SpaceTech Analytics

# SpaceTech Industry Year Overview

2021

January 2022

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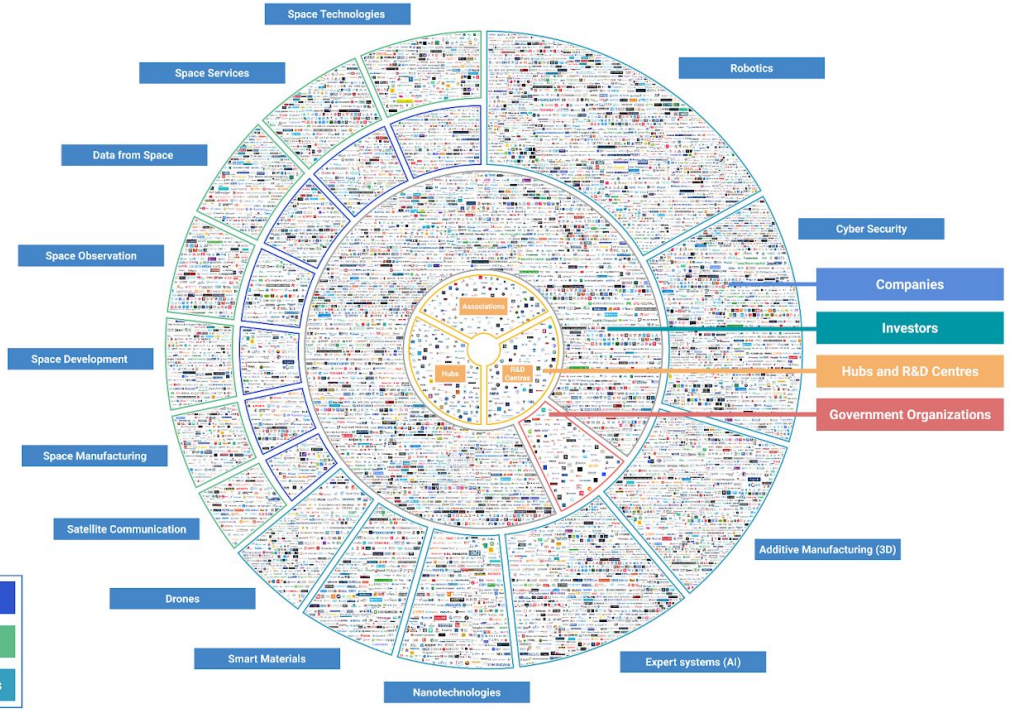
**SpaceTech Industry Year 2021 Overview** summarizes key observations in the SpaceTech ecosystem, a rapidly evolving and exponentially growing industry, and its development in 2021. In this case study, we have assembled information about key industry trends based on our database of more than **12,000 companies**, **4,000 investors**, and **170+ publicly traded corporations** from the SpaceTech Industry.

The year 2021 can become a **turning point**, a moment of the global shift of the whole industry when it actively started to **democratize** and the space became more affordable not for investors only but for laymen too. The space business has even developed its own market index and specialized research sources. As it becomes ever more integrated into our daily lives, it creates numerous **opportunities** to participate for diversified investors. This study pays particular attention to space-related companies relying on AI, DeepTech, and Longevity. We also highlight the **most prominent space events, top deals, and events of 2021**. SpaceTech has huge economic potential and has already resulted in the emergence of goods and services that have become an integral part of our existence.

