

# Recent Developments in US Commercial Space Activities (2023–2026)

Arthur M. Dula

Harbin, PRC  
Beijing, PRC

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SSI

# CONESTOGA I

September 9, 1982

First Ever Privately Funded Rocket Launch







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# Beijing seeks greater cooperation in space

By WANG QIAN

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China is seeking to deepen international cooperation and communication in the outer-space industry, a senior official said at the 64th International Astronautical Congress on Monday.

"We will focus on commercial cooperation in the space industry and training of satellite control personnel for foreign countries in the coming years," said Ma Xingrui, head of the China National Space Administration.

He said China will pursue the peaceful use and exploration of space.

The country's first space station, now under construction, will be open to foreign scientists and astronauts.

Ma received the 2013 Allan D. Emil Award on Monday for his contributions to the remarkable progress of China's space industry. He is the second Chinese to win the honor, after Liu Jiyuan, former chairman of the Chinese Society of Astronautics, won the award in 2003.

China has already established cooperation deals with 26 countries and regions in the space industry.



WANG JINGSHENG / FOR CHINA DAILY

**A man tries on the space suit of China's astronauts during an exhibition of the 64th International Astronautical Congress in Beijing on Monday.**

As part of the country's effort to enhance international cooperation in space, China Great Wall Industry Corp, the country's only authorized commercial provider of international launch services and satellite in-orbit delivery, plans to sign six to nine satellite construction deals in the next three years, said company President Yin Liming.

Yin also said that eight to 10 international launch services will be operated during the

same period. He said that the communication and exhibitions during the congress would strengthen the confidence of international clients in Chinese satellites and launching services.

"It will bring more commercial opportunities for us," Yin said.

China Great Wall Industry Corp, a subsidiary of China Aerospace Science and Technology Corp, has launched 43 satellites and 37 launch services

for international clients, from 18 countries and regions, as of September.

"We will further explore the potential market for satellite application and seek more international business opportunities," Yin said.

China Aerospace Science and Technology Corp is using the event to showcase its achievements such as the Long March family of rockets and its meteorological satellites to attract

international business.

China hopes to have a 10 percent share of the global satellite market and 15 percent of the international commercial launch market by 2015, China Great Wall said.

It currently has a market share of about 3 percent, with its main clients from Asia, Latin America and Africa.

The country has been providing launch services to international clients since 1990, when a communications satellite was sent into space on a Long March 3 booster.

About 3,600 representatives from around the world are taking part in the congress, according to the organizing committee of the 64th International Astronautical Congress, a five-day event that opened on Monday.

The congress is held every year by the International Astronautical Federation and one of its national societies, and attended by agency heads and senior executives of the world's space agencies. China previously hosted the congress in 1996.

The theme of this year's conference is "prompting space development for the benefit of mankind".

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主足廠景

# Agenda (1/2)

Overview of US Commercial Space Growth

Dominant Player: SpaceX

Emerging Competitors: Blue Origin and Others

Human Spaceflight: Commercial Crew Program

Lunar Activities: CLPS and Artemis Partnerships

# 议程 (1/2)

美国商业航天发展概览

主导者：SpaceX

新兴竞争者：蓝色起源及其他公司

载人航天：商业载人计划

月球活动：CLPS 与阿尔忒弥斯合作伙伴关系

# Agenda (2/2)

Low Earth Orbit: Starlink and Private Stations

Artemis Accords

Launch Cadence and Cost Advantages

Global Context and Cooperation Opportunities

Future Outlook and Implications

Q&A

# 议程 (2/2)

近地轨道：星链与私人空间站

阿尔忒弥斯协定

发射频率与成本

全球背景与合作机遇

未来展望与影响

问答环节

# US Commercial Space Sector Overview

Global space economy: \$613B in 2024

Commercial ~78% of growth

US leads in private investment and launch cadence

Shift to operational maturity (2025–2026)

