

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Official Apollo 11 crew portrait (l-r)

Neil A. Armstrong
Apollo 11 Commander

Michael Collins
Command Module Pilot

Edwin E. "Buzz" Aldrin, Jr.
Lunar Module Pilot

Photo Credit: NASA



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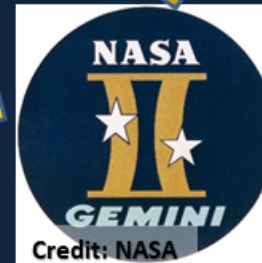
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Apollo was the third manned spaceflight program

Mercury first developed experience and technology for manned spaceflight

Gemini built upon the work of Mercury for the complex Apollo lunar-landings



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Apollo was result of a challenge issued by the late President Kennedy on 25 May 1961 before Congress

“...before this decade is out, of landing a man on the moon and returning him safely to earth.”



Credits: NASA/National Archives/JFK Library



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APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
00:00:00.63

July 16, 1969
8:32:00 AM CDT
13:32:00 UTC

Liftoff of Apollo 11

Crew
Neil A. Armstrong
Michael Collins
Edwin E. "Buzz" Aldrin, Jr.

**Command-and-Service
Module: *Columbia***
Lunar Module: *Eagle*



Photo Credit: NASA
Scan Credit: Kipp Teague

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Apollo 11 lifts off on its historic mission to the moon and fulfilling the challenge made by the late President Kennedy. #Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY


1969-2019



Mission Timeline
2:50:13.03 since launch

July 16, 1969
11:22:13 AM CDT
16:22:13 UTC

Translunar Injection

Photo Credit: NASA
Scan Credit: Kipp Teague



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After several orbits to check out the spacecraft and all systems, Houston gave the go to proceed to the moon. #Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
3:05:03.9 since launch

July 16, 1969
11:37:03 AM CDT
16:37:03 UTC

**Transposition and Docking
Begins**






Photo Credit: NASA
Scan Credit: Kipp Teague

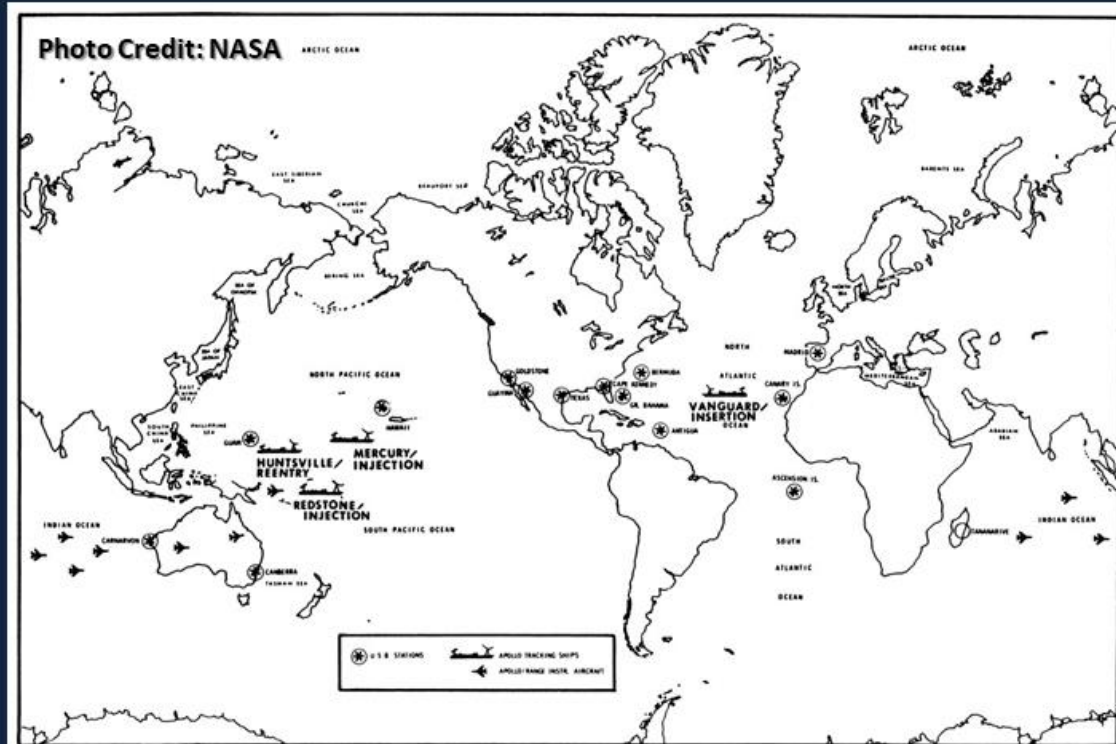
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Docking *Columbia* with *Eagle* and removing it from storage was a critical point in the mission. #Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY 1969-2019

