



Arianespace
welcomes you
to French Guiana



Thanks for coming. It's a *great* time to visit.

Welcome to Europe's Spaceport. And to a remarkable work in progress.

Naturally we hope your visit to French Guiana coincides with the unforgettable spectacle of an Ariane launch. But if it doesn't, there's still plenty to see and do. Our job at Arianespace is to launch satellites—the high technology instruments that have transformed the way we live and work, transmit and gather information, entertain ourselves, even understand our place in the cosmos. Since 1980, customers from around the world have entrusted us to launch their investment in space. In fact, over 2/3 of the world's commercial satellites have begun their service life in Kourou. But as

you are about to discover, Arianespace is just one part of a much bigger team dedicated to improving the way we gain access to space in the 21st century. With our colleagues at the European Space Agency, France's space agency CNES, and dozens of European companies at the cutting edge of spaceflight technologies, we are now adding a set of tools to make Europe's Spaceport more effective than ever. New launch facilities, new launchers, the very real possibility of manned

spaceflight missions—it's all happening right here today. For two decades Europe has set the world standard in commercial space transportation. Now you're about to enjoy a preview of what's in store in years ahead.



In coming years the Spaceport will play an increasingly important operational support role for the International Space Station, via the ATV service module (shown here), and possible manned ferry missions aboard Soyuz, currently under study.

Milestones.

Ariane reflects Europe’s agreement that access to space is not a luxury but a necessity. But early on it was decided that to succeed Ariane would have to be

more than just Europe’s launch system—it would have to become the world’s. This meant innovating in ways never attempted before. Ariane is the first launch system specifically designed to serve the needs of the world’s commercial space community. Naturally, this implies a rocket that is affordable and reliable.

But it also has inspired a complete reappraisal of the way a space

transportation company interacts with its customers.

Rapid decision-making is critical. Technical partnership begins years before launch. Ground facilities are the best in the world. Launch campaigns are efficient and brief: respect of the customer’s

timetable to orbit is paramount. The market’s verdict is

clear. Since 1980, two out of every three launch contracts have been awarded to Arianespace. Today, after orbiting more than 250 spacecraft, our mission remains the same: to offer the world timely access to space based on superior technologies and two decades of specialized expertise.



Perfectly adapted to the international commercial satellite market in the 1980's and 1990's, Ariane 4 orbited more than 200 payloads during its prolific service life. The system's final flight before retirement occurred in 2003.



Successor to Ariane 4 and inheritor of 20 years of distinguished service to the commercial space community, Ariane 5 is the centerpiece of Europe's strategy to successfully compete in the decade to come.

The first two decades:
A chronology.

- 2007.** Debut of Vega and Soyuz commercial spaceflight operations.
- 2005.** Completion of Vega and Soyuz launch pads.
- 2003.** Shareholder and regulatory approval to incorporate Vega (Italy) and Soyuz (Russian Federation) into Arianespace's launcher fleet. Final flight of Ariane 4.
- 2000.** Arianespace marks 20 years of commercial spaceflight with 100th Ariane 4 flight, conducts 8 successful launches in just 4 1/2 months. Company's net worth exceeds 300 million euros based on annual sales of 1 billion euros.
- 1999.** Flight # 119. Service entry of Ariane 5.
- 1998.** Qualification of heavy-lift Ariane 5.
- 1988.** Flight # 22. Maiden flight of Ariane 4.
- 1986.** Flight # 17. First mission launched from new ELA 2 launch pad.
- 1984.** Flight # 9. First commercial flight executed under Arianespace's authority. Flights 1 through 8 were system test and qualification missions.
- 1980.** Creation of the world's first private space transportation company. Shareholders include 36 European industrial partners, 13 financial institutions and France's national space agency CNES.



Why on earth are we *here* ?

Don't look now. But the ground you're standing on is turning at about 1,000 miles per hour. That's twice as fast as it spins further north or south—in Berlin, for example, or Sydney. And it's a very important reason why Europe's Spaceport is located here in French Guiana, 5° north of the equator. While there's little risk that you will spin off the planet, that extra rotational velocity gives a huge added push to rockets launched from the Spaceport. Think 'slingshot' effect. This means we can launch bigger payloads for an equivalent amount of energy. It's important for our customers because it means their satellites reach orbit with a lot more fuel aboard, making them

productive for longer periods—sometimes years longer. Kourou is also perfectly located to place satellites into a variety of orbits. Because we're always operating over water, we can safely launch to the north or to the east. The absence of hurricanes and earthquakes make Kourou the ideal place to launch the world's most advanced commercial satellites. And of course the Spaceport is based on French territory—think of it as a small part of Europe tucked into the northeast corner of South America.

