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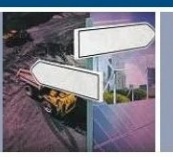

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HISTORIC LAUNCH FOR UAE

Emirati-made Rashid Rover makes nation a pioneer in the Arab world

DUBAI

BY ANGEL TESORERO
Senior Reporter

The UAE made history by becoming the first Arab nation to send a space mission to the Moon, with the successful launch of the Emirati-made Rashid Rover yesterday.

The country also vowed to continue its space ambitions "by achieving high levels of accomplishment and empowering space cadres to develop the national space sector and consolidate the country's advanced position in space."

This was given emphasis by His Highness Shaikh Mohammad Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, following the successful launch of Rashid Rover at 11.38am (UAE time) yesterday, aboard a Japanese lunar lander sent to space by a SpaceX Falcon 9 rocket from Cape Canaveral Space Force Station in Florida, USA.

WAM

■ Shaikh Mohammad with Shaikh Hamdan and Shaikh Maktoum at the MBR Space Centre to witness the launch of Rashid Rover yesterday.

Ambitious programme

While witnessing the launch of the Rashid Rover from the Mohammad Bin Rashid Space Centre's (MBRSC) Mission Control Centre in Dubai, Shaikh Mohammad said: "Rashid Rover is part of the UAE's ambitious space programme, which began with Mars, progressed to the Moon, and soon to Venus. Our goal is to increase our knowledge, enhance our capabilities, and leave a scientific legacy in the history of space and humanity.

"Reaching the Moon is a milestone in our ambitious march to progress for our nation and its people, who know no limits. And our next step is bigger and higher," he underlined.

Reaching the Moon is "a new stopover for our nation ... A new stopover for our cadres and the youth ... A new stopover leading to our journey to explore the Moon," noted Shaikh Mohammad.

"Rashid Rover was designed and developed by Emirati engineers. It aims to pave the way for humanity to make even more qualitative advances in science, technology, communication, and robotics while enabling us to prepare for future missions to the Moon and beyond," Shaikh Mohammad continued.

> Rashid Rover is part of the UAE's ambitious space programme, which began with Mars, progressed to the Moon, and soon to Venus. Our goal is to increase our knowledge, enhance our capabilities, and leave a scientific legacy in the history of space and humanity."
>
> **Shaikh Mohammad Bin Rashid Al Maktoum**

Rashid Rover, aboard the Japanese lander Hakuto-R, will now cruise through space for nearly four months, aiming to land on the Moon's unexplored Atlas Crater in April 2023.

According to MBRSC, Rashid Rover "will provide novel and highly valued data, images, and insights. It will collect scientific data on matters relating to the origin of the solar system, our planet and life."

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“The aspirations of Emirati people are boundless”

Rover launch exemplifies UAE spirit, Vice-President says

The SpaceX Falcon 9 rocket carrying Rashid Rover blasts off from Florida.

DUBAI

BY ANGEL TESORERO
Senior Reporter

The UAE's and the Arab world's first journey to land on the Moon began successfully yesterday, with the triumphant launch of the Emirati-made Rashid Rover aboard a Japanese lunar lander sent to space on a SpaceX Falcon 9 rocket from Cape Canaveral Space Force Station in Florida, USA.

Lift-off was at 11.38am (UAE time) on December 11, and the lunar lander carrying Rashid Rover is on its way for a five-month, fuel-saving 384,400km journey to the surface of the Moon.

His Highness Shaikh Mohammad Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai; Shaikh Hamdan Bin Mohammad Bin Rashid Al Maktoum, Crown Prince of Dubai; and Shaikh Maktoum Bin Mohammad Bin Rashid Al Maktoum, Deputy Ruler of Dubai, were at the Mission Control Centre inside the Mohammad Bin Rashid Space Centre (MBRSC) in Dubai to witness the historic launch of Rashid Rover.

Tweeting on the occasion, Shaikh Mohammad said: “Rashid Rover is part of an ambitious space programme in the UAE. We started with Mars and now moving to the moon while eying Venus. Our goal is to share knowledge, develop our capabilities, and add a scientific footprint in human history.”

