



Returning People to the Moon After Apollo: Will It Be Another Fifty Years?

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The first part of the book recounts the often published events of the first Moon landing, beginning with Kennedy's bold declaration "this nation to commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to earth.". This statement contains the specifications for the program in three words: "Man, Moon, Decade".

Due to the background of the author Pat Norris a distinguishing factor to other Apollo books is his technical background. This book emphasizes the more technical aspects of the program, for example a picture of the recovered injector plate ("shower head") of the first Apollo stage is presented and its complex design explained; another example is the layout and description of functions of the Apollo Command Module dashboard and more.

After the successful first moon landing ("Mission Accomplished" – President R. Nixon) the author describes the following six Apollo missions and their achievements, he assesses the gained American know-how and the legacy of the Apollo program with respect to political, social, technical/managerial and scientific impacts.

Chapter 8 ("The other Competitor in the Race") switches back to describe in detail the activities taking place in Russia during the same time: Sergei Korolev orchestrated the catalog of Soviet space spectacles starting with Sputnik-1 in October 1957. The most important of these "firsts" was Gagarin's orbital flight on April 12, 1961 triggering a "space-race" to demonstrate technological superiority of the systems. America choose to land astronauts on the Moon and bring them back safely "within the decade". The Soviets, especially Korolev's team, had similar ideas and carried out various studies.

Korolev's gigantic heavy-lift N1 rocket was eventually selected as the launcher for a Soviet manned lunar landing program, but without the whole-hearted backing that the Saturn V got in the United States the N1 development experienced many set-backs, was failure prone and never gained track. After Korolev's death in 1966 his assistant Vasily Mishin continued with the N1 development but also failed to make it work – and the program was finally stopped by Valentin Glushko, Korolev's rival.

At the end of the last Apollo flight (#17), Cernan climbed up the ladder into the Lunar Module just before midnight (Houston time) on December 13, 1972 declaring "I take man's last step from the surface, back home for some time to come – but we believe not too long into the future". He didn't realize how much history he was making. He would be the last human to walk on the Moon's surface for at least 50 years.

The author Pat Norris explains why in the following chapters.

He identified three general reasons why humans have not gone back to the Moon: improvements in robotic technology, lack of political will and lack of military interest – and he substantiates each of them in the following chapters by summing up the developments in the United States, analyzing, commenting and even discussing alternatives like options for continuing ISS operations, describes the new Space Launch System (SLS), the Lunar Gateway plans, the Orion space ship , the role of industry and international participation. The author also branches out to private industry describing Elon

Musk's re-usable Falcon rocket family and Jeff Bezos' Blue Origin program. The China chapter discusses the Chinese space activities starting with the first satellite launch (1970), describes China's ambitioned human space program and the Long March launch vehicle developments in an complete, compact way with a lot of not so easy to get insider information folding it in with China's political and military interests and the importance with respect to the Asian hemisphere. I also found the explanation of the naming convention of China's space program components very interesting: Chang'e, is the name of the Chinese Moon goddess. The Chang'e 3 rover was given the name Yutu, or jade rabbit, who in legend accompanied the goddess Chang'e to the Moon. Chang'e and Yutu had a walk-on non-speaking role in the Apollo 11 mission. On July 20, 1969, a minute or two before Armstrong and Aldrin entered the Lunar Module to begin their descent to the lunar surface, Mission Control in Houston asked them to keep an eye out for a legendary Chinese lady and her pet rabbit: "Watch for a lovely girl with a big rabbit. An ancient legend says a beautiful Chinese girl called Chang-o has been living there for 4,000 years. You might also look for her companion, a large Chinese rabbit, who is easy to spot since he is always standing on his hind feet in the shade of a cinnamon tree." Michael Collins was quick to respond with "We'll keep a close eye out for the bunny girl."

At the end of the Cold War, Russia has fallen behind the United States in space affairs. It has been almost thirty years for example since the last even partially successful Russian planetary mission took place. However, under President Vladimir Putin Russia has been sending messages that it is ready to rejoin the top club. But words are cheap –while going to the Moon is not.

In the chapter "Russia and the Rest" the author describes the activities in Russia from the cancellation of the N1 program up to the current partner-cooperation on the ISS, then analyzing and commenting the actual situation in Russia trying to interpret the Russian program plans with respect to going to the Moon (or not) taking the political and financial situation into account.

"The Rest" means nations having active interest in human spaceflight but no own human rated launch capabilities: Europe, India and the ISS partners Canada and Japan. Their current situation is briefly outlined also.

In summary those chapters, outstandingly researched and suitably illustrated provide an up-to-date summary how global human spaceflight activities developed since the last moon landing up to the current 2018/2019 status.

Conclusion by the author Pat Norris: "We saw in the 1960s there's nothing like a good competition to get things moving. In the 2020s the competitive environment will be weaker than sixty years earlier, but there is nevertheless sufficient motivation to demonstrate their national capability in the United States and China that a manned Moon mission looks likelier now than at any time since Apollo 17, perhaps by 2024 and very probably by 2030."

Although not influencing the contents or the book's analyses and conclusions, Europe's Moon Village proposal is not mentioned. The 'Moon Village' vision is a part of ESA Director General Johann-Dietrich Woerner's Space 4.0 concept (presented at the IAF Congress in 2016), a new epoch in the space sector where space exploration is no longer exclusive to the public sector but open to private organizations as well. The Moon Village is open to any and all interested parties and nations. There are no stipulations as to the form their participation might take: robotic and astronaut activities are equally sought after. "You might see not only scientific and technological activities, but also activities based on exploiting resources or even tourism". It is precisely the open nature of the concept that would allow many nationalities. [1]

This might be a way to increase global cooperation, standardization and decreasing overall budget burdens by avoiding duplications.

The impeccable Glossary and Index together with the thoroughly selected images and illustrations provides an excellent and complete and compact compendium of human spaceflight up to the year 2019 which might save you countless Google-research hours to be spent in the internet.

I've never seen such a precise and accurate compilation of manned space exploration facts and exploration plans with respect to human spaceflight illustrated with images, charts and sketches, embracing all the relevant global players such as the US, Russia, China, Japan, Europe and India.

Therefore this highly recommended book belongs in every technical library as a monument of the achievements of human spaceflight and as a vision of what to expect in the future.

Reference:

[1] "Moon Village"

https://www.opsjournal.org/DocumentLibrary/Uploads/Moon%20Village_final.pdf

August 2019, Joachim J. Kehr, Editor SpaceOps News for the Journal of Space Operations & Communicator

<https://opsjournal.org>