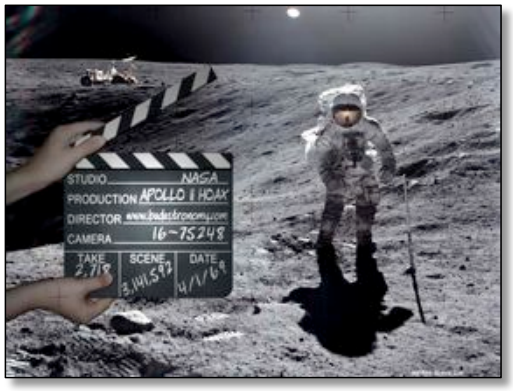
The Great Moon Hoax



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The Great Moon Hoax

Why a hoax?

President Kennedy couldn't deliver on the promise

How many believe it?

6% of all Americans have doubts

At what stage in the Apollo programme did it start?

Man in Earth orbit — yes. Man on the Moon — no.

What is the "evidence"?

Scientific scrutiny makes a good science lesson

...and hopefully an interesting talk.

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Why a Hoax?

Kennedy made a promise…

Impressive… Important… Difficult… Expensive…

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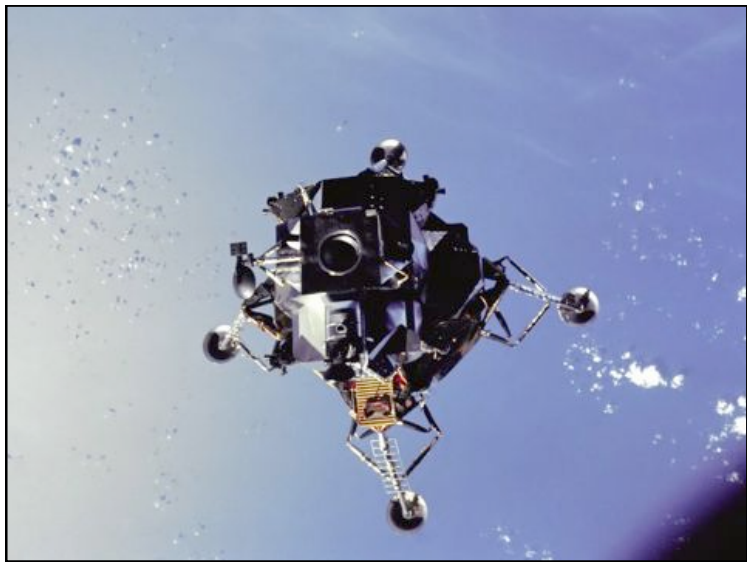

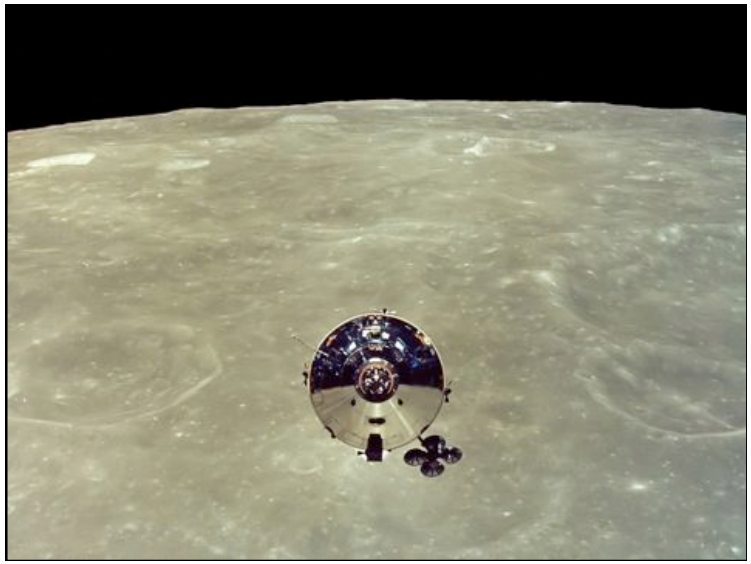

The Evidence

- Computing power just wasn't up to the task
- Radiation in space would kill the astronauts
- Video anomalies : filmed on Earth, just slowed down
  flags wave in the breeze
  dust doesn't fall at the right rate
  hammer and feather experiment
  rocket exhaust not visible from LM
- Image anomalies : *many anomalies are quoted…*

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So Many Image Anomalies...

