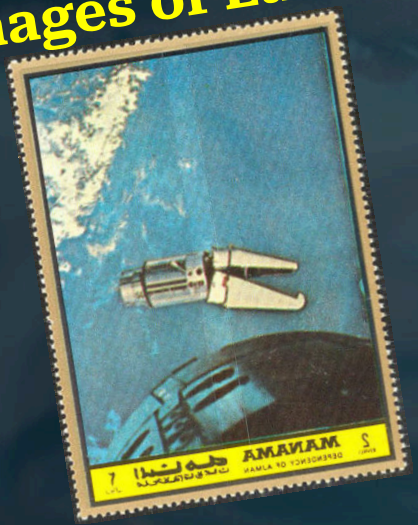
March 2024 - Issue 143

ORBIT

Astro Space Stamp Society

RETURN TO THE MOON
The new players

Gemini-mission Images of Earth



Royal Mail Weather Forecasting Stamps

The Journal of the Astro Space Stamp Society

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Editorial

On 15 February a Moon lander built by Houston-based aerospace company Intuitive Machines was launched on a mission to conduct the first U.S. lunar touchdown in more than a half century and was the first by a privately owned spacecraft which adds to the growing number of missions to the Moon. Umberto Cavallaro takes a look at the new players in his article Return to the Moon.

Don Hillger and Garry Toth explore the Gemini-mission images of Earth and Lin Da An checks out the mail for Shenzhou 9.

Nick Steggall checks out the hole in the Soyuz craft and takes a look at the new Royal Mail Weather Forecasting stamps.

The link to the catalogue of astronomy and space stamps for countries L-M can be found on the right.

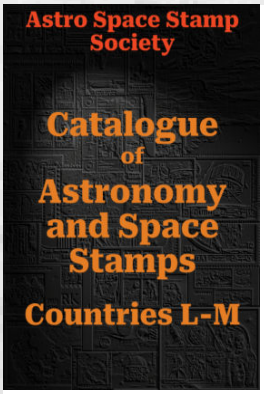
If any members would like to help out with the Society, please feel free to contact us. If you would like to write articles for Orbit or the Newsletter, please feel free to contact us with your articles. (The email address is in the panel below).

Is there any member out there who would like to keep the website and blog site up to date, you're only looking at about an hour a week just to keep it up to date, if you can please get in touch.

The competition for random covers will be back in the next issue of Orbit.

Cheers

Derek



For the Catalogues of Astronomy and Space Stamps - Female Astronauts - Star Trek and Star Wars

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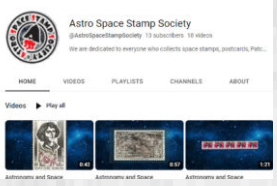

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BLOG

RETURN TO THE MOON
The new players

by Umberto Cavallaro

This article first appeared in AD-ASTRA - N° 59 – January 2024 and is reprinted with permission. You can check out the ASITAF website Here

After the years of oblivion that followed the Moon landing of the last Apollo 17 crew in December 1972, interest in lunar exploits has recently been rekindled by various countries and, progressively, by the public.

For many of the younger ones, there is an interest in events that they did not have the thrill of experiencing in person at the time. In some countries, starting with China, these are important milestones celebrated with national pride.

AD*ASTRA will dedicate a series of articles to this topic which is awakening the interest of many collectors.

Three Asian nations - **China**, **India**, and **Japan** - joined by **Israel** and **Russia** have recently sent probes to the Moon.

Only China and India have been successful so far. Israel, Japan, and Russia saw, one after the other, their probes crash irremediably during the Moon landing.

It was precisely Chinese activism that pushed the United States to launch in 2017 the new lunar programme called Artemis (like the Greek goddess of the Moon).

The Chinese Moon programme

The Chinese Chang'e programme is named after the *Moon goddess of Chinese mythology*. It started with the launch of **Chang'e-1** on 24 October 2007 from the Xichang space center in Sichuan province. The probe entered lunar orbit on 5 November. Three weeks later, on 26 November, when the first photos were officially released, a commemorative stamp was issued, with a limited special series of "golden" stamps.

(Above) Cover commemorating the launch of Chang'e 1, postmarked at Xichang.

(Left) Cover commemorating the release of the first pictures of the Moon and the issue of the "Chang'e" stamps.

Change'1 remained in lunar orbit until July of the following year and created a three-dimensional map of the Moon's surface, made public on 12 November 2008. The long mission allowed China to identify sites suitable for soft Moon landings, and to locate useful materials and their distribution.

