NASA FACTS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
PUBLIC AFFAIRS OFFICE
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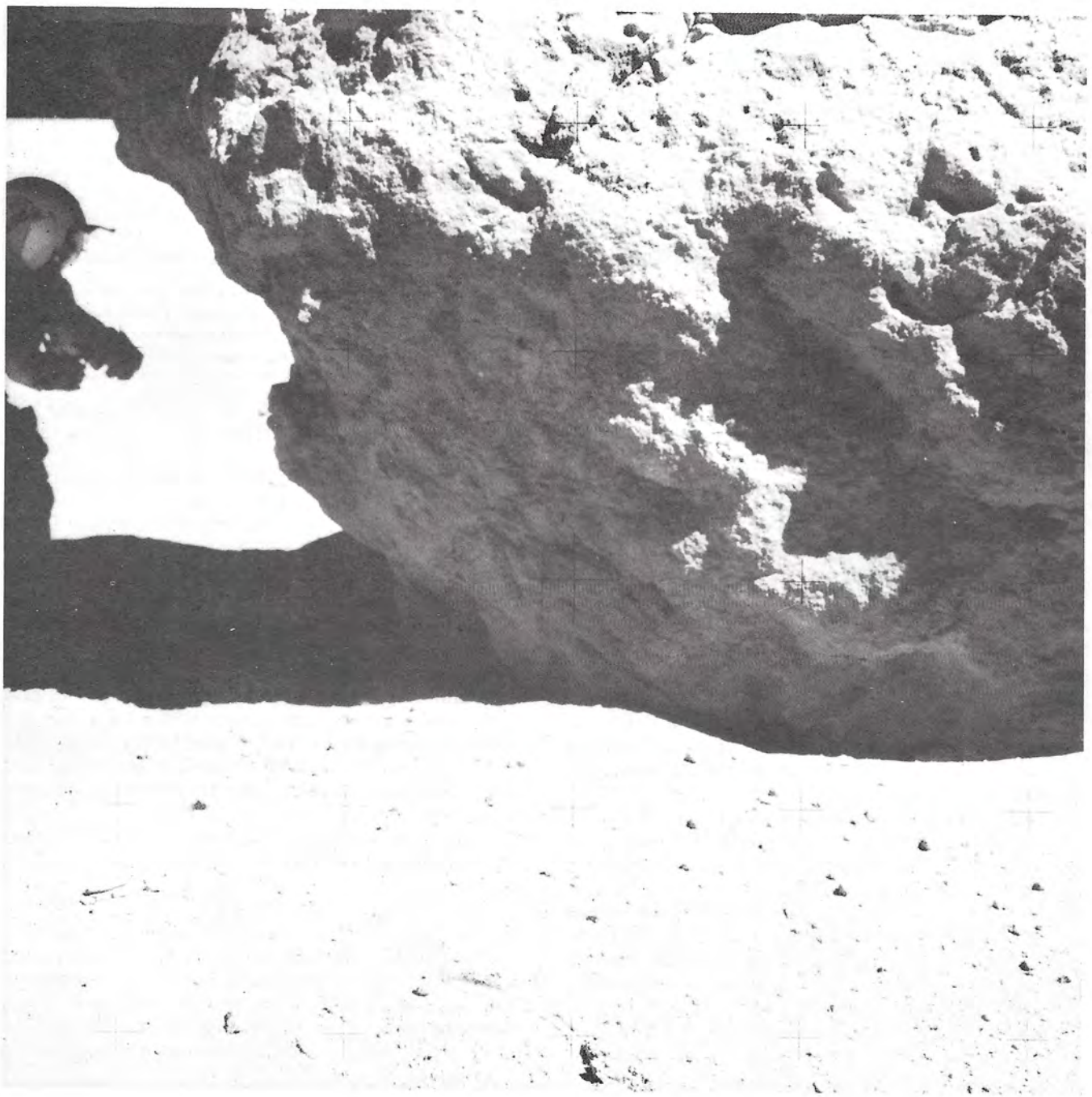
APOLLO 16

FLIGHT TO DESCARTES



THE PICTURES: Spacecraft Commander John Young is dwarfed by one of the biggest lunar boulders yet seen by man (front page). Above, the Saturn V lifts into the cloud-scattered Florida sky to begin the flight to Descartes. Much faster, but equally impressive, was the lunar module liftoff, opposite page, seen by millions of television viewers on Earth. On the back page, Charles Duke works near the Lunar Rover at Stone Mountain (top), and the Apollo 16 crewmen and their families face the cameras at homecoming in Houston (bottom).

Despite being cut 1 day short, Apollo 16 ended as gloriously as it started.

Its legacy is a wealth of scientific data that will tell man more about his very beginnings, perhaps something about his future.

Astronauts John W. Young, Thomas K. Mattingly II, and Charles M. Duke, Jr., accomplished almost everything they set out to do, even though they lost about 24 hours from their flight plan.

PROBLEMS

The change in schedule was made in deference to a potentially faulty thrust vector control system on the service propulsion engine — the rocket needed for the trip back home.

The spacecraft had undocked in lunar orbit, and Mattingly prepared for a maneuver that would raise the command-service module to a 70-mile circular orbit.

Because he experienced oscillations in the engine as he checked it out, Mattingly called off the burn.

While he worked alone in the command module "Casper," Young and Duke lent moral support in the separated lunar module "Orion."

The "go" for landing came almost 6 hours late, but the touchdown on the dusty, block-strewn Descartes was perfect.

