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From Hope to the Asteroid Belt

The UAE Space Programme as National Strategy

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From Hope to the Asteroid Belt: The UAE Space Programme as National Strategy

Missions, institutions and the test of turning prestige projects into a space economy

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Abstract

In little more than a decade the United Arab Emirates has built one of the most active space programmes of any country of its size. The UAE Space Agency was created by federal decree in 2014. In 2019 the first Emirati astronaut flew to the International Space Station (ISS). In February 2021 the Hope probe entered orbit around Mars, making the UAE the first Arab country and the fifth country to reach the planet. In 2023 an Emirati astronaut completed a six-month mission on the ISS and the first spacewalk by an Arab astronaut, while the Rashid rover was lost when the lander carrying it failed to land on the Moon. This paper examines the programme as an instrument of national strategy. Drawing on statements and documents from the UAE Space Agency, the Mohammed bin Rashid Space Centre (MBRSC), NASA and launch partners, it finds that the programme has followed a deliberate sequence: partnership first, then progressively greater national ownership of design, operations and science. It identifies three tests for the next decade. The first is delivery of the Emirates Mission to the Asteroid Belt, due to launch in 2028. The second is whether the AED 3 billion National Space Fund and the rule that half of the asteroid mission's work goes to UAE-based companies can build a commercial space sector. The third is whether the programme's educational and scientific returns can be measured and sustained. The paper closes with recommendations on transparency, industrial participation, data use and risk tolerance.

Keywords: UAE; space programme; Hope probe; Emirates Mars Mission; Rashid rover; UAE Astronaut Programme; Emirates Mission to the Asteroid Belt; National Space Fund; MBRSC; Artemis; Gateway

1. Introduction

Space programmes are usually justified in three ways: as science, as industry and as national statement. The UAE programme is unusual in stating all three openly. This paper asks what the programme has achieved against each, and what will decide its value over the next decade.

Section 2 describes the institutions. Section 3 sets out the record of missions. Section 4 examines the partnership model. Section 5 discusses the economic ambition, and Section 6 the risks. Section 7 sets out recommendations.

2. Institutions

The UAE Space Agency was created under Federal Law by Decree No. 1 of 2014. It reports to the Council of Ministers and has financial and administrative independence. Its role is to develop the national space sector, set strategy and build partnerships.

Alongside it, the Mohammed bin Rashid Space Centre (MBRSC) in Dubai designs and operates satellites, runs the UAE Astronaut Programme and led the Mars and lunar missions. It grew out of the Emirates Institution for Advanced Science and Technology, launched in February 2006, which was merged into MBRSC in April 2015.

The division of labour, a federal agency for policy and funding and an emirate-level centre for engineering and operations, has allowed the programme to combine national strategy with a concentrated technical team.

3. The record of missions

Figure 1 summarises the main milestones.

Satellites. MBRSC lists seven satellites in its development programme, from DubaiSat-1 and DubaiSat-2 to KhalifaSat, launched in 2018 as the first satellite designed and built entirely in the UAE, and MBZ-SAT. MBZ-SAT was launched on a SpaceX Falcon 9 from Vandenberg in California on 14 January 2025. It weighs 750 kilograms and, according to the Dubai Media Office, was developed entirely by Emirati engineers.

Human spaceflight. The UAE Astronaut Programme was launched in April 2017. Its first two astronauts were selected in 2018 from a pool of about 4,000 applicants, and a second pair, including the first Arab woman astronaut, in 2021 from 4,305 applicants (Figure 2). On 25 September 2019 Hazzaa AlMansoori flew on Soyuz MS-15 from Baikonur, becoming the first Emirati in space; during his mission he carried out 31 scientific experiments. In 2023 Sultan AlNeyadi spent six months on the ISS as part of Expedition 69, the longest Arab space mission, and on 28 April 2023 completed a spacewalk lasting 7.01 hours, the first by an Arab astronaut. MBRSC states that the mission made the UAE the 11th country to send astronauts on long-duration missions to the ISS.

