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Neil Armstrong

Monish Ranjan Chatterjee

University of Dayton, mchatterjee1@udayton.edu

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Apollo 17, carrying astronauts Eugene A. Cernan, the commander; Ronald E. Evans, the Command Module pilot; and Harrison H. Schmitt, the Lunar Module pilot and, as a trained geologist, only scientist to visit the Moon, was launched on December 7, 1972. On this mission, astronauts Cernan and Schmitt conducted the longest LRV traverse on a single extravehicular activity, a trip of about 100 kilometers. They collected the largest amount of lunar soil and rock ever returned to Earth. Apollo 17's return to Earth on December 19, 1972, marked the end of U.S. efforts to send humans to the Moon.

Results of the Apollo Program

The major objective of the Apollo Program was accomplished with the landing of twelve American astronauts on the Moon and their safe return to Earth. These landings demonstrated the capability of American engineering, restoring American prestige by finally beating the Soviet Union in the space race. Scientists studying lunar rock samples were finally able to determine the age and origin of the Moon, finding that the Moon formed about 4,560,000,000 years ago, probably from the debris ejected when an asteroid struck Earth.

George J. Flynn

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Neil Armstrong

Date: Born on August 5, 1930, in Wapakoneta, Ohio

Definition: As commander of the Apollo 11 lunar land-

ing mission in 1969, the first human to walk on the moon.

Significance: In addition to his outstanding and pioneering contributions to the National Aeronautics and Space Administration's (NASA) crewed space-flight program, Armstrong has served with distinction as a professor of aerospace engineering, chairman and director of several corporations, and member of presidential commissions.

Early Life and Education

Born to Stephen and Viola Louise Armstrong in Wapakoneta, Ohio, in 1930, Neil Armstrong was an avid enthusiast of flying from an early age. He received his student pilot's license at age sixteen, before receiving a driver's license. In 1947, he entered the aeronautical engineering program at Purdue University with a scholarship from the U.S. Navy. Two years later, he was called to active duty and earned his pilot's wings at the Naval Air Station in Pensacola, Florida. As the youngest pilot in his squadron, he flew seventy-eight combat missions from the flight deck of the USS *Essex* in Korea in 1950. He won three Air Medals for his combat duty. At the end of the war, Armstrong returned to Purdue and received his baccalaureate degree in 1955.

Professional Activities at NASA

After graduating from Purdue, Armstrong joined NASA's Lewis Flight Propulsion Laboratory in Cleveland, Ohio. Later, he transferred to NASA's High-Speed Flight Station at Edwards Air Force Base, California. There, as an aeronautical research pilot, he flew X-15 airplanes to altitudes over 200,000 feet, at speeds up to 4,000 miles per hour. As a test pilot, Armstrong also flew the X-1 rocket airplane, the F-100, F-101, F-102, F-104, F-5D, B-47, and other aircraft. Armstrong's experience with the X-15 led to his selection as a pilot of the X-20 Dyna-Soar, an experimental craft that could leave the atmosphere, orbit the earth, reenter the atmosphere, and land like a conventional aircraft. However, the X-20 project was canceled in 1962, and Armstrong then decided to become an astronaut.

In September, 1962, Armstrong was one of the first two civilians selected for astronaut training. In his first flight assignment, he served as a backup command pilot for the Gemini GT-5 mission. On March 16, 1966, Armstrong served as the command pilot for Gemini 8, and, along with pilot David R. Scott, successfully docked two vehicles in space for the first time. The flight was terminated ahead of its three-day schedule due to a malfunctioning thruster.

Demonstrating exceptional piloting skill, the crew overcame the problem and brought the craft to a safe landing. Subsequently, Armstrong served as backup command pilot and backup commander for the Gemini 11 and the Apollo 8 missions, respectively.

Armstrong's most significant role as an astronaut occurred during his command of the manned lunar landing mission of Apollo 11 from July 16 to July 21, 1969. The crew for this historic flight consisted of spacecraft commander Armstrong, Lunar Module pilot Edwin "Buzz" Aldrin, and Command Module pilot Michael Collins. On July 20, 1969, the human race accomplished what many consider the single greatest technological achievement of all time. For the first time in human history, a man set foot on a celestial body beyond the earth. After landing on the lunar surface at about 4:18 P.M. eastern daylight time, Armstrong radioed back to mission control the now-famous words, "Houston, Tranquillity Base here. The *Eagle* has landed." Six hours later, Armstrong stepped off the Lunar Module onto the surface of the Moon. Taking his first steps on the Moon, he uttered the immortal words, "That's one small step for man, one giant leap for mankind." Shortly thereafter, he was joined by Aldrin, and the two astronauts spent twenty-one hours on the lunar surface, collecting 46 pounds of lunar rocks. Their liftoff from the surface of the Moon was partially captured on a television camera they left behind, and they successfully docked with Michael Collins, who had continued to orbit the Moon alone in the Command Module *Columbia*.

Post-NASA Activities

Following his historic walk on the Moon, Armstrong received a master of science in aeronautical engineering from the University of Southern California. In the fall of 1971, he accepted a position as professor of aerospace engineering at the University of Cincinnati, an interdisciplinary post he held until 1980. Thereafter, he served as the chairman of the board of Cardwell International Corporation in Lebanon, Ohio, until 1982, when he became the chairman of the board of Computing Technologies for Aviation (CTA) Incorporated of Charlottesville, Virginia.

In 1984, along with the test pilot Charles E. "Chuck" Yeager, Armstrong joined the National Commission on Space (NCOS), a presidential panel created to develop goals for the space program in the twenty-first century. However, the explosion of the space shuttle *Challenger* on January 28, 1986, placed the commission's report on hold. Following the *Challenger* disaster, Armstrong was named

vice chairman of the Presidential Commission on the Space Shuttle *Challenger* Accident. Over the years, Armstrong, an intensely private and unassuming man, has avoided as much as possible making public appearances. On the occasion of the thirtieth anniversary of the first lunar landing on July 20, 1999, he gave a lighthearted speech before the National Press Club in Washington, D.C., on behalf of the National Academy of Engineering. He described spaceflight as one of the greatest engineering achievements and observed that while "science is about what is, engineering is about what can be."

Monish R. Chatterjee

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See also: Apollo Program; Korean War; National Aeronautics and Space Administration; Space shuttle; Test pilots; X planes; Chuck Yeager

Astronauts and cosmonauts

Definition: The astronauts and cosmonauts were a select group of men and women trained by the United States and the Soviet Union to travel in outer space.

Significance: The astronaut and cosmonaut programs provided the world with the talented pilots who formed the foundation of human exploration of outer space. These men and women extended knowledge of the universe and brought the human race to the surface of the Moon. Politically, astronauts and cosmonauts were also used as warrior-heroes in the Cold War.