# 美国商业航天领域概览

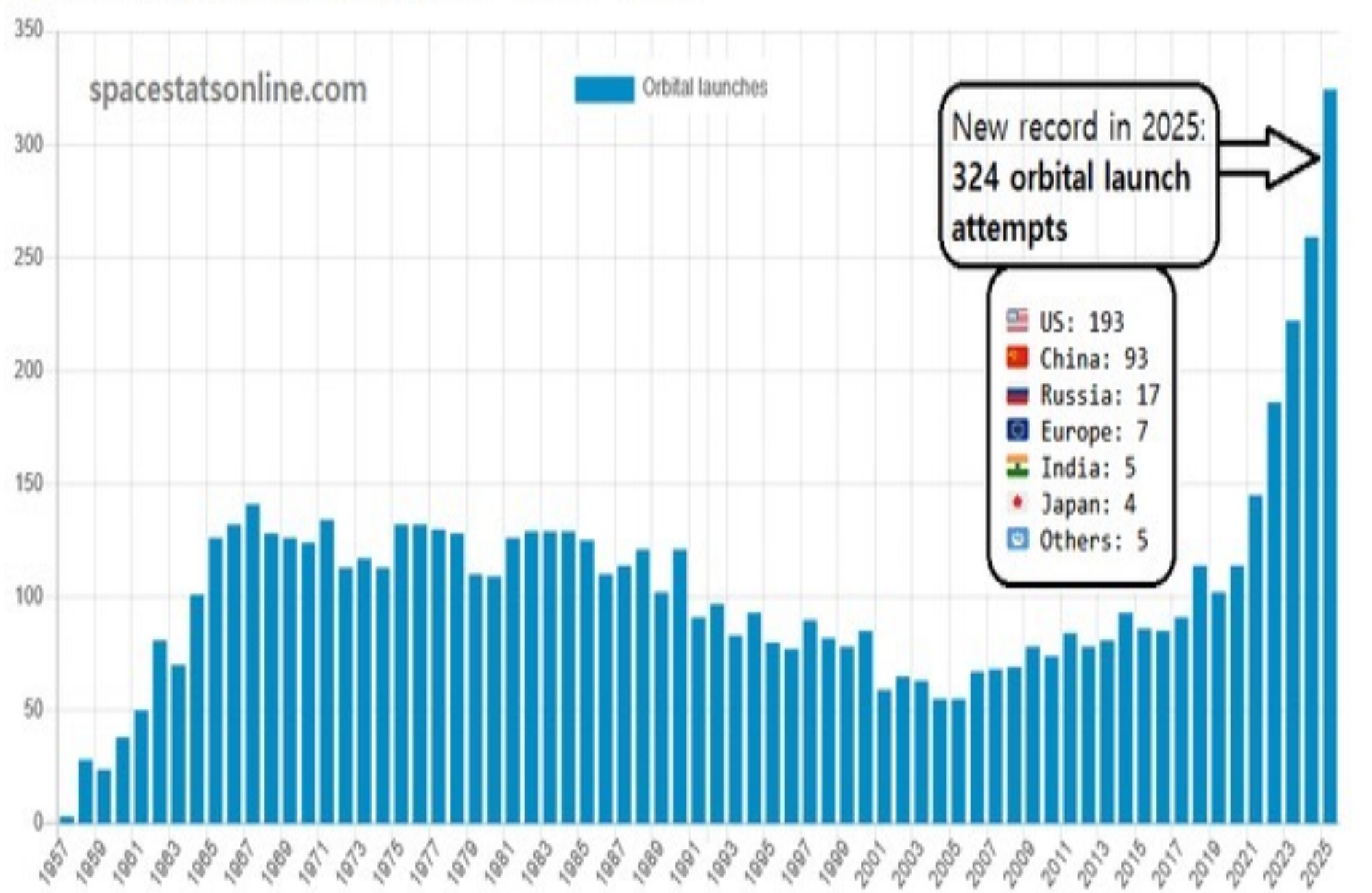
2024年全球航天经济规模约6130亿美元

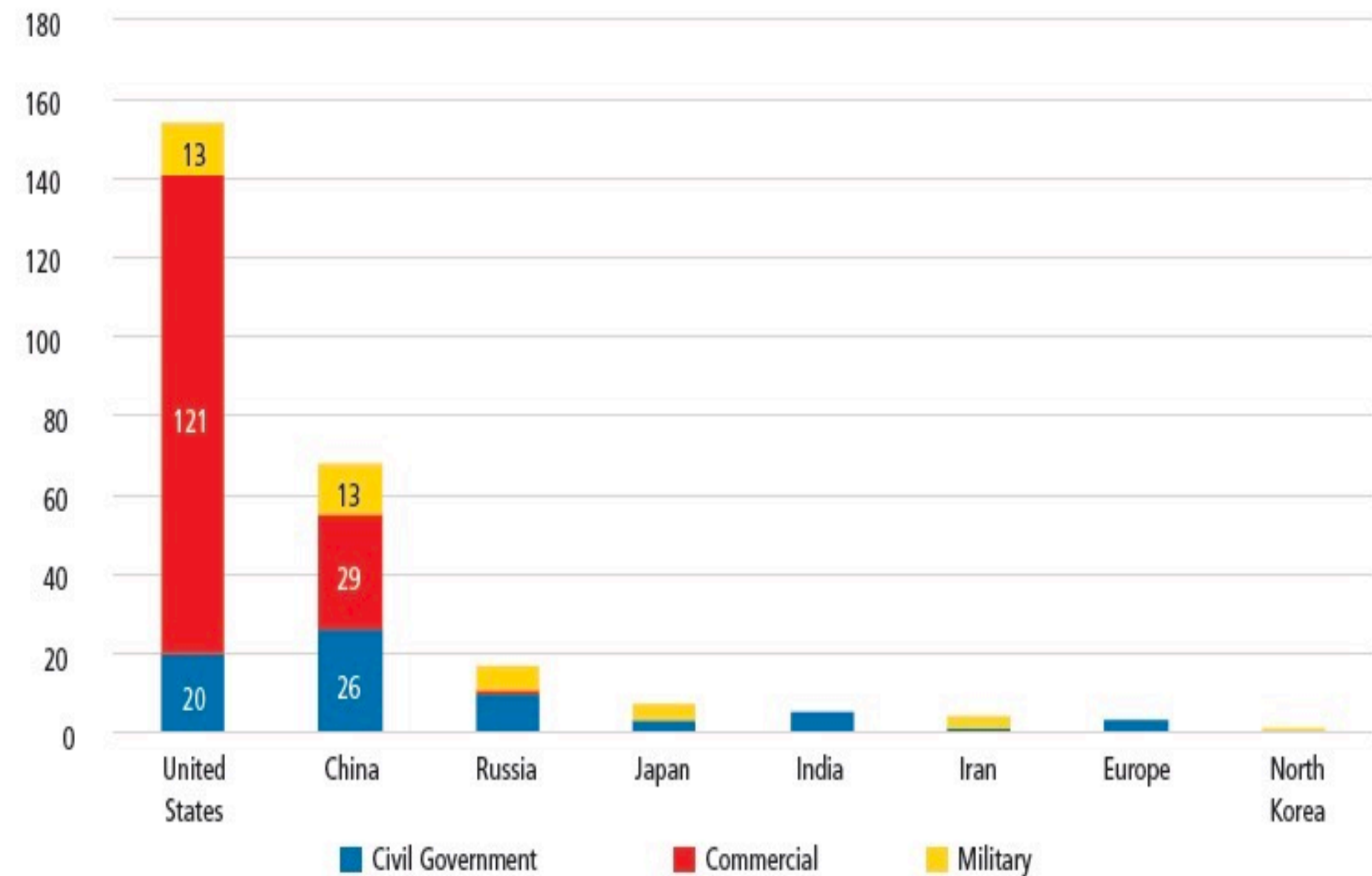
商业活动贡献约78%的增长

美国在私人投资和发射频率方面领先

2025–2026年转向运营成熟期

# Orbital launches by year 1957-2025





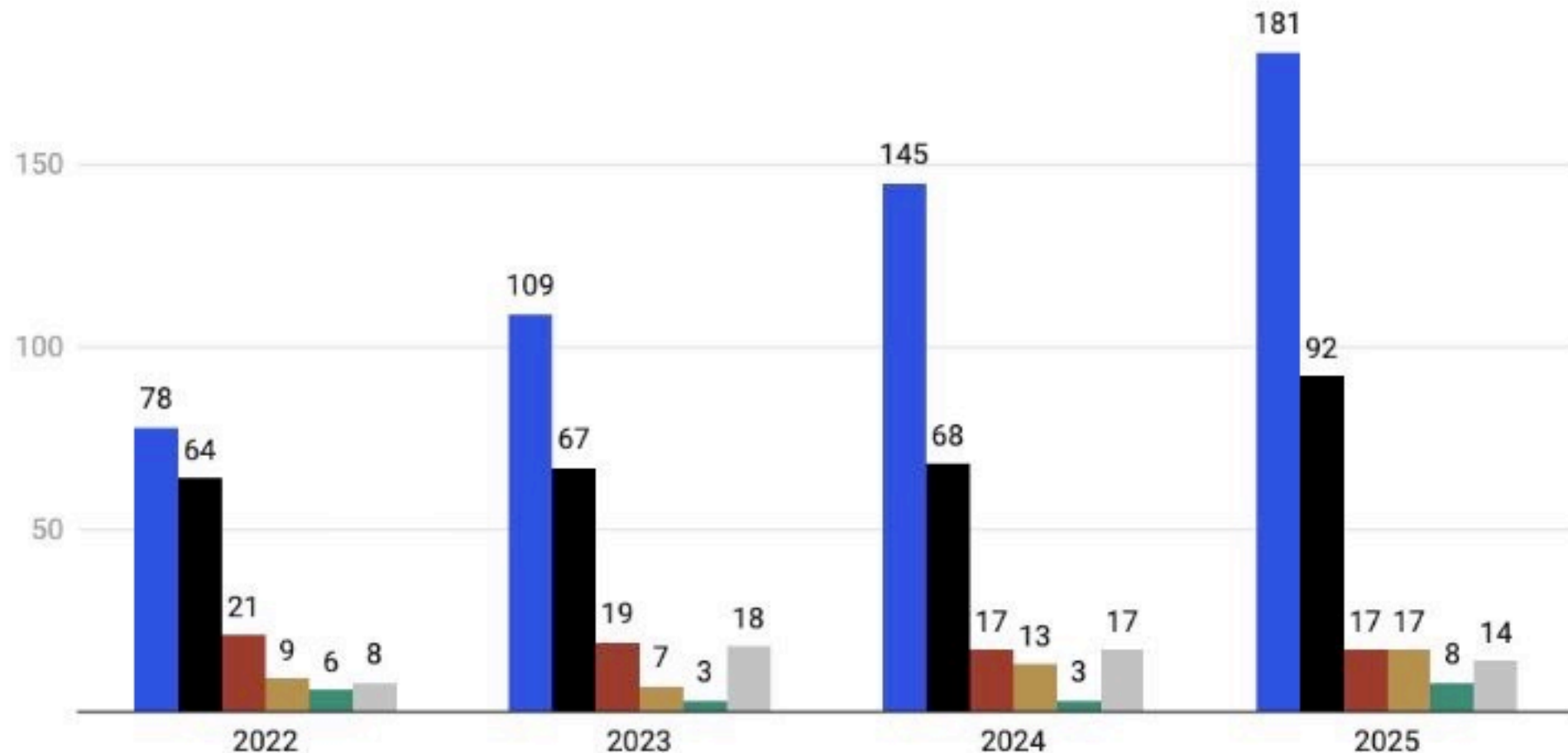
# Global Launch Reaches Record Heights in 2025

