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Did NASA Really Put Men on the Moon?

“We choose to go to the moon. We choose to go to the moon in this decade... not because [it is] easy, but because [it is] hard...” The words of John F. Kennedy’s famous and inspirational speech at Rice University on September 12, 1962 struck a chord with America. Whatever men and women unite and apply themselves to is possible, even if it appears impossible! The world watched live while the Apollo 11 mission, with a crew of three astronauts, left the earth’s orbit on a trajectory to the moon and landed two astronauts on the moon. Yet, Bill Kaysing claimed the whole landing was faked by NASA. Where does the truth lie and what do the facts show? A massive amount of third-party evidence proves that Neil Armstrong’s step onto the moon did actually happen and was indeed not just a hoax made up by NASA to fool the world.

In 2001, Fox TV aired a documentary called “Did We Really Land on the Moon?” The video featured an interview with Bill Kaysing and other so-called experts on the moon “conspiracy.” Bill Kaysing claimed in this video that the moon landing was impossible and introduced several ideas behind his hoax theory. First, he makes the case that there was sufficient motivation to fake the lunar landing in the context of the Cold War especially considering the prevailing idea that whoever made it to the moon first would win the Cold War. Second, Kaysing believes that the scenes of the lunar landing seen across the world were pre-filmed in Nevada’s

Area 51, a high security US Air Force facility shrouded in secrecy. In the Fox TV documentary, a number of arguments were made.

The first argument was that there were no stars visible in either the pictures or videos of the lunar landing and since there is no atmosphere on the moon the stars must be visible. If the astronauts were actually on the moon, then we would be able to see the stars in the pictures and videos.

Secondly, the argument was also made that the photos were made up and essentially “photoshopped” to use a term not yet coined. A couple reasons lie behind this claim. The first is because the lighting of Buzz Aldrin coming down the ladder of the lander is in such perfect light despite being in the shadow from the sun. The second is that the crosshairs of the camera seem to be in front on the picture in some places, yet behind objects in other places, supporting the theory that those objects had been added in the dark room after the picture was taken.

Thirdly, the flag is claimed to be seen waving in the videos after the astronauts set it up on the moon’s surface leading to conjecture that the flag could not wave when there was no air on the moon.

Fourthly, there is no blast crater left from the rocket of the lunar lander as can be seen from the pictures and video of the lander on the moon’s surface. The surface of the moon was covered with dust, so Kaysing said there should be a blast crater below the lander from the rocket blast as it landed.

Fifthly, the Van Allen radiation belt, a zone around the earth consisting of energetic charged particles (mostly from the solar wind), would have killed the astronauts from severe radiation. Kaysing claims that safe travel through these belts was impossible (*Conspiracy Theory: Did We Land on the Moon?*).

These arguments are presented in the video as proof that the landing could not have actually happened and was faked. But instead of blindly accepting these arguments as facts, readers owe it to themselves to consider whether these arguments make sense and, more importantly, whether they are backed up by facts and solid reasoning. One must acknowledge that to deny the reality of Apollo 11 is to deny the reality of all the Apollo landings on the moon.

The cameras taken to the moon, made by Hasselblad, although very expensive and high-quality cameras, were restricted in dynamic range capability in the same manner that cameras today are restricted. A camera can only properly expose objects within a certain range of brightness (known as dynamic range) at the same time. In the video *Nvidia Debunks Conspiracy*