**Manned Space
Flight Tracking
Network
for Apollo 11**

**17 land stations
4 ships
6-8 jet aircraft**



MANNED SPACE FLIGHT TRACKING NETWORK



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In order to keep in contact with Apollo 11, the Manned Space Flight Tracking Network was expanded to include ships and aircraft. #Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

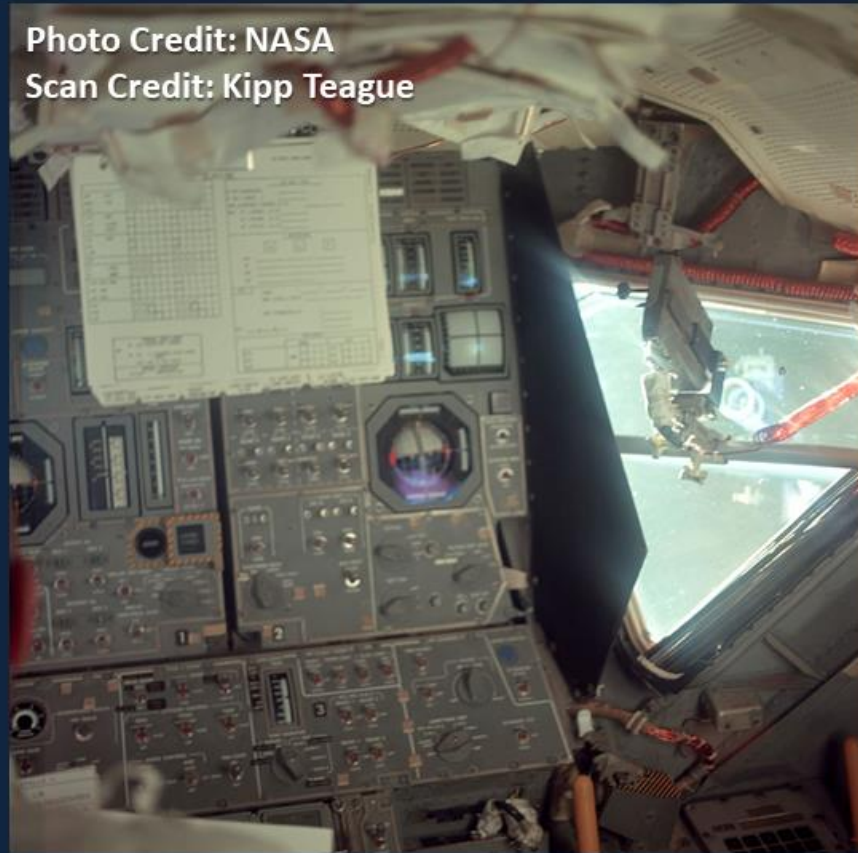
Mission Timeline
~55:41:00 since launch

July 18, 1969
4:13 PM CDT
21:13 UTC

3rd TV broadcast

**Inspecting the Lunar Module
(LM)**

Photo Credit: NASA
Scan Credit: Kipp Teague



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Four TV broadcasts were made by Apollo 11 on the way to the moon. The LM inspection broadcast lasted 1 hour and 36 minutes. #Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
75:49:50.37 since launch

