GIZA

This is a depiction of how the Sphinx and the three Pyramids at Giza would align with Orion's Belt in the year 10,450 BC. The three Pyramids exactly simulate the stars Delta Orionis [Mintaka], Epsilon [Alnilam], and Zeta [Alnitak] that comprise the Orion Belt.

During this era, the Age of Leo, The Sphinx, which originally may have fully resembled a lion, would have been looking directly due east at it's celestial counterpart as it rose at dawn of the vernal equinox in 10,450 BC. At the same time, the Nile would have corresponded with the Milky Way. Other constructions in Egypt mirror key components of the Orion Constellation.

V2

In Germania, dal 1933-34, i militari presero il completo controllo della ricerca sui razzi e fondarono il centro di Peenemunde dove in seguito realizzarono i famosi V-2 (V sta per Verteltung, vendetta). Il V-2 era un razzo sofisticato. La sua massa era di circa 14000 kg ed era alto 14.3 m. Il propellente era ossigeno liquido (5500 kg) mescolato con 4225 kg d'alcool (75%) ed acqua (25%). Poteva trasportare un carico di 1100 kg con altezza di picco di circa 100 km e gittata di circa 350 km. Il propellente era spinto nella camera di combustione da pompe centrifughe alimentate da una turbina a vapore; il vapore era prodotto da reazioni chimiche fra perossido d'idrogeno ed una soluzione acquosa di permanganato di potassio. Il primo test soddisfacente venne fatto nell'ottobre 1942 e nel settembre 1944 iniziò l'uso operativo dei V-2 che, con il loro carico di bombe, vennero lanciati contro l'Inghilterra. Fra il settembre 1944 e il marzo 1945 ne vennero lanciati più di 1000 e di questi circa l'8% fallirono alla partenza; dei restanti il 50% colpì il bersaglio.

SPUTNIK

History changed on October 4, 1957, when the Soviet Union successfully launched Sputnik I. The world's first artificial satellite was about the size of a basketball, weighed only 183 pounds, and took about 98 minutes to orbit the Earth on its elliptical path. That launch ushered in new political, military, technological, and scientific developments. While the Sputnik launch was a single event, it marked the start of the space age and the U.S.-U.S.S.R space race.

The story begins in 1952, when the International Council of Scientific Unions decided to establish July 1, 1957, to December 31, 1958, as the International Geophysical Year (IGY) because the scientists knew that the cycles of solar activity would be at a high point then. In October 1954, the council adopted a resolution calling for artificial satellites to be launched during the IGY to map the Earth's surface.

In July 1955, the White House announced plans to launch an Earth-orbiting satellite for the IGY and solicited proposals from various Government research agencies to undertake development. In September 1955, the Naval Research Laboratory's Vanguard proposal was chosen to represent the U.S. during the IGY.

The Sputnik launch changed everything. As a technical achievement, Sputnik caught the world's attention and the American public off-guard. Its size was more impressive than Vanguard's intended 3.5-pound payload. In addition, the public feared that the Soviets' ability to launch satellites also translated into the capability to launch ballistic missiles that could carry nuclear weapons from Europe to the U.S. Then the Soviets struck again; on November 3, Sputnik II was launched, carrying a much heavier payload, including a dog named Laika.

Immediately after the Sputnik I launch in October, the U.S. Defense Department responded to the political furor by approving funding for another U.S. satellite project. As a simultaneous alternative to Vanguard, Wernher von Braun and his Army Redstone Arsenal team began work on the Explorer project.

On January 31, 1958, the tide changed, when the United States successfully launched Explorer I. This satellite carried a small scientific payload that eventually discovered the magnetic radiation belts around the Earth, named after principal investigator James Van Allen. The Explorer program continued as a successful ongoing series of lightweight, scientifically useful spacecraft.

The Sputnik launch also led directly to the creation of National Aeronautics and Space Administration (NASA). In July 1958, Congress passed the National Aeronautics and Space Act (commonly called the "Space Act"), which created NASA as of October 1, 1958 from the National Advisory Committee for Aeronautics (NACA) and other government agencies.

GAGARIN

The Soviet Union had launched the world's first spacecraft, Sputnik, in October 1957 and had also sent the first human, Yuri Gagarin, into space on April 1961. NASA responded by sending the first American, Alan Shepard, into space in May 1961, but Shepard's flight was only a suborbital lob, whereas Gagarin had orbited Earth. With Glenn's orbital mission, NASA was finally able to pull back even with the Soviets. On February 20, 1962, John H. Glenn, Jr., became the first American to orbit Earth. An Atlas launch vehicle propelled a Mercury spacecraft into Earth orbit and enabled Glenn to circle Earth three times. The flight lasted a total of 4 hours, 55 minutes, and 23 seconds before the Friendship 7 spacecraft splashed down in the ocean. Most major systems worked smoothly, and the flight was a great success as an engineering feat.

