



Launch Services Program

Established in 1998, NASA's Launch Services Program (LSP), based at the agency's Kennedy Space Center in Florida, ensures a reliable capability for launching the agency's science and robotic missions by procuring commercial launch vehicles for NASA and NASA-sponsored payloads. LSP functions as a broker, matching spacecraft with the best-suited rockets, managing the launch process, and providing support from pre-mission planning to post launch. The program's main objectives include delivering safe, cost-effective, and on-time launch services, including mission analysis, spacecraft integration, and payload processing to ensure mission success.

LSP works with a variety of customers, ranging from NASA centers and educational institutions to international partners such as ESA (European Space Agency), Indian Space Research Organization (ISRO), and JAXA (Japan Aerospace Exploration Agency). Other government agencies, including the United States Space Force (USSF), National Reconnaissance Organization (NRO), and National Oceanic and Atmospheric Administration (NOAA), also collaborate with LSP.

The program supports the mission needs of its customers from conception until well after launch, offering customized services and contracts based on the complexity, duration, and risk tolerance of the

mission. These comprehensive end-to-end services range from advanced planning, business aspects, technical services, launch site operations, launch operations, to post-launch activities. They include spacecraft design, procurement of commercial launch services, certification of rockets, standalone testing of spacecraft, countdown participation, and post-launch data analysis.

Launch vehicles are complex, high-performance rockets that use two or more stages to transport a spacecraft to space. These rockets must be compatible with the spacecraft they launch and must withstand harsh environments, including vibration, contamination, electromagnetism, extreme temperatures, and structural loads to complete their missions. LSP helps implement NASA's policy of a mixed-fleet launch strategy, which uses both existing and emerging domestic launch capabilities to ensure access to space. To achieve this, LSP works with many commercial launch providers to provide a range of rockets capable of reaching space.

The spacecraft, or payloads, serve various purposes in space, including communication, Earth observation, meteorology, navigation, planetary exploration, and transportation of humans and cargo. Each rocket is selected and tailored to help its spacecraft reach the correct destination in space, whether that is a

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A SpaceX Falcon 9 rocket carrying NASA's Imaging X-ray Polarimetry Explorer (IXPE) spacecraft soars upward after liftoff from the launch pad at Launch Complex 39A at NASA's Kennedy Space Center in Florida at 1 a.m. EST on Thursday, Dec. 9, 2021. Photo Credit: NASA/Cory S. Huston

particular orbit around Earth, landing on the surface of another planet such as Mars, or heading billions of miles away into the Kuiper Belt.

Additionally, LSP serves as a key consultant for NASA's Artemis missions, supporting what will be humanity's first space station in lunar orbit - Gateway - by advising on HALO (habitation and logistics outpost), the Power and Propulsion Element (PPE), and the logistics element, as well as providing mission management to deliver the Canadian Deep Space Exploration Robotic System to the lunar space station. LSP supports the human landing system(s) in an advisory role as well. It also provides advisory expertise for the agency's Commercial Crew Program and Commercial Resupply Services program missions in support of the International Space Station.



A SpaceX Falcon Heavy rocket with the Psyche spacecraft onboard rolled to the launch pad Tuesday, Oct. 10, 2023, at Launch Complex 39A at NASA's Kennedy Space Center in Florida as part of preparations of the mission to a metal-rich asteroid. Photo Credit: NASA/Aubrey Gemignani



A United Launch Alliance Atlas V 541 rocket, carrying the National Oceanic and Atmospheric Administration's (NOAA) Geostationary Operational Environmental Satellite-T (GOES-T), lifts off from Space Launch Complex 41 at Cape Canaveral Space Force Station in Florida on March 1, 2022. Photo Credit: NASA/Kevin O'Connell & Kevin Davis

Rocket Providers and Capabilities

All expendable rockets use the same basic technology to get into space – two or more rocket-powered stages, which fall away when their engine burns are completed. In recent years, some commercial providers have incorporated or designed methods to reuse parts of their rocket. Whatever a rocket carries above the final discarded stage is considered the payload. LSP works with a large number of commercial launch providers to have a mixed fleet of both emerging and established companies providing several rockets.

Blue Origin – New Glenn

Blue Origin's New Glenn rocket is a single configuration heavy-lift rocket capable of carrying people and payloads. New

Glenn's fully reusable first stage is designed for a minimum of 25 flights. The seven-meter fairing has two times the payload volume of any existing rocket. The Blue Engine 4 (BE-4) will enable New Glenn to launch payloads weighing 45 metric tons to low Earth orbit and 13 metric tons to geostationary transfer orbit.