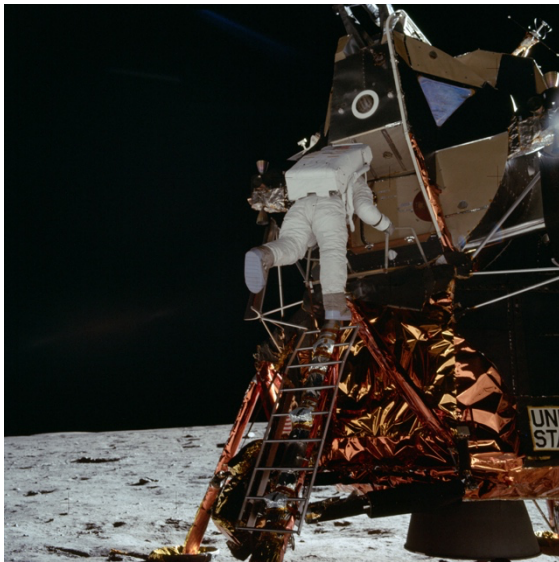


Fig. 1. AS11-40-5866. Buzz Aldrin, photographed by Neil Armstrong, descending out of the Lunar Module. Courtesy of NASA.

Theories About Moon Landing, the presenter explains to a sizeable group how NVIDIA modeled the Apollo 11 lander and the lunar surface in 3D with minute detail. They demonstrated how in the famous picture of Buzz Aldrin stepping out of the lunar module, it was possible for him to be lit as well as he was even though he was in a shadow from the sun. Once they modeled the lunar surface, they found that it reflected the majority of the light hitting it. This majorly affected the lighting in the picture because Aldrin was lit by light reflecting off

the lunar surface. NVIDIA's other objective was to demonstrate why the stars couldn't be seen in the picture. They modeled the sun and the reflectivity of the lunar surface, and their work is demonstrated in the video at 5:40. They then simulated the opening up of the camera's exposure

to where the stars would be visible and the resulting effect on the lunar module and the lunar surface was gross over-exposure. Most professional photographers are familiar with this situation as it's one in which they can't properly expose both subjects, which forces them to choose one. The astronauts chose the lunar surface, of course (IGN).

The claim is made by hoax theorists that the crosshairs in the picture are sometimes below items in the picture, an impossible situation. The crosshairs were engraved on the reseau glass plate in the camera placed between the film and the lens. Phill Parker wrote a report shortly after Apollo 11 about the photo equipment taken to the moon in which he mentions the purpose of the crosshairs. "The crosses are recorded on every exposed frame and provided a means of determining angular distances between objects in the field-of-view" (Parker, 1969). They were also used to detect warping of the film during the development process. The conspiracy claim has been painstakingly refuted by Elena Alb and two other contributors on their detailed website called Moon Hoax: Debunked. They state:

If you examine high-resolution, direct scans of all of the allegedly doctored photographs, you find exactly the same effect: the apparently missing portion of the crosshairs is always on a very bright, overexposed background, and it turns out that often it's not missing at all but simply very faint.

The Fox TV show and other sources that discuss these apparent anomalies show low-

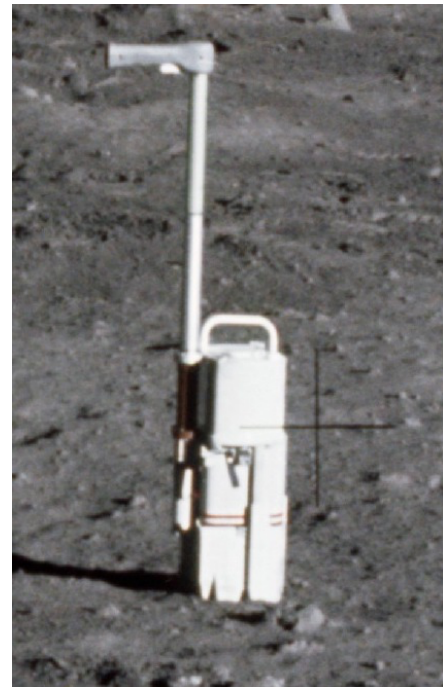


Fig. 2. AS11-40-5931. Cropped from a high-resolution original, the crosshair can be seen over top of the brightest part of the photo, albeit faintly. Courtesy NASA.

quality copies of the pictures instead of high-quality scans: another recurring trick used by conspiracy theorists. (“5.14 How can the camera crosshairs...”)

