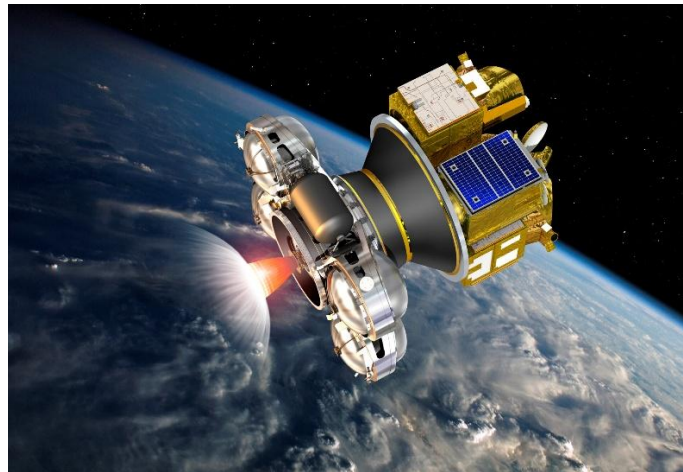


ESA's Orbital Transfer Vehicle ASTRIS will become Europe's Sentinel in Space



Artist's impression of the Ariane Smart Transfer and Release In-orbit Ship (ASTRIS) as it fires its engine around Earth. (image, credit ESA)

The increasing military conflicts on Earth are also affecting space. Europe cannot escape this. The ArianeGroup, named after the European Ariane rocket, is therefore developing a spacecraft to act as a sentinel in space.

Since 2021, ASTRIS has been under development by ArianeGroup GmbH in Germany as part of an ESA contract: The spacecraft is being manufactured in Bremen, and the main engine is being produced in Ottobrunn. Germany's significant financial commitment is likely to be advantageous with regard to potential military applications. In addition to Germany, Austria, Belgium, France, Switzerland, and Spain are also involved in the initial ASTRIS design. [1]

Ariane Smart Transfer and Release In-orbit Ship (ASTRIS) complements the Ariane 6 rocket to increase its versatility, allowing it to reach an even wider variety of destinations. The ASTRIS orbital transfer vehicle will transport payloads between orbits, and take over when the Ariane 6 upper stage has finished its job. For example, Ariane 6 can deliver ASTRIS and its payload to a geostationary transfer orbit and then ASTRIS can fly the payload to its final geostationary orbit, saving time and payload fuel. [3]

ASTRIS complements the Ariane 6 rocket to increase its versatility, allowing it to reach a wider variety of destinations and transfer to different orbits. It features a steerable main engine that can reignite multiple times to perform orbital changes, and it has six thrusters to perform maneuvers such as reorienting itself in space along its trajectory. [3]

ASTRIS is powered by a 5 kN engine called BERTA ("Bi-ergolian space transport propulsion"), according to the specification by the European Space Agency (ESA). The engine is powered by storable propellants that remain liquid over a wide temperature range both on Earth and in space. [1]

ASTRIS is designed to protect satellites in orbit. Key engine technology for ASTRIS comes from Taufkirchen/Ottobrunn. Even back in the days of Messerschmitt-Boelkow-Blohm (MBB), the site was a world leader. MBB Technology was also licensed to US aerospace companies. Site manager Gerald Hagemann intends to maintain this lead. Special 3D printing processes are intended to simplify and accelerate the complex manufacturing techniques.

In Germany, ArianeGroup is known for civilian missions in orbit. In France, however, the majority of its added value is generated through military contracts. For the French military they are building the M51, the only European strategic delivery system for nuclear weapons. It can reach almost any target, including in Asia.

The separation of military and civil use is not so strict anymore, Pierre Godart, head of ArianeGroup

Germany, is increasingly talking about dual-use applications, the combination of civilian and military uses. An important project in this regard is a spacecraft that can operate in space for months after launch.

ASTRIS is designed to be located between the Ariane 6's upper stage and the payloads during launch. Compared to the rocket's height of up to 62 meters, it appears tiny. Yet it extends the operational range far beyond geostationary orbit—to the moon and even more distant destinations.

Importantly, it's capable of continuous operation. The propellants remain ready for use for many weeks at extreme temperatures and, as soon as the two separate components (hydrogen peroxide and ethanol) meet in the combustion chamber, they ignite spontaneously. This ensures great flexibility. Logistics tasks in space become possible, such as transporting payloads without their own propulsion or refueling satellites.

ASTRIS also supports surveillance tasks as many suspicious objects are teeming in orbit specifically targeting certain satellites. No one knows their purpose. Are they spying? Or are they meant to disable hostile objects when necessary? Then the affected country would lose part of its defense capability. ASTRIS, with the appropriate equipment, would also be able to repel attacks. An important step towards European sovereignty. "We in Europe must position ourselves," says Godart.

Meanwhile, the ramp-up of Ariane 6 continues. Instead of four launches in 2025, there are planned for seven this year. On February 12, an Ariane rocket with four solid rocket boosters instead of two successfully took off from Kourou for the first time. [2]

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