



THE SPACE REPORT

THE AUTHORITATIVE GUIDE
TO GLOBAL SPACE ACTIVITY

2 0 2 2

Q3



GLOBAL SPACE WORKFORCE | Q3 MERGERS & ACQUISITIONS | SPACESUITS FOR ALL



Introduction | *The kingdom of Bahrain is the smallest country in the Middle East, measuring only 294 square miles with a population of 1.7 million people. The small nation is an ambitious emerging player in the space sector.*

In 2018, Bahraini space officials signed a Declaration of Principles with the UAE Space Agency (UAESA) and the UAE's Khalifa University. The declaration includes an agreement to collaborate in training the Bahraini space team in satellite technology, design, construction, launching, operations, and control.
Credit: NSSA

Nation in Review: Bahrain

King Hamad bin Isa Al Khalifa established the country's space agency, the National Space Science Agency (NSSA), under Royal Decree No. 11 in 2014. The agency's founding mission was "to devise comprehensive programs to embrace and develop activities related to space science, research, and related studies." The NSSA is concentrating its efforts on near-term satellite launches and infrastructure development.

The kingdom launched its first satellite to establish an initial presence in space earlier this year. The Light-1 Satellite launched on a SpaceX rocket from Kennedy Space Center in December 2021, in a partnership with the United Arab Emirates, the United States, and Japan, which delivered the satellite into orbit from the International Space Station in February.¹ Bahrain inked a deal licensing access to SpaceX's Starlink broadband services in April. In August, Bahrain's National Security Advisor Shaikh Nasser bin Haman Al Khalifa announced a new satellite initiative, declaring that Bahrain will build and launch its own satellite by the end of 2023.²

Bahrain dedicated nearly US\$1.8 million to the NSSA in 2021 and US\$1.7 million in 2022, which amounts to a 4% reduction from 2021 to 2022 and reflects a national trend of reduced government spending.³

The NSSA budget is based on its Space Policy Strategy reached in 2019, which charted Bahrain's space strategy through 2023. The strategy cited collaboration between government and industry stakeholders as critical to the success of its growing space industry. The kingdom's five objectives in space were identified as:

- supporting development
- achieving a presence in space
- attaining leadership for the kingdom
- creating a national space sector
- contributing to the stability of the environment.

The satellite initiative emphasized that this project is an implementation of the kingdom's Space Policy Strategy objectives. The nation hasn't released a detailed timeline for the effort, nor details on the satellite.

Partnerships and foreign investment will be crucial to developing Bahrain's space industry due to its lack of independent launch capability. For now, the kingdom has not actively pursued human spaceflight efforts, including astronaut training programs or commercial spaceflights. In 2018, Bahrain and Russia failed to reach a deal to send Bahraini astronauts to orbit on a Russian launch.

Regional Economic Partnerships

The kingdom has spent 2022 focused on the development of three distinct economic partnerships: with China, the United States, and the Middle East. These partnerships will strengthen economic sectors, heighten technological and scientific collaboration, and accelerate Bahrain's space capabilities.

- **China:** A coalition of Middle Eastern foreign ministers, including Bahraini foreign minister Abdullatif bin Rashid Alzayani and the Secretary General of the Gulf Cooperation Council, visited China in January to discuss increasing energy ties. While this meeting included conversations between the Gulf Cooperation Council (GCC) and the Chinese government, Bahrain's participation in these conversations indicates potential future economic cooperation between the two countries. China has previously shown its interest in funding infrastructure projects in Asian, African, and European countries through its extensive Belt and Road Initiative, and this coalition visit hints at a potential future of Chinese investment into Middle Eastern infrastructure.⁴
- **United States:** The Bahraini government announced the establishment of a United States Trade Zone during a visit to the U.S. Chamber of Commerce in February. The zone will represent a physical hub of U.S. companies with heightened access to the Bahrain International Airport and the Khalifa bin Salman Port and special economic benefits provided to these companies. These benefits include a 0% corporate tax and a low cost-base for American manufacturers. This makes Bahrain one of only two GCC members to have a free trade agreement with the United States. The Trade Zone will bring American firms to Bahrain and could facilitate U.S.-Bahraini partnerships in the space sector. In the same visit to the United States, Bahrain's Crown Prince Salman bin Hamad Al-Khalifa signed six agreements with the United States to deepen ties in multiple sectors, including space sciences and information technology.⁵
- **Middle East:** In July, Bahrain, Egypt, the United Arab Emirates, and Jordan signed 12 economic partnership agreements, valued at US\$3.4 billion. These 12 agreements are the first batch of a potential 87 agreements under the Integrative Industrial Partnership for Sustainable Economic Development, designed to spark Arab economic and industrial cooperation. These partnerships indicate a path toward regional collaboration in space.⁶

