

# Next Stop in Space: THE MOON

By

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Human spaceflight has started in 1961 with the launch of Yury Gagarin, since then most of the human missions have been in the so-called “Low Earth Orbit” (LEO). This indicates an orbital altitude of about 400 km. Hundred of astronauts have flown and since nearly 20 years the International Space Station is permanently inhabited.

The International Space Station (ISS) has been a tremendous political and technical success. However, the ISS program is coming to an end in the next few years. Although national/international stakeholders in the US, Europe Japan Russia, China and others will continue their activities. Major new business ventures are planned in low Earth orbit (LEO) assuring a constant utilization of the opportunities offered there to provide a range of new services. We have now to look to our next stop beyond LEO.

Is the Moon the next destination of humankind and why we shall go back after 50 years?

The Moon is the next destination since it is the closest body outside Earth only 3-4 days trip, compared with about 8 months for Mars.

Why we shall go back?

When we went to the Moon in the 1960s, this was driven only by the political reality of the Cold War. The United States was having a space race with the USSR since the launch of Sputnik in 1957 and going to the Moon before the Soviets became a national priority to show to the world that the Western system was the best.

Once the space race was won by the US when Apollo 11 landed on the Moon in July 1969, the motivation to continue with the exploration of the Moon ended, and so were the Apollo missions. The last man to set foot on the Moon was in December 1972 with the Apollo 17 mission.

In the nearly half a century since the last human Moon mission, a lot have changed:

- New discoveries have been made on the Moon such as presence of water as well as of rare earth materials and other economic valuable resources
- Exponential technologies are making possible for private industries to develop challenging missions like landing a spacecraft on the Moon, independently from government support, and setting-up business models that are financially viable.

The combination of the above developments have made the exploration of the Moon financially interesting and therefore potentially sustainable.

This explain why in many countries – both governments and companies – have plans to go to the Moon, to expand scientific knowledge and to assess the extent to which the Moon's natural resources may generate new wealth for humanity.

Beside the concrete reasons indicated above there is the human drive towards exploration. Humanity since it moved its first steps, probably in Africa, has always explored as a need to improve its conditions. This is probably rooted in our DNA and it is possibly a mechanism of self-preservation of our species. As Konstantin Tsiolkowski said in early XX century, “Earth is the cradle of humanity, but one cannot remain in the cradle for ever”. The Moon is there to help us to move out of Earth. Without the Moon, it would have been much more difficult because of the distance of Mars compared to the Moon. The Moon exploration and settlement is the first step towards making humanity a multiplanetary species. We explore to expand our knowledge, this provides inspirational reason for humanity to look positively to our future rather than being folded in everyday problems. Exploring the Moon will help humanity to cooperate on a global scale and build a more fair and inclusive society learning from the history.

However an important question left to answer is this: how we shall go, to the Moon in a coordinated manner?

This is a hurdle as challenging as any engineering or technological problem to be solved. We need to somehow federate already existing program and business plans. We need to define architectures that are open to all stakeholders, ones that encompass government, corporate, scientific and public interests. The answer should be the *Moon Village*, a common conception of the Moon as a destination for multiple users and missions, for science, utilization and human presence and more. The Moon Village it is not an

“ISS on the Moon”, but it is the ensemble of all efforts – private, governmental and other – aiming to explore and use the Moon in a sustainable manner.

See here below an artistic view of the Moon Village



However, we need now to be more specific on how to go about accomplishing this attractive concept. To foster the implementation of the Moon Village, the Moon Village Association (MVA), has been recently created as non-governmental organization (NGO) based in Vienna, [www.moonvillageassociation.org](http://www.moonvillageassociation.org).

Its goal is the creation of a global informal forum for governments, industry, academia and the public interested in the development of the Moon Village, fostering permanent links between all these stakeholders. The Association will foster cooperation for global – existing or planned – Moon Exploration Programs, be they public or private initiatives.

The utilization of the Moon is a mid- to long-term goal for humanity and it will require the involvement of as many countries as possible. This is the reason why the MVA is involving individuals and organizations in society at large as well as traditional aerospace players: to bridge the gap between space programs and citizens, developing and developed countries. The Association will offer the possibility to those non-traditional players to provide valuable inputs to the Moon Village implementation.

Private citizens, as well as industries, space agencies, universities, research centres and others need a platform to exchange ideas and forge new connections on a global scale. MVA is providing this platform with a global presence of regional networks. Networks have been already created in China, Europe, Africa, India, Cyprus, and Latin America; more will follow. These local networks are organizing outreach events to engage local stakeholders, win their support and give them the opportunity to participate in the Moon Village.

MVA participants will play an important role of accomplishing the unique goal of expanding human presence in a permanent manner beyond Earth. In particular, the Public is a major stakeholder and should play an active role in the Moon Village definition since there is the need for all possible skills and ideas from ethics, spirituality till engineering and much more.

The creation of the Moon Village is bringing several challenges and opportunities. Some of the challenges are related to solve some ethical issues such as the right to use space resources for commercial purposes, how to share the benefits of its resources for all humanity, what are the rights of the future residents on the Moon. A lot of activities are on-going to tackle those issues like the creation of an international code of conduct that will regulate the access and use of space resources and many others. While the area of space law is rapidly expanding, space ethics needs to catch up to ensure human interactions in space are safe, fair and benefit all of humanity.

Spirituality is also an important component of the Moon Village creation as the human presence is an integral part of it. A holistic approach needs to be developed to deal with different disciplines and human needs and these issues require attention by scientists all over the world. Some specific courses need to be set up to develop the sensibility of the issues described in order to make concrete proposals and inform society of the big opportunity that the Moon Village will offer.

The time has finally come to focus on humanity's next stop in space: the Moon. A new world is about to be set up. It has never been more important to move forward in a coordinated manner to engage all available human and technical resources for the benefit of humanity; the emerging global focus on a Moon Village is an ideal way to realize this crucial vision in peace.