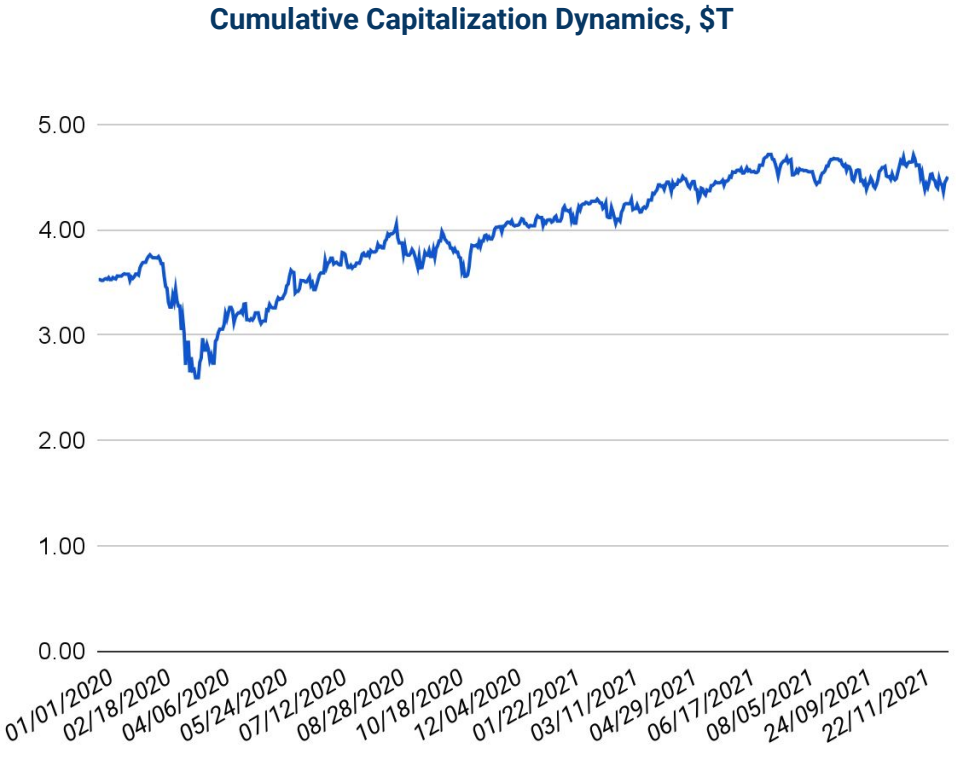
# GLOBAL SPACETECH ECOSYSTEM 2021

| 12,000 Companies | 5,000 Investors | 200 R&D Hubs and Associations | 140 Government Organizations |
|---|---|---|---|




| | |
|---|---|
| USA | Canada |
| UK | Germany |
| China | France |
| India | Israel |
| Spain | Japan |
| Australia | Eastern Europe |
| Singapore | Turkey |
| Southern America | Ireland |
| Gulf Region | EU |
| Africa | Sweden |