## 2025 Orbital Launch Attempts by Country

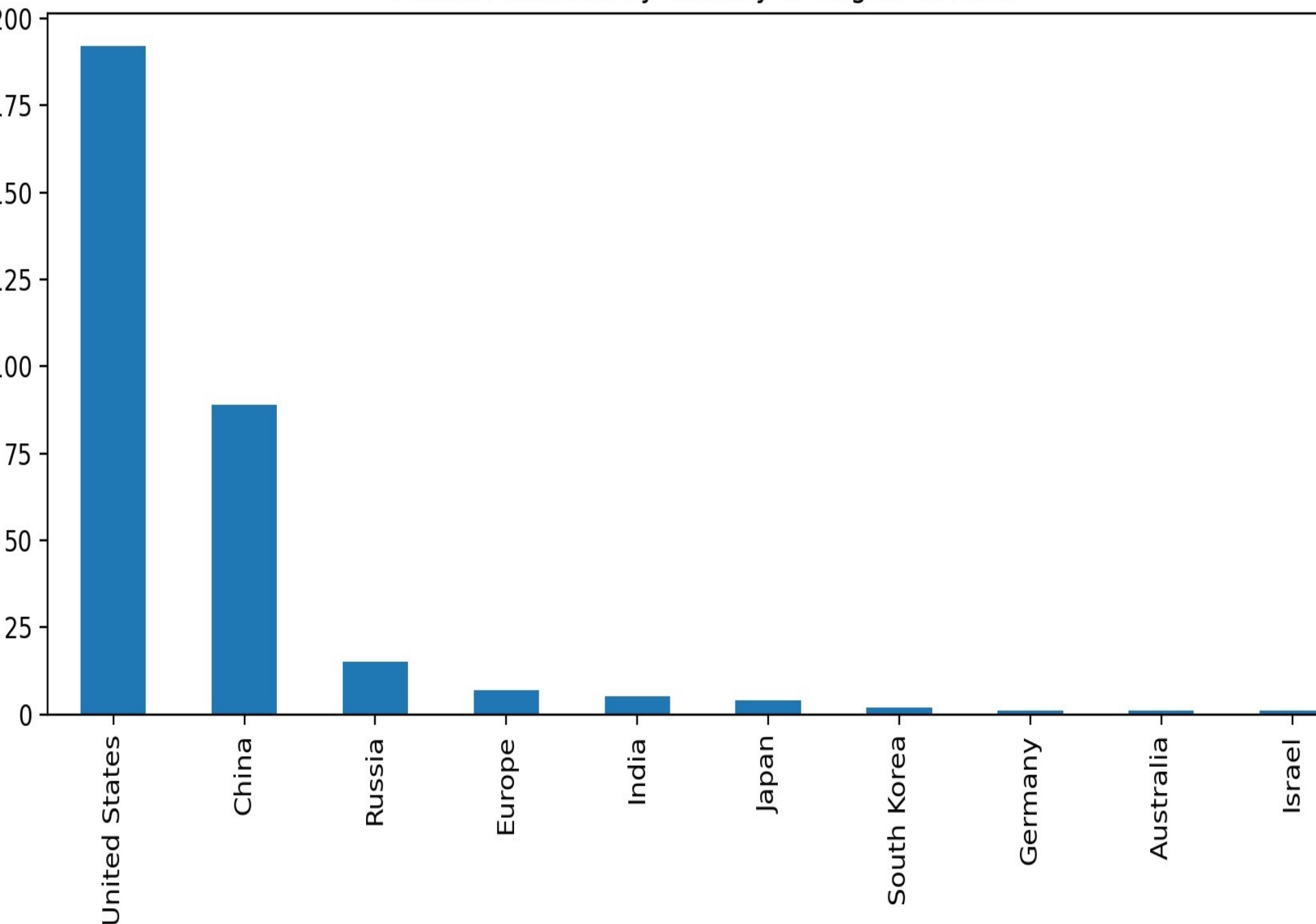
PayloadPro

329 orbital launches were attempted last year. 321 reached orbit/near orbit.

US China Russia New Zealand Europe Other



Orbital Launches by Country or Region in 2025



# Q1 & Q2 2025 Mass-to-Orbit

84.0% reported **SpaceX / 1,122,608.0kg**

**ULA / 30,844.0kg** 100% reported

**CASC / 8,640.0kg** 6.9% reported

**MHI / 7,500.0kg** 100% reported

**Roscosmos / 7,280.0kg** 50% reported

**Arianespace / 4,786.0kg** 100% reported

**ISRO / 2,250.0kg** 100% reported

**Rocket Lab / 685.3kg** 60% reported

**VKS RF / 675.0kg** 20% reported

**Isar Aerospace / 0.0kg** 100% reported

**Chinarocket / 0.0kg** 0% reported

**GalacticEnergy / 0.0kg** 0% reported

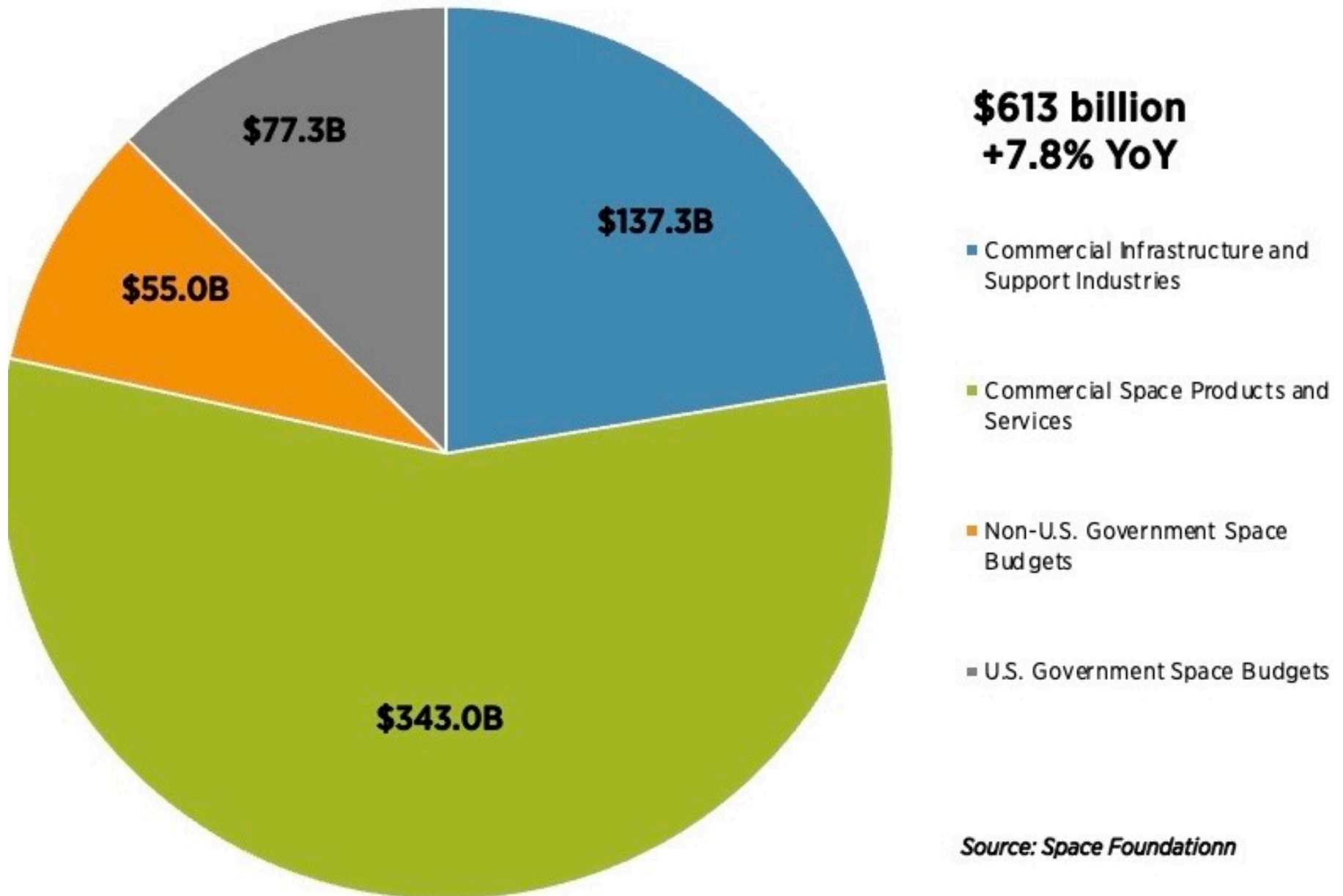
**Northrop Grumman / 0.0kg** 0% reported

