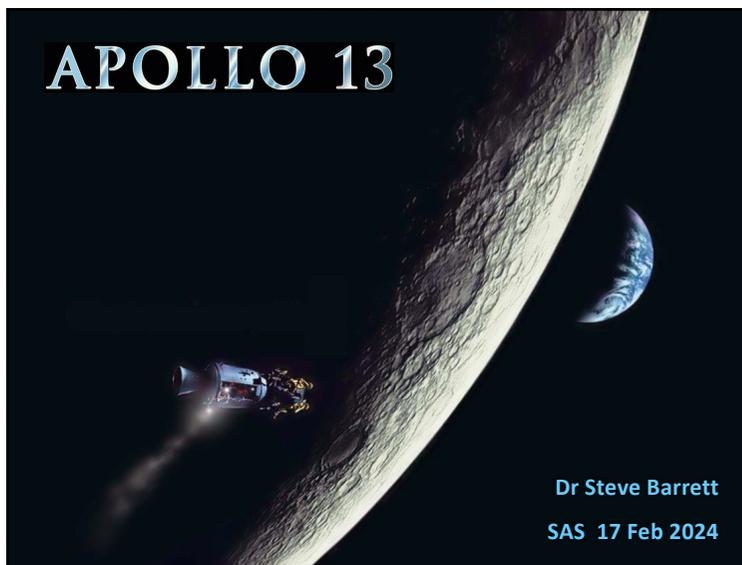


Apollo 13



Apollo 13 Launch



The mission started as for Apollo 8, 10, 11 and 12 with a spectacular launch of the mighty Saturn V rocket.

2

The Astronauts

CM Pilot	Commander	LM Pilot
		
Jack Swigert	Jim Lovell	Fred Haise

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3

Reality and Hollywood

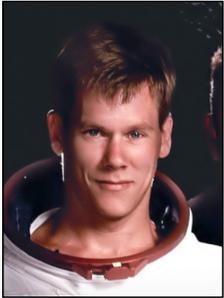
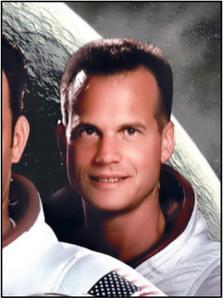
The story of the Apollo 13 accident, and the heroic efforts of those in Mission Control to get the three astronauts safely back to Earth, was immortalised by Hollywood in the 1995 film ...

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4

Apollo 13

The Actors

CM Pilot	Commander	LM Pilot
		
Jack Swigert	Jim Lovell	Fred Haise

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5

Reality and Hollywood

The story of the Apollo 13 accident, and the heroic efforts of those in Mission Control to get the three astronauts safely back to Earth, was immortalised by Hollywood and also by ...

LEGO !

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6

LEGO Apollo 13



APOLLO 13
LEGO Ideas Project
492 pcs

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7

LEGO Mission Control



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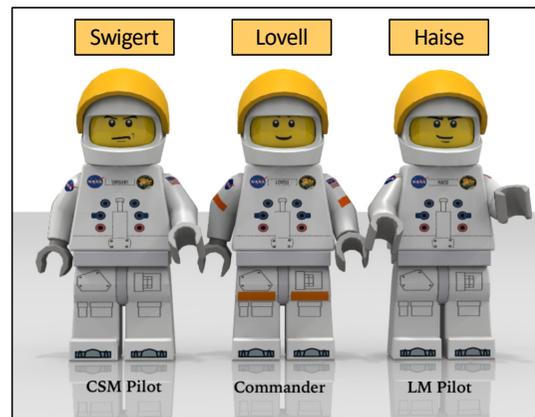
8