APOLLO 1

On January 27, 1967, tragedy struck the Apollo program when a flash fire occurred in command module 012 during a launch pad test of the Apollo/Saturn space vehicle being prepared for the first piloted flight, the AS-204 mission. Three astronauts, Lt. Col. Virgil I. Grissom, a veteran of Mercury and Gemini missions; Lt. Col. Edward H. White, the astronaut who had performed the first United States extravehicular activity during the Gemini program; and Roger B. Chaffee, an astronaut preparing for his first space flight, died in this tragic accident.

A seven-member board, under the direction of the NASA Langley Research Center Director, Dr. Floyd L. Thompson, conducted a comprehensive investigation to pinpoint the cause of the fire. The final report, completed in April 1967 was subsequently submitted to the NASA Administrator. The report presented the results of the investigation and made specific recommendations that led to major design and engineering modifications, and revisions to test planning, test discipline, manufacturing processes and procedures, and quality control. With these changes, the overall safety of the command and service module and the lunar module was increased substantially. The AS-204 mission was redesignated Apollo I in honor of the crew.

EARLY BIRD

The world's first commercial communications satellite was Early Bird, built for the Communications Satellite Corporation (COMSAT) by Hughes. The satellite was launched on April 6, 1965, and placed in commercial service after moving into geosynchronous orbit 22,300 miles above the equator. That meant it was always on station to provide line of sight communications between Europe and North America. But Early Bird didn't have a battery - and worked only when its solar panels were exposed to the sun.

Early Bird handled all types of network traffic, including telephone, television, telegraph and facsimile transmissions. It was designed for an operational lifetime of only 18 months, but actually lasted in service for almost four years. It could handle 240 simultaneous telephone calls or one TV channel at a time - today's communications satellites do much better.

TERESHKOVA

Valentina Tereshkova was born on March 6, 1937. Her father was a tractor driver. Valentina's mother worked in a textile plant.

Valentina started school in 1945 when she was eight years old. She left school to begin working in a textile plant in 1953. She was able to continue her education through correspondence courses.

Valentina became interested in parachute jumping when she was young. Her parachute jumping was one of the reasons she was picked for the cosmonaut program.

On June 16,1963 Valentina Tereshkova was launched into space aboard Vostok 6. She became the first woman to travel in space. Valentina Tereshkova made 48 orbits of Earth. She spent almost three days in space.
In November of 1963, Valentina Tereshkova married Andrian Nikolayev. He was also a cosmonaut. Their daughter, Elena, was born in 1964. Elena was the first child born to a mother and a father who had both traveled in space.
Valentina Tereshkova never made a second trip into space. She became an important member of the Communist Party and a representative of the Soviet government.
Valentina Tereshkova was honored with the title of Hero of the Soviet Union!