Mars. The Emirates Mars Mission, the Hope probe, was launched from Tanegashima in Japan on 20 July 2020 and entered orbit around Mars on 9 February 2021 after a journey of about 494 million kilometres. The UAE became the first Arab country and the fifth country to reach Mars. In 2023 the probe's orbit was altered to allow observations of the small Martian moon Deimos.

The Moon. The Rashid rover, a compact rover of about 10 kilograms built by MBRSC, travelled to the Moon aboard the HAKUTO-R Mission 1 lander of the Japanese company ispace. On 26 April 2023 ispace lost communication with the lander shortly after its scheduled touchdown. MBRSC stated that the rover could not continue its mission, while noting that it had become the first Emirati and Arab mission to enter lunar orbit. A successor, Rashid 2, has since been announced.

Figure 1. Milestones of the UAE space programme, 2006–2028



Source: UAE Space Agency; MBRSC; WAM (25 Sep 2019, 28 Apr 2023); Reuters (9 Feb 2021); ispace (26 Apr 2023); Dubai Media Office (14 Jan 2025); NASA (7 Jan 2024)
Chart: EPIC: Emirati Perspectives and Insight Centre

4. The partnership model

Every major UAE mission has relied on foreign partners for launch and, in the early years, for engineering. KhalifaSat and the Hope probe were launched by Mitsubishi Heavy Industries, which in October 2024 signed a third launch agreement with the UAE Space Agency, for the asteroid mission. Human spaceflight has relied on Russian, US and commercial partners. The lunar rover flew on a Japanese commercial lander.

This model trades independence for speed. Its logic is visible in the progression from satellites built with foreign partners to MBZ-SAT, described as fully developed by Emirati engineers. It is also visible in the January 2024 agreement under which MBRSC will provide the Crew and Science Airlock module for Gateway, the planned station in lunar orbit under NASA's Artemis programme, and NASA will fly a UAE astronaut to Gateway on a future Artemis mission. Under that arrangement MBRSC will also provide engineering support for the life of the station.

The Rashid rover shows the other side of the model: when a partner's system fails, the national payload fails with it, however well it was built.

5. From prestige to a space economy

The programme now aims explicitly at a commercial sector.

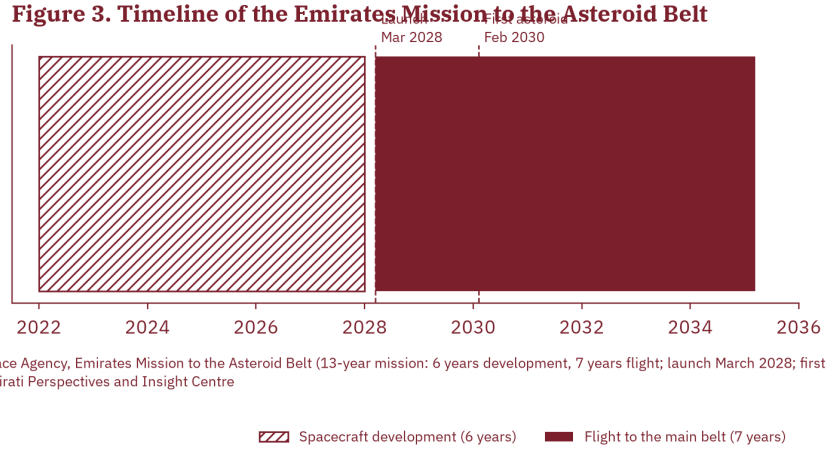
In July 2022 the UAE Space Agency announced an AED 3 billion National Space Fund to support space engineering, science and research, attract start-ups and build partnerships

between national and international companies. Its first named project was Sirb, a constellation of synthetic aperture radar satellites.

The flagship of the next phase is the Emirates Mission to the Asteroid Belt. According to the UAE Space Agency, its spacecraft, the MBR Explorer, is scheduled to launch in March 2028 on a journey of about 5 billion kilometres, using gravity assists around Venus, Earth and Mars, to fly past seven main-belt asteroids. The first encounter is expected in February 2030. Mitsubishi Heavy Industries states that the mission will end with a landing on the seventh asteroid, Justicia. The mission spans thirteen years, six of spacecraft development and seven of flight (Figure 3). The agency has allocated 50 per cent of the project's work to UAE-based private companies.