Apollo 13

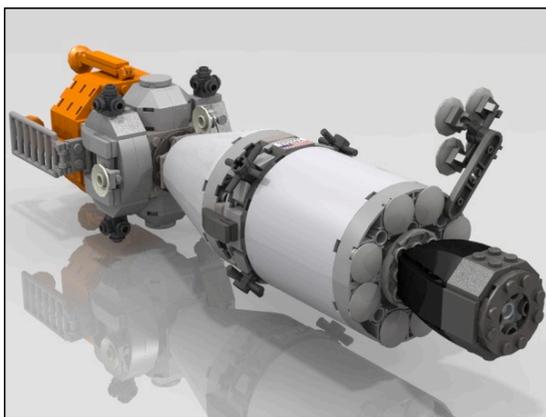
LEGO Mission Controllers



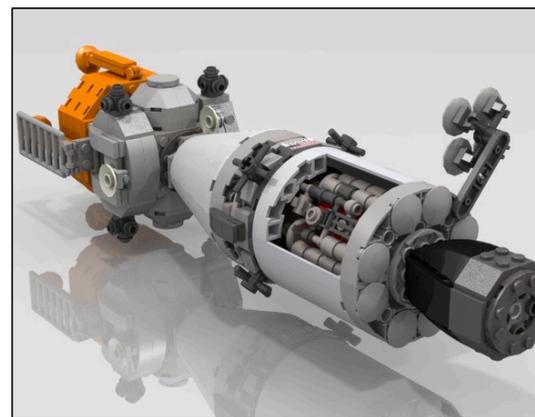
LEGO Astronauts



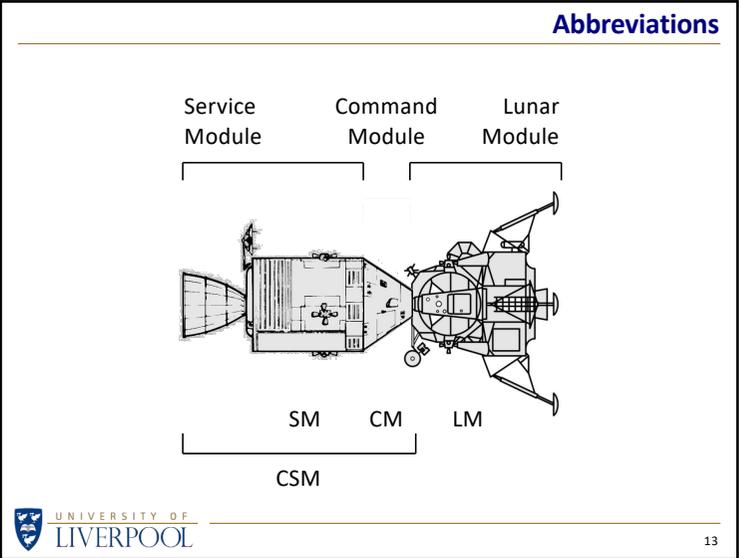
Pre-Explosion



Post-Explosion



Apollo 13



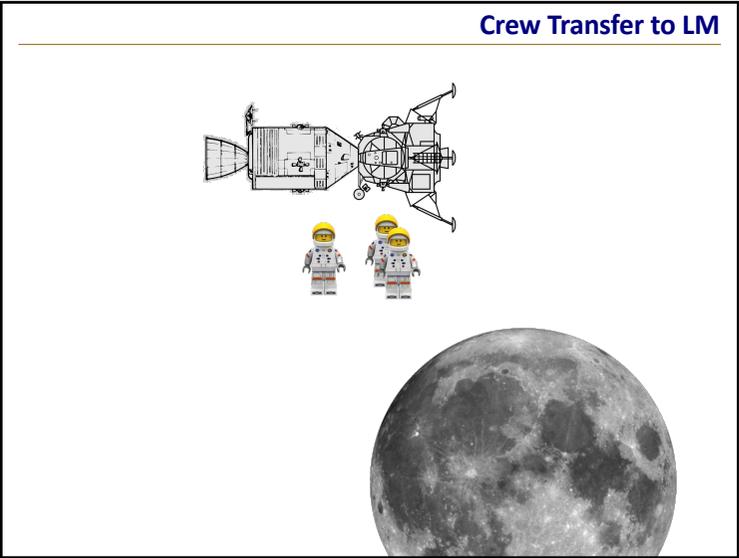
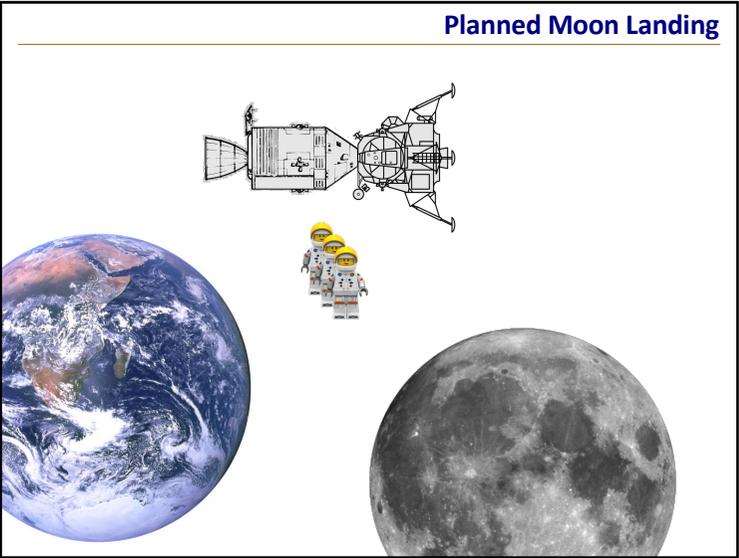
The Mission