Regional Competition

Other players in the Middle East space sector have recently expressed similar space ambition. The UAE recently signed a Memorandum of Understanding for collaboration with the Turkish Space Agency and plans to develop a radar satellite constellation and a lunar lander. The UAE also became the fifth nation to orbit probe around Mars in 2021, with a U.S.-built satellite.

Saudi Arabia launched its first satellite, the Arabsat-1B, in 1985, and by 2018, established the Saudi Space Commission, a state-funded body to advance economic diversification and enhance research and development efforts. In 2020, Prince Sultan bin Salman Al Saud, the first Arab astronaut in space on board a space shuttle mission in 1985, announced plans to invest US\$2.1 billion into the Saudi Space Commission to grow its independent capabilities.⁷ The Saudi kingdom also recently joined the Artemis Accords, signed 18 industry agreements with the United States that support strengthening ties in the energy, communication, and space industries, and announced plans to launch the first female Saudi astronaut by 2023.⁸

Smaller Arab countries have made strides in the space sector. Qatar launched its first satellite in 2013 and announced plans to send astronauts to Mars in the next century.⁹ Kuwait's private industry is designing its second satellite and discussing further partnerships with China.¹⁰ Oman has plans to develop its first satellite in partnership with Virgin Orbit and Polish firm SatRevolution.¹¹



Elizabeth Anderson is a government affairs associate at Space Foundation's Washington, D.C., office. Contact her at eanderson@spacefoundation.org.



Steve Eisenhart

Senior Vice President

RESEARCH & ANALYSIS

Lesley Conn

Director

Tom Roeder

Senior Data Analyst
& Editor

Zoe Hobbs

Data Analyst & Writer

Wendy Perelstein

Data Coordinator

www.TheSpaceReport.org

— CONTRIBUTORS —

Dr. Mariel Borowitz

Associate Professor
Sam Nunn School of
International Affairs
Georgia Institute
of Technology