July 19, 1969
12:21:50 PM CDT
17:21:50 UTC

Lunar orbit insertion begins

Photo Credit: NASA
Scan Credit: Kipp Teague



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Slowing down Apollo 11 and placing it in lunar orbit was the next critical phase of the mission. The window to do so was very narrow. #Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
100:12:00 since launch

July 20, 1969
12:44 PM CDT
17:44 UTC

CSM/LM separation

Photo Credit: NASA
Scan Credit: Kipp Teague



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The *Eagle* crew consisted of Neil Armstrong and “Buzz” Aldrin. A final go/no go by Houston was made about halfway to the moon’s surface.
#Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
102:45:39.9 since
launch

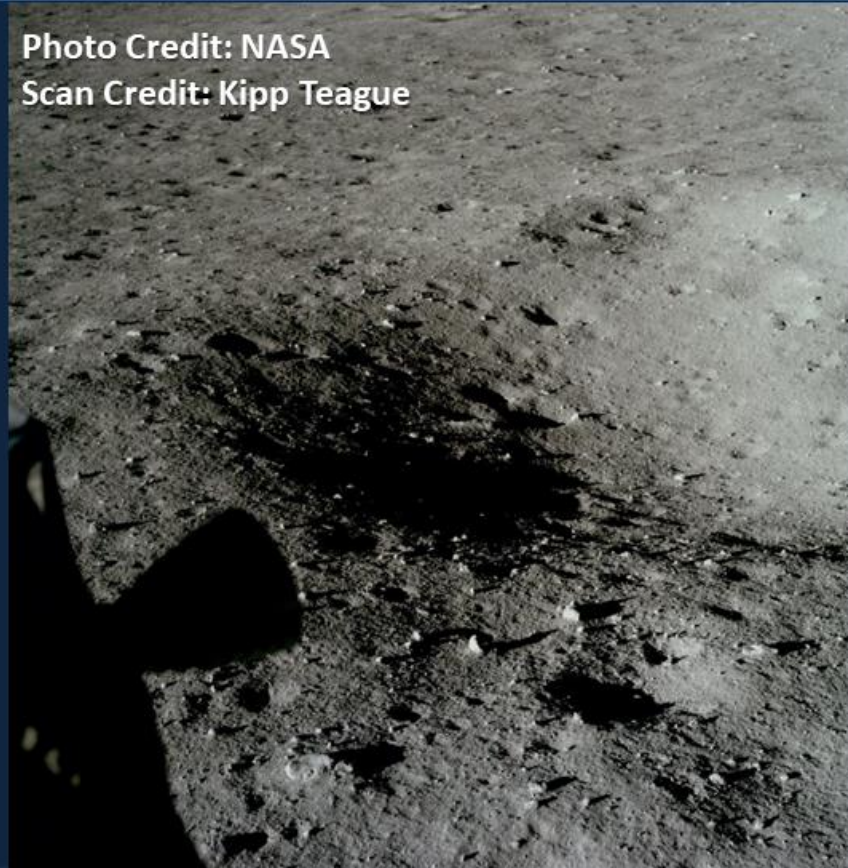
July 20, 1969
3:17:39 PM CDT
20:17:39 UTC

LM lunar landing

At ~3:18 PM CDT
20:18 UTC
Neil Armstrong says;

"Houston, Tranquility Base
here. The *Eagle* has landed."