The Spaceport is ideally positioned to launch satellites into different orbits. Certain will orbit directly over the same spot on the earth-like weather and telecoms spacecraft. Others will fly north to south for scientific or communications missions. Still others will escape earth's gravity to become observatories or visit the solar system.



Anatomy of an Ariane launch campaign

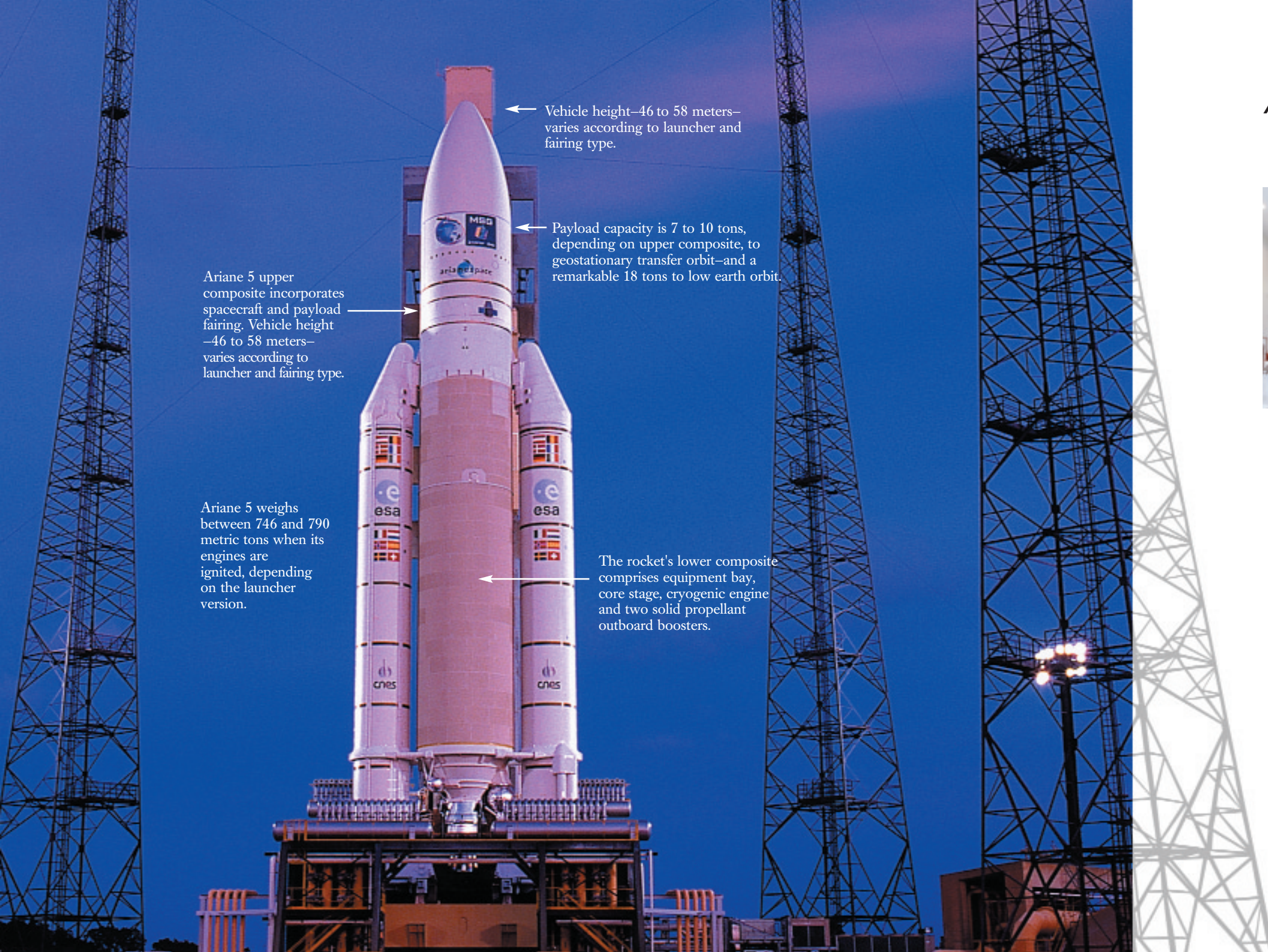
1 ZP: the Ariane Preparation Zone
Each Ariane mission begins at the Launcher Integration Building (BIL). For a duration of two weeks, the Ariane launcher is carefully assembled directly on its launch table. Main stage, solid propellant boosters, vehicle equipment bay and upper stage all converge and are joined together here.