- Shadow angles are inconsistent with illumination by Sun
- Shadow lengths are inconsistent with illumination by Sun
- Shadows are filled in by another light source
- No stars appear in the sky
- No blast crater underneath the Lunar Module engine
- Same background appears in images of different regions

... and dozens more

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So Many Image Anomalies...

Concerning the Hasselblad cameras used…

- Astronauts couldn't operate the cameras with gloves
- Fiducial cross marks appear behind objects
- Images are perfectly framed even though no viewfinder

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Look at the Evidence

Let's look at the evidence, piece by piece, and see how much of it stands up to scientific scrutiny.

Computers

Radiation

Video clips

Still images

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Computing Technology

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Advancing Technology

1954: Scientists from the RAND Corporation illustrate how a "personal computer" might look in the year 2004…

"With teletype interface and Fortran language, the computer will be easy to use."

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Computers Too Big

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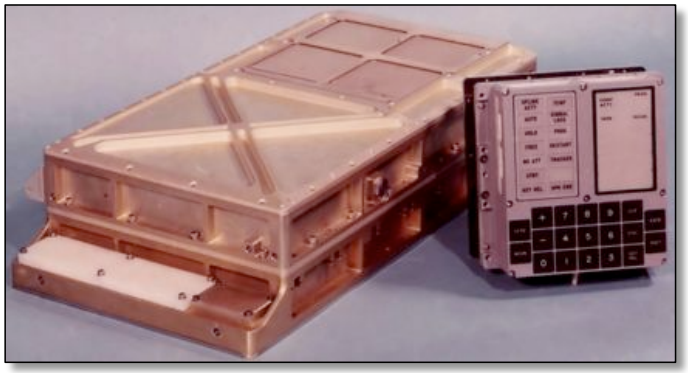
Apollo Guidance Computer



Was this sufficient computing power to put a man on the Moon?

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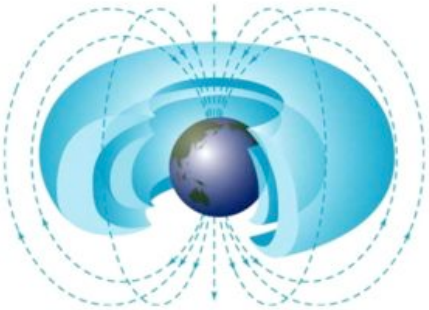
Radiation

Energetic protons and electrons from the Sun get trapped in the Van Allen belts encircling the Earth.

Astronauts travelling to the Moon would receive a "lethal" dose of radiation.



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Blowin' in the Wind

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Apollo 11 Flag

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Rocket Engines on the Moon

Why is there no rocket engine exhaust plume?

It must be a studio model on wires.

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Rocket Engines in Earth Orbit

Engine exhaust plumes are not visible in a vacuum

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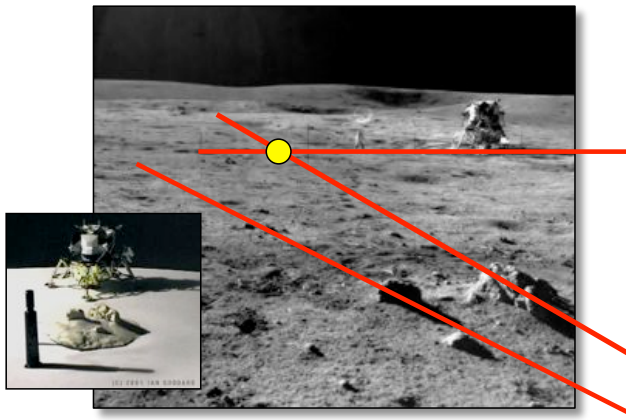
Impossible Shadows



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Where's the Light Source?

If the Sun is the only light source, why is Aldrin visible when in shadow?

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Where Are the Stars?

Why are there no stars in the sky?

NASA didn't want to get it wrong!

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Why Footprints?

Why did the astronauts leave footprints, but the footpads on the Lunar Module did not sink into the soil?

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Sinking in the Soil

Why did the footpads on the Lunar Module not sink into the soil?

Sometimes they *did*.

