

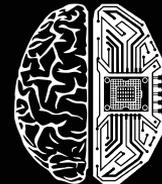
# SpaceTech Government Activity 2021 / Q2 Landscape Overview

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## Teaser

July 2021

[www.spacetechnology.com](http://www.spacetechnology.com)



**SpaceTech  
Analytics**

## Executive Summary

The space age began in 1957 with a race between the US and USSR, but in the over half century since, many new countries have established space agencies and joined in. In the 21st century, the key players are fully equipped with needed cutting-edge spaceflight technologies, and they both compete and cooperate intensely with each other, the European Space Agency being the best example of the latter. The original players still have a significant advantage though; most satellites launched in the world are still launched, and still owned, by the US, Russia, and China.

However, the new players are starting to challenge the world space order, often being willing to allocate abundant resources to do so. Nations such as South Korea and the UAE aspire to become top-10 space countries. Luxembourg is attracting many private technology companies, as it strives to become a major European space hub. Some new entrants are developing independent space ecosystems with manufacturing and R&D capabilities, and some are cooperating in lunar and Mars programs. New players continue to join as the increasing technology growth grows the industry itself; Kenya and Bahrain have joined the list of countries operating satellites, and Argentina and Brazil lead Latin America. Australia and New Zealand have joined the race as well, but for most, the space industry remains underdeveloped with great growth potential.

In this context, an analysis of the National Space Agencies is of great value, as they play crucial roles in the development of their space industries. These roles are: Defining national aspirations; determining and implementing corresponding policies; coordinating space activities; allocating resources properly; and developing international and government-business cooperation. The latter is perhaps the most important, because such cooperation bears many benefits for all participants, including new commercial space companies, especially for emerging space nations.

SpaceTech Analytics (STA) is a leading strategic analytics agency focused on markets in Satellite Technology, Advanced Startups, Space Law, and Economics and other industries of SpaceTech.

STA is producing regular analytical reports on major areas of high potential in the space industries, maintaining ratings of companies and governments based on their innovation potential and business activity in the SpaceTech sphere, and providing strategic consulting to clients, including major investment funds, family offices, insurance companies, government organizations, and big companies among others.

# Introduction

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Since the very beginning of the space age in 1957, countries all over the world have been investing in the development of space technologies. Initially, it was only the United States and USSR (now Russia), but soon Europe and China joined in the effort, and then many others. The creation of government agencies has accelerated during the past two decades, essentially doubling. The rate of progress for new agencies has increased as well, with the appearance of new and aggressive space nations. For example, the United Arab Emirates Space Agency was only formed in 2014, but it has already sent a space probe to orbit Mars.

Up until very recently, only government space agencies have performed planetary missions and human spaceflight, though that is changing rapidly. At first it was about launching satellites into orbit and probes to other planets, but today we have a set of rovers on Mars, a space station built with the cooperation of many different countries, space probes that have left Solar system and telescopes that will see the beginning of the universe. Much more is yet to come. Some agencies have concentrated on implementing high-precision Earth observation satellites, that will help with monitoring conditions on the planet. Others are building instruments that will answer a variety of big questions about physics and space.

While most people interested in space are familiar with the major government agencies, such as NASA and ESA, and their international cooperation on the ISS, the newer smaller players are relatively unknown. However, as demonstrated by the UAE, they are coming along rapidly. The cubesat revolution has enabled dozens of nations. The coming advent of very low-cost launch from systems like SpaceX's Starship/Superheavy will make it possible for smaller nations to participate in the upcoming boom in space activity, unimaginable only a few years ago. The purpose of this report is to highlight these lesser-known activities and players. In addition, it provides an overview of the top-50 space countries, including the primary players. Finally, prominent business cases for international and government-business cooperation are presented here as well.

# Our Approach

## Database

Identification of relevant:

- Companies,
- Investors,
- Hubs,
- Universities & Research Centers,
- Government Ministries, Departments & Agencies,
- Space Associations,

that operate, interact with or are somehow involved in the space industry.

## Applied Research & Analytics Methods

**Descriptive Analysis**

**Mixed Data Research**

**Exploratory Data Analysis**

**Comparative Analysis**

**Qualitative Data Collection**

**Data Filtering**

## Data Sources\*

**Media Overview  
(Articles, Press  
Releases)**

**Industry-Specialised  
Databases**

**Publicly Available  
Sources (Websites)**

**Industry Reports and  
Reviews**

**Industry Leaders  
Interviews**

**Industry Leaders  
Interviews**

Relying on various research methods and analytics techniques, the report provides a comprehensive overview of the space industry. This approach has certain limitations, especially when it comes to the leveraging of publicly available data sources and secondary research. SpaceTech Analytics is not responsible for the quality of the secondary data presented herein; however, we do our best to eliminate the said risks by using different analytical techniques and cross-checking data. Please note that we did not deliberately exclude certain companies from our analysis. In fact, the main reason for their non-inclusion was incomplete or missing information in the available sources. As for the Investors in the main database we include only institutional ones those who've invested in SpaceTech companies or SpaceTech-related companies. SpaceTech companies included in the database are those that are directly in the SpaceTech industry, or partially belong to it through working with clients from the SpaceTech industry, or there are separate departments in the company that work in this sector or cooperate with clients from it.

