

Moon Landing – Consequences: Short, Medium, & Long term

1. Winding Up the Apollo Program

1. Initially, Apollo was planned to go up to **Apollo 20**, with a wide range of Lunar investigation
2. Interest in moon waned (decreased) after Apollo 12
3. The near disaster of **Apollo 13** (Tom Hanks Film!) rekindled much of the interest. [**Apollo 14** – 1st Golf shot on the moon?!?]
4. Apollo 15, 16, 17 – LRV – **Lunar Roving Vehicle**
5. Nixon's VP, **Spiro Agnew**, headed up the Space Task Group. Agnew's resignation had negative impact.
6. Budget Cuts (partly linked to Vietnam) makes **Apollo 17** (Dec 72) the last mission. Only 12 men have walked on the moon!
7. Focus shifts from lunar to orbital: **Skylab** only exclusively US space station 1973-4 (24 weeks occupied) – Prefabricated Orbital Workshop. Orbit decayed and broke up in atmosphere in 1979.
8. US also focus on reusable **Space Shuttle Program 1981-2011**

2. Shift in Focus from Soviets also

1. **Mishin** took over after Korolev's death, but he had alcohol issues and lacked Korolev's abilities
2. Greatest 'Moon' success - **Lunokhod 1**, which landed a robotic 'Lunar Rover' on moon in 1970.
3. 1971: First probe to impact the surface of **Mars**
4. Unsuccessful launches in 1971 & 72 in the **Salyut** program (Three Cosmonauts died in **Soyuz 11** after capsule lost air pressure)
5. **N1** rocket program **cancelled** in 1974 and **Valentin Glushko** replaced Mischin.
6. 1975, 1st probe to orbit & land on Venus
7. Like the US, Focus moves to Salyut and later **Mir** low orbit, modular space stations (Mir 1986-2001) (*Mir* means 'Peace' or 'World')

Key Argument: In many ways, the trajectory of the space race mirrored political tensions in the Cold War. With "Détente" (thawing of Cold War) after May 1972, some limited cooperation in space occurred

3. Moves toward Cooperation in Space

1. With *Détente* came the **Apollo-Soyuz Test Programme** Mainly required synchronization of docking hatches
2. First international docking in orbit **17 July 1975**
3. Other regions enter the space race: **European Space Agency** (1975, but very slow to develop), Chinese **Shenzhou Programme** (2003 – First Chinese citizen in space - Shenzhou 5), JAXA (2003, Japan's space agency)
4. Biggest international cooperation comes with the **ISS – International Space Station**. NASA, Roscosmos (Russia), JAXA, ESA, and CSA (Canada). largest artificial object in space and the largest satellite in low Earth orbit, regularly visible to the naked eye from Earth's surface.
5. First ISS component was launched in **1998**, and the first long-term residents arrived on 2 Nov 2000 after being launched from the **Baikonur Cosmodrome**.
6. Current Space Budgets 2019-20 (approx.): US - \$22 Bn, China \$8.9Bn, Europe \$6.6Bn, Russia \$2.8Bn)
7. US disasters with Shuttle: **Challenger** Explosion 1986 and **Colombia** Disaster 2003.

4. Conspiracy Theories – What do they tell us?

- Partial Origins:** Loss of Confidence in truth by US Government: **McCarthyism** "US State Dept infiltrated by Communists", Increased **CIA** activity (i.e. Bay of Pigs Disaster), Vietnam 'lies' from Dept of Defence (**Pentagon Papers**), Nixon "I am not a crook" & resignation before **impeachment**, resignation of VP **Spiro Agnew** over corruption 'Bagman' charges.
- Discontent around **de-industrialization & Globalization**.
1. Astrophysicist **Neil deGrasse Tyson** – Raw difficulty of the scale of cover-up that would be required. "Just go to the moon!" to prove it was true! Too many document to fake!
 2. Stanley Kubrick – after film **2001 AD – A Space Odyssey** "approached to stage the landing" – promoted by **mockumentary** 'Dark Side of the Moon'!
 3. Howard Berry is Head of MA Film & Television Production at Uni of Hertfordshire – Debunking of fake filming claims.
 4. Modern 'Gaming Engines' can now re-create the lighting conditions to debunk many of the 'light-source' claims.
 5. Impact of the **Dunning-Kruger** Effect – 9/11 & QAnon?!?

5. Militarization & other uses of Space

1. 1973-8 – Soviet '**Almaz**' (highly secret) military space station. only **known** armed, crewed military spacecraft ever flown. Test shorts
2. US -1983-93: **Strategic Defense Initiative** (SDI), nicknamed the "*Star Wars program*", Reagan proposed missile defence system to protect USA from attack by ballistic strategic nuclear attack.
3. Tech insufficiently to fulfil Reagan's vision.
4. International Space Law under **UNOOSA** – United Nations Office of Outer Space Affairs. Founded in 1958.
5. 1967 – '**Outer Space Treaty**' banned weapons Nuclear WMD in outer space (& testing)
6. Commercial Space flights emerging: Elon Musk – **Space X**. Jeff Bezos – **Blue Origin**.

6. Space and Commerce

1. Benefits for the US '**Military Industrial Complex**'. Proprietary technology for companies like Boeing and Lockheed Martin.
2. **Employment:** Approx **400,000** Americans involved in the Apollo program. WvB – "*We are not spending the money on the moon, we spend it here in the United States, creating jobs and new products.*" Products such as Cordless Tools, Enriched Baby Foods, protective paint, NiTi Alloy, Memory Foam, but **NOT** Teflon or Velcro!
3. **GPS** – Reverse engineered radio broadcast from Sputnik – Applied Physics Lab - Johns Hopkins University. Later Communication satellites.
4. 1958 – Post Sputnik, US establishes **ARPA**, (Defense) Advanced Research Projects Agency – "*keep that technological superiority in the hands of the US.*" Information Revolution - Internet (ARPAnet).
5. **Medical** Technology – **MRI** (Magnetic Resonance Imaging) & Computer-Aided Tomography **CAT** scan. Heart monitors & diagnostics