**LandSpace / 0.0kg** 0% reported

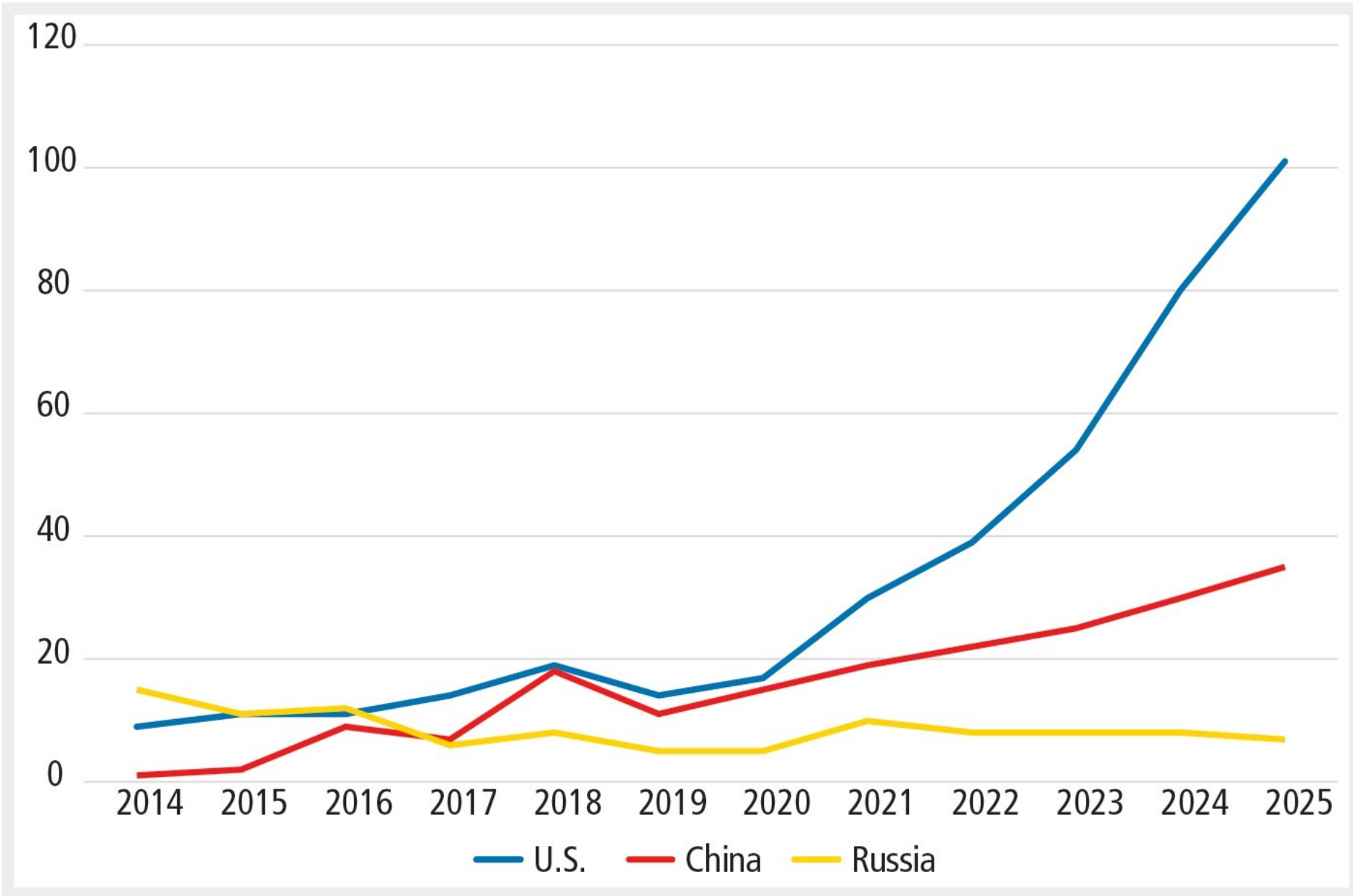
**CAS Space / 0.0kg** 0% reported



## Global Space Economy, 2024

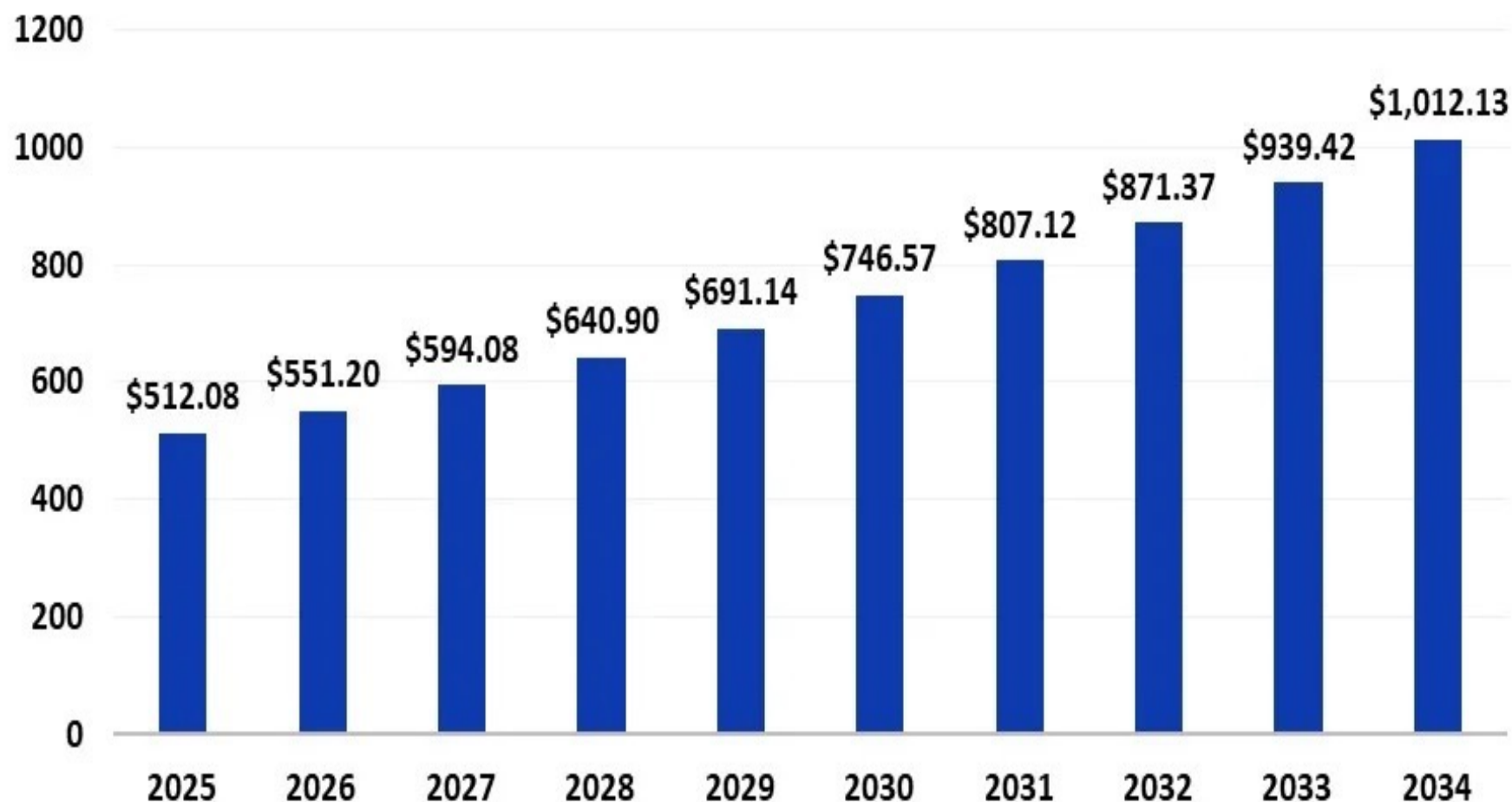


# Midyear launch trends by top 3 launch nations, 2014-2025



Source: Space Foundation database

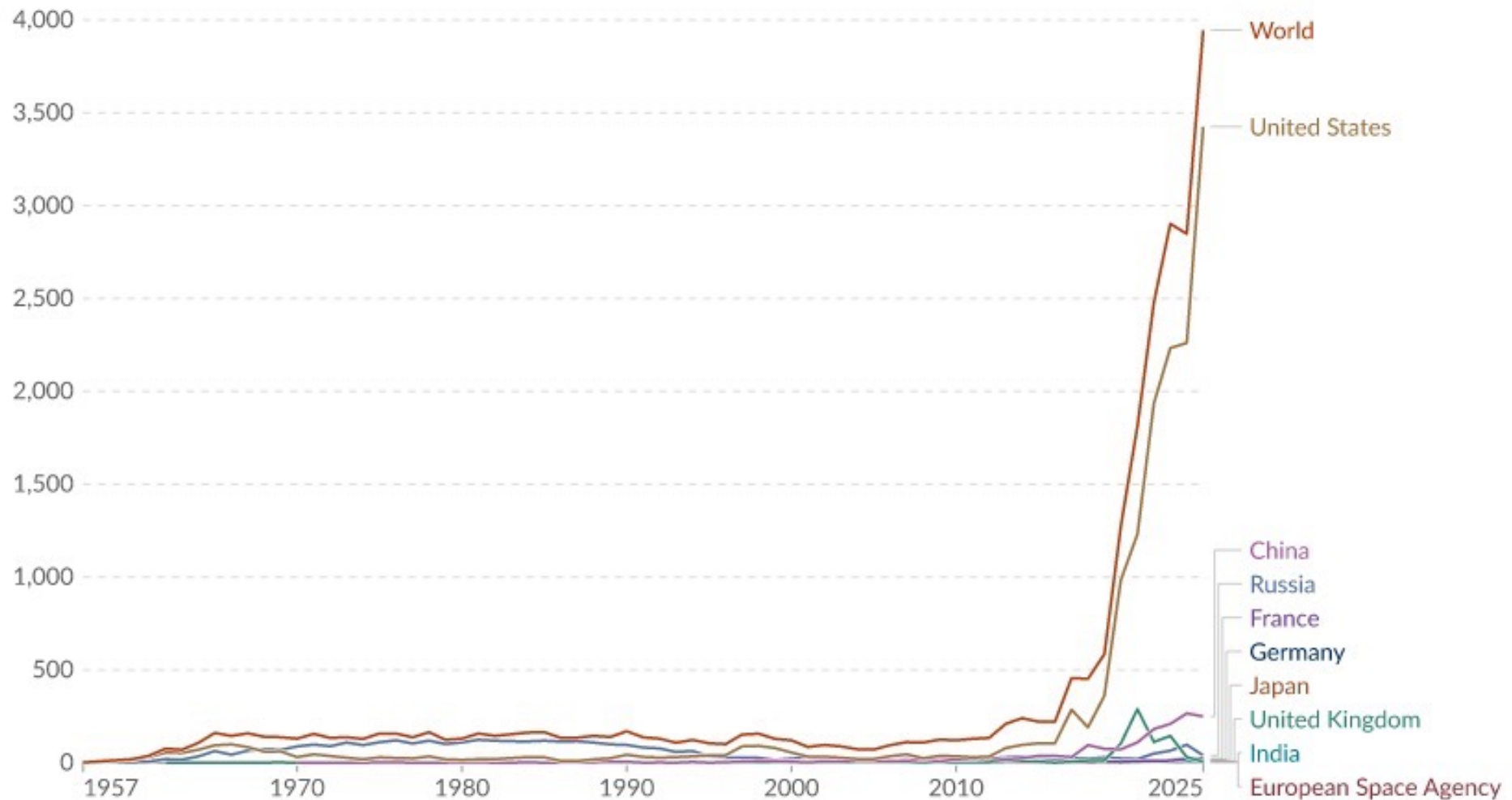
## Space Technology Market Size 2025 to 2034 (USD Billion)