The mission ...

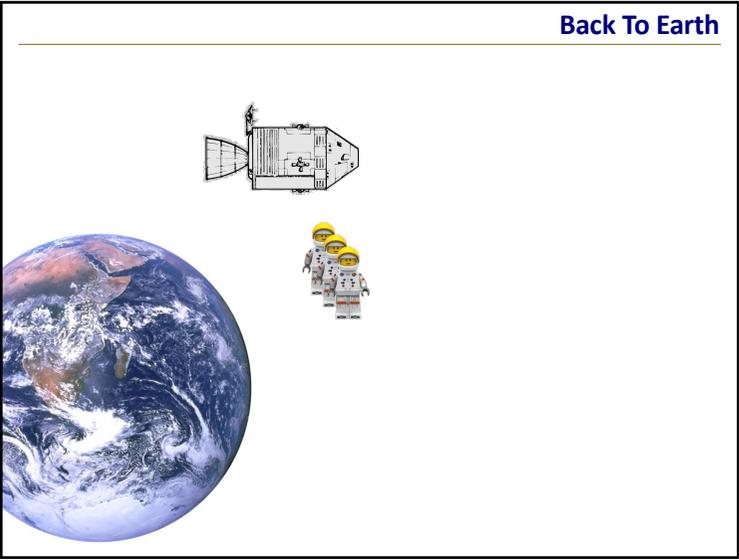
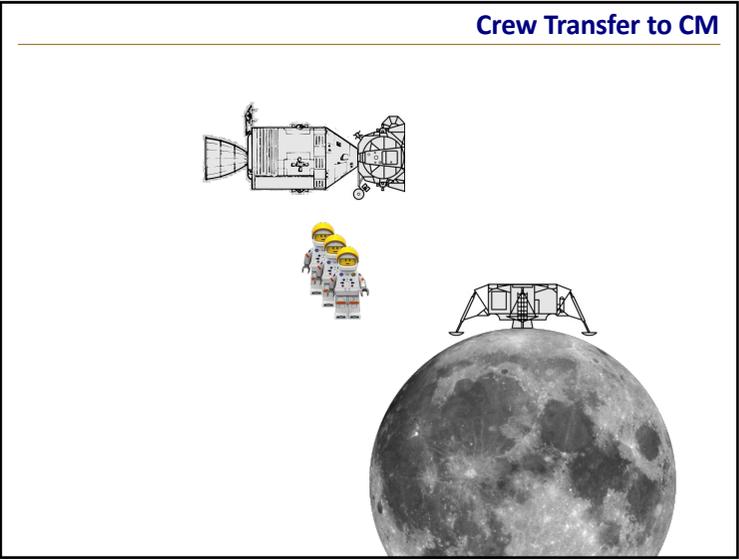
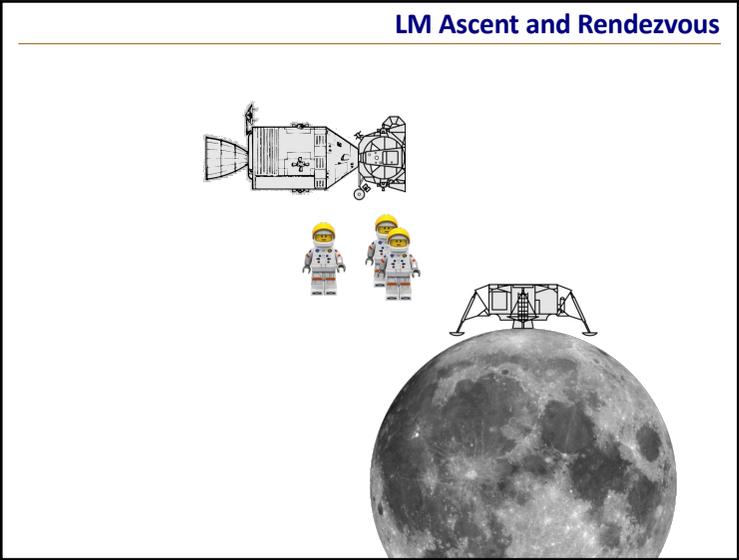
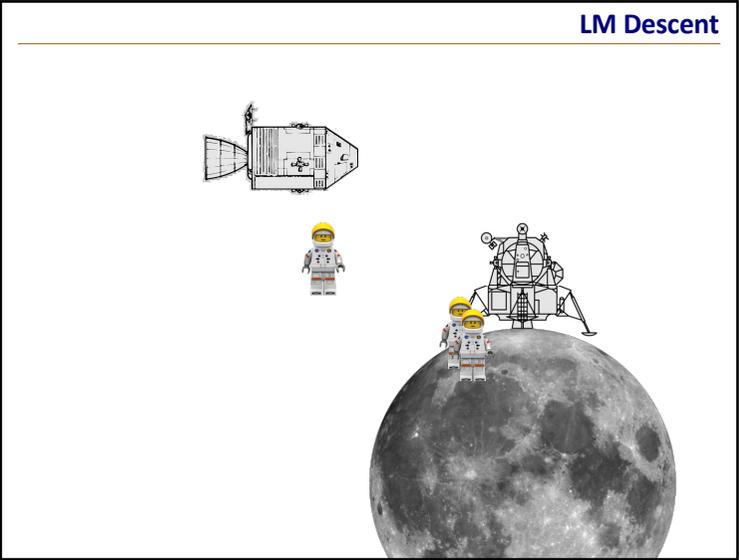
... as it was supposed to happen