The flag can be seen moving a lot as the astronauts set up the flag and push the pole in the surface. However, it is evident that they had some difficulty getting the flag set up securely as can be seen beginning at 49:00 in the video *Restored Apollo 11 Moonwalk - Original NASA EVA Mission Video - Walking on the Moon* posted on NASA’s official YouTube channel. The flag can be seen waving this way and that corresponding with the pole’s moves. At 49:20 the flagpole is at rest briefly and the corresponding motion in the flag itself ceases. At 50:40 the flagpole is installed, and the flag is at complete rest without motion. It is worthy of note that the flag stands away from the pole horizontally because the pole was designed with a horizontal component on the top to keep the flag from drooping next to the pole (NASA).

The lack of a blast crater on the dusty lunar surface does seem to be a very interesting observation by the hoax theorists. Joe Stodola studied astronomy at New Mexico State University in the 1970s and has maintained interest in astronomy and space flight ever since. He is involved with the Grants Pass Astronomy Club and in 2019 he spent 4 months specifically researching the Apollo 11 mission in preparation for a presentation he made at the Josephine Community Library in Grants Pass, Oregon, on the 50th anniversary of the Apollo 11 date of departure. This author did a personal interview with Stodola and he said this about the lack of a blast crater: “The moon has a much lower gravity than Earth... That engine was not a very powerful engine, plus it was regulated during the landing” (Stodola). The lunar lander was a very lightweight craft compared to the whole rocket that left the earth. It was made of aluminum and contained only necessary survival items and documentation tools and instruments.

Alb states in a web page that “lunar gravity is one sixth of the Earth’s, so the LM’s weight on the Moon isn’t 15 tons; it’s 2.5. Moreover, these figures refer to the *initial* weight of the spacecraft, which decreased dramatically as its rocket fuel was used up.” And “since the surface of the Moon consists of hard rock covered by a layer of dust, this rather modest rocket thrust would merely blow away the dust and expose the underlying rock. That’s exactly what we see in the Apollo photographs” (“8.11 How come there’s no blast crater...”). An example of this can be seen in Figure 3.



Fig. 3. AS11-40-5921. Lunar surface below the Descent Stage. Dust has been blown away and rock is seen. Courtesy of NASA.

The Van Allen belts were discovered by James Van Allen in the 1950s. These belts became a grave concern for NASA planners as they prepared to send men to the moon. Even Van Allen himself made proposals of how to surpass this hurdle. But

by February of 1964, NASA was confident that Apollo crews would be passing through the belts fast enough that the spacecraft’s skin and all the instrumentation lining the walls would be enough protection. . . To monitor radiation exposure during the flights, Apollo crews carried dosimeters on board their spacecraft and on their persons. And these readings confirmed NASA had made a good choice. At the end of the program, the agency determined that its astronauts had avoided the large radiation doses many feared would ground flights to the Moon. (Teitel 2014)

The trajectory to the moon was also plotted out so as to avoid the areas of the belts with the highest radiation risk. This decreased the amount of radiation to which the astronauts were exposed.

These are facts discovered in response to the hoax theory. However, there is still a wealth of third-party evidence and arguments for those who will not trust anything from NASA's mouth.

Consider how tense the dynamics between America and the USSR were at the time as the countries were in the middle of the Cold War. Bethany Dorau states in her printed introduction to JFK's speech at Rice University, "The moon had become the ultimate prize, and Americans were increasingly concerned that the Soviets would get there first, delivering a serious blow to US prestige. The race to the moon was not only a contest for supremacy in space, but a display of military technology and the victory of a social and political worldview" (Dorau). In this situation you can be sure the USSR and America were both watching each other very closely. Given that the USSR would have been monitoring Apollo 11, if there was anything strange, suspicious, or faked we can reasonably expect Russia would have been the first to sound the alarm and make the hoax charge against NASA perhaps even before Apollo 11 made its reentry. But the USSR was silent on this, neither officially nor publicly making the charge.