Photo Credit: NASA
Scan Credit: Kipp Teague



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After seeing the computer would land on the edge of a rocky crater, Armstrong manually landed *Eagle* with only 30-45 seconds of fuel left.
#Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
109:24:15 since launch

July 20, 1969
9:56:15 PM CDT
02:56:15 UTC July 21, 1969

Armstrong takes first step

**“That’s one small step for
[a] man...one giant leap for
mankind.”**

Photo Credit: John Saxon
Scan Credit: John Saxon



Photo Credit: NASA
Scan Credit: Kipp Teague



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The [a] was lost due to static in transmission from Armstrong’s famous pronouncement. It was re-discovered when the tapes were digitized.
#Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
124:22:00.79 since
launch

July 21, 1969
12:54:00 PM CDT
17:54:00 UTC

Eagle lifts off from the moon

Video Still Credit: Ken Glover
Material Credit: Mark Gray



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Prior to liftoff much work was done to get an accurate position of Eagle (landing off target) and Columbia's orbit to minimize fuel usage.
#Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
127:52:05.3 since
launch

July 21, 1969
4:24:05 PM CDT
21:24:05 UTC

Final maneuvering by Eagle
before docking with Columbia

Photo Credit: NASA
Scan Credit: NASA Johnson



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Eagle and *Columbia* docked at a slight angle which caused spacecraft oscillations until the docking latches fired and achieved a hard dock.
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APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
135:23:42.28 since launch

July 21, 1969
11:55:42 PM CDT
04:55:42 UTC July 22, 1969

Transearth injection begins

Photo Credit: NASA
Scan Credit: NASA Johnson



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After several lunar orbits to verify spacecraft weight and a recheck of systems, Houston gave the go to proceed back to earth. #Apollo50th #ilwx #iawx @NWS

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1969-2019

The most reproduced photo of
Apollo 11

“Buzz” Aldrin on the lunar
surface



Photo Credit: NASA
Scan Credit: Kipp Teague



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The Apollo 11 image of “Buzz” Aldrin on the moon and “Earthrise” from Apollo 8 are two of the best known images from the Apollo program.
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Heart rates during the extravehicular activities (EVA)

Armstrong (top)
Aldrin (bottom)

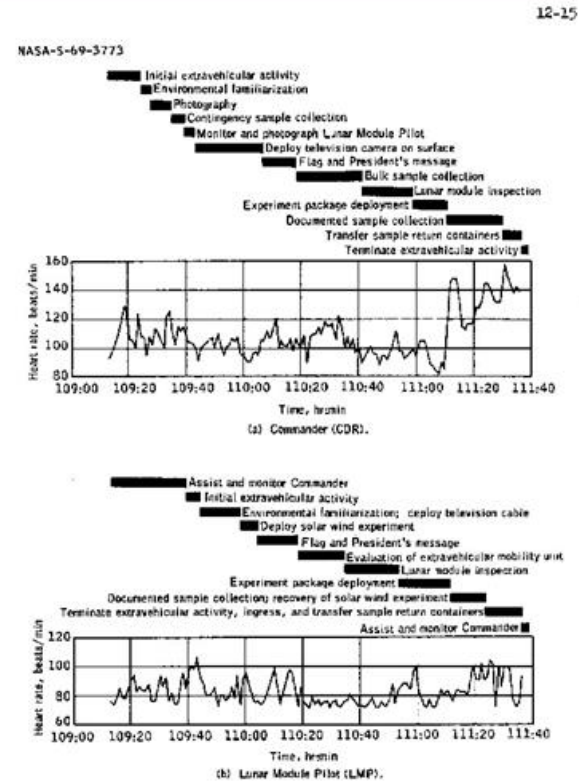


Figure 12-3.- Heart rates during extravehicular activities.

Photo Credit: NASA



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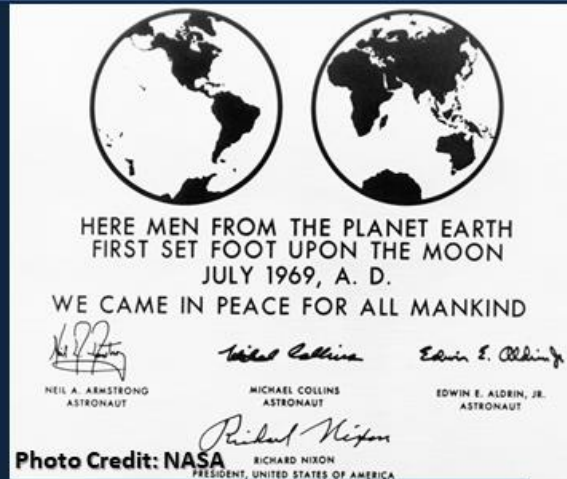
The post mission report showed that the heartrates of Armstrong and Aldrin varied greatly while they were on the lunar surface. #Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Items that were left on
the lunar surface

