First Rendezvous with a Comet

On August 6, 2014, the Rosetta mission spacecraft became the first in history to rendezvous with a comet (67P/Churyumov-Gerasimenko) as it orbits the sun. About two months later, the small Philae lander deployed from Rosetta touched down on the comet and bounced several times before alighting on the surface. Philae obtained the first images ever taken from the surface of a comet, and sent back valuable scientific data for several days.
On May 5, 2018, InSight will be launched on its mission to Mars. It is a robotic scientific explorer to investigate the deep interior of Mars. It is scheduled to land on Mars November 26, 2018. It will allow us to better understand the origin of Mars.
Launch of the James Webb Space Telescope

Projected for October 2018, the JWST will be launched in the Ariane 5 ECA. The telescope is an orbiting infrared observatory that will complement and extend the discoveries of the Hubble Space Telescope, with longer wavelength coverage and greatly improved sensitivity. Unlike Hubble, it will orbit the sun, not the Earth. It will be lined up with Earth and its location will be 1.5 million kilometers from Earth.
OSIRIS-REx is Launched

On September 8, 2016, NASA’s Origin, Spectral Interpretation, Resource Identification, Security-Regolith Explorer spacecraft is on its path for a two-year journey to asteroid Bennu. It was designed to rendezvous with, study, map the asteroid’s surface to select a sample site, collect a sample, and return the sample of Bennu to Earth. This sample of a primitive asteroid will help scientists understand the formation of our solar system more than 4.5 billion years ago. Bennu was chosen due to its potential hazard for impact with Earth in the 22nd century. It will acquire its sample of Bennu in July 2020 and be returned to Earth in September 2023.
Astronaut Scott Kelly and Cosmonaut Mikhail Komienko return to Earth on March 1, 2016 after their 340 day space mission, longest recorded time at the International Space Station. NASA selected 10 investigations to conduct with identical twin astronauts Scott and Mark Kelly. These investigations provide broader insight into the effects and changes that may occur in spaceflight as compared to Earth by studying two individuals who have the same genetics, but are in different environments for one year.
Project Orion took its first launch on December 5, 2014 with an unmanned flight launched on a Delta 4 Heavy rocket. NASA named this mission Exploration flight Test-1 (EFT-1). It made two orbits before splashing down in the Pacific. The flight tested many subsystems, including its heat shield, electronics and parachutes. Orion will play an important role in NASA's journey to Mars. It is designed to carry astronauts farther into the solar system than ever before. Orion’s structure is similar to the Apollo Capsule that took astronauts to the moon. Orion will eventually carry astronauts to an asteroid. The ultimate goal for Orion is to carry humans to Mars.
Mars Rover Curiosity Lands

After a nine month trip, Curiosity landed on August 6, 2012. The car-sized rover is studying Mars' habitability. To find out, the rover carries the biggest, most advanced suite of instruments for scientific studies ever sent to the martian surface. The rover will analyze samples scooped from the soil and drilled from rocks to record of the planet's climate and geology. The rover's onboard laboratory will study rocks, soils, and the local geologic setting in order to detect chemical building blocks of life.
It has discovered that Mars has the conditions once fit for Ancient (microbial) Life since it contains active, ancient organic chemistry.
Dawn was launched September 27, 2007. NASA’s Dawn spacecraft became the first probe ever to enter orbit around an object in the main asteroid belt between Mars and Jupiter. It began its orbit around Asteroid Vesta on July 16, 2011 and studied it for one year before traveling to the dwarf planet Ceres. It began orbiting Ceres on March 6, 2015.
NASA's Lunar Reconnaissance Orbiter (LRO) Launched

The LRO was launched aboard an Atlas V rocket from Cape Canaveral Air Force Station in Florida on June 18, 2009. The satellite will relay more information about the lunar environment than any other previous mission to the moon.

LRO has collected a treasure chest of data with its seven powerful instruments, making an invaluable contribution to our knowledge about the moon. LRO experiences 12 earthrises every day.
NASA's Mars Reconnaissance Orbiter blasted off from Cape Canaveral August 12, 2005, on a search for evidence that water persisted on the surface of Mars for a long period of time. Mars Reconnaissance Orbiter is studying the history of water on Mars.

