**SOLAR ORBITER: TESTING COMPLETE**

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Engineers have completed their testing of ESA’s Solar Orbiter spacecraft in preparation for launch early next year.

Equipped with a suite of ten instruments, Solar Orbiter will capture the closest ever pictures of our star, the first images of its poles, and make detailed observations of solar activity. Its specially designed heatshield is capable of enduring temperatures of more than 500 degrees Celsius.

Over the past year, Solar Orbiter has been undergoing a series of rigorous tests at the IABG test centre near Munich, Germany. The spacecraft is due to be packed into an Antonov cargo plane on 31October for shipping to Florida. Launch on an Atlas 5 rocket from Cape Canaveral, is planned for February 2020.

**A-ROLL**

**10:00:10:00**

**Solar Orbiter in the IABG clean room – wide and pan into close-ups of the spacecraft**

Protected from contamination in a cleanroom, this is one of the last views of Solar Orbiter in Europe. After a year of tests here at IABG in Munich, the ESA spacecraft is ready to be packed-up and flown to Florida for launch.

Built by Airbus in the UK, engineers had the challenging task of designing a mission capable of observing the Sun as close as 42 million kilometres away…within the orbit of Mercury.

**10:00:40**

**Daniel MÜLLER, Solar Orbiter Project Scientist, ESA**

*The spacecraft has a number of key new technologies that have been developed just for the purpose of flying close to the Sun. We have a specific heat shield designed just for Solar Orbiter that will reach temperatures of over five hundred degrees centigrade on the front side and will keep things as cool as just about 50 degrees centigrade on the backside to protect the sensitive electronics.*

**10:01:01**

**Close-up Sun shots and animations…into heliosphere animations**

The Sun generates a bubble of plasma, enveloping the entire solar system. Known as the heliosphere, anything within it – including Earth – is subject to a stream of charged particles called the solar wind. Violent space weather from flares and coronal mass ejections has the potential to damage satellites, disrupt communications and knock out power grids on the ground. Solar Orbiter will help answer fundamental questions about the Sun’s activity.

**10:01:36**

**César GARCÍA, Solar Orbiter Project Manager, ESA**

*One of the key questions that scientists have is how the heliosphere is actually generated and how it's accelerating. So, what is really driving the solar winds? And the second key question of the mission is understanding what makes the Sun change or vary over this eleven-year cycle that we all know. So, understanding the magnetic properties of the Sun and how this changes over these eleven-year cycle is one of the key scientific objectives of solar orbiter.*

**10:02:02**

**Solar Orbiter close-ups showing the apertures**

To measure the magnetic environment around the Sun, Solar Orbiter is fitted with extremely sensitive instruments. And to capture the closest ever pictures of our star, the heatshield has peepholes through it…covered by protective doors.

**10:02:19**

**Frédéric AUCHÈRE, Solar Orbiter Principal Investigator**

*We are going to places where no other solar telescopes have been before. We are going to be very close to the sun to take very high-resolution images of the sun. Unprecedented spatial resolution. And we are also going to fly over the poles of the sun - regions that are very much unknown because we don't see them very well from Earth, but they are the source of the solar wind and therefore very important.*

**10:02:40**

**Orbital animations:**

<http://www.esa.int/spaceinvideos/Videos/2019/10/Solar_Orbiter_s_journey_around_the_Sun>

To reach this orbit after launch, the spacecraft will use the gravity of Venus and Earth – over the course of several years.

**10:02:51**

**SOHO images**

Solar Orbiter is building on the rich legacy of ESA’s previous missions to the Sun, including Ulysses and SOHO. In orbit around our star for more than 20 years, SOHO is still returning spectacular images.

**10:03:05**

**Parker animations (NASA):**

<http://parkersolarprobe.jhuapl.edu/Multimedia/Videos.php>

This new solar mission will complement NASA’s Parker Solar Probe, which launched last year.

**10:03:14**

**Daniel MÜLLER, Solar Orbiter Project Scientist, ESA**

*We will not get as close to the sun, but we will have a vastly bigger payload complement, so more instruments with more cameras looking at the Sun. So, we will do science that is complementary to Solar Probe and the two will really have a great deal of synergy.*

**10:03:26:00**

**Clean room images**

Scientists and engineers have been working on ESA’s Solar Orbiter mission for more than 20 years…with launch just months away, they can now look forward to unravelling the mysteries of the Sun.