2 BAF: Final Assembly Building
After completion of work in the Launcher Integration Building, Ariane is towed on its mobile launch table to the Final Assembly Building. For the next nine days, numerous operations, including fuelling of the upper stage and arming of the pyrotechnic systems, will take place. Final preparation of spacecraft is completed in the payload encapsulation hall. Actual mating of the payload and launcher is the final step.

3 Launch Vehicule Transfer
With launcher and payload now fully integrated, Ariane 5 is ready to be towed on its launch table to the launch pad. Combined weight of the launch vehicle and its table is 1,700 metric tons. The table is equipped with an umbilical mast and two cryogenic arms for fuelling the ESC-A cryogenic upper stage.

4 ZL: the Ariane launch pad
Final countdown and lift-off take place from Launch Zone #3. The facility incorporates a concrete pad with its tower, three flame ducts (with 15-meter above-ground extensions to dampen acoustic effects detrimental to payloads), four lightning arrester masts, a water tower and two storage areas for liquid hydrogen and oxygen.

5 CDL3: Ariane Mission Control
This bunker complex is the heart of every Ariane launch campaign. CDL3 assures mission coordination, launcher control and monitoring functions from initial launcher integration through to countdown and lift-off.



← Vehicle height—46 to 58 meters—varies according to launcher and fairing type.

← Payload capacity is 7 to 10 tons, depending on upper composite, to geostationary transfer orbit—and a remarkable 18 tons to low earth orbit.

→ Ariane 5 upper composite incorporates spacecraft and payload fairing. Vehicle height—46 to 58 meters—varies according to launcher and fairing type.

Ariane 5 weighs between 746 and 790 metric tons when its engines are ignited, depending on the launcher version.

← The rocket's lower composite comprises equipment bay, core stage, cryogenic engine and two solid propellant outboard boosters.

Ariane 5: The flagship.



Ariane 5 and its associated launch infrastructure represent an integrated business system for preparing and launching the world's largest, most advanced commercial spacecraft. ELA 3, the sophisticated Ariane 5 launch complex, combines facilities for executing each of the steps critical to the launch campaign—everything from launcher assembly to spacecraft

preparation. The result is a seamless, swift process allowing unusually fast turnaround times between launches. With twin launch tables and multiple

payload processing resources, Ariane 5 can absorb high levels of customer demand. A new variant of the system, capable of launching up to 10 tons into geostationary orbit, will receive commercial certification in the near future.



Mission control and range operations (telemetry, weather, safety, etc) are centralized in the Jupiter mission control room 13 kilometers from the Ariane 5 launch pad. Actual spaceflight operations are conducted from the CDL3 facility.

September 27, 2003.
Ariane Flight 162
successfully delivers three
spacecraft into orbit.



The fleet.

The days when one launch system fitted all satellite configurations are over. Considering that innovative orbital business ventures can today be based on satellites as small as volley balls, or spacecraft weighing up to ten tons, it clearly makes sense to offer customers a launch vehicle precisely dimensioned to

meet their mission requirements. That's why, between now and 2006, the Spaceport will be reconfigured to accommodate two complementary launch systems alongside



Heavy lift Ariane 5

In service since 1999, Ariane 5 is currently able to launch spacecrafts weighing up to seven tons, with a planned increase to ten tons as the launch system evolves. Measuring five meters in diameter, Ariane 5's spacious payload fairing can accommodate even the largest commercial satellites.

Ariane 5. The arrival of Vega and Soyuz to the Spaceport represents a major step forward for Europe's competitiveness in commercial space. For the first time a single launch services provider will be

Prompt, efficient and affordable access to orbit for low mass payload customers is Vega's guiding design principle.



Light lift Vega.