Chang'e 2 launch commemorative cover.

The reconnaissance of the lunar surface was completed during the subsequent **Chang'e-2** mission, launched on 1 October 2010 from the XSLC (Xichang Satellite Launch Center). After having imaged the lunar surface with a better definition (1.3 m resolution), it undertook a new mission, becoming the first probe in the world to reach a Lagrange point between the Sun and Earth, starting from lunar orbit. After a 6-month stay at Lagrange Point L2, it continued its journey into outer space, heading towards asteroid 4179 Toutatis.

On 1 December 2013 it was the turn of **Chang'e-3**, which started the second phase of the Chinese lunar exploration programme, consisting of a soft Moon landing. This was the first soft landing on the lunar surface since the Soviet Union's probe Luna 24 in 1976, and so China became the third country to successfully land on the Moon.

(right) Chang'e 3 launch commemorative cover canceled at Mianning ShaBa post office in Sichuan.

On 15 December, the Yutu rover was released onto the lunar surface, equipped with six wheels and automatic sensors to autonomously explore the lunar surface. The rover can transmit video in real time, and can perform simple analysis of soil samples. Energy was provided by 2 solar panels, allowing the rover to operate through lunar days, as well as charging its batteries.

Yutu gets off the lander and begins exploration. On the far left, commemorative cover with red military postage and cancellation from the China "Space Post Office" in Beijing. On the left, special cancellation of the Beijing Aerospace City.

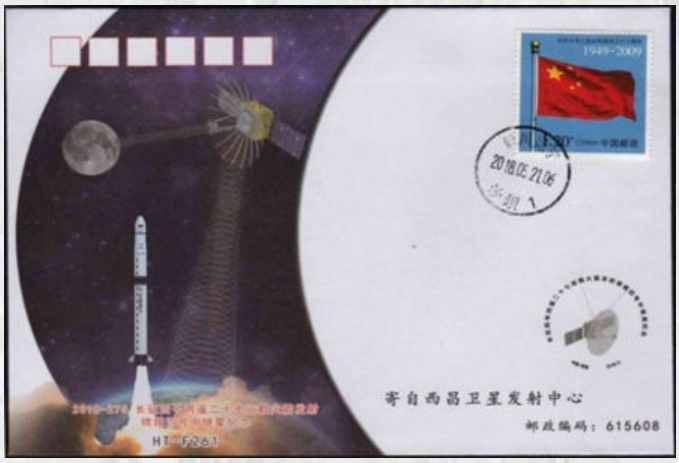
On 23 October 2014, the **Chang'e-5 TI** probe was launched around the Moon to test the high-speed reentry system and verify the functionality of the reentry capsule in view of the future Chang'e-5 mission.

For the first time, covers were carried on a Chinese lunar mission.

(Left) Two different types of covers carried around the Moon on the Chang'e-5 TI probe. The "flown-proof" postmark of the XSLC (Xichang Satellite Launch Center) bears the date of the day the covers were loaded into the cabin (1 Sept. 2014).

After years of preparation, **Chang'e-4** was launched on 8 December 2018 and on 3 January 2019, for the first time in history, it landed on the hidden side of the Moon, in the Von Kármán crater.

(Right) Commemorative launch cover, with red triangular military stamp postmarked at Sichuan Mianning ShaBa post office (near Xichang Satellite Launch Center).

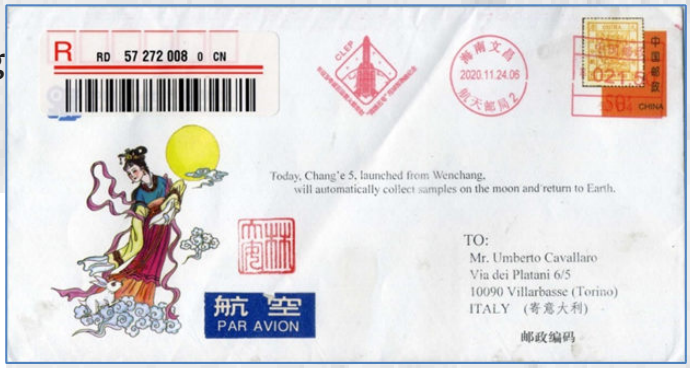


To prepare for this mission, in May 2018 China launched the Queqiao communication satellite, positioned at the L2 Lagrangian Point of the Earth-Moon system, about 60 thousand kilometers from the lunar surface, to operate as a radio relay for mission communications.