After a seven-month cruise to Mars and six months of aerobraking to reach its science orbit, Mars Reconnaissance Orbiter began seeking out the history of water on Mars with its science instruments. The instruments zoom in for extreme close-up photography of the martian surface, analyze minerals, look for subsurface water, trace how much dust and water are distributed in the atmosphere, and monitor daily global weather.
NASA Returns Humans to Space

Space Shuttle Discovery (STS-114) launched July 26, 2005 successfully into orbit, marking NASA's first return to human spaceflight after the Columbia Tragedy.
January 2004, NASA successfully landed two Mars Exploration Rovers, Spirit and Opportunity, on the surface of Mars within the span of 3 weeks. Mars Rovers, Spirit and Opportunity, land on opposite sides of Mars and begin exploring the planet. Since their landing, the rovers have sent more than 100,000 high-resolution, full-color images of the planet’s surface.
First Space Probe to Orbit Saturn

Following a 7-year, 2 billion mile journey, the Cassini-Huygens spacecraft became the first spacecraft to go into orbit around Saturn on June 30, 2004. It was launched from Cape Canaveral, Florida on October 15, 1997.
Space Shuttle Columbia Disaster

Columbia Mission STS-107 broke up in the atmosphere over Louisiana and Texas 15 minutes before its scheduled landing on February 1, 2003. An investigation blamed the thermal insulation foam that broke off during takeoff. It created a hole that allowed hot gases to enter the wing upon re-entry. All crew members' lives were lost.
April 28, 2001 was the day an American businessman Dennis Tito became the first tourist to fly into space, but not with NASA. NASA refused his $20 million offer, so he went to the International Space Station with the Russian space program aboard the Soyuz space capsule. He was given limited access to the space station.
The Near Earth Asteroid Rendezvous, the NEAR-Shoemaker spacecraft successfully landed on the surface of the asteroid Eros on February 12, 2001.
Building the International Space Station Begins

Expedition One of the International Space Station was launched October 31, 2001 by Baikonur Cosmodrome in Kazakhstan with Astronaut William Shephard and Cosmonauts Yuri Pavolich Gidzenko and Sergi Kirkalev.
The Apollo 13 Mission occurred between April 11 and April 17, 1970. 56 hours into the flight of Apollo 13, the oxygen tank in the service module ruptured and damaged several of the power, electrical, and life support systems. The world watched anxiously as NASA figured out how to bring the crew home safely after several harrowing days in space.
First Spacecraft to Orbit Another Planet

On November 13, 1971, the American space probe Mariner 9 is the first spacecraft to orbit Mars. It had been launched May 30, 1971.
Pioneer 10 was launched on March 2, 1972 to Jupiter from Kennedy Space Center in Florida. It is the first spacecraft that had to travel through the asteroid belt where objects as small as dust particles through large rocks, some as large as Alaska are traveling at 72,000 km/hr.

On December 3, 1973, the spacecraft was the first to make direct observations and obtain close-up images of Jupiter. Pioneer 10 also took measurements of the gas giant's magnetosphere, radiation belts, magnetic field, atmosphere, and interior.
First Satellite to Map Earth's Living Resources

On July 23, 1972, Landsat 1 is launched from Kennedy Space Center, starting the longest continuous observation of Earth's land surfaces from space. Its mission is to perform an Earth resource mapping mission. It provided data on vegetation, insect infestations, crop growth, and associated land use information. Deforestation in the Amazon Rainforest in Western Brazil comparing 1975 to 2012.
On December 17, 1972, Apollo 17 was the last of the six Apollo missions to the moon, and the only one to include a geologist, Dr. H. Jack Schmitt. Other crew members were Eugene Cernan, and Ronald Evans.
First U.S. Space Station

