3 years using advanced technology. How about 300 years! The Gaia team will complete this in only a period of 5 years. Immediately after insertion in its final orbit, Gaia will be on its way to its target region. Where will Gaia be in space?

Stage IV - the Fregat booster - is a complex stage to put the rocket from Earth into orbit above Earth. It is the fourth and final stage of the four-stage rocket. This stage includes four main parts: the Fregat core and three strap-on boosters. Stage IV - the Fregat - is a complex stage which is able to start and stop several times. This allows it to 'stage' by separating the different stages of the rocket from each other. Each stage performs complex manoeuvres and to have launched ESA's Cluster and Mars Express satellites and will launch more ESA satellites in the future.

How do rockets work?

The oxidizer (fuel and oxygen) are burnt inside the rocket producing frequency radio waves. These waves are used to control the rocket and direct it into the different orbits of the payload. The payload (the satellite to be launched) is released from the rocket at the right moment and flies to the Earth's orbit. After Gaia comes to the end of its 'lifetime', it will be left to orbit freely. As its orbit is far from Earth and the L2 Lagrangian point of the Sun-Earth system, at about 1.5 million kilometres from the Earth. This L2 point represents a location where gravitational and repulsive forces are balanced. This orbit is eclipse-free, about 10 metres across, and will weigh around 2000 kg.

What does Gaia mean?

For ancient Greeks, Gaia was the goddess of Earth, the Universal Mother. More recently, this name was adopted for a theory which states that the Earth (including all living organisms, the biosphere, the rocks, the air, and the oceans) behaves like a living system in its own right. Now it is the name given to this ambitious project to discover the structure, origin and evolution of our Galaxy.

How is a satellite controlled from the Earth?

How do we measure the distance to our Galaxy?

Stellar parallax is very difficult to measure because it is needed to determine a stellar parallax and this is why we can only measure the distance to the closest stars. Gaia will measure the distance to billions of stars. Stellar parallax can be measured by using the apparent angular displacement of a star in the sky when viewed from opposite points of the Earth's orbit around the Sun. Stellar parallax can be converted into distance by using simple geometry.

How many people work in the Gaia project?

Currently about 2500 people are working on Gaia, including ESA staff and members of the space industry, scientific community and academic world. How long does it take to build a satellite like Gaia?

A mission like Gaia may be studied and discussed for several years before ESA's advisors approve it. Detailed designing and advanced technology studies then take 3 years to build and test the satellite, and prepare it for launch. Who builds the satellite?

Many individuals, scientific institutes, and industrial companies contribute to a mission like Gaia. As many as 20 to 30 companies might be involved. Who will have access to the data gathered by Gaia?

The data acquired by Gaia will be converted into useful information (distances, velocities...) by experts in different fields. The data will be made available to the scientific community. How much will the Gaia mission cost?

The cost of the Gaia mission is about 600 million Euros.

Where will Gaia be in space?

Gaia will be operated in a Lissajous-type orbit, around the L2 Lagrangian point of the Sun-Earth system, at about 1.5 million kilometres from the Earth. This L2 point represents a location where gravitational and repulsive forces are balanced. This orbit is eclipse-free, which allows a very stable thermal environment and a high observing efficiency, and lies in a low radiation region.

How is a satellite controlled from the Earth?

Radio signals are sent to the satellite using large radio dishes which are pointed to the satellite's location in space. The large quantity of information sent from the satellite to the ground is also transmitted by high frequency radio waves. How many grippers does Gaia have?

Gaia will have about 1000 grippers. Gaia will make use of an advanced gripper mechanism to catch the ‘dead’ satellite. How many stars will Gaia measure?

Gaia will measure about one billion stars. This constitutes about 1 per cent of the total star content in the Milky Way. How much will the Gaia mission cost?

The cost of the Gaia mission is about 600 million Euros.

What is Gaia?

Gaia is a satellite that the European Space Agency will launch into space in 2013. Gaia will measure about one billion stars. This constitutes about 1 per cent of the total star content in the Milky Way. It is the apparent angular displacement of a star in the sky when viewed from opposite points of the Earth's orbit around the Sun. Stellar parallax can be converted into distance by using simple geometry.

How will Gaia be transported into space?

The payload (the satellite to be launched) is released from the rocket at the right moment and flies to the Earth's orbit. After Gaia comes to the end of its ‘lifetime’, it will be left to orbit freely. As its orbit is far from Earth and the L2 Lagrangian point of the Sun-Earth system, at about 1.5 million kilometres from the Earth. This L2 point represents a location where gravitational and repulsive forces are balanced. This orbit is eclipse-free, about 10 metres across, and will weigh around 2000 kg. Why go to space to measure parallaxes?

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How far is the closest star to us?

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