Steve Edelman

Associate Editor



Pierre Lionnet

Research & Managing Director

Ruth Butler

Research Support

Brian McCarrie

Stacy Nepp

Donny Yuen

Web Support

Elizabeth Anderson

Contributing Writer



Chris Quilty

Founder and Partner
Quilty Analytics

Justin Cadman

Partner

Design Development Team

ROMIE LUCAS

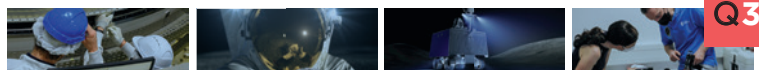
graphic design & illustration



- 4 Al Jazeera. "Gulf Ministers Visit China to Discuss Strengthening Energy Ties." Jan. 10, 2022. <https://www.aljazeera.com/news/2022/1/10/gulf-ministers-visit-china-expected-to-strengthen-energy-ties>. Accessed Sept. 27, 2022.
- 5 Godinho, Varun. "Bahrain Begins Construction on United States Trade Zone." Feb. 21, 2022. <https://gulfbusiness.com/bahrain-begins-construction-on-united-states-trade-zone/>. Accessed Sept. 27, 2022.
- 6 Arabian Business. "Bahrain Joins UAE, Jordan, Egypt in Sustainable Economic Development Partnership." July 26, 2022. <https://www.arabianbusiness.com/politics-economics/bahrain-joins-uae-jordan-egypt-in-sustainable-economic-development-partnership>. Accessed Sept. 27, 2022.
- 7 Radwan, Rawan. "Saudi Arabia's Ambitious Space Programs Provides Foretaste of Exciting Collaborations to Come." Arab News. Jan. 23, 2022. <https://www.arabnews.com/node/2009881/saudi-arabia>. Accessed Sept. 27, 2022.
- 8 Reuters. "US and Saudi Arabia Sign 18 Agreements in Energy, Other Areas." July 16, 2022. <https://www.reuters.com/business/us-saudi-arabia-sign-18-agreements-energy-investment-state-tv-2022-07-15/>. Accessed Sept. 27, 2022.
- 9 Wall, Mike. "Saudi Arabia Aims to Launch its 1st Woman to Space as Soon as 2023." Space.com. Sept. 22, 2022. <https://www.space.com/saudi-arabia-astronaut-program-1st-woman-launch-2023>. Accessed Sept. 27, 2022.
- 10 China Global Television Network. "Kuwait Eyes Cooperation with China in Space Exploration." Sept. 18, 2022. <https://news.cgtn.com/news/2022-09-18/Kuwait-eyes-cooperation-with-China-in-space-exploration-expert-1dQDbFYQBG/index.html>. Accessed Sept. 27, 2022.
- 11 Virgin Orbit. "The Sultanate of Oman and Virgin Orbit Announce International Consortium on Country's First Mission to Deep Space." Jan. 26, 2022. <https://virginorbit.com/the-latest/the-sultanate-of-oman-and-virgin-orbit-announce-international-consortium-on-countrys-first-mission-to-deep-space/>. Accessed Sept. 27, 2022.

Nation in Review: Bahrain

- 1 "Bahrain's First-Ever Satellite Launched into Orbit." Zawya.com. Feb. 5, 2022. <https://www.zawya.com/en/business/bahrains-first-ever-satellite-launched-into-orbit-l21f8anr>. Accessed Sept. 16, 2022.
- 2 Bahrain News Agency. "100% Bahraini-built Satellite Project Launched." Aug. 21, 2022. <https://www.bna.bh/en/HMKingissuesdecrees50,51,52/HMKingissuesdecrees50,51,52/100BahrainibuiltSatelliteprojectlaunched.aspx?cms=q8FmFJgiscL2fwlzON1%2BDqzRSnExeuqSz9MyLrPoWVl%3D>. Accessed Sept. 27, 2022.
- 3 Kingdom of Bahrain government. "Bahrain's Budget and the Fiscal Balance Program." https://www.bahrain.bh/new/en/finance-budget_en.html. Accessed Sept. 27, 2022.



1 | Space Workforce

- 3 Space Workforce Trends in the United States, Europe, Japan, and India
- 4 European Space Industry Employment, 2011-2021
- 4 European Space Industry Employment by Country, 2016-2021
- 5 European Space Workforce Demographics, 2021
- 5 ESA Workforce Demographics, May 2022
- 5 Japanese Space Industry Employment, 2010-2020
- 6 Japanese Space Industry Employment by Sector, 2015-2020
- 6 JAXA Workforce, 2012-2022
- 6 JAXA Workforce Demographics, 2022
- 7 Space Agency Employment for Selected Countries
- 20 Change in U.S. Private Employment, Aug. 2021-Aug. 2022

2 | Space Infrastructure

- 24 Exploration Extravehicular Mobility Unit (xEMU)

3 | The Space Economy

- 31 Announced Acquisitions and Equity Financings Q3 2022



SPACE FOUNDATION'S MISSION:
Be the preeminent resource for space education,
a trusted source of space information, and a provider
of exceptional forums for the exchange of ideas.

As a 501(c)(3) nonprofit organization, philanthropic support is vital in fueling the Space Foundation's important programs and services. Every gift is significant in funding our work to **inspire, educate, connect, and advocate** for the global space community.

Discover the impact of giving at www.SpaceFoundation.org/Donate

SPACE FOUNDATION HQ

4425 Arrowswest Drive
Colorado Springs, CO 80907
+1.719.576.8000

WASHINGTON, D.C.

1700 North Moore Street, Suite 1105
Arlington, VA 22209



SPACE FOUNDATION