On May 14, 1973, Skylab, a small orbital space platform, is launched. It was occupied by three separate crews over a period of two years. It was an important arena for a number of scientific experiments. In 1979, it reentered Earth’s atmosphere and disintegrated.
Voyager 2 Reaches Saturn

Voyager 2 was launched first, on August 20, 1977, but was the 2\textsuperscript{nd} probe to reach Saturn in August of 1981. Voyager 2 came within 101,000 kilometers (63,000 miles) of Saturn. Voyager 2 noticed changes in Saturn’s atmosphere since the Voyager 1 encounter and took more detailed images of the planet’s rings. Voyager 2 was downlinking at a rate of 44.8 kilobits per second. After its encounter with Saturn, Voyager 2 headed to Uranus.
The first manned mission of the Space Transportation System (STS-1), Space Shuttle Columbia is launched early morning on April 12, 1981. Two astronauts sat strapped into their seats on the flight deck of Columbia, a radically new spacecraft known as the space shuttle (reusable spacecraft).

John Young, the commander, had already flown in space four times, including a walk on the moon in 1972. Bob Crippen, the pilot, was a Navy test pilot who would go on to command three future shuttle missions. But nothing either man had done or would do was quite like this. They went on a 54-hour mission that ended with unpowered landing at Edwards Air Force Base in California.
First American Woman in Space

Sally Ride became the first American woman to fly in space from June 18th to June 24th. She was an astronaut on a space shuttle mission. Her job was to work the robotic arm. She used the arm to help put satellites into space. She flew on the space shuttle again in 1984. She was aboard the Challenger Space Shuttle mission STS-7.
First African-American Astronaut

August 30, 1983, Guion (Guy) Bluford was a mission specialist on Space Shuttle Challenger (STS-8). He became the first African American in space. Bluford says it took him awhile to recognize the historical significance of his selection to be the first African-American in space. But when his pioneering role became apparent, Bluford says he embraced it.
First Untethered Spacewalk

During NASA Space Shuttle mission STS-41-B February 3, 1984, Astronaut Bruce McCandless takes the first untethered spacewalk using a propulsion system using gaseous nitrogen as propellant with 24 nozzle thrusters. He used the new MMU (Manned Maneuvering Unit). To operate the propulsion system, the astronaut used his fingertips to manipulate hand controllers at the ends of the MMU's two arms. He flew out a distance of 100 meters from the shuttle, took a photo of the historic event which made the cover of Time magazine.
Magellan was sent on its way to Venus from the space shuttle. May 4, 1989. It arrived at Venus in September 1990. Using radar, it mapped 99% of the surface at high resolution.
Launch of Hubble Space Telescope

Space Shuttle Columbia lifted off for mission STS-31, carrying the Edwin Hubble Space Telescope April 24, 1990. The telescope is in orbit 570 km from Earth’s surface. Hubble is one of the most productive scientific instruments ever built. It photographs stars, planets, and galaxies. It has made more than 1.2 million observations since its mission began.
The comet first spotted in March 1993 was surprisingly orbiting Jupiter instead of the Sun as it had been captured by the massive planet’s gravity. Over time, the comet had broken apart. The collisions took place over several days as 21 separate fragments of the comet smashed into Jupiter's atmosphere, leaving blotchy scars behind. This was the first collision of two solar system bodies ever to be observed. All the collisions occurred between July 16 and July 22, 1994.
First Rover on Mars

The Mars Pathfinder, a small robotic rover began its exploration of the surface of Mars on July 4, 1997. It examines the nearby terrain, sending back amazing images of the planet’s surface. It had been launched on a Delta 11 rocket.
Representatives from 15 countries met on January 29, 1998 in Washington D.C. to sign agreements to establish the framework for cooperation among the partners on the design, development, operation, and utilization of the International Space Station (ISS). The countries represented were the United States, Russia, Japan, Canada and participating countries of the European Space Agency (Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland and the United Kingdom).
NASA's First Female Shuttle Commander

Space Shuttle Columbia's 26th flight (STS-93) was led by Air Force Colonel Eileen Collins. She is the first woman to command a Shuttle mission. The mission took place July 22-27, 1999.
First American Spacecraft on the Moon