# GLOBAL SPACETECH ECOSYSTEM 2021

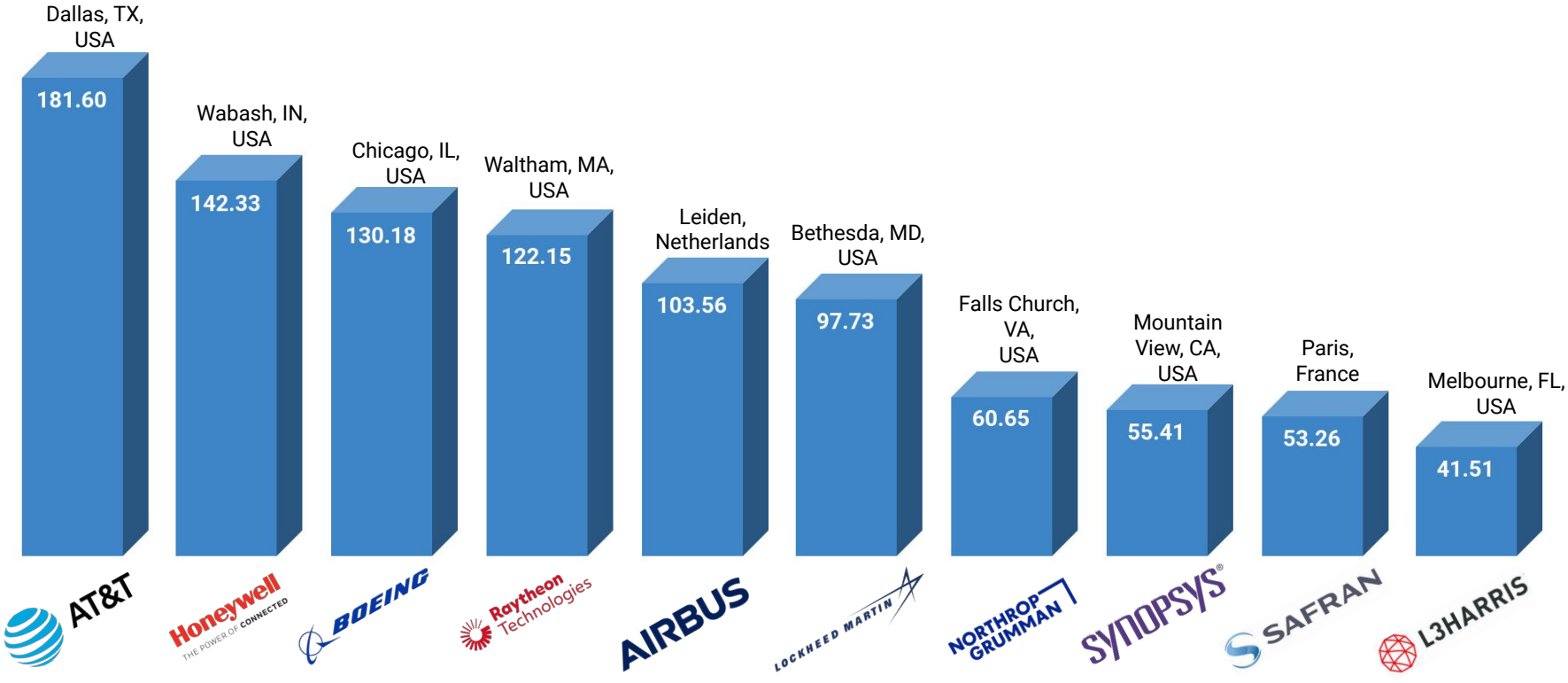



Despite the COVID-19 crisis and the dramatic fall in companies' capitalization levels in February 2020, the capitalization of **177 publicly traded companies** grew from **$3.5 trillion** at the beginning of 2020 to **$4.5 trillion** at the the end of 2021. The total capitalization increase in this period was 32.6%.

The largest core companies by market capitalization are AT&T Inc., and Honeywell International Inc., Boeing and Raytheon Technologies.

**SpaceTech** companies are similar to other companies in the sector (i.e., the ones that reached series B or C funding rounds), which means that the **growth** in their market capitalization can be an approximation of the dynamics in the entire sector. The anticipated growth in the industry is expected to **affect** the favorable market capitalization of SpaceTech corporations.