# Annual number of objects launched into space

Our World  
in Data

This includes satellites, probes, landers, crewed spacecrafts, and space station flight elements launched into Earth orbit or beyond.

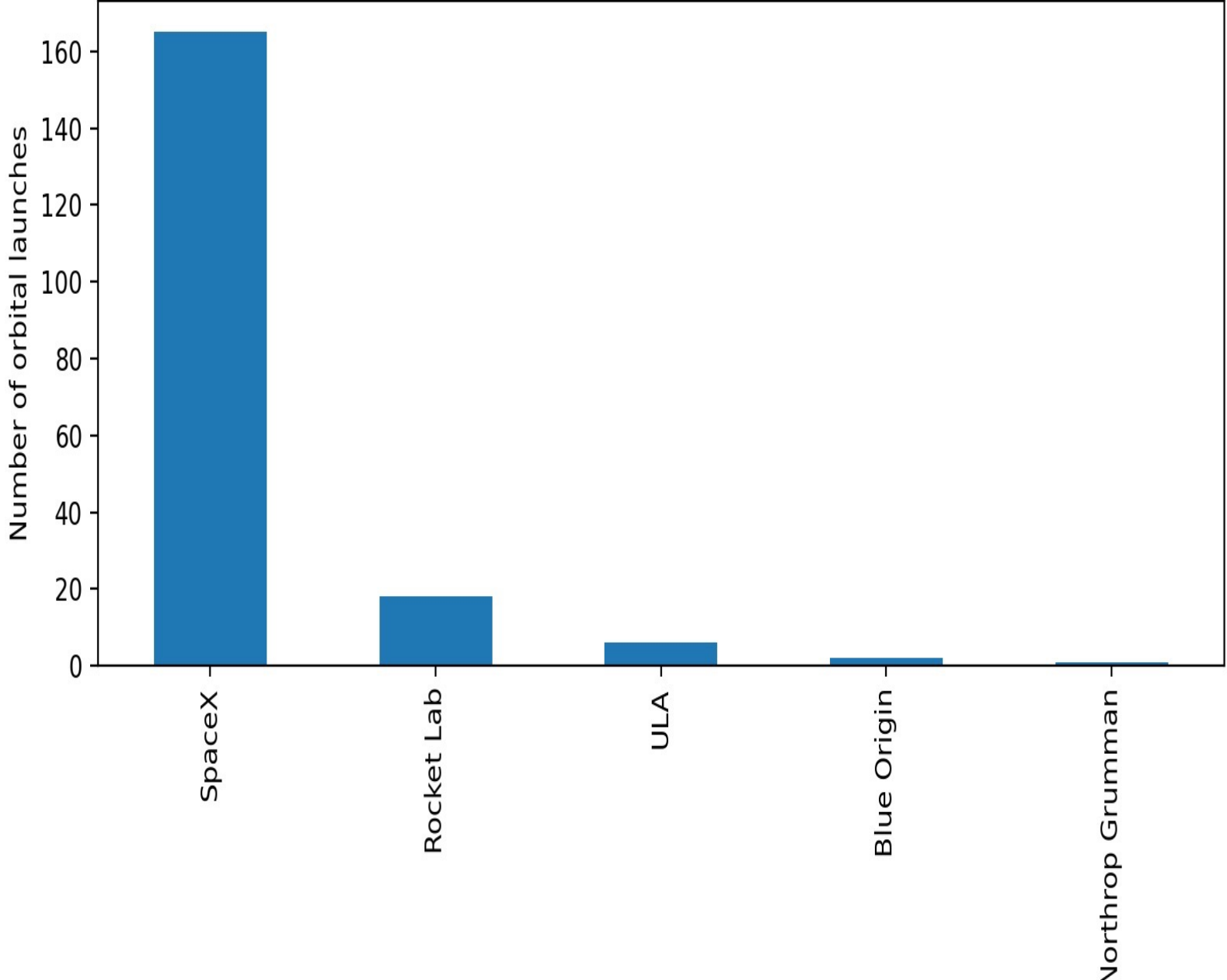


Data source: United Nations Office for Outer Space Affairs (2025)

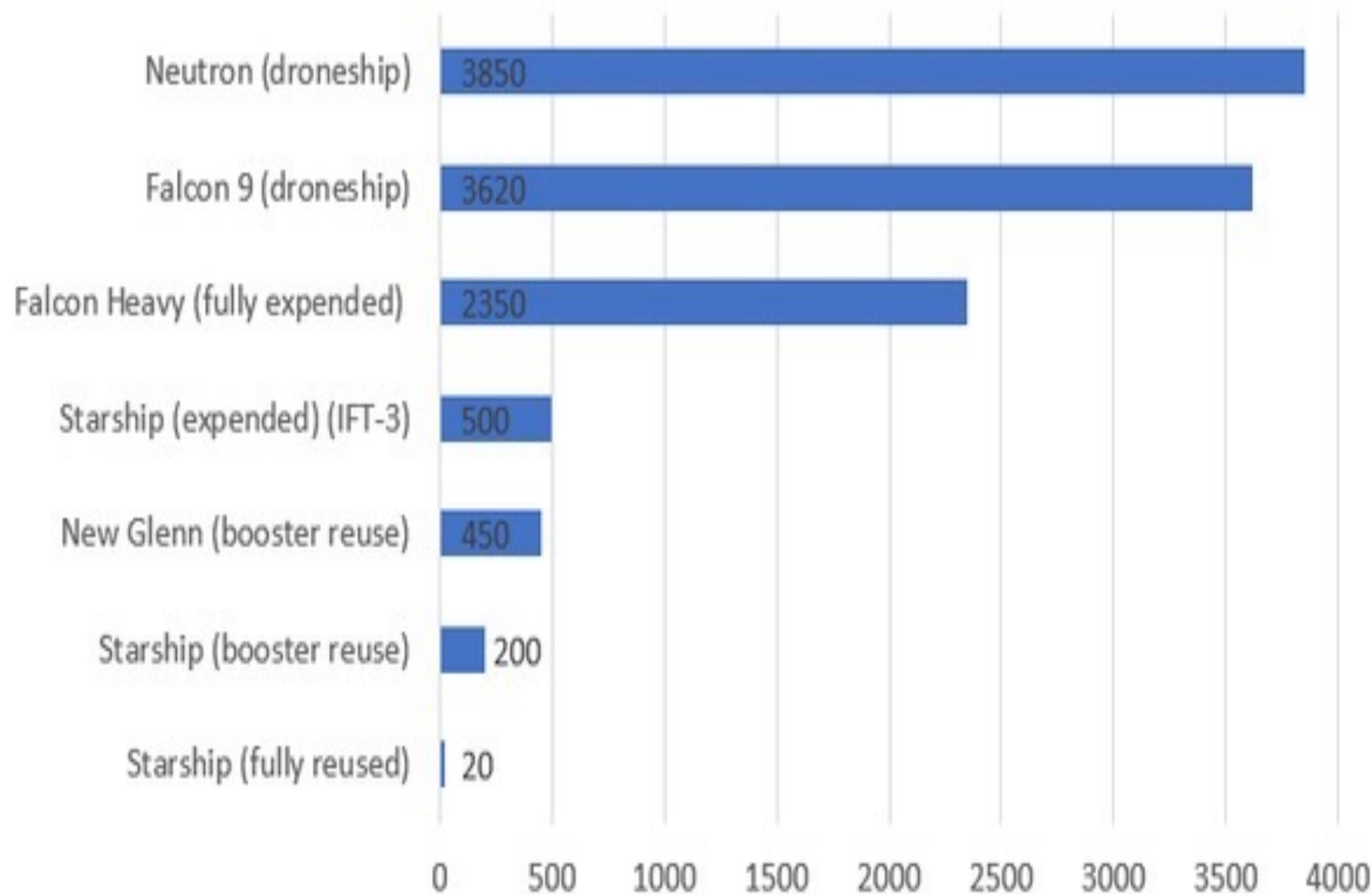
OurWorldinData.org/space-exploration-satellites | CC BY

Note: Where they differ, launch attributions are based on the commissioning country, not the country conducting the operations.