TOUCHDOWN

"Old Orion is finally here, Houston!" Duke exclaimed at 8:23 p.m. CST April 20.

The journey to Descartes started more than 4 days earlier. Liftoff from Pad A of Launch Complex 39 at the Kennedy Space Center in Florida was right on time — 11:54 a.m. Sunday, April 16, 1972.

A little more than 2-1/2 hours later, the crew performed the translunar injection burn that headed them toward the Moon.

Paint flaking from the ascent stage of Orion, a lockup in Casper's navigation system, and a balky steerable antenna on Orion were other pesky difficulties encountered before the landing, but they proved far less worrisome than the thrust vector control situation.

But, once on the surface, Young and Duke turned their attention to exploration.

FIRST EVA

The first extravehicular activity (EVA), during which the lunar roving vehicle (Rover), was assembled, the Apollo lunar surface experiments package (ALSEP) deployed, the United States flag raised, and the solar wind composition experiment erected, lasted 7 hours and 11 minutes.

The Rover logged 4.2 kilometers of lunar travel, and the explorers collected 41 pounds of rock and dust samples.

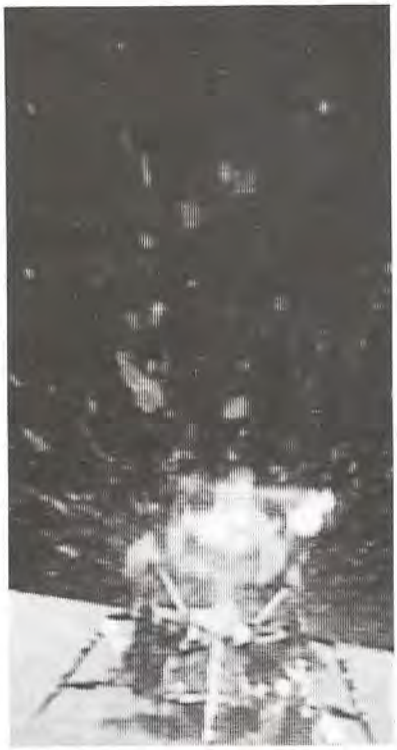
EVA-2 lasted 12 minutes longer than the first, and sample weight was exactly double. Rover travel was 11.5 kilometers.

Young picked up a rock and made Earth-bound scientists perk up with "This is the first one I've seen I really believe is crystalline."

The pair also scooped up a special sample from under a lunar boulder.

The third and final surface exploration was the shortest – 5 hours 40 minutes – but perhaps the most spectacular.

When they reached North Ray Crater, Young and Duke found it an awesome sight, three-quarters of a mile across and more than 200 yards deep, the general vicinity spotted with massive boulders.



HEAVYWEIGHT

Collected samples weighed about 90 pounds, bringing the 3-day total to about 213 pounds. Distance covered in the Rover totalled 27.1 kilometers, about

MAJOR EVENTS: APOLLO 16

Event	Date (April 1972)	Time (CST)
Launch	16	11:54 a.m.
Translunar Injection	16	2:27 p.m.
Lunar Orbit Insertion	19	2:22 p.m.
Orion Landing: Lat. 8°54'13" S Long. 15°30'48" E	20	8:23 p.m.
First EVA		
Depressurize LM	21	10:47 a.m.
Repressurize LM	21	5:58 p.m.
Second EVA		
Depressurize LM	22	10:33 a.m.
Repressurize LM	22	5:56 p.m.
Third EVA		
Depressurize LM	23	9:25 a.m.
Repressurize LM	23	3:05 p.m.
Orion Liftoff	23	7:26 p.m.
Orion and Casper Dock	23	9:35 p.m.
Transearth Injection	24	8:15 p.m.
Transearth EVA (Mattingly)		
Hatch Open	25	2:43 p.m.
Hatch Closed	25	3:45 p.m.
Splashdown (Pacific): Lat. 0°43.2' S Long. 156°11.4' W	27	1:45 p.m.

16.8 miles. And time on the three EVAs added up to 20 hours 14 minutes.

The ALSEP heat-flow experiment was put out of commission when John Young accidentally pulled a wire loose, but the rest of the package is returning steady information.

Mattingly, in Casper, was equally busy with his mapping cameras and scientific instruments.

After lunar liftoff, televised by the remotely controlled camera on the Rover, and rendezvous and docking with the command module, Orion was turned loose. It immediately started a slow tumbling. The trouble may have been an improperly positioned circuit breaker.

The scientific subsatellite was launched into a short-lifetime orbit rather than the preplanned 1-year-lifetime orbit. This was a result of skipping a shaping burn by the spacecraft so as not to exercise the service propulsion system any more than necessary.

Radio contact with the subsatellite was achieved after Orion's batteries died — the science package and the LM use the same frequency.

NO LM IMPACT

Without attitude control, the LM ascent stage could not be impacted onto the Moon as planned. It is expected to fall from orbit on its own before Apollo 17.

Apollo 16 headed home at 8:15 p.m. April 24. When the craft rounded the Moon and radio contact was reestablished after the transearth injection burn, Mattingly reported that "morale around here

just went up a couple hundred percent."

Obviously, the thrust vector control problem had not been forgotten.

On the homeward leg, Mattingly got his own chance to conduct EVA. He spent a bit more than an hour outside the spacecraft, retrieving film from the scientific instrument module and activating the microbial response experiment.

Splashdown occurred at 1:45 p.m. CST Thursday, April 29, some 175 miles southeast of Christmas Island in the Pacific after a journey of 1,391,550 miles to, around, and from the Moon.

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