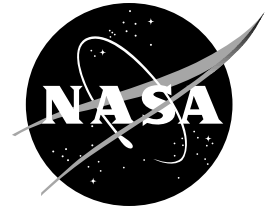


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DID U.S. ASTRONAUTS REALLY LAND ON THE MOON?

Yes. Astronauts did land on the Moon.

Beginning with the Apollo 11 lunar landing on July 20, 1969, a total of 12 astronauts explored the Moon's surface on foot and traveling in the lunar rover vehicle.

On Apollo missions 11, 12, (Apollo 13 was aborted, but returned to Earth safely), 14, 15, 16 and 17, the commanders and lunar module pilots conducted a series of experiments, photographed their lunar surroundings and returned to Earth 382 kilograms (843 pounds) of lunar surface materials consisting of more than 2,000 separate samples.

From time to time we are asked the question above as a result of at least one book and recurring articles in various publications based either on its content or individuals' expressions of their opinions.

Apart from the fact that millions of people saw the Apollo series on television and heard them on radio in real time, perhaps the lunar material is as irrefutable proof as any that the Moon missions were not "faked." The rocks and particles, still under study by scientists worldwide, were clearly formed in an atmosphere lacking oxygen and water and they show major chemical differences from any previously known Earth rocks. This material could not have been collected, or even manufactured on Earth, and clearly comes from an entirely different world.

Even if NASA had set out to "fake" the Apollo or any of its other programs, there is no possibility it could have done so. Since its inception in 1958, NASA has operated an "open" program, i.e.: all activities have been covered in depth by the news media. For example, during Apollo 11, over 3,500 media representatives from all over the world were at Kennedy Space Center, Florida, for the liftoff. Most of these press, television and radio reporters shifted immediately after launch to Johnson Space Center, Texas, to follow the operational phases through splashdown in the Pacific Ocean and recovery by an aircraft carrier with the U.S. President aboard. Before undertaking the Apollo program, NASA had to justify it to the President and Congress before funds were appropriated. The Apollo series cost approximately \$25 billion.

A number of specific queries have been received regarding the book, "We Never Went To The Moon," in which the author claims the Defense Intelligence Agency (DIA) set up a secret organization

in the Nevada desert where the simulated-for-television landings took place. The author alleges that there is no visible crater (produced by engine blast) under the lunar module (LM) in photographs of it resting on the Moon's surface. His ideas in this respect seem to be based on two misunderstandings about the Moon:

(1) Although the descent engine on the LM is powerful, most of its operation takes place thousands of feet above the Moon during the early stages of the landing. Because the lunar atmosphere is a near-perfect vacuum, no air currents are set up that would scour the surface at a distance as might occur during a landing on Earth. Movies of the landing show that, at the moment of touchdown, a small amount of surface dust is blown away, but the relatively cohesive lunar surface seems to deflect the blast sideways, rather than developing a crater directly underneath the LM.

(2) The lunar soil is not a fluffy dust but a moderately dense and cohesive material somewhat like wet sand or ploughed farm soil. Therefore, it is not surprising that the LM engine did not excavate a crater.

The lunar surface, in fact, turned out to be much more dense, compact, and resistant to penetration than some scientists originally thought.

On the Apollo 15 mission, the first soil mechanics tests were conducted using a penetrometer--a device to measure resistance to penetration by a coring bit. The penetration test showed great resistance to penetration. A trench, dug to about 14 inches, showed that soil was fine-grained and highly cohesive; a vertical wall was maintained with no difficulty. To quote from the "Apollo 15 Preliminary Science Report," pages 7-18:

"The material at the bottom of the trench was reported to be much harder than that above. The LMP (lunar module pilot) indicated that . . . further excavation necessitated chipping out the material, which came out in platy fragments approximately 0.5 cm long... The cohesion was not destroyed by remolding even after prolonged exposure to an atmosphere. A sample from the top of the trench was similar in behavior to the sample from the bottom, although its grain size was slightly finer."

In other activities, the astronaut succeeded in implanting the flagpole to a depth of only 20 inches before it required hammering. Holes driven into the lunar surface for heat-flow experiments were observed not to collapse when the digging tools were removed. Surveyor I, the first American spacecraft to achieve a soft landing on the Moon, transmitted a picture of a footpad resting on the surface; it had sunk in less than one inch. The Apollo Lunar Roving Vehicles, which weighed only 80 pounds in the Moon's gravity, drove on the lunar surface and left very shallow tire tracks.

Some surface dust can be seen in Apollo on-the-surface photos. A thin film of dust adheres to the Rover vehicle, the equipment, and especially the light-colored suits of the astronauts. However, all our evidence indicates that the lunar soil is too cohesive for the LM descent engine to excavate a large crater during the lunar landing.