U.S. Orbital Launches by Provider in 2025



## Cost to LEO per kg of various launch vehicles



# SpaceX Overview

Founded in 2002

600+ Falcon launches by 2026

Pioneer of reusable boosters

2025 record cadence (~170 launches)

# SpaceX 概览

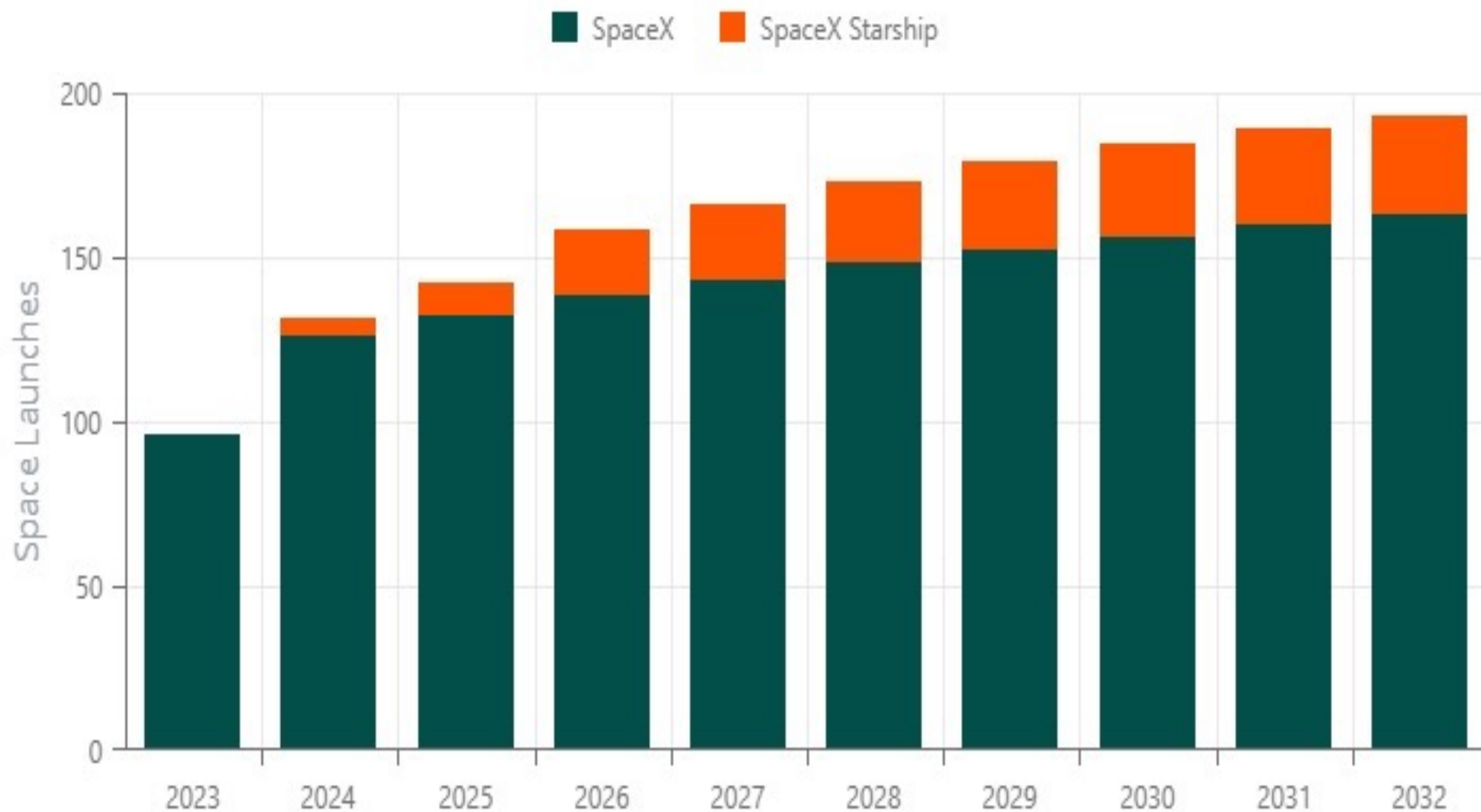
成立于2002

截至2026年猎鹰系列火箭发射超600次

可重复使用助推器的先驱

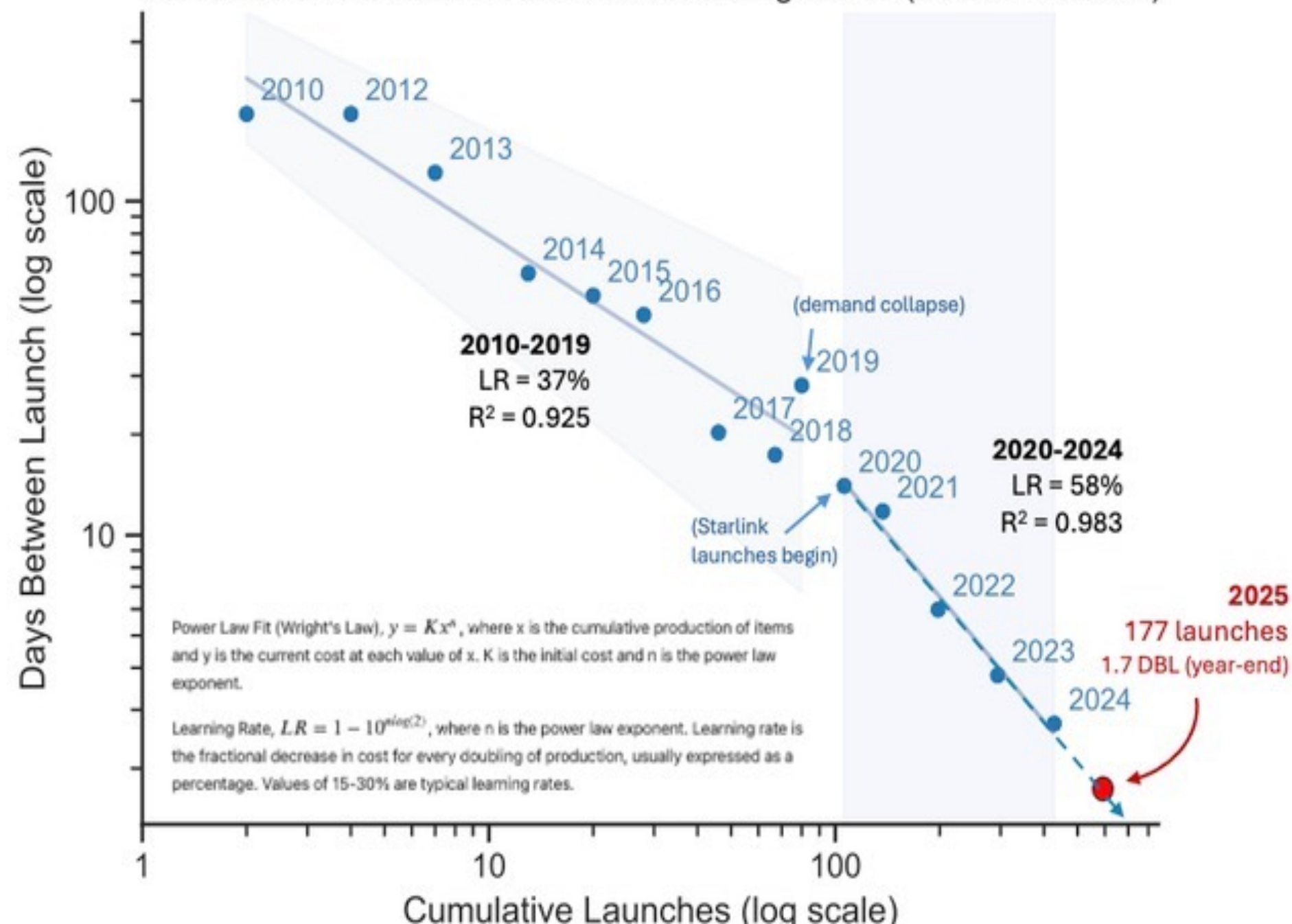
2025年创纪录发射频率（约170次）

# Number of SpaceX Orbital Space Launches



Source: ABI Research (PT-3414)

