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### SPECIAL REPORT



## AL NEYADI ALL SET FOR SPACEWALK

All you need to know about UAE astronaut's mission, which will make him first Arab to perform feat and UAE the 10th country to achieve it | P6

# Meet MBRSC team working on Rashid 2 moon explorer

SPACE AGENCY CHIEF SHARES PHOTO AND WISHES MEMBERS LUCK IN MISSION

**DUBAI**  
Gulf News Report

**T**he Mohammad Bin Rashid Space Centre (MBRSC) in Dubai has started working on the Rashid 2 rover.

Sharing photos of the team, Salem Al Marri, director-general of MBRSC, tweeted: "We are proud of you, and may God grant you success in your next mission to the surface of the Moon."

It follows the loss of communication with the Japanese lander *Hakuto-R* carrying the first Rashid rover moments before touchdown on the Moon on Tuesday.

On Wednesday, following a visit to MBRSC where he met the Emirates Lunar Mission team, His Highness Shaikh Mohammad Bin Rashid Al Maktoum, Vice-President and Prime Minister of UAE and Ruler of Dubai, announced the launch of Rashid 2, a new Emirati lunar mission that will be undertaken by MBRSC.

### Ready for challenges

In a tweet yesterday, MBRSC pledged that the team will continue to live up to the expectations of Shaikh Mohammad.

"We continue to live by your words, and under the guidance of your wise leadership. Today, with restored optimism and ambition, we begin working on the Rashid 2 rover to reach the Moon," the MBRSC said.

Through the Emirates Lunar Mission, MBRSC accomplished



### RASHID 2 TEAM

- Hamad Al Marzouqi, Director of Emirates Moon Exploration Project
- Abdullah Al Shehhi, Mechanical Systems Officer,
- Ahmed Salem, Systems Engineering Officer
- Salem Al Mulla, Design Officer
- Ahmed Sharaf, Electrical Systems Officer
- Dr Mohammad Al Zaabi, responsible for Moon operations
- Mohammad Wali, responsible for tests
- Mohammad Khoury, Programming Officer
- Sarah Al Muaini, Communications Systems Officer
- Amna Busoud, Design and Mobility Officer
- Reem Al Muhaisni, Thermal Systems Officer
- Sultan Al Mismar, Navigation Systems Officer

its ambitious goal of designing and building the world's most compact rover and becoming the first Emirati and Arab rover to reach the lunar orbit before the landing attempt onboard iSpace's *Hakuto-R* lander.

### Achievements

These achievements are momentous for a nation's first lunar mission and highlight the UAE's commitment to advancing space exploration.

The Rashid Rover, integrated into iSpace's *HAKUTO-R* lander, successfully lifted off atop a SpaceX Falcon 9 rocket on December 11, 2022, from Cape Canaveral Space Force, Florida.

The ELM marked the first Emirati lunar mission, making the UAE the first Arab country to attempt a lunar landing.

Rashid Rover was built to traverse and explore the Moon's surface with a unique con-

figuration. Weighing about 10 kilograms, the Rover is around 80cm high, around 53.5cm long, and close to 53.85cm wide.

MBRSC partnered with 10 international and four UAE-based entities for the Emirates Lunar Mission's science programme.

In collaboration with close to 40 scientists and researchers, MBRSC developed the main instruments, the optical cameras, microscopic imager and Langmuir probe on board the rover.



**DUBAI**  
BY SAJILA SASEENDRAN  
Senior Reporter

**T**he UAE's second astronaut Sultan Al Neyadi, who is on the longest Arab space mission on the International Space Station (ISS), is all set to embark on his riskiest job that will make him the first Arab to spacewalk today.

The 41-year-old former Network Engineer with the UAE Armed Forces, whose full name is Sultan Saif Hamad Al Neyadi, is scheduled to venture into outer space today to perform the first spacewalk by an Emirati, achieving a new milestone in the country's space exploration.

The father-of-five from Al Ain will make the UAE proud again as his Extravehicular Activity (EVA) outside the space station will make the UAE the 10th nation in the world to achieve the feat. As the entire country waits to watch the 'Sultan of Space' float in the vacuum of space in his bulky ISS spacesuit called the Extravehicular Mobility Unit (EMU), *Gulf News* gives you all the details that you need to know about the historic space event.