(Left) Cover commemoratiing the launch of Queqiao, cancelled at the Sichuan Mianning ShaBa p.o.

In fact, the lander alone – being on the hidden side of the Moon, from which the Earth is never visible – would not have been able to communicate with the Earth. The Chang'e 4 module was photographed by NASA's Lunar Reconnaissance Orbiter. During the mission, the first biological experiment was: cotton, potato, and rapeseed seeds germinating on the Moon.

The third phase of the Chang'e programme, on 23 November 2020 was launched from the Wenchang space center on Hainan Island **Chang'e 5.** It was the first Chinese mission to bring back to Earth samples of lunar soil and rocks.



(Right) Cover produced by the China Post for the 1999 World Stamp Exhibition, shipped on the day of the launch of Chang'e 5 from the Wenchang space center on Hainan Island. Special red machine cancellation from Wenchang Post Office, Hainan Space.
On the envelope is printed the sender's red personal seal.

After landing in the Ocean of Storms on 1 December, the Chang'e 5 probe collected 2 kg of lunar soil samples two days later and left the lunar surface.

(Left) Cover commemorating the completion of lunar sample collection, with postmark from XiBeiWang Post Office near the Beijing Aerospace Control Center.
(Right) Cover commemorating the re-entry of Chang'e 5 which bounced off the atmosphere above the Arabian Sea before re-entering the atmosphere within China's national borders above the Tibet Plateau. The golden envelope was canceled in the post office of Ali, a remote location in Northern Tibet, very difficult to reach especially in winter, where fewer than 100 envelopes were cancelled.

The Chang'e 5 probe performed a skip re-entry, bouncing off the atmosphere above the Arabian Sea before the actual atmospheric entry. The module successfully landed on 16 December 2020 in Inner Mongolia, bringing lunar soil samples back to Earth.

The overview of future Chang'e missions, recently presented at the IAF Congress in Baku 2023, suggests that China is not yet capable of planning a human Moon landing this decade.

The Japanese Moon programme

Japan began testing the technologies necessary for future lunar or interplanetary missions as early as 1990. In fact, the **Hiten** ("celestial creature") probe, also known as **Muses-A**, was launched from the Kagoshima Space Center on 24 January 1990. It was the first robotic probe to reach the Moon since 1976, when Russia sent Luna 24.

(Left) Cover commemorating the launch of Hiten/Muses-A (by Stefan Bruylants) with postmark from Uchinoura (Kagoshima Space Centre).
(right) Similar envelope cancelled at the Usuda Remote Space Tracking Centre.

The innovative probe intended to develop alternative routes with low propellant consumption to reach the Moon using gravity assist. It was placed in a highly elliptical Earth orbit that brought it close to the Moon ten times during the mission that ended on 10 April 1993, when the probe was intentionally made to impact the Moon.
The Japanese were often the first to use innovative techniques which often paved the way for new developments.

On 12 September 2007, **SELENE** (SELEnological and eNgineering Explorer which could be translated as "mission to study the geology of the Moon and to test new engineering technologies") was launched from the Tanegashima space center. The probe was later renamed **Kaguya**, after the lunar princess Kaguya Hime. It had the objective of mapping the surface of the Moon (the most detailed map until then), studying its topography and geology and obtaining scientific data on the origin and evolution of the Earth's natural satellite, and developing new technologies for future lunar exploration. It was described as "the most challenging lunar mission since Apollo."

Cover commemorating the launch of Selene (from the collection of Stefan Bruylants).

It was intentionally made to impact the Moon on 1 February 2009.

(Far left) Cover commemorating the launch of HAKUTO-R mission.
(left) Cover commemorating the launch of HAKUTO-R lunar landing attempt.

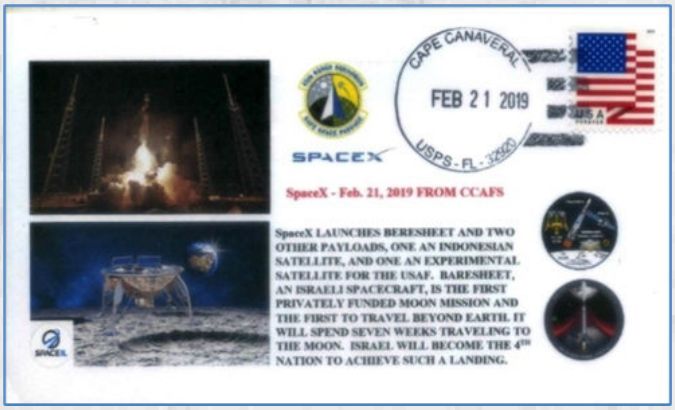
On 11 December 2022, a mission began that should have marked an important stage in the history of space exploration. The Japanese company Ispace attempted to land the first private lander on the Moon, after the failure of the first private mission by Israel Aerospace Industries, which we will talk about below.