## NASA

NASA is getting ready to send astronauts to explore more of the Moon as part of the Artemis program, and the agency has selected SpaceX to continue development of the first commercial human lander that will safely carry the next two American astronauts to the lunar surface. At least one of those astronauts will make history as the first woman on the Moon. Another goal of the Artemis program includes landing the first person of color on the lunar surface.

**"With this award, NASA and our partners will complete the first crewed demonstration mission to the surface of the Moon in the 21st century as the agency takes a step forward for women's equality and long-term deep space exploration,"**

said Kathy Lueders, NASA's associate administrator for Human Explorations and Operations Mission Directorate. "This critical step puts humanity on a path to sustainable lunar exploration and keeps our eyes on missions farther into the solar system, including Mars."

The firm-fixed price, milestone-based contract total award value is

**\$2.89B**



Illustration of SpaceX Starship human lander design that will carry the first NASA astronauts to the surface of the Moon under the Artemis program.

# R&D Hubs, Associations and Government Organizations

Government Organizations - 136  
 R&D Centres - 132  
 Associations - 53  
 Hubs - 19

Associations

Hubs



## Plunge of the Cost of Space Activities will Make Smaller Nations More Ambitious

Country	Acceded to Outer Space Treaty	Acceded to Moon Agreement	Acceded to Artemis Accords	Passed National Legislation on Space-Resource Utilization	Space Mining Activity	Mars Program	Moon Program
USA	+	-	+	+	+	+	+
China	-	-	-	+	+	+	+
EU	-	-	-		+	+	+
UAE	-	-	+	+	+	+	+
Germany	+	-	-	-	+	-	-
France	+	-	-	-	-	-	-
Russia	+	-	-	+	+	+	+
India	+	-	-	-	-	+	+
Japan	+	-	+	+	+	+	+
Saudi Arabia	-	-	-	-	-	-	-

## Current Capabilities of Government Agencies are Small, but will Grow Rapidly

Country	Astronauts	Operates Satellites	Have Spaceport(s)	Sounding Rocket Capability	Orbital Payload Capability	Ability to Develop and Deploy Liquid Rocket Engines	Ability to Operate Space Probes	Human Spaceflight Capability
USA	+	+	+	+	+	+	+	+
China	+	+	+	+	+	+	+	+
EU	+	+	+	+	+	+	+	+
UAE	+	+	-	-	-	-	+	-
Germany	+	+	-	+	-	+	-	-
France	+	+	+	+	+	+	+	-
Russia	+	+	+	+	+	+	+	+
India	+	+	+	+	+	+	+	-
Japan	+	+	+	+	+	+	+	-
Saudi Arabia	-	+	-	-	-	-	-	-

# Government Agencies (According to Number of Employees\*)

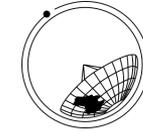
1-100



100-1000



>1000



\* Those agencies for which the numbers of employees could not be readily determined are not represented here.

# UAE Has Made Rapid Progress

The UAE is an ambitious country that has already become a regional leader and a respected international partner. Wanting to diversify from oil, the space sector is recognized as an integral part of their knowledge-based economy. Nowadays, the UAE has well-developed satellite building, data processing, and all other related technologies, and is already capable doing deep-space missions, as demonstrated by its recent Mars orbiter.

## Space exploration projects

Emirates Mars Mission

UAE aims to establish a settlement on Mars by 2117

Emirates Lunar Mission

It seeks to explore neglected regions of the Moon

AE Astronaut Programme

It trains Emirati astronauts for specialist work in space missions

## Earth-related projects

Global Navigation Satellite Systems



### Applications

- Autonomous vehicles
- Drones (UAV)
- Precision farming
- Accurate navigation in urban canyons
- GNSS cybersecurity