The technical details of communications were known ahead of time outside NASA as revealed in an Electronics World article titled, "*Communications on the Moon.*" Published in the August 1969 issue of the magazine, the article was written in a future tense toward the trip, and it was likely printed and possibly even mailed out in July like many magazines. Among the details cited are specific radio frequencies of communication between Houston and Apollo 11, to which

anyone with the proper equipment could listen. One would not expect this information to be released if NASA was planning a hoax!

Also cited in the Electronics World article are technical specifications for the live video signal. Instead of the broadcast standard of 525 lines at 30 frames per second video format as used in broadcast at the time, the camera was designed for 320 lines at 10 frames per second. The signals received would be “scan converted” or upscaled and the frames duplicated to meet the normal broadcast standard for transmission by TV networks. The reason for using this different format is given in the article: “Scan conversion of the signals is needed because the TV camera, to conserve power and communications bandwidth, operates on standards markedly different from commercial TV” (Electronics World). This lower quality video signal explains why the live video looked so poor compared to regular TV programming.

Sven Grahn flew from his home in Sweden to Florida where he joined his friend Richard S. Flagg to monitor the transmissions from Apollo 17. They set up on the viewing area next to everyone else and then waited for the launch of the rocket. They set up radios in the back of Richard’s car for listening to the radio transmissions of the rocket. Grahn says, “Our little Titusville station picked up strong voice signals up to 8 minutes after launch on 259.7 MHz” (Grahn). They also picked up signals for subsequent passes while the spacecraft was in orbit. When the spacecraft left the earth’s orbit, they changed frequency to 2287.5 Mhz; Grahn and Flagg used a nine-meter parabolic dish procured from the US Air Force surplus supplies. This dish was able to tune in to spacecraft communications while on the way to the moon, in lunar orbit, during the lunar landing, and up till 80 minutes after the landing when the astronauts switched to low power output to conserve energy. They later heard the astronaut in the Command Module count down before going over the moon’s horizon in lunar orbit.

In his presentation for the Grants Pass Astronomy Club at the Grants Pass Unitarian Church on August 7, 2019, Stodola stated that when Apollo 11 landed on the moon, one of the things left on the surface was a retroreflector. Essentially a special reflector, it is used for lunar laser ranging which is where scientists use it to reflect a laser beamed from Earth back to Earth. Timing this operation allows scientists to determine the precise distance of the moon from the earth at different times and more precisely calculate its orbit. Retroreflectors were taken on the Apollo 11, 14, and 15 missions. James Hansen in his biography of Neil Armstrong titled *First Man: The Life of Neil A. Armstrong* makes the following statement: “For those few misguided souls who still cling to the belief that the Moon landings never happened, examination of the results of five decades of LRRR [Laser Ranging Retro-Reflectors] experiments should evidence how delusional their rejection of the Moon landing really is” (Hansen 515-516). The fact that these reflectors were left on the moon is not so much evidence as is the fact that, for the Apollo 14 and 15 missions, after the reflectors were deployed by the astronauts, they were detected by observatories on the earth within days. This precludes any possibility that they were deployed by a later mission from an orbiter or other unmanned spacecraft. No lunar missions earlier than Apollo 11 are known to have carried these reflectors.

Perhaps the most interesting argument of all is that there were over 400,000 people involved in the NASA project to make Apollo 11 happen. If one subscribes to the idea that all the Apollo missions were faked then he or she must also of necessity subscribe to the implausible idea that NASA was able to not only convince each and every single one of these employees and participants to keep absolute silence regarding any personal experience or facts regarding a hoax, but it would have done it so well that 50 years later we still have no solid evidence disproving the lunar landings. On top of this NASA would have also had to convince all third parties like

Grahn who tracked the Apollo missions in one way or another. This would be an incredible feat that even America's National Security Agency has not been able to achieve.