Northrop Grumman Innovation Systems – Antares

Northrop Grumman's Antares rocket is a two-stage rocket with an optional third stage that provides low Earth orbit launch capability for payloads weighing up to 17,637 pounds (8,000 kilograms). The rocket is primarily used to support the company's Commercial Resupply Services contract with NASA.

Northrop Grumman Innovation Systems - Pegasus XL

The three-stage Pegasus rocket is used to deploy small satellites weighing up to 1,000 pounds (453.59 kilograms) into low Earth orbit. Pegasus is carried aloft by the Stargazer L-1011 aircraft to approximately 40,000 feet over open ocean, where it is released and free-falls five seconds before igniting its first stage rocket motor. With its unique delta-shaped wing, Pegasus typically delivers satellites into orbit in a little over 10 minutes.

United Launch Alliance – Atlas V

Atlas V uses a standard common core booster, up to five solid rocket boosters, a Centaur upper stage in a single- or dual-engine configuration, and one of several sizes of payload fairings. The Atlas V can carry a payload weighing up to 41,570 pounds (18,850 kilograms) to low Earth orbit.

United Launch Alliance – Vulcan Centaur

United Launch Alliance's newest launch vehicle, the Vulcan Centaur rocket has a fairing of 5.4 meters in diameter (available in two different lengths) and can carry a payload weighing up to 60,000 pounds (27,200 kilograms) to Low Earth orbit, and up to 15,400 pounds (7,000 kilograms) into geosynchronous Earth



A long exposure photo of a United Launch Alliance Atlas V rocket launching the Lucy spacecraft from Space Launch Complex 41, Saturday, Oct. 16, 2021, at Cape Canaveral Space Force Station in Florida. Lucy will be the first spacecraft to study Jupiter's Trojan Asteroids. Photo Credit: NASA/Bill Ingalls

orbit. Up to six solid rocket boosters can be added to increase its performance.

SpaceX – Falcon 9

Falcon 9 is a reusable, two-stage rocket designed and manufactured by SpaceX for the transport of people and payloads into Earth orbit and beyond. Falcon 9 is the world's first orbital class reusable rocket. Reusability allows SpaceX to reuse the most expensive parts of the rocket, which in turn drives down the cost of space access.

SpaceX – Falcon Heavy

Falcon Heavy is composed of three reusable Falcon 9 nine-engine cores whose 27 Merlin engines together generate more than 5 million pounds of thrust at liftoff, equal to approximately 18,747 aircraft. As one of the world's most powerful operational rockets, Falcon Heavy can lift nearly 141,000 pounds (64 metric tons) to orbit.

Launch Sites

LSP operates from several launch sites around the world, using the different capabilities of each site to meet all the agency's missions. The decision on the proper launch site location is based on the type of science, and what orbital destination the satellite needs to reach to gather the science.

Cape Canaveral Space Force Station and NASA's Kennedy Space Center

Located along Florida's central Atlantic coast between Jacksonville and Miami, our nation's premiere spaceport is

National Aeronautics and Space Administration

John F. Kennedy Space Center
Kennedy Space Center, FL 32899

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ideal for launching spacecraft requiring equatorial orbits. This is due to its closer proximity to the equator. This launch site is also ideal for missions requiring a west-east orbit.

Vandenberg Space Force Base

Located along California's central coast between Los Angeles and San Francisco, Vandenberg is the preferred launch site for spacecraft requiring a north-south orbit and is also best for missions with a polar orbit destination.

Wallops Island Flight Facility

Located on the Eastern Shore of Virginia, Wallops Island Flight Facility is NASA's principal facility for suborbital research programs.

Reagan Test Site, Kwajalein Atoll

Located between Hawaii and Australia, Kwajalein Atoll is used for missions requiring equatorial orbits and low inclinations.

Kodiak Island, Alaska

Due to its wide launch azimuth and unobstructed downrange flight path, Pacific Spaceport Complex – Alaska (formerly Kodiak Launch Complex) is one of the best locations in the world for polar launch operations.

Additional launch sites

Additional launch sites specific to LSP's Venture-Class Acquisition of Dedicated and Rideshare (VADR) launch services contract include:

- Rocket Lab Launch Complex 1 in Mahia, New Zealand
- Mojave Air and Space Port in Mojave, California
- Starbase in Boca Chica, Texas

LSP – Earth's Bridge to Space – has launched more than 100 primary missions.

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For more information about LSP, consult these fact sheets:

[Hanger AE Fact Sheet](#)

[Rocket Risk Fact Sheet](#)

[LSP's Earth's Bridge to Space Info Book](#)