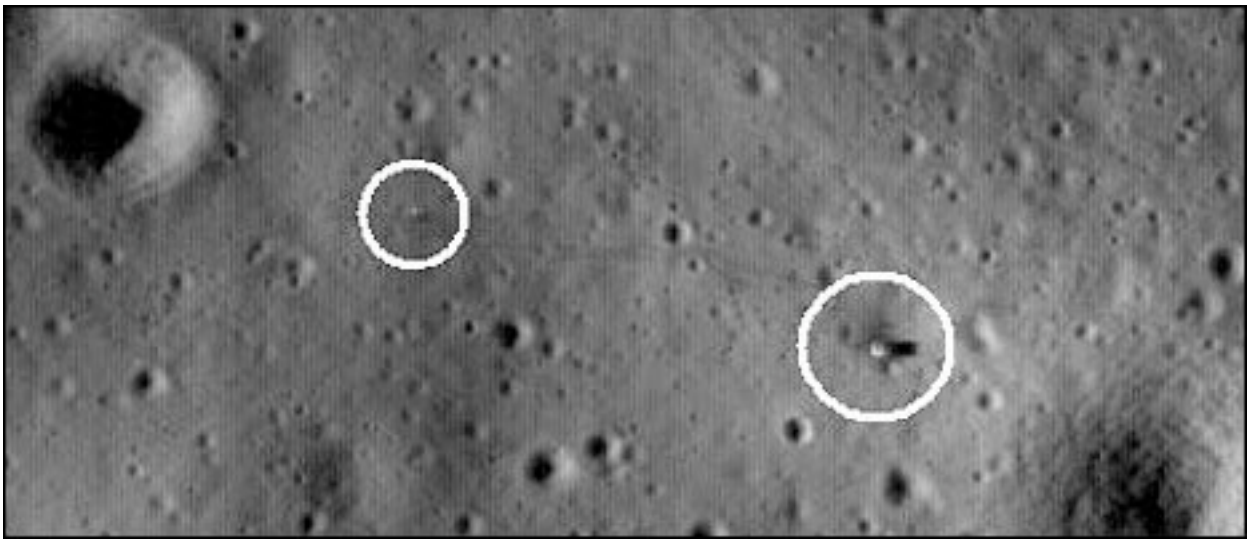
New images of Moon landing sites



Science instruments (circled left) and the lunar module lower stage (circled right) are connected by a footprint trail

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A US spacecraft has captured images of Apollo landing sites on the Moon, revealing hardware and a trail of footprints left on the lunar surface.

The release of the images coincides with the 40th anniversary of the first manned mission to land on the Moon.

The descent stages from the lunar modules which carried astronauts to and from the Moon can clearly be seen.

The image of the Apollo 14 landing site shows scientific instruments and an astronaut footpath in the lunar dust.

It is the first time hardware left on the Moon by the Apollo missions has been seen from lunar orbit.

The pictures were taken by Nasa's Lunar Reconnaissance Orbiter (LRO) spacecraft, which launched on 18 June.

The Apollo 11 mission touched down on the Moon on 20 July 1969

The spacecraft is carrying three cameras on board: one low-resolution wide-angle camera and two high-resolution narrow-angle cameras mounted side-by-side.

These are known collectively as the Lunar Reconnaissance Orbiter Camera (LROC) instrument.

"The LROC team anxiously awaited each image," said the instrument's principal investigator Mark Robinson of Arizona State University.
"We were very interested in getting our first peek at the lunar module descent stages just for the thrill - and to see how well the cameras had come into focus. Indeed, the images are fantastic and so is the focus."

Astronaut trail

The camera instrument was able to capture five of the six Apollo sites, with the remaining Apollo 12 site expected to be photographed in the coming weeks.
Future LROC images from these sites will have two to three times greater resolution.
Long shadows from a low sun angle make the locations of the lunar modules' descent stages particularly evident.
The image of the Apollo 14 landing site had a particularly desirable lighting condition that revealed additional details.
The Apollo Lunar Surface Experiment Package, a set of scientific instruments placed by the astronauts at the landing site, is discernable, as are the faint trails between the module and instrument package left by the astronauts' footprints.
The LRO satellite reached lunar orbit on June 23 and captured the Apollo sites between July 11 and 15.
Though it had been expected that LRO would be able to resolve the remnants of the Apollo mission, these first images were taken before the spacecraft reached its final mapping orbit.
"Not only do these images reveal the great accomplishments of Apollo, they also show us that lunar exploration continues," said LRO project scientist Richard Vondrak of Nasa's Goddard Space Flight Center in Greenbelt, US.
"They demonstrate how LRO will be used to identify the best destinations for the next journeys to the Moon."
Although the pictures provide a reminder of past lunar exploration, LRO's primary focus is on paving the way for the future.
Data returned by the mission will help Nasa identify safe landing sites for future explorers, locate potential resources, describe the Moon's radiation environment and demonstrate new technologies.