APOLLO 11
The crew of Apollo 11: Commander Neil A. Armstrong, Command Module pilot Michael Collins, Lunar Module pilot Edwin E. Aldrin, Jr. May 1, 1969.
The first manned journey to the Moon began at Pad A, Launch Complex 39, Kennedy Space Center, Florida with the liftoff of Apollo 11 at 9:32 a.m. EDT on July 16, 1969.
The Apollo spacecraft reached Earth parking orbit after 11 minutes. After one and a half orbits the Saturn thrusters fired and the astronauts began their journey to the Moon.
On July 20, 1969, after a four day trip, the Apollo astronauts arrived at the Moon.
At 1:47 pm EDT, July 20, the Lunar Module "Eagle" carrying Neil Armstrong and Edwin Aldrin, separated from the Command Module "Columbia". "You cats take it easy on the lunar surface", Collins said as he released the LM.
Over the next day, Michael Collins would orbit the Moon while his colleagues walked on its surface.
"Houston, Tranquility Base here. The Eagle has landed." These words ushered in a new era of human exploration at 4:18 pm EDT on July 20, as the first manned flight to the Moon touched down.
"That's one small step for man, one giant leap for mankind." At 10:56 pm EDT on July 20, 1969, Neil Armstrong became the first human to set foot on the Moon.
Aldrin joined Armstrong on the surface less than fifteen minutes later. As he left the LM, Aldrin said, "Now I want to partially close the hatch, making sure not to lock it on my way out." "A good thought." replied Armstrong.
The footprints left by the astronauts in the Sea of Tranquility are more permanent than many solid structures on Earth. Barring a chance meteorite impact, these impressions in the lunar soil will probably last for millions of years.
In the few hours that Aldrin and Armstrong were on the Moon, there was little time to set up scientific experiments, but a small package (the EASEP, or Early Apollo Scientific Experiments Package) was deployed. More extensive scientific studies were done on later Apollo missions.
Millions of Earthlings watched the drama unfold on TV images taken by the black and white lunar surface camera.
The astronauts returned to the Lunar Module after 2 hours and 32 minutes on the surface (2:15 for Aldrin). The flag had been difficult to set up, and was actually knocked over when the LM took off from the Moon 21 hours after landing.
After lifting off from the lunar surface, the LM made its rendezvous with the Command Module. The Eagle docked with the Command Module, and the lunar samples were brought aboard. The LM was left behind in lunar orbit while the 3 astronauts returned in the Columbia to the blue planet.
The final phase of Kennedy's challenge was completed at 12:50 p.m. EDT on July 24, 1969, when the Columbia splashed down about 812 nautical miles southwest of Hawaii, returning the 3 astronauts safely to Earth. The day before splashdown, Aldrin said, "We feel this stands as a symbol of the insatiable curiousity of all mankind to explore the unknown."

SKYLAB

Launch Date/Time: 1973-05-14 at 17:30:00 UTC
On-orbit dry mass: 90607 kg
The Skylab (SL) was a manned, orbiting spacecraft composed of five parts, the Apollo telescope mount (ATM), the multiple docking adapter (MDA), the airlock module (AM), the instrument unit (IU), and the orbital workshop (OWS). The Skylab was in the form of a cylinder, with the ATM being positioned 90 deg from the longitudinal axis after insertion into orbit. The ATM was a solar observatory, and it provided attitude control and experiment pointing for the rest of the cluster. It was attached to the MDA and AM at one end of the OWS. The retrieval and installation of film used in the ATM was accomplished by astronauts during extravehicular activity (EVA). The MDA served as a dock for the command and service modules, which served as personnel taxis to the Skylab. The AM provided an airlock between the MDA and the OWS, and contained controls and instrumentation. The IU, which was used only during launch and the initial phases of operation, provided guidance and sequencing functions for the initial deployment of the ATM, solar arrays, etc. The OWS was a modified Saturn 4B stage suitable for long duration manned habitation in orbit. It contained provisions and crew quarters necessary to support three-person crews for periods of up to 84 days each. All parts were also capable of unmanned, in-orbit storage, reactivation, and reuse. The Skylab itself was launched on May 14, 1973. It was first manned during the period May 25 to June 22, 1973, by the crew of the SL-2 mission (73-032A). Next, it was manned during the period July 28 to September 25, 1973, by the crew of the SL-3 mission (73-050A). The final manned period was from November 16, 1973, to February 8, 1974, when it was manned by the crew from the SL-4 mission (73-090A).

COLUMBIA 1981
Before Columbia's launch in 1981, there was no such thing as a reusable spacecraft in active service. In an age when no one took space travel for granted, hundreds-of-feet-high rockets would lift people into orbit and beyond, with only small sections of those rockets returning their human crews to Earth. It would have been the equivalent of travelling by car to a vacation in the woods – and returning back to the city on a skateboard.
Meanwhile, on April 12, 1981, seven million pounds of thrust shot the Space Shuttle Columbia into orbit, making it the first and only reusable spacecraft in the world. It was 20 years – to the day – after Russian Yuri Gagarin became the first human in space.
There were just two people aboard Columbia on that maiden voyage – Commander John Young and Pilot Robert Crippen. After the launch, Columbia's solid rocket boosters fell back into the ocean for reuse, with its huge liquid fuel tank breaking away minutes later to burn up in the Earth's atmosphere. After two days in orbit, Young and Crippen brought Columbia safely back to Earth, its shakedown cruise successful.

CHALLENGER
On January 28, 1986 America was shocked by the destruction of the space shuttle Challenger, and the death of its seven crew members.
January 28, 1986,11:38:00 a.m. EST. First Shuttle liftoff scheduled from Pad B. Launch set for 3:43 p.m. EST, Jan. 22, slipped to Jan. 23, then Jan. 24, due to delays in mission 61-C. Launch reset for Jan. 25 because of bad weather at transoceanic abort landing (TAL) site in Dakar, Senegal.... Explosion 73 seconds after liftoff claimed crew and vehicle. Cause of explosion was an O-ring failure in right SRB. Cold weather was a contributing factor."