Last evening, Al Neyadi shared latest images of him and his spacewalk colleague, Nasa flight engineer Stephen Bowen, all suited up in their bulky spacewalk suits. "Tomorrow [April 28], Steve Bowen and I will do a spacewalk outside the ISS to change the Radio Frequency Group unit and prepare for the installation of solar panels. After a long period of training, we are ready to take on the challenge and create a new milestone for our mission," he tweeted.

**■ When is Al Neyadi's spacewalk?**

Al Neyadi's historic spacewalk along with the Nasa astronaut Stephen Bowen is scheduled to take place from 5.15pm in the UAE today. It is expected to last for about six and a half hours.

**■ How can one watch it?**

The Mohammad Bin Rashid Space Centre (MBRSC) in Dubai will provide live coverage of the historic space event on its website from 4.30pm here. Yesterday, the agency behind the UAE Astronaut Programme sent out an SMS to residents to watch the live coverage of the UAE's "journey towards a new milestone in space exploration." MBRSC also urged space aficionados to take part in this historic milestone using the hashtag #UAESpacewalk on social media.

**■ What is a spacewalk?**

Any time an astronaut gets out of the space station or a space shuttle into the vacuum of space, it is called a spacewalk. A spacewalk is also called an EVA.

**■ Why do astronauts spacewalk?**

Astronauts go on spacewalks for various reasons. This could be to do science experiments to let scientists know how being in space affects different things. Astronauts do maintenance and repair works on the space station, shuttle spacecraft or satellites while spacewalking. By going on spacewalks, astronauts can fix things instead of bringing them back to Earth for repair. Spacewalks also let astronauts test new equipment.

**■ Why is it so risky?**

Spacewalking is considered the riskiest job of astronauts as they exit the relative safety of the space station and get into the void of outer space. Tethered to the ISS, they zip along with the space station that orbits the Earth at 28,000km/h.

Due to the pressurised resistance of the massive spacesuit, performing a spacewalk is not only physically demanding, but also mentally taxing. Astronauts must pay attention

# ALL YOU NEED TO KNOW ABOUT AL NEYADI'S SPACEWALK

*Watch event live as Emirati astronaut becomes first Arab to undertake the task and make UAE the 10th country to achieve the feat*



**55 hours**  
Al Neyadi has trained at NBL in preparation for spacewalks

**6.2m**  
gallons of water the world's largest indoor pool at NBL holds

**WHAT ARE THE SPECIALITIES OF THIS SPACEWALK?**

- First spacewalk by Sultan Al Neyadi.
- First Emirati and first Arab spacewalk.
- Eighth spacewalk by Stephen Bowen.
- It is the US Spacewalk 86.
- It is the first spacewalk for Expedition 69.
- It is the fourth space station spacewalk in 2023.

**Spacewalk jargon**

- Egress — exit the ISS through the Quest Airlock
- Ingress — enter the ISS through the Quest Airlock
- EVA — Extravehicular Activity (spacewalk)
- EMU — Extravehicular Mobility Unit (spacesuit)
- BRT — Body Restraint Tether (cord)
- APFR — Articulating Portable Foot Restraint (foot hold)
- PGT — Pistol Grip Tool (drill)
- CLB — Crew Lock Bag (toolbox)
- SAFER — Simplified Aid For EVA Rescue (life jacket device)

**Al Neyadi's historic spacewalk along with Nasa astronaut Bowen is scheduled to take place from 5.15pm in the UAE today. It is expected to last for about six and a half hours.**



■ A screengrab from animated video showing how Al Neyadi and Bowen will perform the spacewalk in the vacuum outside ISS.



■ Al Neyadi prepares for the historic spacewalk. Spacewalking is considered the riskiest job of astronauts.

**WHO ALL ARE SUPPORTING EVA?**

Nasa flight engineer Woody Hoburg will be the "Suit IV, the person who helps both Steve and Sultan get suited up in the morning and then help them doff their suits at the end of the day. He, along with Nasa flight engineer Frank Rubio, will assist the astronauts in and out of their spacesuits and monitor their spacewalk.