Shaikh Mohammad said: “Reaching the Moon is yet another step forward in the UAE's ambitious journey. The aspirations of Emirati people are boundless and nothing can hold them back. The best is still to come.

“The UAE launched Rashid Rover today in preparation for a lunar landing. We will be the fourth nation in the world and the first Arab country to set foot on the Moon's surface if the mission is successfully completed,” he added.

Born from the desert dunes of the UAE, Rashid Rover — named after the late Shaikh Rashid Bin Saeed Al Maktoum, builder of modern Dubai — will study the characteristics of lunar soil, the petrography (composition and properties of lunar rocks) and geology of the Moon. It will also take photos of the moon's dust movement, surface plasma conditions, and the lunar regolith (blanket of superficial deposits covering solid rocks).

The Japanese-made lunar lander Hakuto-R carrying Rashid Rover will land on Atlas Crater, located at 47.5°N, 44.4°E on the Moon's southeastern outer edge of Mare Frigoris (Sea of Cold). Atlas Crater has a diameter of 88 kilometres, believed to have been formed between 3.2 to 3.8 billion years ago. It is circular in shape and bounded by an intricately terraced rim wall. The crater is 2km deep and has a complex floor covered in hills and cracks.

It is there where Rashid Rover will capture photos and collect information of the unexplored Moon crater.

According to MBRSC, Rashid Rover will provide about 10 gigabytes of recorded material, scientific data and new images to the global scientific community.

AHEAD OF SCHEDULE

The launch of the Emirati-made compact lunar rover has been postponed thrice — first on November 28; second on November 30 and December 1 — to allow for additional pre-flight checks of the launch vehicle (SpaceX Falcon 9 rocket).

Rashid Rover, however, was actually delivered well ahead of the original 2024 deadline. Shaikh Mohammed first announced Rashid Rover in September 2020, and the initial goal was to land it on the Moon by 2024.

No one was more excited for the launch of Rashid Rover than the group of Emirati engineers who built Rashid Rover from scratch with their own hands.

Speaking to *Gulf News* hours before the launch, Abdulla AlShehhi, Rover Mechanical Engineering Lead, said: “We are very excited for the launch of the first mission by the UAE to land on the Moon. We built Rashid Rover with our own hands and if you have built something with your own hands and you see the name of the UAE on it and it will go to the Moon, the feeling is really indescribable.”

The launch was a success and it happened according to plan. Dimitra Atri, astrophysicist at New York University in Abu Dhabi, praised the UAE and its burgeoning space programme. He told *Gulf News*: “Planetary exploration using rovers is technically challenging and the fact that Rashid Rover was built in the UAE demonstrates the capa-

LONG BUT ECONOMICAL ROUTE

The Japanese-made lunar lander carrying Rashid Rover and other payloads to the Moon will take a low-energy route rather than a direct approach. This means the landing on the Moon will take about five months after launch, in April 2023.

Dr Hamad Al Marzooqi, project manager of Emirates Lunar Mission at MBRSC, earlier told *Gulf News* about the rationale for the fuel-saving but longer route. He said: “The main factor is the cost of the mission. The cost comes from the volume and mass of the spacecraft. In order to reach to the moon within six days — which is the shortest path — you would need to burn a lot of fuel, which means that you need a big tank and a big propulsion system to do that.

“But it will have a huge impact in cost so, in order to reduce the cost of the mission, ispace (our partner) has selected their approach that they can reach to the lunar surface within five months but it will be less costly because it will burn much less fuel. They will use a smaller tank and propulsion system, therefore the launch cost and the cost of developing the developing system will be lower,” he explained.