MIR
The Russian space station Mir was successfully de-orbitted on 23 March 2001 after 15 years in space (10 years longer than the station's planned lifetime). Observers in Japan and Fiji saw the remains of Mir burn up in the Earth's atmosphere. The surviving fragments hit the intended target area in the southern Pacific Ocean, 5,800km off the eastern coast of Australia.

History: Mir (meaning 'Peace') was launched in 1986 by the then Soviet Union and was intended to provide the Russians with a large orbiting platform for scientific research. It followed the series of Salyut space stations placed in orbit in the 1970s. Mir was assembled from a number of smaller modules – additional components were added from 1987 to 1996 – which specialised in areas such as astrophysics, remote sensing of the Earth and life sciences. The station was resupplied by unmanned Progress modules which also carried waste away when they left.
The Russians managed to maintain a presence on the station for virtually all of its 14-year lifetime, while the multinational International Space Station (ISS) was merely in its planning stage. Over 100 people from more than a dozen nations have taken up residence on board, including one Briton, Helen Sharman and one Anglo-American, Michael Foale.
Originally the station was expected to have a lifespan of seven years but this was extended to allow Mir to provide a training base for the construction of the ISS and to carry out joint operations with the US shuttle fleet.
Accomplishments: Advantages of having a space-based habitation include the ability to perform experiments in microgravity (the virtually weightless environment onboard spacecraft in Earth orbit) in disciplines as varied as life sciences, fluid mechanics and protein crystal growth. For astronomers Mir provided an excellent site for X-ray telescopes looking at the Universe's more energetic phenomena. However the most useful experiments carried out on Mir were those using the cosmonauts themselves. Any serious exploration of the Solar System beyond the vicinity of the Earth and Moon requires the crew of a spacecraft to experience microgravity for very long periods of time (for example, this would be around two years for a return trip to Mars). The effect of this on the human body has become much clearer after the many years spent in space by different Russians. For example, the Russian cosmonaut Dr. Valeri Polyakov spent 14 months on board from January 1994 to March 1995, breaking the previous record for the longest consecutive number of days in space.
Mir's final days: On June 25, 1997 a Progress cargo ship collided with one of the station's modules causing a loss of air pressure and forcing the crew to make emergency repairs. Although the mission continued as planned, this incident led to serious speculation about the end of Mir. In 1999 it was left unoccupied for the first time in many years and the Russian authorities made the decision to deorbit the station. This allowed the Russian space agency to switch funding to their sections of the ISS. An attempt to stave off Mir's destruction was made by a commercial company, MirCorp which envisaged the use of the station as a space hotel. It used private finance to fund a last mission to the station which began on April 6, 2000. The cosmonauts left on June 16 that year.
MirCorp did manage to obtain a single customer, the US millionaire Denis Tito who payed $10 million for a stay on the station. However, the Russians gave the final order to destroy Mir before he could make his visit and MirCorp will now look at building an ISS module for commercial use.
The station's last days began on 18 January 2001 when a Progress supply vessel was launched to carry fuel to Mir. This fuel was used to nudge the space station into the Earth's atmosphere in a controlled descent in March 2001.
This has brought what was once the prestige project of the Russian Space Agency to a fiery end – it lacked the glamour (and enormous funding) of the ISS but is recognised as a genuine first outpost in Earth orbit.

HUBBLE
Hubble Space Telescope evokes a new sense of awe and wonder about the infinite richness of our universe in dramatic, unprecedented pictures of celestial objects. Like a traveler sharing their best snapshots, we present a selection of Hubble's most spectacular images (1990-1995).
Servicing Mission 4, the last scheduled flight of the space shuttle to the Hubble Space Telescope, has been cancelled. On Jan. 16, NASA Administrator Sean O'Keefe announced his decision to call off the mission, which would have performed Hubble maintenance work and installed new

instruments. O'Keefe cited the new safety guidelines set out following the Columbia tragedy as the primary basis for his decision.
Hubble was designed to be visited periodically by astronauts who would perform repairs and install new equipment. Astronauts made several servicing visits to the telescope in the years after Hubble's launch in 1990. This final servicing mission would have taken place in 2006.
Feb. 7, 2005 — The White House has released its 2006 (FY06) budget request. The request does not include any funding for a Hubble servicing mission.