Before humans could take their first steps on the moon, the mysterious and forbidding lunar surface had to be experienced by robots. Surveyor 1 became the first American spacecraft to soft land on the Moon on June 2, 1966.
On July 4, 2016, Juno reached the orbit of Jupiter to begin its observation of the gas giant. Juno is an unmanned research spacecraft designed to study the makeup, origin and evolution of Jupiter. Since orbiting, it is now taking a series of risky dives once every two weeks for a few hours beneath Jupiter’s intense radiation belts where it will study the gas giant from as close as 2,600 miles over the planet's cloud tops. The last mission to the gas giant, Galileo, which ended in 2003, spent most of its mission five times farther away than Juno will get. The principal investigators for the Juno spacecrafted are right here in San Antonio at Southwest Research Institute.
The Solar & Heliospheric Observatory (SOHO) project is a cooperative effort between the European Space Agency (ESA) and NASA. SOHO has given us a better idea of what powers the Sun and how it behaves. Unexpectedly, it has also become the great comet hunter, discovering over 3,000 comets.

SOHO was launched on December 2, 1995. The SOHO spacecraft was built in Europe with the help of American scientists. NASA was responsible for the launch and is now responsible for mission operations. SOHO moves around the Sun in step with Earth due to the combined gravity of the Earth and the Sun keeping it an orbit locked to the Earth-Sun line. It orbits the Sun much closer than the Earth. Its distance from Earth is 1,500,000 km (4 times the distance to the moon.)
An upcoming mission called Solar Probe Plus, scheduled to launch in 2018, will be humanity’s first voyage to a star, exploring the sun’s outer atmosphere from as close as 3.7 million miles from the sun’s surface. That is a tenth the distance from the sun to Mercury, far closer than any spacecraft has ever gone. It will investigate the coronal heating to attempt to explain why the corona is hotter than the layers below it.
The Asteroid Redirect Mission (ARM) mission is targeted for launch in Dec. 2021, NASA plans to send a robotic spacecraft to an asteroid tens of millions of miles from Earth, capture a multi-ton boulder, and bring it to an orbit near the moon for future exploration by astronauts. The mission will support NASA’s goal of sending humans to Mars in the 2030’s, and how it will demonstrate technology relevant to defending Earth from potentially hazardous asteroids.
First Hispanic Astronaut

Franklin Chang-Diaz aboard the Columbia Space Shuttle (STS-61C) January 12, 1986, became the first Hispanic in space. Franklin Chang-Diaz is a Costa Rican-America.
Space Exploration Technologies (Space X) was the first commercial company in history to deliver cargo to the International Space Station on May 25, 2012. The California-based company has a lucrative contract with NASA to bring cargo to the station. Space X uses its own rocket Falcon 9 and spaceship, the Dragon. Currently Dragon only carries cargo to space, but it was designed from the beginning to carry humans.
Mars Exploration Program (MEP) is led by NASA to explore the possibilities of life on Mars, to study the planet’s climate and natural resources. NASA has used orbital spacecraft, landers and Mars rovers to help with their efforts. The ultimate goal is to prepare for human exploration on Mars in the 2030's.
After decades of exploration, on September 12, 2013, Voyager 1 reaches a historic milestone for mankind--interstellar space which is specifically the space between each star's realm of plasma influence. Looking back toward our sun, Voyager 1 would only see it as a tiny point of light. It would take about 300 years for Voyager 1 to reach the inner edge of the Oort Cloud and possibly about 30,000 years to fly beyond it. Unfortunately, Voyager 1, only has enough electrical power to keep its instruments through at least 2020, which will mark 43 years of continual operation. At that point, mission managers will have to start turning off these instruments one by one to conserve power, with the last one turning off around 2025.
In 2015, NASA completed the critical design review for the Space Launch System – a first for a NASA exploration class vehicle in almost 40 years -- and continues to move forward with production of the launch vehicle. The SLS will be the most powerful rocket ever built. When completed, SLS will enable astronauts to begin their journey to explore destinations far into the solar system. This powerful rocket will greatly extend space exploration and science. The first crewed flight of SLS and NASA’s Orion spacecraft is scheduled for 2021.
The National Aeronautics and Space Administration began operation on October 1, 1958. It was created to perform civilian research on space flight and aeronautics. President Eisenhower appoints Dr. T. Keith Glennan as NASA’s first administrator and Dr. Hugh Dryden (left) as first deputy administrator.
On December 18, 1958 an Air Force Atlas booster placed into orbit the first communications relay satellite, Project SCORE (Signal Communications by Orbiting Relay Equipment). The next day, President Eisenhower’s Christmas message was beamed from this satellite, the first voice sent from space. The satellite used a tape recorder to store and forward voice messages.
On March 3, 1959 NASA sent Pioneer 4 to the moon, successfully making the first U.S. lunar flyby - passing within 37,000 miles of the lunar surface.
First U.S. Mammals in Space