The national industrial strategy lists space technology among the industries of the future it seeks to develop, which places the space programme inside the wider effort at economic diversification.

Figure 3. Timeline of the Emirates Mission to the Asteroid Belt



Source: UAE Space Agency, Emirates Mission to the Asteroid Belt (13-year mission: 6 years development, 7 years flight; launch March 2028; first encounter February 2030); MHI (11 Oct 2024)
Chart: EPIC: Emirati Perspectives and Insight Centre

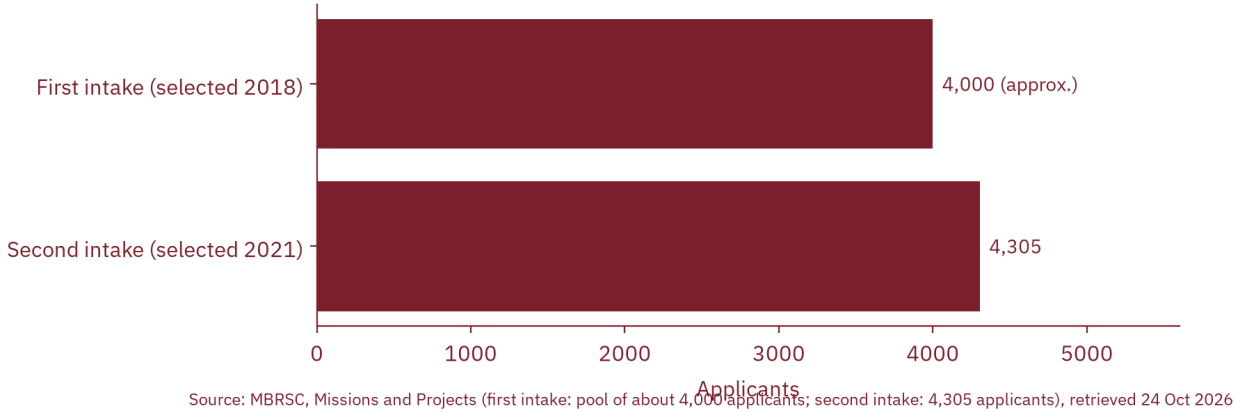
6. Risks and open questions

Technical risk. The asteroid mission is far more complex than Hope: a longer flight, multiple flybys and a landing. Its schedule leaves little room for delay before the 2028 launch window.

Measurement. Public sources describe inputs and milestones well, but not outcomes. The number of Emiratis employed in the space sector, the revenue of UAE space companies and the value of contracts placed under the 50 per cent rule were not found in an opened official source for this paper.

Risk tolerance. The loss of Rashid was handled openly, and a successor was announced. A programme that attempts difficult missions will have further failures; the public framing of risk matters to its sustainability.

Figure 2. Applicants to the UAE Astronaut Programme



Source: MBRSC, Missions and Projects (first intake: pool of about 4,000 applicants; second intake: 4,305 applicants), retrieved 24 Oct 2026
Chart: EPIC: Emirati Perspectives and Insight Centre

7. Recommendations

1. **Publish an annual space sector report.** It should include employment, company revenues, National Space Fund commitments and contracts awarded to UAE companies.
2. **Report the 50 per cent rule transparently.** Disclose the value and type of work placed with UAE-based firms under the asteroid mission.
3. **Maximise the use of mission data.** Continue open release of Hope and future mission data and link it to university research and teaching.
4. **Build launch and lander redundancy into planning.** Where possible, design national payloads so that a partner failure does not end a whole mission line.
5. **Frame failure as part of the programme.** Set public expectations that ambitious missions carry risk.

8. Conclusion

The UAE space programme has delivered a sequence of genuine firsts with remarkable speed. Its next decade will be judged less by firsts than by whether it builds a durable industrial and scientific base. The asteroid mission is both its greatest technical test and the clearest test of that wider ambition.

About this paper

EPIC-PP-2026-023. Written by the EPIC Research Team. All data are cited to public sources listed in the references; where no published value exists, the paper says so.

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