ISS
Boeing provides mission support for the International Space Station (ISS) and the current Expedition crew. The ISS is used to conduct basic and applied research to support human exploration of space and to take advantage of the space environment as a laboratory for scientific, technological, and commercial research. More than four times as large as the Russian Mir when completed, the ISS is the largest, most complex international scientific project in history and our largest adventure into space to date.
As the prime contractor, Boeing is responsible for design, development, construction and integration of the ISS and assisting NASA in operating the orbital outpost. Boeing built all of the major U.S. elements. In addition, Boeing oversees thousands of subcontractors around the globe and works with 16 international partners on the project.
The company also prepares every ISS U.S. component for space flight at the Space Station Processing Facility at Kennedy Space Center, Fla. About 2,100 Boeing people across the country support the space station. Boeing employees in Canoga Park, Calif., Houston, Huntsville, Ala., Huntington Beach, Calif. and Kennedy Space Center, Fla., work with NASA on the ISS project.
The first ISS module was launched in 1998, and the station has been staffed continuously since November 2, 2000. Expedition crews one through nine have conducted scientific research and assisted in the assembly of the space station. Until the space shuttle returns to flight, a smaller two-person Expedition ten crew currently operates the station.
A three-person Expedition crew typically stays about four to six months aboard the ISS. If the crew needs to evacuate the station, it can return to Earth aboard a Russian Soyuz vehicles docked to the ISS. Additional crewmembers are brought to the ISS by the space shuttle and Soyuz. The space shuttle and Russian Progress supply vehicles also deliver supplies to the ISS.
Crews aboard the ISS are assisted by mission control centers in Houston and Moscow. If necessary, controllers on the ground can also operate the ISS.
The ISS should be completed about 2010. More than 40 space flights will be required to assemble the 100 major components of the space station. Approximately 28 shuttle flights are remaining to complete the ISS.

COLUMBIA 2003
Saturday's destruction of the space shuttle Columbia - like Challenger in 1986, was nothing less than catastrophic - not only for the American people, but also for the program that has for so long been known around the world as a symbol of success and excellence. More than that however, was the loss of seven fine men and women who dedicated and ultimately gave their lives in pursuit of space exploration, and the loss for a number of children and spouses of the most important people in their lives.
There were many - myself included, who at first thought terrorists might have been behind it. But after thinking it through and realizing that the shuttle broke up over the Dallas, Texas area at an altitude of over 200,000 feet - which combined with the problems with heat tiles coming off the left wing during liftoff, it now seems more likely that the shuttle died of 'natural causes'. Besides, there is no weapon outside U.S. hands or even within the U.S. arsenal capable of shooting an object that high up - especially without being noticed.

Columbia (STS-107 crew patch, right) had a rich history, and being an amateur space buff, watching liftoffs and landings was a joy unto itself. The destruction of the shuttle Challenger in 1986 was an almost fatal blow to the program; the loss of Columbia - the maiden ship of the reusable orbiter program and which brings the loss of our reusable orbiters to 40 percent of the ones built, must not let either the American public or especially Congressional simpletons who are always looking for ways to cut funds from one program to put it into another - usually their own pockets to use this as an excuse to cut funding to NASA or worse, to end the shuttle program altogether.

What has not been explained with the loss of the tiles from the left wing during liftoff is this: What did they not learn from Challenger in the way of erring on the side of caution? By this and by way of explanation, I am suggesting that once the shuttle reached an appropriate altitude, they could have jettisoned the external fuel tanks before leaving earth's atmosphere and returned either to the Kennedy Space Center in Florida or any of the several designated landing sites worldwide, to include either the White Sands Missile Range in New Mexico or Edwards Air Force base in California? Granted, the mission would have been delayed and hindsight is always 20-20, however with the loss of Challenger, this is not exactly unchartered territory we're traveling into.

While the loss of the Columbia shuttle and more importantly, the seven astronauts (above left) is devastating, we must nonetheless continue exploring space and see what the heavens have to offer. Failure to do so would undermine the legacy of those who died Saturday as well as those others who have also made the ultimate sacrifice in their pursuit of exploring the heavens.

While there are no words that adequately describe the loss of those seven brave men and women, their sacrifice will nonetheless be forever remembered along with the Challenger seven and the three Apollo 1 astronauts in NASA's hall of heroes. They join their colleagues and friends in the heavens and while America mourns, the investigation will determine what can be done to make space travel safer for those yet to come.

For that and for so much more, they will indeed be missed, and a nation in mourning indeed owes its thanks.