



LISA Pathfinder - the first step towards observing Einsteins gravitational waves from space

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Airbus Defence and Space has now delivered the LISA Technology Package for the next ESA scientific mission. LISA Pathfinder - the first step towards observing Einsteins gravitational waves from space
Complicated inner workings for a complicated proof: with the LISA Technology Package (LTP), Airbus Defence and Space has now delivered the heart of the LISA Pathfinder scientific space probe. LISA Pathfinder will enable the test of advanced technology with which the gravitational waves described by Einstein can be observed from space. Gravitational radiation will allow astronomers to study our universe in a new way and future telescope systems will be able to observe exotic sources, such as colliding super-massive black holes or neutron stars, as never before.
The LTP has been installed into the satellite also built by Airbus Defence and Space. Both the LTP and the satellite itself must now prove their operational suitability in a comprehensive series of tests at IABG in Ottobrunn, near Munich.
LISA Pathfinder is paving the way for a future large space observatory that ultimately will directly observe and precisely measure gravitational waves. These minute distortions in space-time require very sensitive and highly precise measuring technology, the performance of which can only be tested in a space environment.
The LTP, which weighs around 150 kilograms, consists of a laser interferometer measuring changes in the distance between two precision-engineered gold/platinum test masses, each weighing 1.96 kilograms. Once in orbit, the two test masses will be released from a locking mechanism and then held in position with a weak electrostatic field that can be very precisely controlled. The laser interferometer and electrostatic sensors track the motion of the test masses inside the spacecraft, ensuring that the test masses remain undisturbed. The interferometer can measure the relative position and orientation of the test masses - which are around 40 centimetres from each other - with a high degree of precision (< 0.01 nanometres, which is less than one millionth of the width of a human hair).
The launch of the LISA Pathfinder is scheduled for autumn 2015. Once in orbit, a dedicated propulsion module will take LISA Pathfinder to around 1.5 million kilometres towards the Sun, away from any interference from the Earth.
Airbus Defence and Space in the UK was chosen by the European Space Agency (ESA) to build the LISA Pathfinder and is responsible for delivering the integrated turnkey satellite. Airbus Defence and Space in Germany has been commissioned by the ESA and the German Aerospace Center as the systems leader for the LTP, which was developed with contributions from European research institutes.
Airbus Defence and Space
Airbus Defence and Space is a division of Airbus Group formed by combining the business activities of Cassidian, Astrium and Airbus Military. The new division is Europe's number one defence and space enterprise, the second largest space business worldwide and among the top ten global defence enterprises. It employs more than 38,000 employees generating revenues of approximately 13 billion per year.
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