There will always be people who will not believe a story, but this does not make it untrue. The arguments that Bill Kaysing puts forth may be convincing from a casual glance to the observer unfamiliar with the field. However, the arguments do not hold up to a close examination and comparison with the verified facts of the story. The third-party evidence, from the radio listeners to the laser ranging reflectors also adds to the argument for the verity of the lunar landing. There is additional evidence, much additional evidence, that this paper cannot not accommodate, which may be found via the sources used for this piece. Kaysing's arguments that the lunar landings couldn't happen in an age when the president of the United States affirmed that even hard things are possible, are an affront to the lofty visions and high goals of the citizens of this free nation. When one denies truth as revealed through facts, he places himself in a position he claims is infallible, in which he is unwilling to learn. But no human can be infallible. Everyone is prone to error, and the wise acknowledge this. Therefore, with concrete facts backing up opposition to these lunar conspiracy theories, the fact that Americans still fall for them shows that many people do not see value in searching out truth backed up by facts. Does the truth matter? This author believes the answer is yes.

Works Cited

- Alb, Elena, et al. "5.14 How can the camera crosshairs be behind objects?" *Moon Hoax: Debunked!*, www.moonhoaxdebunked.com/2017/07/513-how-can-camera-crosshairs-be-behind.html. Accessed 21 August 2019.
- Alb, Elena, et al. "8.11 How come there's no blast crater under the LM's engine?" *Moon Hoax: Debunked!*, www.moonhoaxdebunked.com/2017/07/89-how-come-theres-no-blast-crater.html. Accessed 21 August 2019.
- Conspiracy Theory: Did We Land on the Moon?*, John Moffett (Director, Producer, Writer); Bruce M. Nash (Executive Producer, Writer), Fox TV, 15 Feb. 2001.
- "*Communications on the Moon.*" *Electronics World*, Aug. 1969, www.rfcafe.com/references/electronics-world/communications-moon-electronics-world-august-1969.htm. Accessed 18 Aug. 2019.
- Dorau, Bethany Groff. "VISIONS OF A NEW ERA: JFK: 'We Choose to Go to the Moon'." *Defining Documents: The 1960s*, Apr. 2016, pp. 31–35. *EBSCOhost*, search.ebscohost.com/login.aspx?direct=true&db=khh&AN=127106166&site=ehost-live.
- Grahn, Sven. *Tracking Apollo-17 from Florida*. www.svengrahn.pp.se/trackind/Apollo17/APOLLO17.htm. Accessed 18 Aug. 2019
- Hansen, James R. *First Man: The Life of Neil A. Armstrong*. Simon & Schuster, 2005.
- IGN. *Nvidia Debunks Conspiracy Theories About Moon Landing*. YouTube, 23 Sept. 2014, www.youtube.com/watch?v=syVP6zDZN7I. Accessed 18 Aug. 2019.
- Kennedy, John Fitzgerald. "We Choose To Go To the Moon." 12 Sept. 1962, Rice University Stadium, Houston.

NASA. *Restored Apollo 11 Moonwalk - Original NASA EVA Mission Video - Walking on the Moon*. YouTube, 17 July 2014,

www.youtube.com/watch?time_continue=2829&v=S9HdPi9Ikhk. Accessed 18 Aug. 2019.

Parker, Phill. "APOLLO-11 HASSELBLAD CAMERAS." *Apollo Lunar Surface Journal*,

NASA, 1969, <https://www.hq.nasa.gov/alsj/a11/a11-hass.html>. Accessed 21 Aug. 2019.

Stodola, Joe. Personal interview. 18 Aug. 2019.

Stodola, Joe. "Exploring the Moon Landing." Grants Pass Astronomy Club, 7 Aug. 2019,

Unitarian Church, Grants Pass, OR

Teitel, Amy Shira. "*Apollo Rocketed Through the Van Allen Belts*." *Popular Science*, 19 Sept.

2014, www.popsci.com/blog-network/vintage-space/apollo-rocketed-through-van-allen-belts/. Accessed 18 Aug. 2019.