A commemorative
plaque on the ladder of
Eagle's landing gear



The crew left approved personal items on the
moon. Armstrong left an Apollo 1 mission patch.



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There were several items that were left behind on the moon that ranged from an official plaque to various personal items by the crew. #Apollo50th #ilwx #iawx @NWS

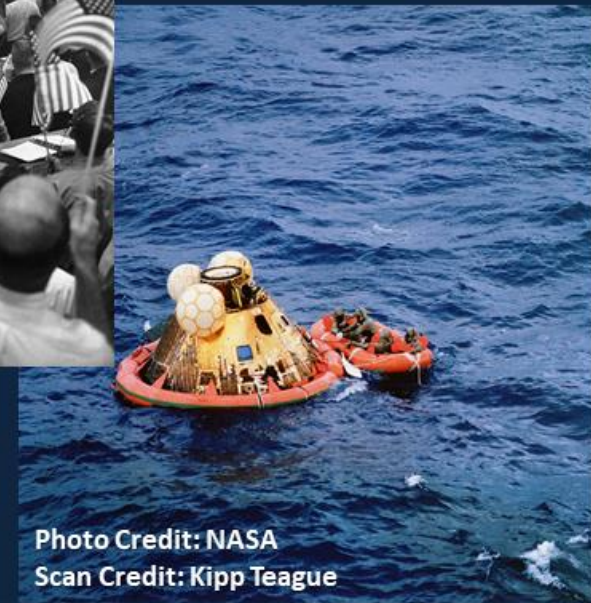
APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
195:18:35 since launch

July 24, 1969
11:50:35 AM CDT
16:50:35 UTC

Splashdown



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Due to thunderstorms the landing area for Apollo 11 was moved 215 miles to the northeast to a position 825 miles southwest of Honolulu.
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APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
~196:30:00 since launch

July 24, 1969
1:02:00 PM CDT
18:02:00 UTC

Apollo 11 crew in the mobile quarantine facility visited by President Nixon



Photo Credit: NASA
Scan Credit: Kipp Teague



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The crew was quarantined from 24 July 1969 to 10 August 1969 to ensure they did not bring back any germs from the moon. #Apollo50th #ilwx #iawx @NWS

APOLLO 11 GOLDEN ANNIVERSARY

1969-2019

Mission Timeline
430:26:46 since launch

August 3, 1969
6:58:46 AM CDT
11:58:46 UTC

The Apollo 11 mission clock officially stopped when the passive seismic experiment was turned off.



Photo Credit: NASA
Scan Credit: Kipp Teague



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The Apollo 11 mission clock stopped on 3 August 1969 when the passive seismic experiment was turned off; just over 430 hours after launch.
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APOLLO 11 GOLDEN ANNIVERSARY