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14



Apollo 13



Apollo 13

Splashdown

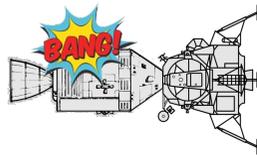


The Mission

The mission ...

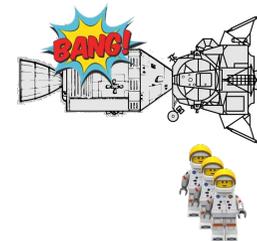
... as it actually happened

Houston, We've Had a Problem



A fan inside one of the oxygen tanks had faulty wiring insulation, so when the tank was stirred a spark caused the oxygen tank to explode, damaging the fuel cells and blowing out a side panel of the SM.

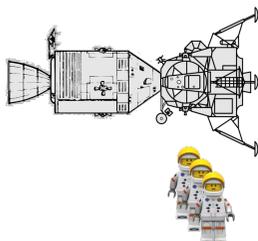
Into the LM Lifeboat



Contingency plans for a three-day flight returning from the Moon with a crippled CSM had been thought about, but Apollo 13 was at least four days from Earth.

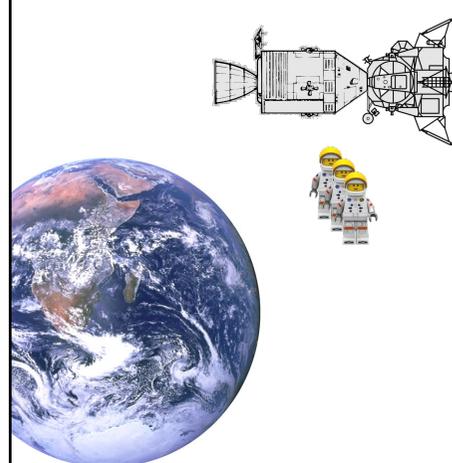
Apollo 13

Survival Mode

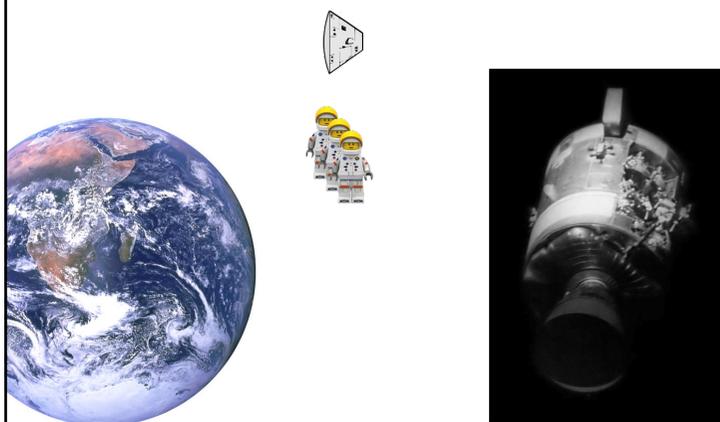


How could they ensure that the remaining oxygen, water and electrical power would last long enough to get them home safely?

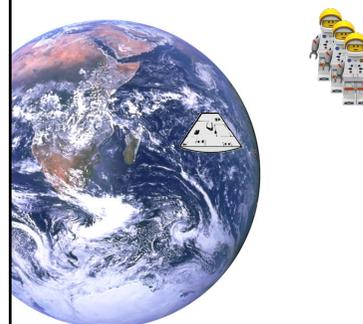
Crew Transfer to CM



SM and LM Jettisoned

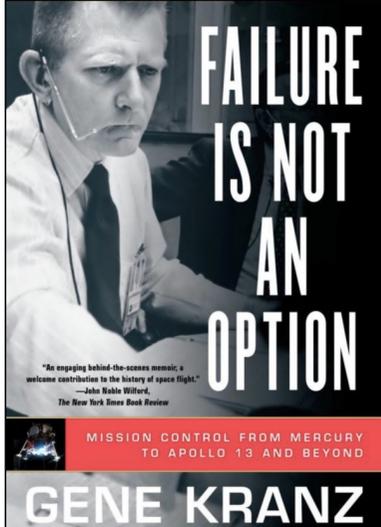