# TOP 10 PUBLIC SPACETECH COMPANIES BY CAPITALIZATION IN 2021

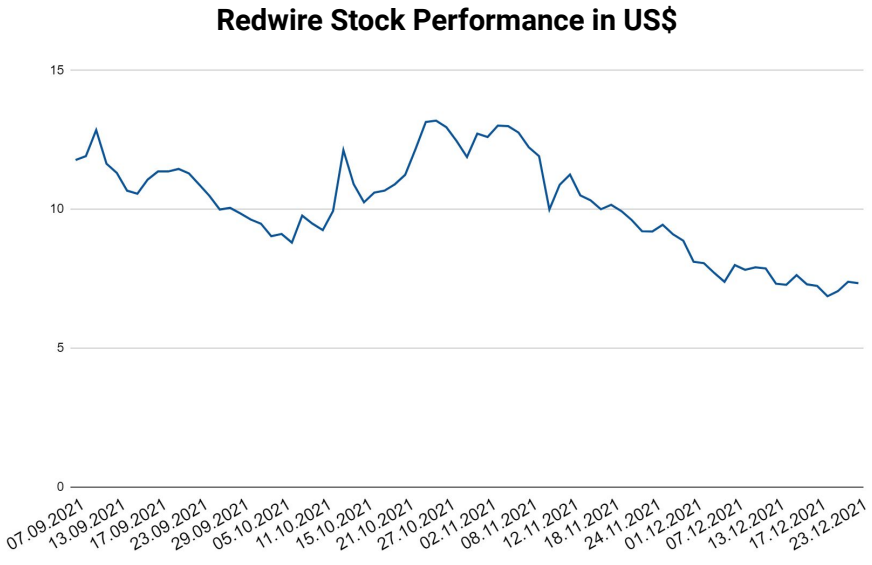


# 100 LEADING COMPANIES IN THE SPACETECH SECTOR*

| | |
|---|---|
| 1 | Advantech Wireless |
| 2 | Aerojet Rocketdyne Holdings |
| 3 | AirBorn |
| 4 | Airbus |
| 5 | Akka Belgium |
| 6 | Amgen |
| 7 | Anaren |
| 8 | Arqiva |
| 9 | ASRC Federal |
| 10 | Astronics |
| 11 | Avibras |
| 12 | BAE Systems |
| 13 | Ball Aerospace |
| 14 | Bharat Sanchar Nigam |
| 15 | BlueHalo |
| 16 | Boeing |
| 17 | Carlisle Interconnect Technologies |
| 18 | CASIL |
| 19 | China Resources |
| 20 | China Spacesat Technology |
| 21 | Collins Aerospace |
| 22 | Comtech Xicom Technology |
| 23 | Curtiss-Wright |
| 24 | Cytec Industries |
| 25 | Dassault Aviation |
| 26 | DigitalGlobe |
| 27 | DRS Defense Solutions |
| 28 | Dynetics |
| 29 | EaglePicher Technologies |
| 30 | EchoStar |
| 31 | ELECNOR |
| 32 | EnerSys |
| 33 | ENSCO |

*by number of employees in alphabetical order

# NEWEST PUBLIC ENTRIES: REDWIRE




| | | | |
|---|---|---|---|
| IPO Date | 09.03.21 | Mean Daily Return | -0.66% |
| Ticker | RDW | Volatility of Daily Returns | 5.34% |

**Redwire Corporation** is an American aerospace manufacturer and space infrastructure technology company headquartered in Jacksonville, Florida. Formed on June 1, 2020, by private equity firm AE Industrial Partners, Redwire was initially created through the merger of Adcole Space and Deep Space Systems. Shortly after formation, Redwire acquired Florida-based Made In Space, Inc. The addition of Made in Space added 3D printing and other actual space manufacturing to the company's portfolio. Redwire Corporation is accelerating humanity's expansion into space by delivering reliable, economical, and sustainable infrastructure for future generations.

Redwire's stock has performed relatively well after its IPO on September 3, 2021, on the **NYSE**. Launching at the price of $12.24 per share, it experienced a slight rise in the first few months, peaking at $13.19 on October 26, 2021. Since then, the stock price has relatively stabilized, but the volatility still remains rather high mostly due to a small amount of time passing since the company's IPO. That said, the price stands at **$7.34** per share as of December 23, 2021. The company has also maintained a positive high Mean Daily Return ratio of **-0.66%**.