HAKUTO-R was the result of a project started in the Google Lunar XPRIZE. The probe was launched from Cape Canaveral with a SpaceX Falcon 9. The chosen trajectory, which allowed it to reach the Moon without using a large amount of fuel, but extended the travel time to around five months, brought Hakuto-R as far as 1.5 million kilometers from Earth. The lander has therefore become the private probe to move furthest from our planet. Unfortunately, the HAKUTO-R mission control center in Nihonbashi lost signal on 26 April 2023, shortly before the scheduled Moon landing. NASA's Lunar Reconnaissance Orbiter then photographed the impact site of the lander that had crashed near the Atlas crater. On board was the small rover, Rashid, made by the United Arab Emirates.

The new JAXA lunar lander mission SLIM (Smart Lander for Investigating Moon) was successfully launched on 7 September 2023 to demonstrate precision landing technology, and was expected to land on the Moon on 19 January 2024.

The Israeli Moon programme

The first private space lander in history was **Bᵉreshit**. Its name (which in Hebrew means "In the Beginning") takes up the initial word of the Hebrew version of Genesis, the first book of the Bible: "In the beginning God created the heavens and the Earth". It carried on board a digital "time capsule" containing a Bible and the entire Wikipedia. The capsule was built by Israeli companies and associations, led by **SpaceIL**, the organization founded in Tel Aviv in 2011 to participate in the Google Lunar X Prize.



Cover commemorating the launch of Bᵉreshit mission.

The "biblical" probe – equipped with solar panels built in Nerviano (Milan) by a company of the Leonardo group – was launched from Cape Canaveral on 21 February 2019. The chosen trajectory, which exploited several flybys around the Earth to acquire the necessary speed – it made it possible to reach the Moon using a reduced quantity of fuel (as Japan had already done), but extending the journey to two months.

Selfie shot in which appeared the plaque of the Israeli flag.

The Moon landing was expected on the evening of Thursday 11 April. Just 22 kilometers above the lunar surface, the probe sent to Earth a final "selfie shot" in which appeared the plaque of the Israeli flag and the writing "Small Country, Big Dreams." The probe should have landed in the Mare Serenitatis (Sea of Serenity), where NASA's Apollo 17 mission had arrived on 11 December 1972. Immediately afterwards there was an engine failure, communications were interrupted and the probe crashed onto the lunar surface, one step away from the finish line.

Israel has become the seventh country in the world to enter lunar orbit and attempt a Moon landing. Despite the accident, the Bᵉresheet mission, with its original economic navigation procedure created by Israeli astrophysicists, paved the way for future low-cost lunar explorations.

Cover commemorating the crash into the Moon.

The Indian Moon programme

On 23 August 2023, **Chandrayaan-3** (Chandra = moon, yaan = journey) became the first spacecraft to successfully land near the Moon's south pole, making India the fourth country to land on lunar soil, after the former Soviet Union, the United States and China.

The first vehicle from the Indian Space Agency ISRO to enter lunar orbit was Chandrayaan-1. Launched on 22 October 2008, from the Satish Dhawan Space Center (SHAR) Sriharikota, in south-eastern India. On 14 November the probe released the Moon Impact Probe which after a 25-minute flight impacted on the Moon, allowing the presence of water to be detected at the Moon's south pole, while Chandrayaan-1 continued to operate in lunar orbit for 312 days.

On 22 July 2019 a lander and a Moon rover were launched. However, the mission ended with the lander crashing on the lunar surface due to software problems.

With **Chandrayaan-3**, India became the fourth nation in the history of space exploration to successfully complete a soft landing on the Moon, after the Soviet Union, the United States and China.

Launched on 14 July 2023 with the aim of collecting scientific data on the Moon, the probe successfully landed on the Moon on 23 August 2023. This is the first mission ever to land near the Moon's south pole. The mission, as expected, ended after one lunar day (14 Earth days).