**10:03:40 END**

10:03:46 [GEN ends]

**B-ROLL**

**10:03:40**

**Daniel Müller, Solar Orbiter Project Scientist, ESA**

Soundbites in English

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*We will not get as close to the sun, but we will have a vastly bigger payload complement, so more instruments with more cameras looking at the Sun. So, we will do science that is complementary to Solar Probe and the two will really have a great deal of synergy.*

**10:04:30**

**Daniel Müller, Solar Orbiter Project Scientist, ESA**

Soundbites in German

**10:06:23**

**César García, Solar Orbiter Project Manager, ESA**

Soundbites in English

*One of the key questions that scientists have is how the heliosphere is actually generated and how it's accelerating. So, what is really driving the solar winds? And the second key question of the mission is understanding what makes the Sun change or vary over this eleven-year cycle that we all know. So, understanding the magnetic properties of the Sun and how this changes over these eleven-year cycle is one of the key scientific objectives of solar orbiter.*

*The job of Solar Orbiter is to continue what Europe has been doing over the last 25 years and learning more about our neighbour star. The mission consists of a spacecraft that will orbit the Sun and will be looking deep into what happens on the surface of the Sun and connect what happens on the surface with the wind that the Sun is emitting towards the Earth and towards the solar system. At the same time, it will also investigate, and it's pure science, it will investigate what drives the 11 year solar cycle. So, why's the sun varying over a period of 11 years.*

**10:07:47**

**César García, Solar Orbiter Project Manager, ESA**

Soundbites in Spanish

**10:12:04**

**Frédéric Auchère, Solar Orbiter Principal Investigator**

Soundbites in English

*We are going to places where no other solar telescopes have been before. We are going to be very close to the sun to take very high-resolution images of the sun. Unprecedented spatial resolution. And we are also going to fly over the poles of the sun - regions that are very much unknown because we don't see them very well from Earth, but they are the source of the solar wind and therefore are very important.*

*I'm looking forward to the launch of Orbiter. I've been working on that mission for 15 years. The instruments are all in good shape, they are integrated in the spacecraft. And all I'm waiting for now is to just go there and go visit the Sun.*

**10:12:50**

**Frédéric Auchère, Solar Orbiter Principal Investigator**

Soundbites in French

**10:15:08**

**Tim Horbury, Solar Orbiter Principal Investigator**

Soundbites in English

*Well, Solar Orbiter is all about understanding how the Sun affects interplanetary space and indeed our lives on Earth. It's about making that connection between the Sun and space. And what does that connection is really the Sun's magnetic field, which stretches out into space. And it's the highway along which the particles travel as they go into the solar system. And our instrument is going to measure that magnetic field in space.*

*The magnetic field is this connection between the Sun and space. So it's really important that we measure it very accurately by being able to measure it. And we can understand how the particles move through space and also the magnetic field carries energy with it. And the interaction between the magnetic field in the particles is what accelerates the wind, heats it and ultimately drives its dynamics.*

**10:15:58**

**Ian Walters, Airbus Defence and Space**

Soundbites in English

*There are many technical challenges that we've had to overcome to build Solar Orbiter. Obviously, we have to overcome the problem that we're going very close to the Sun. And so thermally it gets extremely hot and we have to protect ourselves against the intense glare of the Sun. We have a heat shield for that. So, one of the challenging technologies has been to find the right materials and the right design to build the right kind of heat shield for us. But we also have solar arrays that stick out into the Sun, here we've reused technology we’d already developed for the Bepi- Colombo mission to Mercury. So, we were able to use the same kind of technology there and also the high gain antenna, which we use to relay all the data back to Earth also sticks out into the glare of the Sun. So we've had to coat that with this special black coating which was developed, also, especially for this mission.*

*So, on the outside of the heat shield, we get up to about 600 degrees centigrade. But in the shadow, this sometimes confuses people, in space there is no air. So actually, when you're in a shadow, it's extremely cold, even when you're very close to the Sun. So behind the spacecraft, we can reach temperatures down to minus 180 degrees, which is extremely cold. And so, yes, we do drop a lot of temperature from the top of the heat shield to the bottom. The heat shield is only about 15 centimetres across and between the front and the back of the heat shield, we go from something like 600 degrees to about 100 degrees or less. So, it's a huge temperature gradient.*

**10:17:36**

**Justin Byrne, Airbus Defence and Space**

Soundbite in English

*Solar Orbiter is really building on the heritage of Bepi-Colombo, which we launched last year to Mercury, but it then takes it to another level. So, we're closer to the Sun. We're having to look at the Sun, trying to see the poles. And it needs to be much more optically clean, much more electrically, magnetically clean. And obviously, it's so close to the Sun, if anything goes wrong, the spacecraft has to look after itself. There's a lot of autonomy and protection systems, because if it drifts a slight bit, it will destroy itself. So it's a very, very sensitive mission.*

**10:18:13**

**Eckard Settelmeyer, Airbus Defence and Space**

Soundbites in German

**10:20:01**

**Shots of Solar Orbiter in the IABG cleanroom, Munich October 2019**

**10:22:53 END**

**10:22:58 GEN END**