# 100 LEADING INVESTORS IN THE SPACETECH SECTOR*

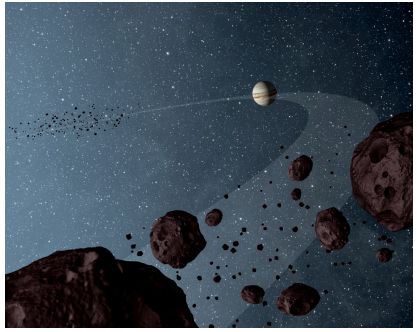
| | |
|---|---|
| 1 | 3i Group |
| 2 | 500 Startups |
| 3 | Accel |
| 4 | Acequia Capital |
| 5 | Alchemist Accelerator |
| 6 | Alumni Ventures Group |
| 7 | Andreessen Horowitz |
| 8 | AngelList |
| 9 | Atlas Venture |
| 10 | Bain Capital Ventures |
| 11 | BDC Venture Capital |
| 12 | Benchmark |
| 13 | Berkeley SkyDeck |
| 14 | Bessemer Venture Partners |
| 15 | Blue Cloud Ventures |
| 16 | BoxGroup |
| 17 | Brand Capital |
| 18 | Canaan Partners |
| 19 | Carbon Trust |
| 20 | Creative Destruction Lab |
| 21 | Crosslink Capital |
| 22 | CRV |
| 23 | DCVC |
| 24 | East Ventures |
| 25 | Eight Roads Ventures |
| 26 | Enterprise Ireland |
| 27 | Felicis Ventures |
| 28 | First Round Capital |
| 29 | Five Arrows Principal Investments |
| 30 | Foundation Capital |
| 31 | Founder Collective |
| 32 | Founders Fund |
| 33 | FundersClub |

*by levels of investment, in alphabetical order

# TOP MOMENTS THAT MADE HEADLINES IN 2021 SPACE INDUSTRY

## Lucy in the sky with asteroids

NASA launched Lucy on a grand 12-year asteroid tour last fall with plans to fly by several space rocks that share Jupiter's orbit. Lucy — a mission named after a fossilized early human, who was named after The Beatles' song — will study the origins of the solar system. The asteroids are thought to be leftover pieces from planetary formation.The spacecraft will explore one asteroid in the solar system's main belt and seven Trojan asteroids. The latter are thought to be remnants of the early solar system trapped in stable orbits.



**The spacecraft launched with an Atlas V rocket on October 16 and will travel 4 billion miles in a sort of loop-the-loop, circling back to Earth three times for gravity boosts. That means it will be the first vehicle to return to Earth's vicinity from the outer solar system.**

## That time the sky was falling…

On May 8, a piece of China's biggest rocket, Long March 5B, entered the atmosphere above the Maldives in the Indian Ocean, with most of it burning up in the process. People in the Middle East reported they saw debris, but no one was hurt. For a brief moment, though, it gave some people a case of Chicken Little: Despite scientists' best estimates, no one knew exactly where in the world it was going to strike. Forecasts indicated a chance the enormous rocket could rain debris on major cities.

**Astrophysicists tracking the rocket core said it was statistically unlikely that the barreling fragment would hit land, endangering people. Most of the junk that plunges back to Earth burns up or splashes into the ocean.**

# ASTRA REACHES ORBIT

Alameda, CA., November 20, 2021. Astra Space, Inc. (“Astra”) (**Nasdaq: ASTR**) successfully completed its first commercial orbital launch for the United States Space Force November 19, 2021.

**The launch was conducted from Astra’s Kodiak Spaceport, located at the Pacific Spaceport Complex in Kodiak, Alaska.**

Astra’s launch system successfully demonstrated the orbital placement of a test payload to

**an inclination of 86.0 degrees at an altitude of 500 km**

**an orbital velocity of 7.61 kilometers per second in 8 minutes and 47 seconds.**

**"I think the vehicle's ready for launch,"** Astra co-founder and CEO Chris Kemp said, referring to LV0008 launch vehicle. **"We're working on all the details around the dates and the range, and we'll be making some announcements soon as to the schedule. But don't expect a long wait for the next flight."**

# TOP MOMENTS THAT MADE HEADLINES IN 2021 SPACE INDUSTRY

NASA awards **$415M** for private space stations

| | | |
|---|---|---|
| Nanoracks | $160M | **"Starlab"** Nanoracks, Voyager Space, Lockheed Martin |
| BLUE ORIGIN | $130M | **"Orbital Reef"** Blue Origin, Sierra Space, Boeing, Redwire |
| NG NORTHROP GRUMMAN | $125M | **Unnamed** Northrop Grumman, Dynetics |

This year, NASA named SpaceX the winner of the lunar program and awarded it with **$2.9B** more. However, **Blue Origin** didn't agree with the decision and filed a lawsuit, which it lost.