Unlike other probes previously launched to the Moon, both the Vikram lander and the Pragyan rover had no radioisotope units to heat the instruments during the long lunar night. Before shutting down, the rover performed a surprising maneuver (not pre-announced by ISRO): it turned on some small engines, obtaining a thrust that allowed it to lift about 40 centimeters from the lunar ground. The test worked perfectly and will be useful for future missions that aim to bring samples of lunar soil back to Earth.

Cover Commemorating the launch of Chandrayaan-1 canceled at Ahmedabad (from the collection of Madhukar Jhingan).

The commemorative launch cover of Chandrayaan-2 cancelled in Surat (from the collection of Madhukar Jhingan)

Cover commemorating the launch of Chandrayaan-3, canceled at Sriharikota with ordinary postmark and special pictorial cancel (from the collection of Madhukar Jhingan)

The Russian Moon programme

Luna 25 was also arriving at the lunar South Pole almost at the same time as Chandrayaan-3. Launched on 10 August 2023 with a Soyuz-2 Fregat rocket from the Vostochny cosmodrome, almost at the eastern end of the country, it entered lunar orbit and should have descended on 21 August, in the race to land on the Moon before the Indian probe.

However, Luna 25 crashed on the lunar surface the day before, due to an anomalous functioning of the on-board control system, and to an incorrect maneuver and prolonged firing of the thrusters.

It would have been the first lunar probe in Russia's modern history and was to represent the rebirth, and mark the first step in the development of technologies aimed at a future settlement, planned together by Russia and China. Instead, the failure of this mission

crystallises the space crisis into which Moscow plunged after the collapse of the Soviet Union and from which it was never able to recover. Aware of the weakness, especially on the electronics side, Roscosmos at the time of Exomars had established a relationship with ESA, which was abruptly interrupted following the invasion of Ukraine. After the crisis with China in 2011, following the failure of the Phobos-Grunt probe, the agreement with Beijing was resumed 10 years later with the aim of jointly building an orbiting station and a base on the Moon.

The failure of this mission may have once again weakened Russia's position vs China, casting doubt on future cooperation.

(Left) Cover commemorating Luna 25's entry into lunar orbit.
(right) Cover commemorating the crash of the probe on the lunar surface.

Sea Launch

By Nik Steggall

The Sea Launch launch company was a multinational venture with the United States, Norway, Russia and Ukraine. It provided orbital launch services from 1999 to 2014. It used a mobile sea-launch platform for equatorial launches of commercial payloads on the Zenit-3SL launch vehicle. The platform came from a former mobile floating and drilling platform called Ocean Odyssey. In 2014, Russia began its military intervention in Ukraine and Sea Launch suspended operations and subsequently mothballed its vessels.

The Odyssey was a self-propelled, semi-submersible, mobile platform. Odyssey worked with the Sea Launch Commander assembly and control vessel to support the sea launches. Its home port was the Port of Long Beach, California in the United States.

The expendable launch vehicle used was the Zenit-3SL. It was launched 36 times, with three failures and one partial failure. The Zenit-3SL was part of the Zenit family of rockets designed by the Yuzhnoye Design Bureau and manufactured in Ukraine. The Block DM-SL upper stage was manufactured by RKK Energiya of Russia, and the payload fairing was manufactured by Boeing of the United States.

The Pacific Ocean launches from Ocean Odyssey were from a point at 154 degrees west latitude and approximately 370 km east of Kiritimati. The rockets were integrated in California before being transported by the Sea Launch Commander to the launch site and the Ocean Odyssey launch platform, where the Zenit was erected on the platform and a three-day countdown began. From here, the countdown was fully automated, with launch personnel being evacuated from the platform to the Sea Launch Commander prior to launch.

The Eutelsat 70B was a commercial communications satellite from the European Telecommunications Satellite Organisation, (Eutelsat). It was launched on 3 December 2012 and was designed to provide telecommunications services to the Middle East, Central Asia, South East Asia and parts of Africa. It will replace the Eutelsat 70A satellite, previously known as Eutelsat W5. Launched in 2002, it currently occupies the same 70.5° East orbital position as the Eutelsat 70B satellite.

Images left to right: (1) An original cover by Pete Sarmiento commemorating the Sea Launch of the Eutelsat 70B satellite. The cover has been cancelled at the post office in North Long Beach, California, the home port of Odyssey, and dated December 3, 2012; (2) Eutelsat 70B launch by the Zenit-3SL launch vehicle from the Sea Launch platform; (3) The Sea Launch Odyssey launch platform. The Zenit-3SL launch vehicle is being erected on the Odyssey launch platform; (4) The Zenit-3SL launch vehicle being errected on the launch platform.