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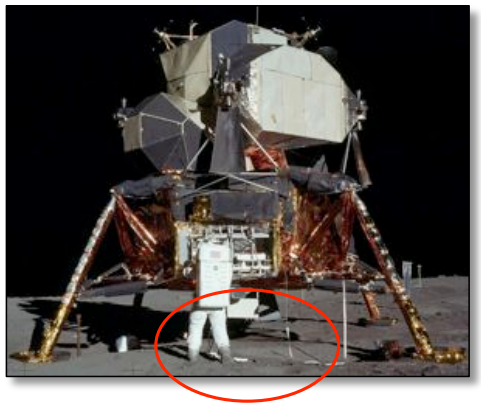
Sinking in the Soil

Why is there no 'blast' crater visible below the descent engine?



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Sinking in the Soil

Sometimes there *is* a small blast crater — it is simply rather shallow.

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Studio Set

Two views taken from different locations have "identical" backgrounds.

Is this proof that the same studio set "backdrop" was used twice?

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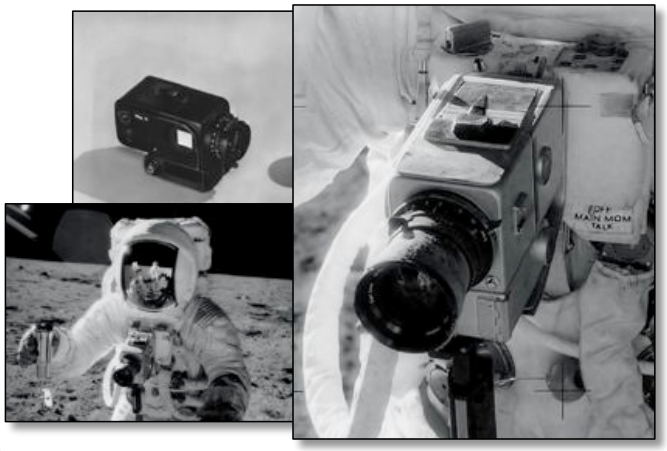
Hasselblad Cameras



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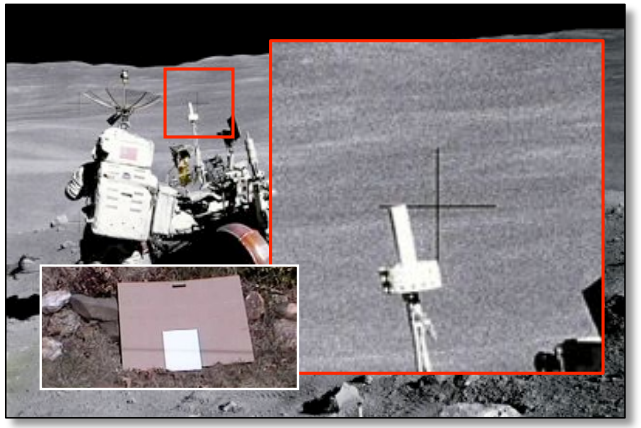
Impossible Images



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How Did They Get Perfect Framing?

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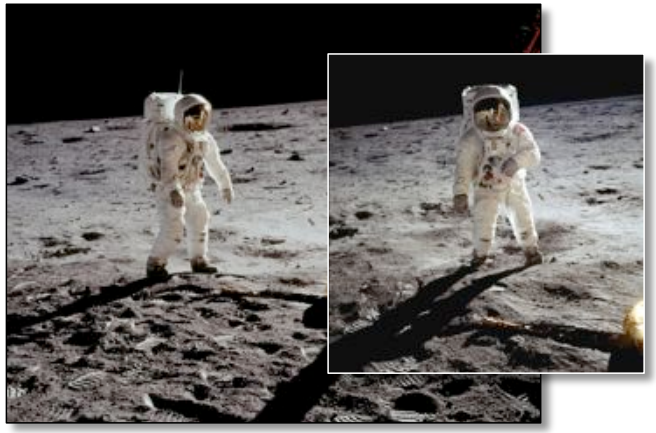
Spot the Difference



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How Did They Get Perfect Framing?

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Signs of Life

Take 1

Take 2

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Proof

So the question remains...

Is there *any* evidence that can prove, beyond any reasonable doubt, that the moonlandings *did* take place?

That depends on your definition of 'reasonable'.