Designed to accommodate light payloads in the 1.5 ton range, Vega is ideally suited for launching smaller scientific and constellation telecoms spacecraft into low earth orbits. Vega is a single body launcher with three solid propulsion stages, and an additional liquid propulsion upper module for attitude and orbit control, and satellite release. First flight from the Spaceport is programmed for 2007.



able to offer different rocket technologies precisely matched to payload size and mass. The customer benefits are clear: enhanced reactivity, a gain in launcher availability, and greater flexibility in mission costing. Vega will be launched from the reconfigured launch

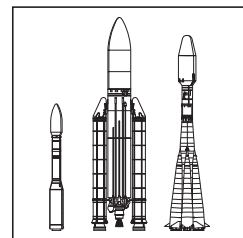
pad Number One at the heart of the main Kourou Spaceport complex, alongside the existing Ariane 5 installation. Soyuz will be based at a brand new launch facility located 10 kilometres north of the ELA launch zone. From ground-breaking to final completion, the work required to bring Europe's versatile new launcher

Medium lift Soyuz.

Launching from Kourou will dramatically increase Soyuz's payload capacity, enabling it to launch telecommunications satellites weighing up to 3 tons into geostationary transfer orbit.



fleet to operational status will last 36 months. First launches of Soyuz and Vega are scheduled for 2007.



Contrasting size and mass of Arianespace's new launcher trio illustrates the versatility of the fleet principle.

Sputnik, Laika, Yuri Gagarin—Soyuz's historic contribution to the annals of spaceflight is unmatched. Robust, reliable, fully modernized, the rocket's arrival at the Spaceport marks the beginning of a new chapter in its distinguished service life. Soyuz has been launched more than 1,700 times, and is the only vehicle apart from the US space shuttle qualified for manned flights to the International Space Station.



Propulsion and assorted technologies.

Sneema Moteurs
groupe sneema

Contraves | Space
 Upper stage payload shroud and related support and technologies.


CENTRE SPATIAL GUYANAIS
Port spatial de l'Europe
Europe's Spaceport







ELA launch pad mechanical services prime contractor.

ELA launch pad fluid management services.
Manufacturer of solid boosters and associated propulsion systems.



Production of booster solid propellant.

Ariane prime contractor, integration and operational support.


Who does what at the Spaceport ?

Yes, we know it can be a little confusing as prime contractor for all site figuring out who's who and who does installations and provides logistic what at Europe's Spaceport. In a support for launcher and payload nutshell, here's how things work. ESA– preparation. To do so, it coordinates the European Space Agency–has the activities of several small and global oversight responsibility for medium size companies in French program definition, funding and Guiana. Arianespace is the operating supporting the Spaceport's mission. company mandated to market and CNES–the French space agency–acts execute spaceflight operations and is



responsible for the overall coordination of ground and on-board industrial operators at the launch facilities. The Guiana Space Center is the point of convergence for each of the industrial and operational players active at the spaceport, including European aerospace companies proficient in each of the mission-critical disciplines necessary to prepare the launch vehicle and service customer payloads. These activities include launcher integration, propulsion, the manufacture of

solid rocket fuel and boosters, telemetry, satellite preparation, and more. Other companies with permanent operational staffs in Kourou supply the range of service and support activities necessary to ensure that the Spaceport operates smoothly. An especially critical role given that the Spaceport's 1200 permanently assigned staff-members are joined by up to an extra 100 during the labor-intensive weeks preceding each launch.

The European Space Agency defines overall policy and is responsible for development of the Ariane and Vega launchers, and the Soyuz launch pad. The agency draws on the technical and managerial resources of CNES for program execution.



Arianespace has responsibility for all launch systems and flight operations.



France's national space agency CNES acts as program prime contractor and has managerial authority for all Spaceport development and fixed assets.



Control and command systems management.



Control and command systems management.



Command and control systems management.



Liqua nyarogen ana oxygen/nitrogen/helium production for Ariane 5.

How *you* fit into Europe's future in space.

Europe's space program is a valuable international asset. For more than twenty years, Arianespace's customers—private corporations, governments and international organizations alike—have offered the critical support necessary to ensure our success. That support will be just as vital in years to come. If your company or nation is considering an investment in space, we hope that your visit to the Spaceport will reinforce a positive perception of Europe's dedication to flexible, affordable and dependable spaceflight. Success also depends on the goodwill and informed opinion of our fellow European Union citizens. Thanks to your encouragement, investment and creative participation, Europe has become a fully engaged participant in the peaceful development and exploration of space. Europe's space program enriches our community of nations, and demonstrates the rewards to be derived from close cooperation. Your continued support will ensure that the adventure has only just begun.





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