

The History of Astronomy

Overview

Since the earliest times, stars and planets have fascinated people. Ancient peoples in Asia, Europe, Africa, and the Americas tried to understand the heavens, attaching stories to them. In the last hundred years, we have made rapid progress in our understanding and exploration of our universe including manned and unmanned missions throughout our solar system. Below is a sample of some of the milestones in astronomy history.

- Prehistoric Anasazi use spirals carved into rock as a calendar (based on movement of the sun and moon) at Chaco Canyon, New Mexico.
- 2800 B.C. Egyptians establish a 365-day year based on the sun. They and other ancient civilizations assign myths to constellations, often explaining natural phenomenon.
- 1800 B.C. Stonehenge is built based on the apparent movement of the sun. At solstice, the sun rises at a marker stone.
- 400 B.C. Exodorus, an ancient Greek, develops the concept of fixed stars—meaning that all the stars move across the sky together at the same time. He also noted that some objects move independently. These objects were called Wanderers, or planets, and included the sun, moon, Mercury, Venus, Mars, Jupiter, and Saturn.
- 150 B.C. The Greek Hipparchus lists 850 stars in his catalog and makes an accurate estimate of the moon's size.
- 46 B.C. Julius Caesar proclaims the year is 365 days long.
- A.D. 130 Ptolemy, the Greek scholar, developed a mathematically based astronomical system, based on the concept that we live in an Earth-centered universe, the sun and planets revolving around the Earth.
- 800s The Arabs revive Ptolemy's *Almagest*, a map that measures the position of stars and planets. It is still used today. They also create fine instruments for measuring the position of the stars. Caliph Harun-al-Rashid sets up a collection of ancient works on astronomy that later becomes an important research center in Baghdad.
- 1400-1700s Native Americans create and use Bighorn Medicine Wheel in Wyoming. Lines drawn between markings on the wheel point to the location of the solstice sunrise and sunset. Markings also indicate the rising points of the brightest stars. About 50 medicine wheels exist, and were used by Native Americans during this time period.



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- 1543 Nicolaus Copernicus dies after publishing *Revolutions of Heavenly Spheres*. He argues that we live in a sun-centered solar system.
- 1577 Tycho Brahe accurately measures the changing positions of the planets and sees the Great Comet of 1577.
- 1582 Pope Gregory XIII changes our yearly calendar by adding a leap year every four years to compensate for the fact that the Earth's orbit of the sun actually take $365\frac{1}{4}$ days. It is called the Gregorian Calendar.
- 1600 Johannes Kepler discovers that the planets move around the sun in ellipses.
- 1609 Galileo Galilei makes a refracting telescope and sees that the moon has craters and that Jupiter has moons that revolve around it. Later he publishes a book about his findings and theories and is put under house arrest by the Catholic church.
- 1687 Isaac Newton publishes *Principia*, in which he states his natural laws, including the law of gravity. He also invents the reflecting telescope.
- 1718 Edmund Halley shows that stars change their positions over time.
- 1781 William Herschel discovers Uranus.
- 1900 Harlow Shapley studies globular clusters, ball-shaped collections of stars, and uses them to measure the size of our galaxy.
- 1924 Edwin Hubble proves that fuzzy patches on the sky are large groupings of stars we now call galaxies. He realizes that the universe is much bigger than was originally thought. Later, he determines that the universe is expanding.
- 1926 The first liquid-fueled rocket is launched by Robert Goddard.
- 1930 Clyde Tombaugh discovers Pluto.
- 1957 The U.S.S.R. launches *Sputnik I*, the first man-made object to orbit the Earth.
- 1960s Many breakthroughs occur in space travel and exploration, both manned and unmanned missions.
- 1961 The Soviets send the first man into space, Yuri Gagarin.
- 1969 The Americans Neil Armstrong and Edwin Aldrin are the first men to walk on the moon.
- 1970 *Venera 7* probe (U.S.S.R.) lands on Venus and transmits data about temperature and pressure.



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- 1971-1972 U.S. *Apollo 15* and *Apollo 17* are the first missions to use moon rovers to drive across the moon's surface. The U.S. *Mariner 9* probe orbits Mars and takes pictures of the surface.
- 1973 The U.S. launches the *Sky Lab* space station that orbits the Earth. On-board crews conduct studies. The U.S. *Mariner 10* probe records information about Mercury's surface.
- 1974 The U.S. *Pioneer 10* and U.S. *Pioneer 11* probes travel to Saturn, where they take photographs of new moons and rings.
- 1975 *Venera 9* and *Venera 10* transmit the first photographs of the surface of Venus to Earth.
- 1976 The U.S. *Viking 1* and U.S. *Viking 2* probes take pictures of the Martian surface, and collect substantial data about the atmosphere and surface.
- 1977 The U.S. launches *Voyager 1* and *Voyager 2* to explore Jupiter, Saturn, Uranus, and Neptune.
- 1978 Two *Pioneer* spacecraft reach Venus to map the surface and study the atmosphere.
- 1981 The U.S. launches the first space shuttle.
- 1986 The Soviet Union launches space station *Mir*, where cosmonauts spend a record 366 days living in tight quarters and conducting research.
- 1989 Cosmic Background Explorer detects radiation from Big Bang.
- 1990 The Hubble Space telescope is launched by the U.S. to record information about our solar system and the universe.
- 1995 The U.S. *Galileo* spacecraft is the first to orbit Jupiter.