**Axiom Space** was awarded with **$1.69M** for the first private astronaut mission to the International Space Station.

amazon ~ $1,19B ULA

On **April 19,** it became clear that **Amazon** has secured Atlas V rocket by **United Launch Alliance** for nine launches, supporting deployment of its **Project Kuiper** initiative. According to the estimated launch cost dating back to 2016, the deal can vary from **$990 million** to **$1,38 billion.** Project Kuiper is a third initiative (apart from Starlink and Oneweb) that plans to establish a global broadband internet access through a constellation of modern satellites in low earth orbit. The plan is to put 3,236 advanced satellites on orbit. Atlas V is going to be gradually replaced by a two-stage-to-orbit **Vulcan Centaur** rocket. The first flight of this vehicle is planned to take place in **2022**.

amazon | project kuiper

# 2021 ACQUISITIONS


**Raytheon acquired SEAKR Engineering, Inc.**
Raytheon Intelligence & Space acquired a space electronics manufacturer for an undisclosed sum on November 29.

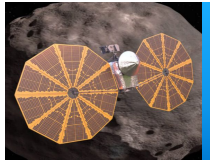

**BAE Systems acquired In-Space Missions**
In-Space Missions is a UK company that designs, builds, and operates satellites and satellite systems.


**SpaceX acquired Swarm**
Swarm, a satellite data and communications start-up, was acquired by SpaceX on July 16.


**Astra acquired Apollo Fusion**
Apollo Fusion offers electric propulsion engines. Astra will incorporate their technology for delivering payloads to GEO.

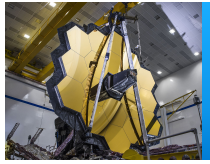

**OneWeb acquired TrustComm**
The acquisition of the satcoms provider allows OneWeb on strengthening the cooperation with the US Government.

# MISSION STATUS



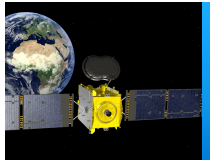
### Lucy Mission

**Successfully launched on** October 16, 2021.
Lucy is the first space mission to study the Trojan asteroids associated with the planet Jupiter. One solar array is not deployed properly; NASA is working to fix it.



### James Webb Space Telescope

**Successfully launched on** December 25, 2021.
The James Webb Space Telescope will find the first galaxies that formed in the early universe and peer through dusty clouds to see stars forming planetary systems.

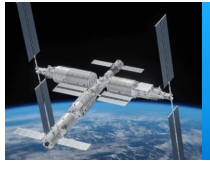


### Eutelsat Quantum

**Successfully launched on** 30 July, 2021.
A communications satellite developed thanks to a partnership between the ESA, Eutelsat, and Airbus, launched by Arianespace together with a Brazilian satellite.

### European Robotic Arm

**Successfully docked on** July 29, 2021.
The Robotic Arm was launched to the ISS and attached to the Russian Segment. This will notably improve the effectiveness of extravehicular activities and help the astronauts.



### Tiangong Space Station

**Successfully launched on** April 29, 2021.
This is the core module of the Chinese space station in the Earth orbit. The carrier rocket then went to an uncontrolled fall. Other modules may be launched in May and June 2022.

### Boeing Orbital Flight Test 2

**Rescheduled for** late May 2022.
The second uncrewed flight of the Boeing's Starliner spacecraft intended to dock with the ISS was rescheduled due to several technical issues.

### Artemis 1

**Rescheduled for** March 12, 2022.
The first uncrewed launch of the SLS that was to deploy 13 cubesats to a distant lunar retrograde orbit was rescheduled due to an issue with an engine controller.

### New Glenn

**Rescheduled for** Q4, 2022.
Blue Origin's reusable heavy-lift launch vehicle capable of carrying people and payloads to the Earth orbit has been delayed since 2020.