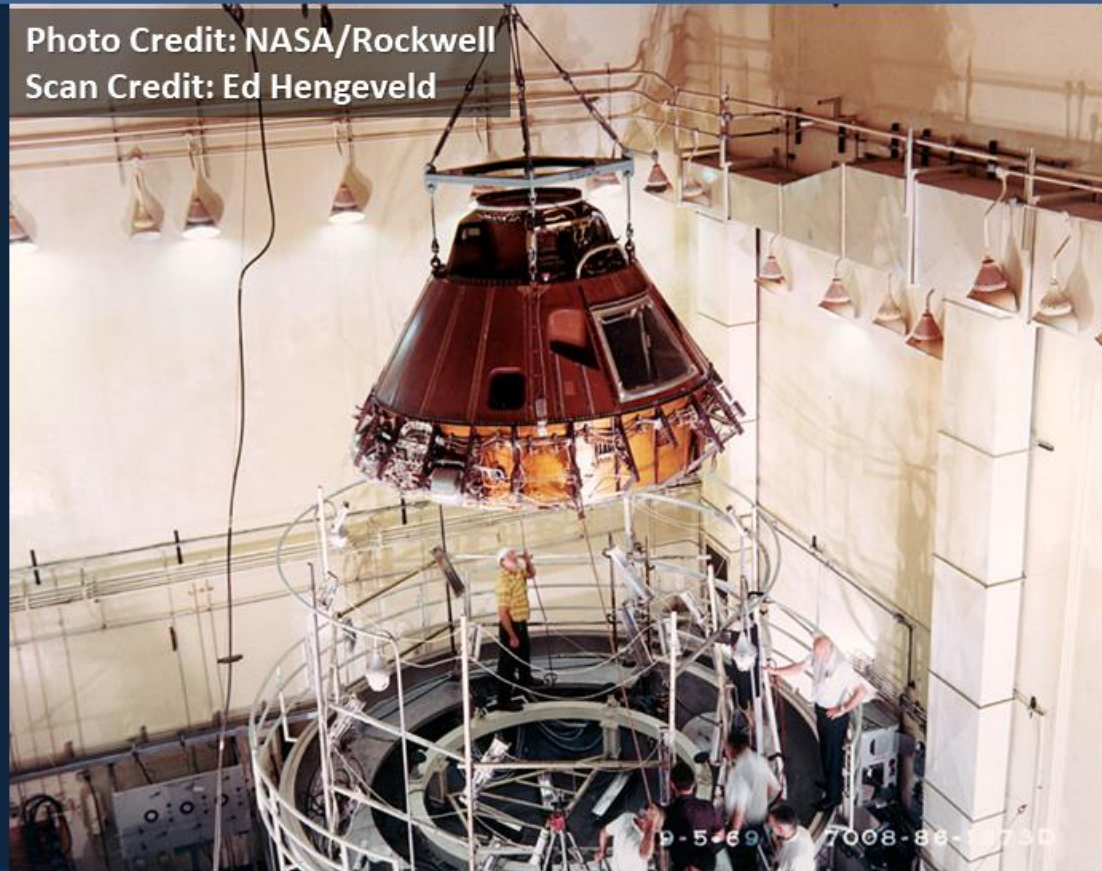
1969-2019

Command Module
Columbia

September 5, 1969

**vacuum bake
preparation**

Photo Credit: NASA/Rockwell
Scan Credit: Ed Hengeveld



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After inspection *Columbia* was vacuumed baked to remove residual moisture before being encased in plastic for display at the Smithsonian.
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**Lunar Reconnaissance
Orbiter Photo of the
Apollo 11 Landing Site**

**Altitude of 24 km (15 miles)
above the surface**



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40 years later the LRO took photos of the Apollo 11 landing site. The dark line to the crater is an unplanned walk done by Armstrong. #Apollo50th #ilwx #iawx @NWS

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1969-2019

"...I think one could reasonably make the case that Apollo laid the foundations for modern planetary science, certainly as it relates to the origin and evolution of the terrestrial planets."

Professor Ian A. Crawford, University of London, in Astronomy and Geophysics, December 2012

What was learned from the Apollo Program

- Discovery of anorthosite showed the moon once had very complex geological processes
- Confirmed the theory that the moon formed from debris blown off the earth in a collision with a Mars-sized object early in Earth's life
- Research from the lunar samples has produced more than 2,500 scientific papers through 2015
- The space shuttle's basic structure was made stronger and safer while reducing weight



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Although the Apollo Program was originally not done for scientific reasons, much was learned and that learning still continues to this day.
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