Splashdown



Apollo 13

Gene Kranz



That famous phrase was spoken by actor Ed Harris but not by Kranz himself.

However, Kranz used it for his autobiography because it reflected so succinctly the attitude of those working in Mission Control.

29

What Happened To ...?

The Command Module (call sign 'Odyssey') made it safely back to Earth with its three occupants.

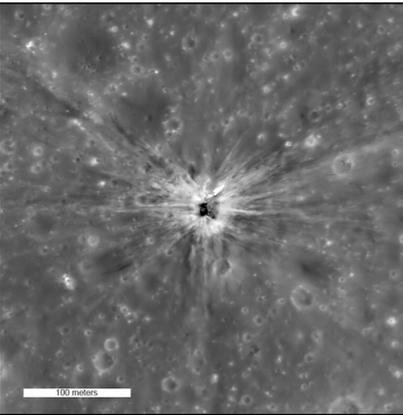
What about the rest of the Apollo hardware?

The third stage of the Saturn V rocket, after it had accelerated the CSM+LM spacecraft towards the Moon, was given one last task to perform ...



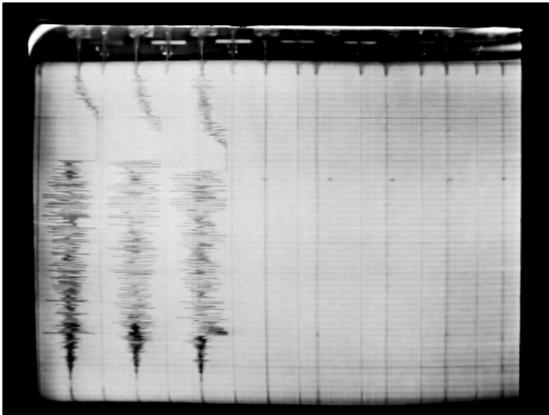
30

Saturn S-IVB Impact Site



31

Apollo 12 Seismometer



32

Apollo 13

What Happened To Aquarius?

After the Lunar Module (call sign 'Aquarius') was jettisoned it re-entered the Earth's atmosphere and disintegrated.

However, it was important to ensure that its re-entry was controlled to ensure that any surviving components fell into the deepest Pacific trench.

In particular ...