10GB
of recorded data to be provided by Rashid Rover to researchers

2024
was the original deadline for the Rashid Rover

384,400
km is distance Rashid Rover will cover to the lunar surface

2km
depth of Atlas crater, where the Hakuto-R lander will alight

> “... If you have built something with your own hands and you see the name of the UAE on it and it will go to the Moon, the feeling is really indescribable.”
>
> **Abdulla AlShehhi** | Rover Mechanical Engineering Lead

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‘Nothing can hold Emirati people back,’ Shaikh Mohammad tweets

Updates and more pictures on the UAE's lunar mission

Watch a video encapsulating the various stages of the UAE's lunar mission

- **Above:** The Mission Control Room at Mohammad Bin Rashid Space Centre in Dubai during the launch.
- **Right:** Members of the media watch the live streaming of the launch from Cape Canaveral Space Force Station in Florida at the Mohammad Bin Rashid Space Centre in Dubai.
- **Far right:** A Rashid Rover miniature at the Mohammad Bin Rashid Space Centre in Dubai turns the centre of attention.

Photos: Ahmed Ramzan/Gulf News

Shaikh Mohammad Bin Rashid, Shaikh Hamdan Bin Mohammad Bin Rashid and Shaikh Maktoum Bin Mohammad Bin Rashid with senior officials applaud the successful launch at MBRSC.
Ahmed Ramzan/Gulf News

Rashid Rover signifies soaring dreams, Emirati youth say

Young Emiratis laud leadership, express Arab pride, hope for more space success

DUBAI
BY SAJILA SASEENDRAN
Senior Reporter

Young Emiratis have expressed their pride and excitement about the successful launch of the UAE's Rashid Rover to the moon yesterday.

Speaking to *Gulf News* about the Emirates Lunar Mission's milestone achievement, the Emirati youth remembered the country's leadership with gratitude and hailed their vision and determination that saw the first Arab moon mission successfully lifting off.

"The Rashid Rover actually lifted our dreams to the moon. It is not just the dreams of the Emiratis, but that of all the Arabs," said **Omar Al Madhaani, a content creator**.

The UAE stands to be the fourth nation in the world and the first Arab country to land on the moon's surface when the mission is successfully completed.

"I am so proud about this moment. This was [the UAE's Founding Father, the late] Shaikh Zayed's dream and our leaders and scientists have made it come true. We have shown once again that sky is not your limit if you dream big," added Al Madhaani.

Determined people

Amal Ahmad, a prominent person of determination who champions the country's achievements in many fields, said: "We are indeed people with determination. The launch of the Rashid Rover had to be postponed a couple of times. Yet, we were determined to go ahead with the mission. We never give up. [His Highness] Shaikh Mohammad [Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai] wants us to be number one in everything and I am so proud that he is leading us in showing to the world that we are number one," she added.

Making history

Shaikha Al Hosani, an Emirati influencer, said: "This means a lot not only for the UAE, but for all the Arab countries. When this mission will be complete, it will add a big chapter in the Arab history.

"As an Emirati, I am so proud that this great lunar mission has happened from the UAE and the Rashid Rover was built by the Emiratis.

"Our Arab ancestors were well-known for exploring and inventing many things. Now, the UAE is doing such explorations and I hope that in future people will read about our Emirati explorers also in the history books."

Matter of mindset

Khalid A Awadhi, who works with the social media and marketing section of an exhibitions company, said the UAE's lunar feat which followed its other space achievements such as sending the first astronaut to space and the launch of the Hope Probe to Mars, showed that you do not need to have a big country to make big achievements.

"It is not because we have oil that we have done all this. It is all about the vision and mindset of the leadership. That is what makes big things possible.

"We should not just stop. We should go deeper into the space," Al Awadhi said.

"When we get more data, we can gain more knowledge and create more ideas and innovations in our world," he reasoned.

The SpaceX Falcon 9 rocket trails across the horizon after its launch from the Cape Canaveral Space Force Station in Florida.

CAPABILITIES

Small in appearance yet hugely sophisticated

DUBAI
BY ANGEL TESORERO
Senior Reporter

Designed and developed fully by an Emirati team, Rashid Rover is touted as the world's most compact rover that could land on the Moon.

Rashid Rover's height is 70cm, length is 50cm and width is 50cm. Its weight is approximately 10kg with payload, but it can climb over an obstacle up to 10cm tall and descend a 20-degree slope.