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Hammer and Feather

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Kicking Up Some Dust

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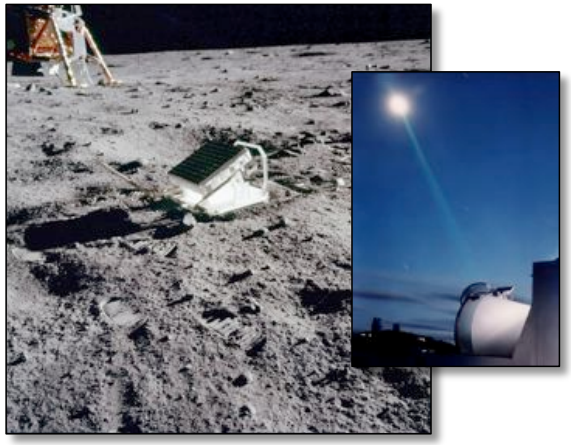
Reflectors



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Can Hubble See Apollo?

Despite what some Moon Hoax advocates believe, we still have to obey the laws of physics.

Resolution of the HST ~ λ / D ~ 0.2 μradians

~ 10 millionths of a degree

~ 0.05 arc seconds.

To see an object a few metres across at a distance of 400,000 km would need a resolution of

~ 0.01 μradians

~ 0.002 arc seconds.

The Lunar Module is too small by a factor of ~ 30.

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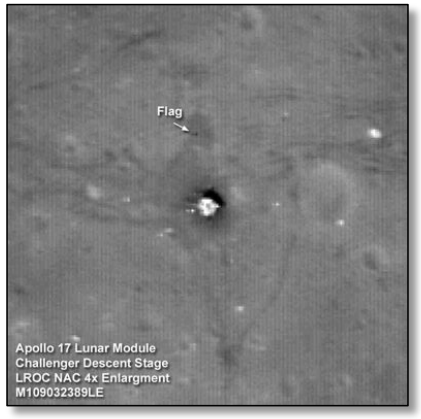
Can Anything See Apollo?

The mapping satellite Lunar Reconnaissance Orbiter Camera (LROC) has a Narrow Angle Camera (NAC) that can see the evidence.



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Be Sure of Your Facts

Professor Goddard does not know the relation between action and reaction and the need to have something better than a vacuum against which to react. He seems to lack the basic knowledge ladled out daily in high schools.

New York Times editorial 1921

Correction: It is now definitely established that a rocket can function in a vacuum. The Times regrets the error.

New York Times July 1969

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What's Wrong With This Image?

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What's the Point?

Why are there so many Moon Hoaxers?

Do they really believe their "scientific evidence"?

Most arguments can be countered with some basic physics...
...so analysis of the "evidence" makes a good science lesson.

Thinking about why things (might) behave differently on the Moon can help teach "Physics on Earth".

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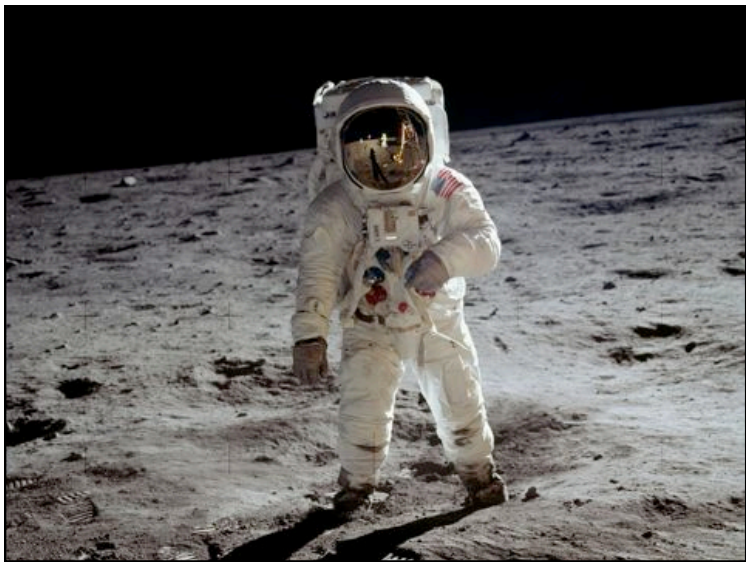

The Great Moon Hoax

http://www.liv.ac.uk/~sdb/Talks

Dr Steve Barrett 12 Apr 2016