### Gaganyaan

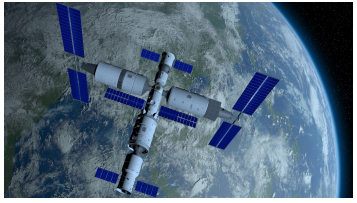
**Rescheduled for** June 2022.
Gaganyaan is the first indian vehicle capable of flying crew with three members. ISRO will launch Vyomitra, a humanoid robot, in it to conduct some tests.

### Ariane 6

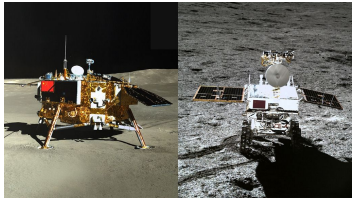
**Rescheduled for** Q2 2022.
European expendable launch system developed by ArianeGroup on behalf of ESA is said to have been delayed due to the COVID-19 pandemic.

# MISSION STATUS: PLANETARY SCIENCE

Spacecraft from three Mars exploration programs from the United Arab Emirates, China, and the United States (Hope, Tianwen-1, and Mars 2020) arrived at Mars in February.

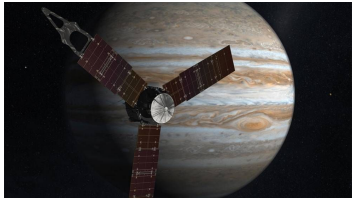


China began construction of the Tiangong space station (Phase 3 of the Tiangong program) with the launch of the Tianhe core module on April 29, 2021. A Tianzhou cargo delivery mission was launched on May 29, 2021, and the Shenzhou 12-crew mission – on June 17, 2021.



China's Chang'e-4 lander and Yutu-2 rover reached a 1,000-day milestone on the far side of the moon while remaining operational. The lander and rover are reportedly in good condition. The payloads aboard are also working properly and will continue the scientific exploration in the first mission on the far side of the moon.

The IXPE telescope was launched on a Falcon 9 on December 9, 2021. The long-delayed James Webb Space Telescope, the largest optical space telescope ever built, was launched toward the Sun–Earth L2 point by a European Ariane 5 rocket on December 25, 2021. The complex deployment of the spacecraft has begun,and will take months to complete.



The Juno probe continues its exploration of Jupiter. Originally, its mission was intended to conclude on July 31 by burning up in Jupiter's atmosphere following its 35th perijove. However, on January 8, 2021, NASA announced that the probe was granted a second mission extension through September 2025.

# MAJOR TRENDS IN THE NEW SPACE ECONOMY

| A Growing Relationship Between Space and Climate Change | Increased Capital Formation | Mitigating Orbital Debris | Space Security | Telecoms a Near-Term Focus |
|---|---|---|---|---|
| Space and sustainability have aligned. With more governments and investors focused on **environment, social, and governance (ESG) factors**, satellite imagery will provide them with key data on the environmental impact of all space activities. | Despite COVID-19, last year saw the biggest **private investment in space** to date, with space capital formation on multiple fronts. First, investors are rethinking "old" vs. "new" space. It is less about the disruption and replacement of traditional players and more about how the capabilities of new entrants complement them. | According to the US National Oceanic and Atmospheric Administration, the number of active satellites in orbit could **increase by 50%** or more in 2022. As space becomes more congested, the threat of "space junk" — orbital debris from old spacecraft and satellites — to **new satellites and rocket launches** has grown. | Space has become an increasingly **contested domain among countries**, underscoring the need for "**space domain awareness**" by private and governmental players. That means identifying, characterizing, and understanding objects in the orbit. In the USA, space could, therefore, become even less of a partisan issue. | Satellite operators see value across all three orbital altitudes — **GEO, MEO, and LEO (Geostationary Equatorial Orbit, Medium Earth Orbit and Low Earth Orbit, respectively)** — with companies taking different approaches to blending them. |

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