When Nasa astronauts conduct spacewalks, they rely on the Mission Control Center (MCC) at NASA's Johnson Space Center in Houston to help them complete their tasks.

The UAE's first astronaut and Al Neyadi's backup, Hazzaa Al Mansouri is the first Arab Increment Lead responsible for the seamless integration and execution of ISS crew activities. The Mission Control Centre team at the MBRSC will also be coordinating from Dubai.

Tomorrow, Steve Bowen and I will do a spacewalk outside the ISS to change the RFG unit and prepare for the installation of solar panels. After a long period of training, we are ready to take on the challenge and create a new milestone for our mission."

**Sultan Al Neyadi** | UAE astronaut

to their work as well as their safety, a large number of tools, interacting with the crew on board and with the team back in mission control, all while the clock is ticking. They need to be protected from radiations and temperatures ranging from -150 degree to 120 degree Celsius.

**■ What makes spacewalks special?**

For astronauts who have performed spacewalks, nothing comes close to the experience of spacewalking. The scene is matchlessly magnificent. Light and darkness flash by with the rapid alternation of day and night as they orbit the Earth every hour and a half. There is a distinct feeling of freedom and weight-

lessness. Spacewalkers are also treated to the smell of space.

**■ How do spacewalkers stay safe?**

When astronauts go on spacewalks, they are protected from the harsh outer space environment in their spacesuits called EMUs, known as the world's smallest spacecraft and the ultimate in Personal Protective Equipment (PPE). The ISS EMU weighs 145kg while on Earth. Not only does the complex garment protect astronauts from the extreme conditions of space, it is in itself a mobile life support system with an oxygen supply, electrical power, water-cooling equipment, ventilating fan and an in-suit drink bag.

Astronauts put on their spacesuits several hours before a spacewalk. The suits are pressurised. This means that the suits are filled with oxygen. Breathing only oxygen helps prevent the gas bubbles in their body causing pain in their shoulders, elbows, wrists and knees. This pain is called getting "the bends" because it affects the places where the body bends.

**■ What tasks will they perform in spacewalk?**

Theirs is the 261st spacewalk in support of space station assembly, maintenance and upgrade. The duo will work in the vacuum of space on the starboard side of the station's truss structure of the ISS. They will retrieve a piece of communications equipment called a Radio Frequency Group (RFG) unit that's due to be returned to Earth. They will also prepare the ISS for the installation of advanced solar arrays, which will occur on a future spacewalk.

**■ What is EVA RFG Retrieval?**

EVA RFG Retrieval is one part of the spacewalk by the astronaut duo. During the spacewalk, they will retrieve an S-band Ra-

dio Frequency Group (RFG) antenna equipment, which enables communication with Earth, and bring it inside the space station for refurbishment.

Al Neyadi will be removing a multi-thermal insulation tent over the equipment. Bowen will be carried to the RFG unit by the station's robotic arm. He will use a drill to unscrew the bolts to remove the hardware from the station. Both of them will then carry it to the station.

**■ What is EVA for iROSA?**

The spacewalk is part of a series to augment the station's power channels with new ISS Roll-Out Solar Arrays (iROSAs). The duo will work on a series of preparatory tasks related to the solar array installation EVAs planned for later in the mission. This prepares cables for the future installation of upgraded solar arrays on the starboard side of the station's truss. The cable work is being done in advance of the installation of the station's fourth roll-out solar array. The iROSA is due to be delivered on the next SpaceX Dragon cargo mission in June.

**■ What else will they do?**

The duo will also rearrange foot restraints spread out on different parts of the station's exterior for their own use and to facilitate the use by future spacewalkers.

**■ How did Al Neyadi prepare for spacewalks?**

Al Neyadi had trained for more than 55 hours at Nasa's Neutral Buoyancy Laboratory (NBL) at the Johnson Space Center in Houston, US in preparation for spacewalks. During his time at the NBL, Al Neyadi underwent nine runs of six hours each, training underwater simulating spacewalks utilising the full mock-up of the ISS in the world's largest indoor pool that holds 6.2 million gallons of water.