# Falcon 9 Annual Launch Cadence Learning Curve (Launch Site: All)



# Starship Progress

Fully reusable super-heavy vehicle

~11 test flights by early 2026

Booster catch and orbital refueling demos

2026 goal: 10–25+ flights

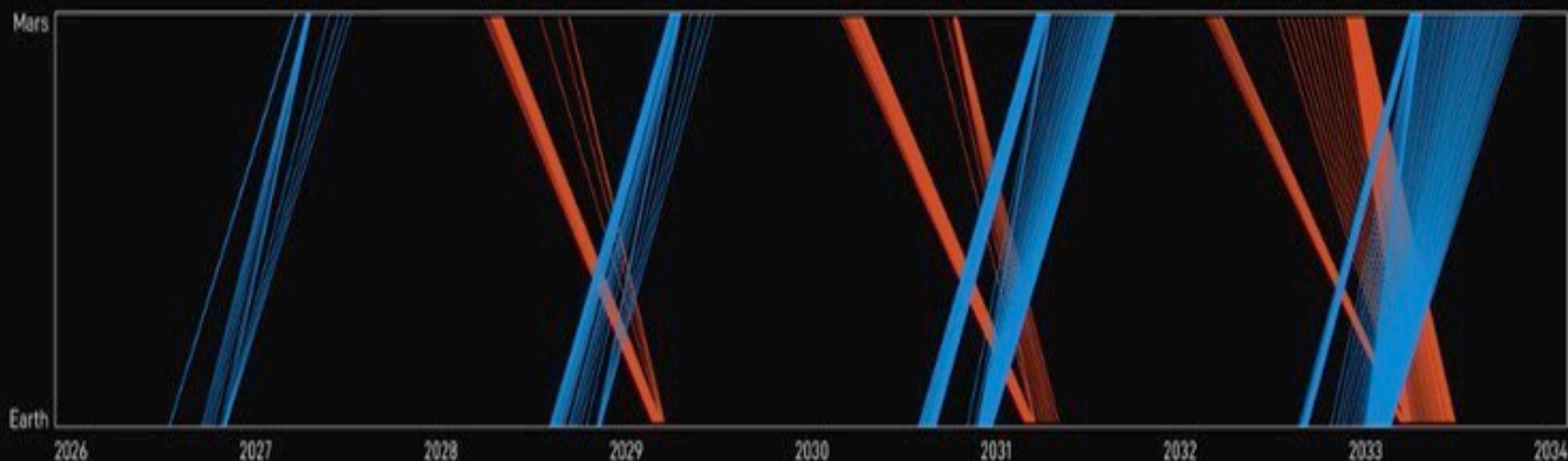
# 星舰进展

完全可重复使用的超重型运载器

截至2026年初约11次试飞

完成助推器捕获与在轨加注演示

2026年目标：10-25次以上飞行



## 2026

|         |   |
|---------|---|
| LANDERS | 5 |
|---------|---|

|                      |    |
|----------------------|----|
| PAYLOAD PER SHIP (t) | 10 |
|----------------------|----|

### GOALS

- Prove we can get to Mars
- Send min viable vehicles with goal of maximize learning
- Demonstrate key technologies needed for Mars transit and landing

## 2028-29

|         |    |
|---------|----|
| LANDERS | 20 |
|---------|----|

|                      |    |
|----------------------|----|
| PAYLOAD PER SHIP (t) | 75 |
|----------------------|----|

### GOALS

- Land initial infrastructure
- Confirm resource availability
- Prep landing areas
- Deliver equipment for people

## 2030-31

|         |     |
|---------|-----|
| LANDERS | 100 |
|---------|-----|

|                      |     |
|----------------------|-----|
| PAYLOAD PER SHIP (t) | 150 |
|----------------------|-----|

### GOALS

- Resource mining & propellant generation
- Build roads & pads
- Habitat construction
- Increase power generation & storage

## 2033

|         |     |
|---------|-----|
| LANDERS | 500 |
|---------|-----|

|                      |     |
|----------------------|-----|
| PAYLOAD PER SHIP (t) | 300 |
|----------------------|-----|

### GOALS

- Increase independence from Earth
- Mine & process Mars resources
- Global mobility
- Global communications

# Starlink Constellation

~9,400 operational satellites (Jan 2026)

Global broadband capacity growth

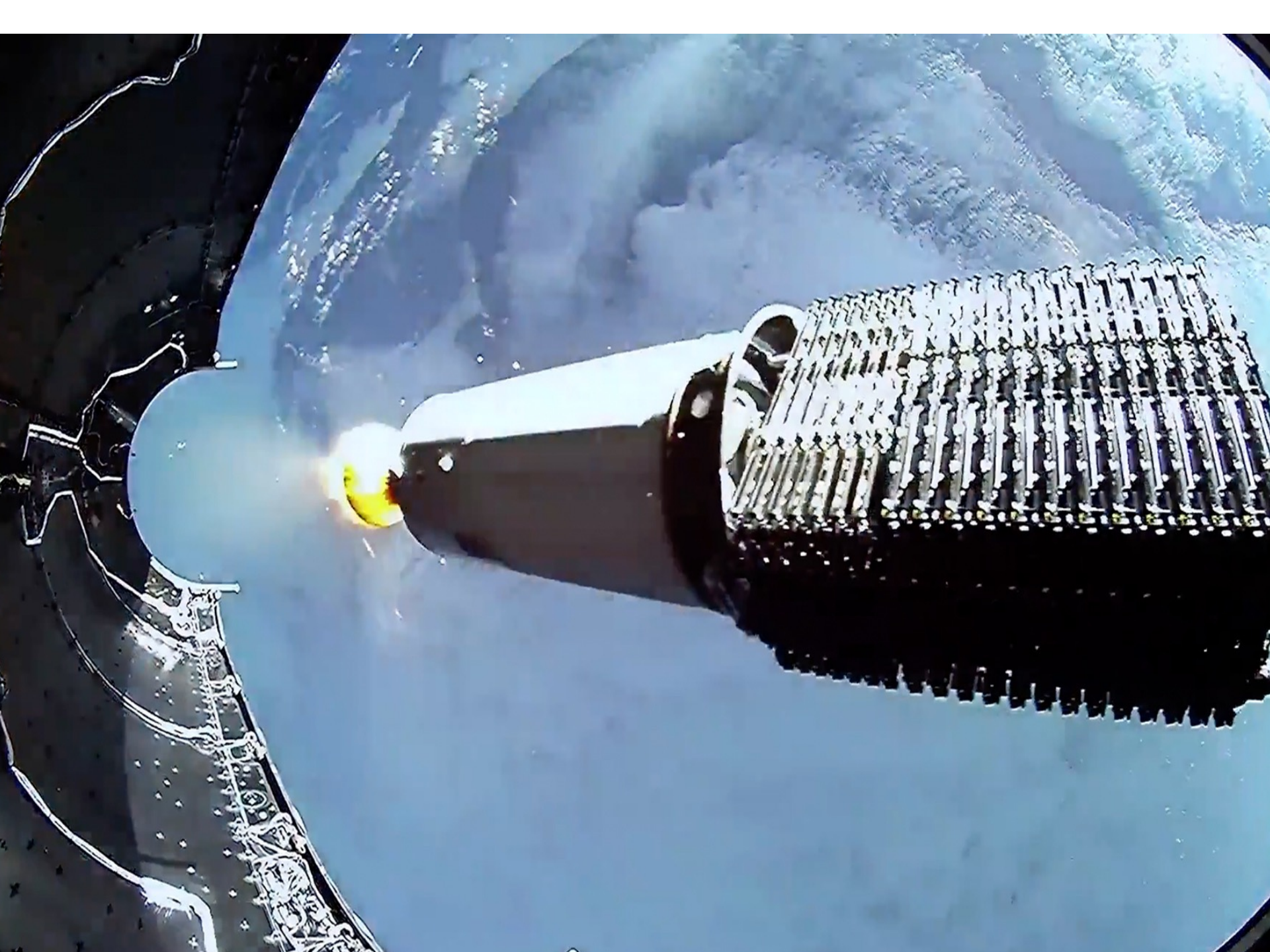
Orbit reconfiguration for sustainability