Arab Satellite 813 cooperative project of Arab countries



### Applications

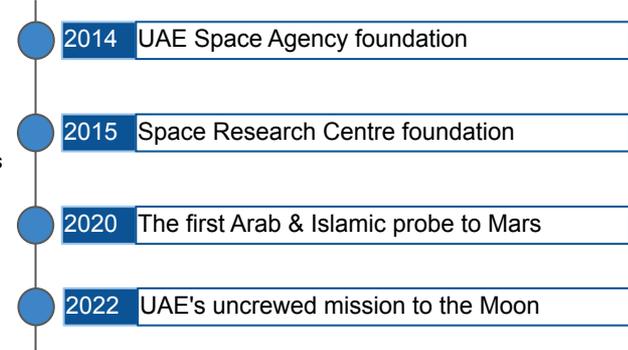
- Environmental mapping and monitoring
- identifying natural resources
- Land cover dynamics
- Crop and mining site conditions
- Internal water quality and spread
- Land erosion and soil pollution versus climate

## UAE Space Agency



Main responsibilities: establishing partnerships, assisting academic programs, advancing national and regional space exploration, and investing in research, development and commercial space projects.

**Budget In 2021** \$ 5 000 000 000



## Scientific Hubs and Centers



### Mohammed bin Rashid Space Center (MBRSC)

**Type:** Scientific hub

**Category:** Research, exploration, satellites and space systems development

**Description:** It is a technological hub which provides scientific research and exploration, satellites and space systems development, satellite imagery, ground station services, observation, and remote sensing. The hub oversees the 2017 National Space Programme, particularly the UAE Astronaut Programme, the Mars 2117 Strategy, which aims to build a city on Mars by 2117.



### Space Reconnaissance Center (SRC)

**Type:** Scientific hub

**Category:** Satellite imagery

**Description:** SRC is a high-end technological center for receiving, processing satellite imagery data and information exploitation that assist in early warning, monitoring, and planning security missions of the UAE Armed Forces. The received data comes either from satellite constellations such as IKONOS (USA), IRS (India), and KOMPSAT (Korea), or aerial platforms like aircrafts. The SRC operates the Falcon Eye satellite additionally.

## Academia



### Sharjah Academy for Astronomy, Space Sciences and Technology (SAAST)

**Type:** Research laboratories

**Category:** Research, exploration

**Description:** It is continuously working on expanding its research laboratories to ensure that it is a vital and effective contributor to the development of the Astronomy, Space sciences & Technology field as well as the space sector. The Academy operates the UAE Meteor Monitoring Network project funded by the UAE Space Agency to monitor the sky for any type of space debris whether it is human-made like satellites or meteors and fireballs.

# Companies and R&D Centers Subordinated to National Space Agencies

## US



## Luxembourg



## UAE



## Argentina



## New Zealand



## India



## Australia



## South Korea



## United Kingdom



## Russia



# The Global Exploration Roadmap (GER)



The GER is a non-binding document that smaller space agencies co-author to foster coordination and partnership opportunities. It emphasizes the importance of cooperation to realize individual and common goals and objectives for **ISECG** (International Space Exploration Coordination Group) members.

Exploration Strategy							North America			
International Space Station (ISS) → Moon → asteroids → Mars → other destinations							 USA	 Canada		
Asia										
 China	 India	 Korea	 Japan	 Vietnam	 Thailand	 UAE				
South America			Australasia			Other Members				
 Brazil	 Mexico		 New Zealand	 Australia		 EU	 Russia			
Europe										
 France	 Italy	 UK	 Germany	 Romania	 Luxembourg	 Norway	 Germany	 Switzerland	 Portugal	 Ukraine

## Conclusions

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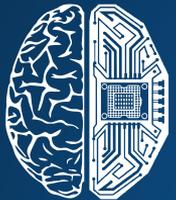
The USA with its NASA and the military is leading the SpaceTech industry by a large margin, most recently in partnership with relative newcomers like SpaceX. They have groundbreaking projects in the exploration of Mars, Venus, and Jupiter, and plan to launch the most powerful space telescope ever in late 2021. There are at least six significant launches planned for 2021, some of which has already been achieved. Russia and China are fiercely competing with the US, and starting to cooperate with each other. However, the new space nations are appearing to challenge the world space order. Much will depend on the cooperation ties between new and old players.

Agencies like the Japanese JAXA and the European ESA are focused on “peaceful use of outer space”, which means that they strive not for superiority, but for progress in technology and science through cooperation. Both agencies are focusing on sustainable means of conducting space activities, minimizing the amount of new space debris and gathering environmental data to aid in pollution reduction.

The Arab and Indian programs are continuously working to become the significant players in the Spacetech industry. Increasingly, other countries have established national space agencies and are trying to do the same, despite usually smaller budgets. These programs are showing the fastest results among newly established space agencies.



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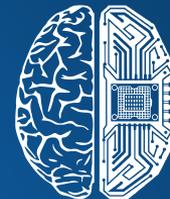
Deep  
Knowledge  
Analytics

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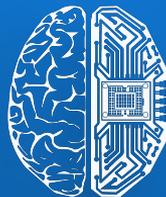
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