The U.S. launched 2 monkeys, Able (rhesus macaque) and Baker (squirrel monkey), aboard a Jupiter missile in the nose cone on May 28, 1959. They recovered them after a sub-orbital flight of 300 miles in altitude. Both monkeys were recovered unharmed.
The U.S. launched Tiros 1 (Television Infrared Observation Satellite), the first successful meteorological satellite for monitoring Earth’s weather. It has been in orbit since April 1, 1960.
On May 5, 1961 Astronaut Alan Shepard became the first American to “fly” in space on the Freedom 7 from Cape Canaveral, FL. His sub-orbital flight (straight up to space and back down to Earth again) was 15 min. ending in splashdown into the Atlantic Ocean. This flight proved that man could control a spaceship in weightlessness and in strong G-forces.
On May 25, 1961, President John F. Kennedy made his “Urgent National Needs” speech to challenge Americans to support space exploration and placing a man on the moon. He committed the U.S. and NASA to landing on the moon by the end of the decade.
Astronaut John Glenn was launched into orbit around the Earth. He made 3 complete orbits in the Friendship 7 Mercury spacecraft on February 20, 1962.
On March 23, 1965, aboard the Gemini 3, astronauts Gus Grissom and John Young became the first two Americans in Space. They flew 3 low orbits in the spacecraft they named “Molly Brown” and splashed down in the Atlantic Ocean about 5 hours after launch. Their mission's primary goal was to test the new maneuverable spacecraft.
Gemini IV stayed aloft for 4 days and on June 3, 1965 astronaut Ed White performed the first EVA (Extra Vehicular Activity) with the help of an 8 meter tether. It lasted for 21 minutes and was described as "exhilarating."
On January 27, 1967, during a simulation aboard Apollo-Saturn 204 on the launch pad at Kennedy Space Center, flash fire broke out in a pure oxygen atmosphere on the capsule. Gus Grissom, Ed White, and Roger Chaffee died aboard of asphyxiation.

“Failure is not an option in Mission Control. Our astronauts’ lives depend on us.”
Aboard Apollo 8 on December 21, 1968, astronauts Frank Borman, Jim Lovell, and Bill Anders were the first humans to orbit the moon. They sent a message to the earth at lunar sunrise on Christmas eve.
First Man on the Moon

Apollo 13 – A Successful Failure

56 hours into the flight of Apollo 13, the oxygen tank in the service module ruptured and damaged several of the power, electrical, and life support systems. This occurred between the days of April 11-17, 1970. The world watched anxiously as NASA figured out how to bring the crew home safely after several harrowing days in space.
The Challenger disaster occurred on January 28, 1986 when the NASA Space Shuttle orbiter Challenger (OV-099) (Mission STS-51L) broke apart 73 seconds into its flight, leading to the deaths of its seven crew members, which included five NASA astronauts and two Payload Specialists. The spacecraft disintegrated over the Atlantic Ocean, of the coast of Cape Canaveral, Florida. One of the payload specialist, Christa McAuliffe, was to be the first Teacher in Space.