLA RANDO**

**CHEOPS PROJECT MANAGER, ESA**

**[ENGLISH]**

*“CHEOPS stands for CHARACterising exoplanet satellite. It’s a mission dedicated to the characterisation of exoplanets which have been already detected on the ground or from space with other missions and other techniques. But really CHEOPS is about taking the next step in investigating planets beyond our Solar System and in particularly aims at providing a reliable and accurate measurement of the size of the planets and from there being able to derive their density and therefore their composition.”*

*“We are using a very special camera, a sophisticated camera, and we are measuring the light, the quantity of light which is originated by a star outside the Solar System and how this quantity of light varies when a planet, an exoplanet, is transiting in front of it. This is the measurement technique used then to derive the size and therefore the density of the planet.”*

*“It’s not easy and the instrument was designed to be able to perform accurately over long periods of time and the satellite was designed around the instrument to guarantee these stable conditions, as an example, stable thermal conditions. As you can see the satellite has a sunshield, protecting the instrument form the direct sun illumination and this is very important to allow the proper thermal stabilisation of the detector inside the instrument.”*

**NICOLA RANDO**

**CHEOPS PROJECT MANAGER, ESA**

**[ITALIAN]**

An explanation of the CHEOPS mission.

Characterising the composition of exoplanets.

Why CHEOPS is a technical challenge

10:10:43:03 – BR\_003

**KATE ISAAK**

**CHEOPS PROJECT SCIENTIST, ESA**

**[ENGLISH]**

*“We’re a so-called follow up mission and with CHEOPS we will know where to point and when to point and by where I mean we know our targets. They’re bright stars which are known to host the type of planets we want to observe and we will know when these planets transit, that is when the planets move across the disc of the star and we can measure the changes in the output of the star, the measured output of the star, in order to measure the size of the planet. We’ll be focusing on smaller planets, so Earth-sized to Neptune-sized planets which have been found by other missions, such as Kepler, to be very abundant around other stars, sunlike stars, something which is not so much the case in our own Solar System. So it’s a big question, what are these smaller planets and what are they made of and with CHEOPS that is what we’re aiming to discover.”*

***“****By combining the mass that we have from existing measurements made on ground with the sizes that we will get from CHEOPS we’re able to determine density, the mean density of this planet. Is it very high density? So more along the lines of rock or iron or is it more low density, or puffy, alongs the line of gas?”*

*“To date there are almost 4000 exoplanets which are known and have been confirmed and of all these none has been found to be like ours. There are many different types of planets, with very many different types of orbits, for example something called hot Jupiter - a big gassy Jupiter-like planet as we have in our own Solar System but very close to the Sun, so with an orbital period of 2 or 3 days. So it goes the whole way round the Sun in what takes the Earth a year a few days for this large planet. So the temperatures are 3, 4, 5, 6000 Kelvin so much hotter than we have on Earth and a lot hotter than one would like to have in one were living on the planet.”*

*“CHEOPS will definitely make a difference. We will be able to study these smaller planets, these Earth to Neptune sized planets and start to determine what they are actually made of and by knowing what they’re made of, their composition, starting to put constraints on their structure, studying large samples of these planets we will be able to start to pin down their structure, their formation and their evolution history.”*

*“CHEOPS is a European mission, an ESA mission. It’s led by Switzerland with 10 other member states making contributions. Contributions to the instrument, so to the payload, the instrument that will make the measurements but also to the centres which will operate the satellite and also analyse the data that we will get down from the satellite.”*

*“No, we will not be able to see the little green men waving. That’s something for a future mission but we will be taking the first steps towards looking for these planets that are mostly like to be able to host life.”*

10:14:08:23 – BR\_004

**ANDRES BORGES ALEJO**

**CHEOPS PROJECT MANAGER**

**AIRBUS DEFENCE AND SPACE, MADRID**

**[ENGLISH]**

*“Certainly it’s not simple at all because we are looking at the stars that are millions of millions of kilometers away from the Earth and what we have to do is to define a way in we can find exoplanets so far away. Therefore the intention is to have an instrument that is built in a focused manner because what we’re interested in is not to see the star or to see the exoplanet, it’s to see the light that is coming from the star.”*

**ANDRES BORGES ALEJO**

**CHEOPS PROJECT MANAGER**

**AIRBUS DEFENCE AND SPACE**

**MADRID**

**[SPANISH]**

Explanation of the CHEOPS mission.

Characterising exoplanets.

Why the CHEOPS mission is a technical challenge.

10:17:36:21 – BR\_005

**CHEOPS IN CLEAN ROOM, AIRBUS DEFENCE AND SPACE, MADRID**

10:20:45:10 – BR\_006

**EXOPLANETS ANIMATION**

10:20:45:10 – END

10:22:01:07 - ESA STING