3D cameras on board

Rashid Rover has 3D cameras, advanced motion system sensors and communication system that are powered by solar panels. There are four cameras that move vertically and horizontally, including the two main cameras, which are Caspex (camera for space exploration) that can withstand vibrations during launch and landing

Engineers at MBRSC went through five modules until they reached with the final flight model that was launched yesterday.

Rover Mechanical Engineering Lead Abdulla AlShehhi summed up the effort that went into the launch: "We have done a lot of preparation for the launch – from creating simple to complex engineering models and conducting several rounds of tests to ensure a safe journey to the Moon."

bilities and ambitions of a country with a very young but rapidly growing space programme. If successful, the UAE, along with Japan will become the fourth country in space exploration history to successfully land on the Moon after the United States, former Soviet Union and China."

CHALLENGING LANDING

Hakuto-R will use the gravitational pull of the Earth and sun to guide it to the Moon. As it gets closer to the lunar surface, the Japanese-made lander will first orbit the moon with an increasingly elliptical trajectory, before angling itself vertically to softly land on the moon and perform a fully-automated landing. This is the most critical part of the lunar mission, with several missions having failed before, including that of India and Israel.

"The most critical part would be the landing phase but we have prepared Rashid Rover to sustain the shock load. We have tested all types of materials until we reached with the final flight model that is placed inside the Hakuto-R lander," AlShehhi assured.

GULF NEWS

Setting our sights on the Moon, and beyond

UAE in an elite club with the scientific drive to further mankind's journey of discovery

Once more, the UAE is bravely going where few other nations have gone, beyond our planet, seeking to add to our depth of knowledge on our closest neighbour, the Moon.

On Sunday, December 11, the UAE became the first Arab nation to launch a mission to the Moon. Onboard a SpaceX Falcon rocket now thundering towards an orbital rendezvous with our ever-present satellite.

Indeed, for almost as long as this planet has existed, the Moon has been our constant companion, its presence allowing us to calculate time and keep calendars, giving us a sense of place and purpose. Despite this long-standing and, yes, almost timeless relationship, we know little about it.

Make no mistake — the challenge ahead is indeed mighty. Only the US, the former Soviet Union and China have managed to land missions — manned or otherwise — on the lunar surface, with both Israel and India attempting but failing to do so.

Regardless, this ambitious mission from the UAE to put the rover Rashid on the surface marks a milestone in space exploration and in this nation's continuing voyage beyond the bounds of our terrestrial planet.

His Highness Shaikh Mohammad Bin Rashid, Vice-President and Prime Minister of the UAE and Ruler of Dubai, and Shaikh Hamdan Bin Mohammad, Crown Prince of Dubai, were in the control room of the UAE's space agency to watch the probe begin its five-month long mission to the Moon.

As Shaikh Mohammad rightly noted in a tweet, "reaching the Moon is another milestone in the ambitious march of a country and a nation whose aspirations have no limits," adding that the UAE is determined to "pass on knowledge, developing our capabilities, and adding a scientific footprint in human history is our goal."

Shortly after John F Kennedy was elected President of the US in 1960, he united his nation and captured the world's imagination with a promise to place a man on the Moon by the end of that decade. It was a pledge made to push mankind because it was indeed unimaginably hard. Six decades on, the challenge of reaching out and successfully landing on the Moon remains incredibly difficult — a technical and logistical challenge.

Right now, as the Rashid Rover travels through the black void of space, this nation has already achieved a remarkable feat. That feat speaks to the inventiveness, technological prowess and organisational capabilities that few other nations can muster. In that alone, we all can take pride. But we can take pride too knowing that when this nation sets its sights on making the impossible happen, extraordinary feats do indeed manifest and coalesce in a common goal.

This mission to the Moon is but the latest chapter in our vision that the ties of Earth cannot restrain the dreams of our homeland. Already one of our own has circled Earth and viewed the UAE from the International Space Station. Already, a probe from this nation has travelled to Mars. And now we are on our way to the Moon.