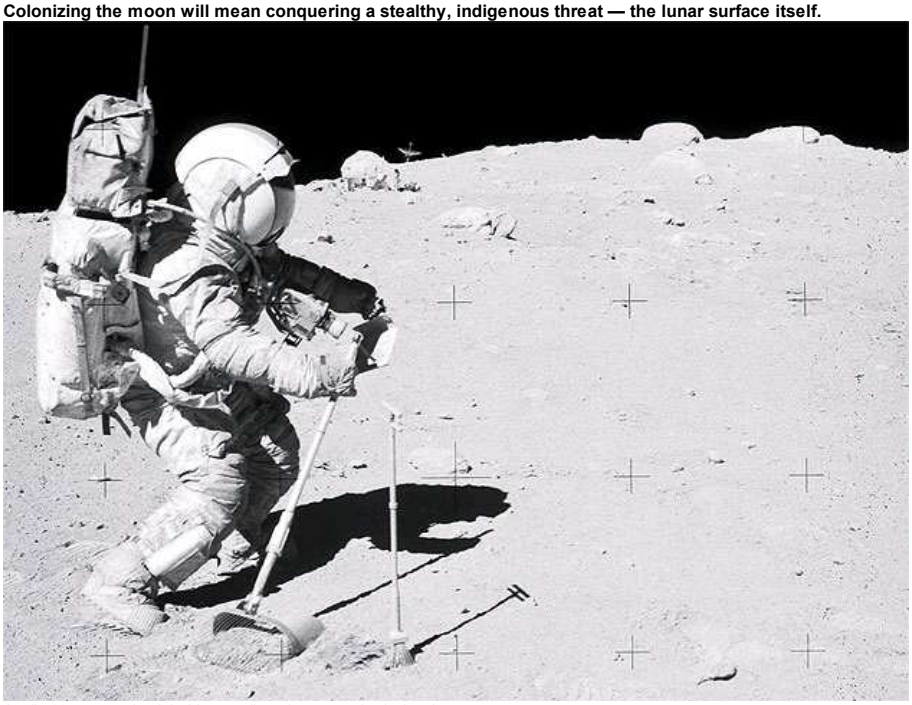
The Next Threat to Astronauts: Moon Dust

Colonizing the moon will mean conquering a stealthy, indigenous threat — the lunar surface itself.



Apollo 16 commander John Young collects lunar samples by hand.

By Ian Christe

Published in the June 2007 issue.

NASA is planning to build a lunar outpost by 2024, but the agency has a nitty-gritty problem to tackle first: jagged, ultraclingy moon dust, which could threaten the entire mission. Apollo astronauts discovered that the dust, with grains roughly the size of powdered glass, quickly jams spacesuit joints, clogs air filters and chokes radiators, causing the batteries of moon rovers to overheat. After a hard day taking giant leaps for mankind, astronauts tracked particles into their modules — and eventually their lungs — leaving the moonwalkers congested and dizzy.

For a colony to survive indefinitely on the moon, scientists must prepare new suits, devices and vehicles that can withstand the rigors of lunar turf. And while the metallic oxides in the dust could yield breathable oxygen, titanium for spare parts, and hard silicon to form landing pads, faulty processing could potentially create caustic acids that would corrode equipment and put lives in jeopardy.

Unfortunately, NASA has used nearly all 837 pounds of lunar material retrieved during Apollo missions, and the agency's existing supply of fake moon dust, or lunar simulant, is also running short. "To go back to the moon and stars we first need to journey into the Earth," says Chuck Owens, an engineer at the NASA Marshall Space Flight Center.

NASA has contracted with the small Wisconsin-based company Orbitec to produce 16 tons of lunar simulant. Orbitec's process is secret, but it involves material milled from a cinder quarry in Arizona that provides rocks normally used in highway beds.

Problem solved? Not quite. There are different kinds of lunar dust. Some simulants may be suited for drill testing, while others have the right chemical stuff to attempt oxygen and water harvesting. Orbitec's simulant is modeled after lowland lunar dust, but highland dust has its own unique properties. NASA is developing standards for a base-line simulant that could be modified for use in various tests, but it could take years to hammer out the details.

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For now, Orbitec is forging ahead, contracting to supply another 15 tons of lunar simulant to clients such as Lockheed Martin and the California Space Authority, which needs to fill a giant sandbox for a $250,000 lunar mining competition.

To moonproof rovers such as the cargo-hauling ATHLETE, NASA will have to create tons of simulated lunar dust.

Moon
NASA
tech watch

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4. RE: The Next Threat to Astronauts: Moon Dust
i think that getting to the moon is childs play with the tec. we have tody,we did it in the 60s with less computing power then my wrist watch,as for colinizing the moon,we go under ground.we are then protected form radiation and small rocks from space.but please do it this time without politics if you can,for if we hadant we would be on mars today.remember the word ockums razor and we stand a chance. AlQH

3. RE: The Next Threat to Astronauts: Moon Dust
This lunar dust almost certainly was a major factor responsible for Irwin's extraordinary, apparently self-limiting, stress test-hypertension (> 275/125) upon his return from Apollo 15.I have never seen stress test- blood pressures even approaching this level, having supervised >5000 stress tests at a hospital -based stress test lab. William J. Rowe M.D.

2. RE: The Next Threat to Astronauts: Moon Dust
Website: SearchExpress.org
I think NASA needs to concentrate on self assembly robotics if it wants to colonies the moon and eventually mars. These machines would land rover the surface for metal ores accumulate them to extract then refine/fabricate the next generation of 'lunarbots' to fulfill all the required tasks of construction, tunneling/mining, repairing and chemical extractions (oxygen-hygrogen,etc.) Given the fact that the moon is within a light second for communications these machines could be partly remote operated where human initiative might be required. This should reduce the manned lunar base costs to about 8-10 billion usd given the fact that most of the necessary infrastructure would be built on site-remotely allowing the 'lunar naught's to land and move straight in. Self assembly technology and similar forms of AI robotics (robo-insects, wormbots etc)are already in existence we only need to conglomerate them into one technological package for such an undertaken. If this technique of human exploration/colonization could be matured then we will at last be able to leave the cradle and enter the cosmos, safely and on sound economical principals!

1. RE: The Next Threat to Astronauts: Moon Dust
Meteorites of any size may penetrate structurs thtt have kevlar based armor. NASA is aware of how frequent falls rare on Moon. The must know that visitations may be more frequent on the Lunar surface. He-3 that has arived from solar wind fallig on the moon. It's not clear how dangerous this nuclear reactant is to human respiratory systems.

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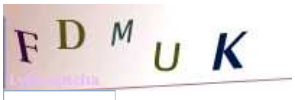

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