Plutonium Power



Alan Bean (Apollo 12) removes the plutonium fuel cask from the LM to transfer it to the RTG in front of him that powers the experiments on the lunar surface.

RTG = Radioisotope Thermoelectric Generator

Jim Lovell and Tom Hanks



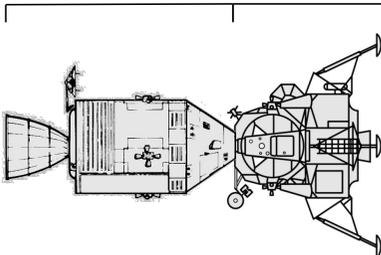
Read All About It!



Apollo 13

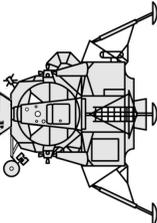
Who Made What

Command and Service
Modules



North American Rockwell

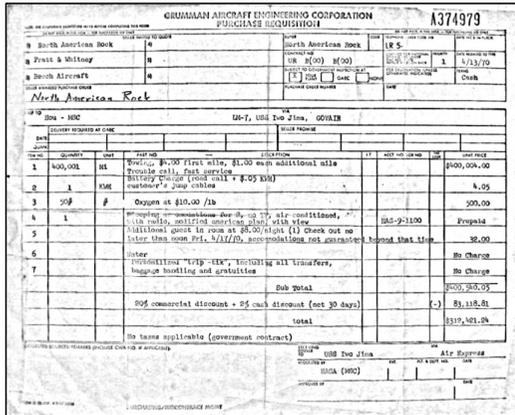
Lunar
Module



Grumman Aerospace

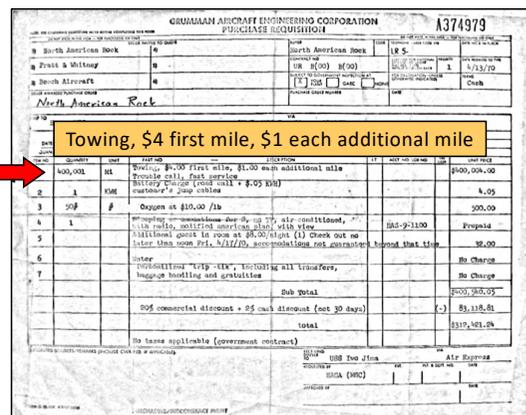

37

Grumman Invoice To North American




38

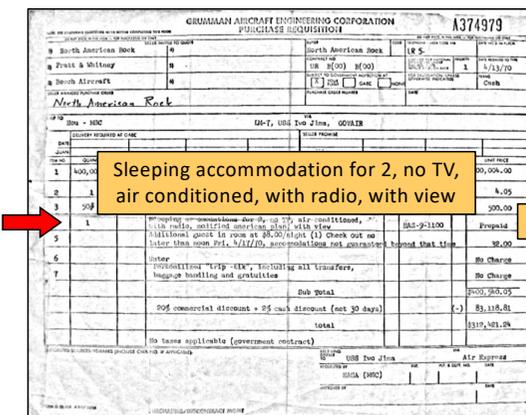
Grumman Invoice To North American



Towing, \$4 first mile, \$1 each additional mile


39

Grumman Invoice To North American



Sleeping accommodation for 2, no TV, air conditioned, with radio, with view

Prepaid


40

Apollo 13

Grumman Invoice To North American

GRUMMAN AIRCRAFT ENGINEERING CORPORATION PURCHASE REQUISITION A374979									
To: North American Rock		Ship to: North American Rock		Contract No: 185		Date: 1/13/70		Club	
Description of Material: North American Rock Qty: 1 Unit Price: \$8.00 Total Price: \$8.00 Additional guest in room at \$8/night (1) Check out no later than 11:00 PM. 3/17/70. Accommodation not available beyond that date.									
Total: \$8.00 Net: \$8.00 Tax: \$0.00 Total: \$8.00									

Additional guest in room at \$8/night



41

Epilogue – Recovery of Odyssey



42

Epilogue – NASA's Finest Hour



Duke, Lovell, Haise, Kranz, Lunney, Griffin, Brand, Lousma, Kerwin (2015)

APOLLO 13

www.liverpool.ac.uk/~sdb/Talks

Dr Steve Barrett
SAS 17 Feb 2024