# 星链星座

约9400颗在轨卫星（2026年1月）

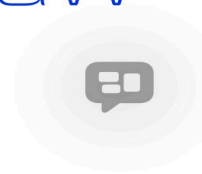
全球宽带容量快速增长

为可持续性进行轨道重构





# Blue Origin Introduces TeraWave, a 6 Tbps Space- Based Network for Global Connectivity



Purpose-built to  
serve enterprise-  
grade customers

# Crew Dragon

Reliable ISS transport since 2020

Multiple crew missions in 2025–2026

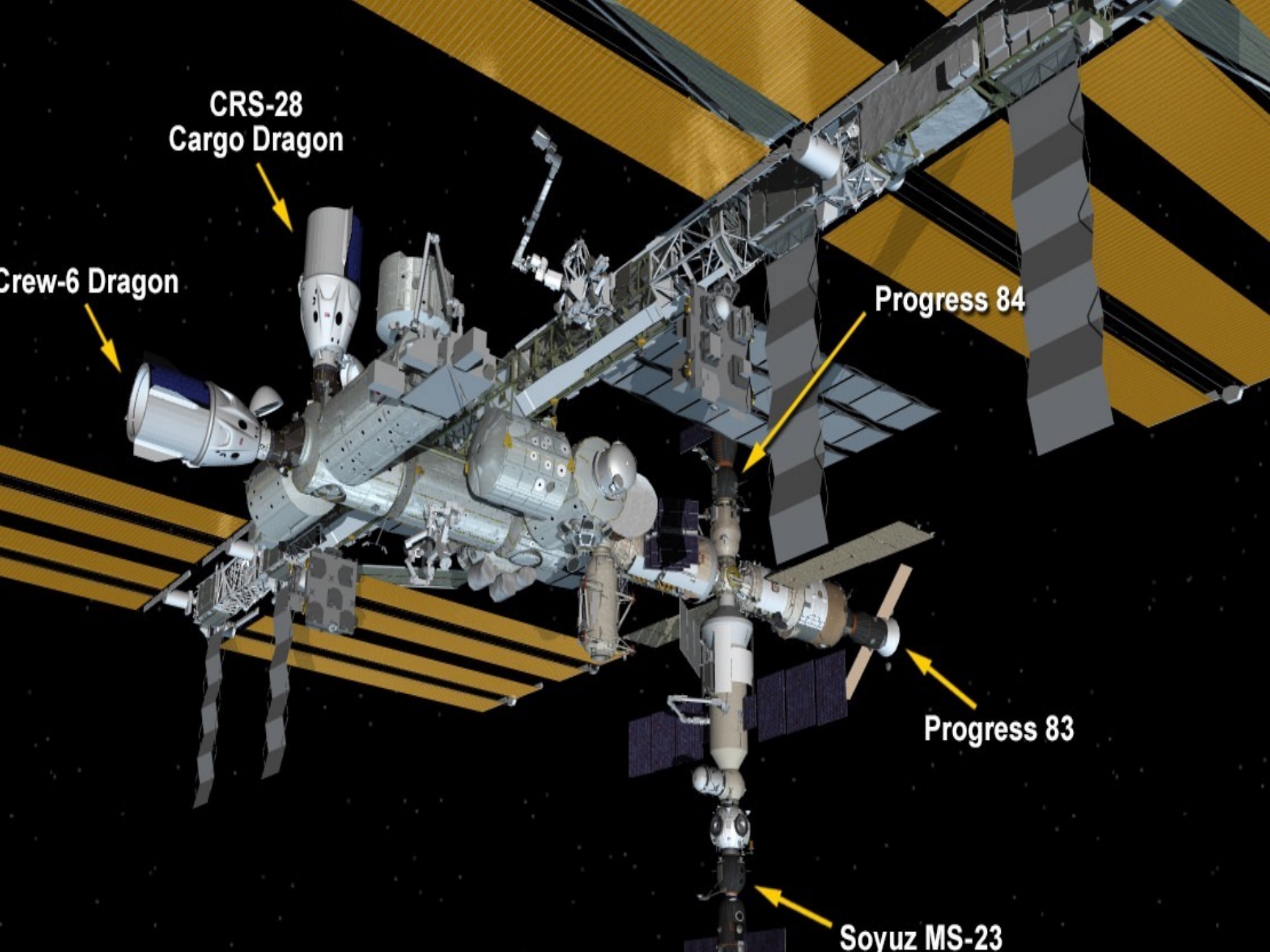
# 载人龙飞船

自2020年起提供可靠的国际空间站运输服务

2025–2026年多次载人任务







**CRS-28  
Cargo Dragon**

**Crew-6 Dragon**

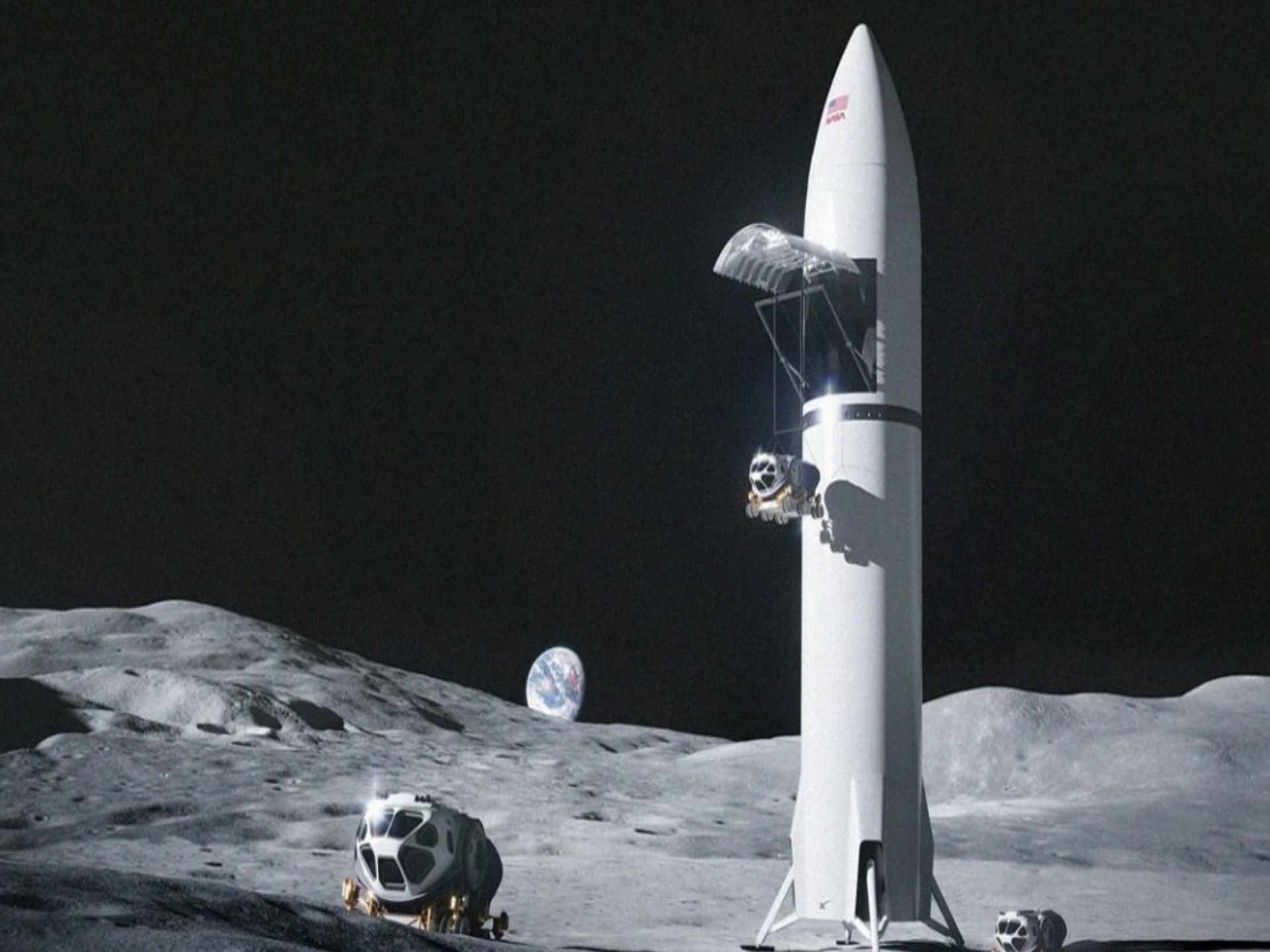
**Progress 84**

**Progress 83**

**Soyuz MS-23**

# Starship HLS for Artemis

Selected for Artemis III lunar landing  
Dedicated crew landing variant



# CONSTRUCTION TIMELINE

Crew

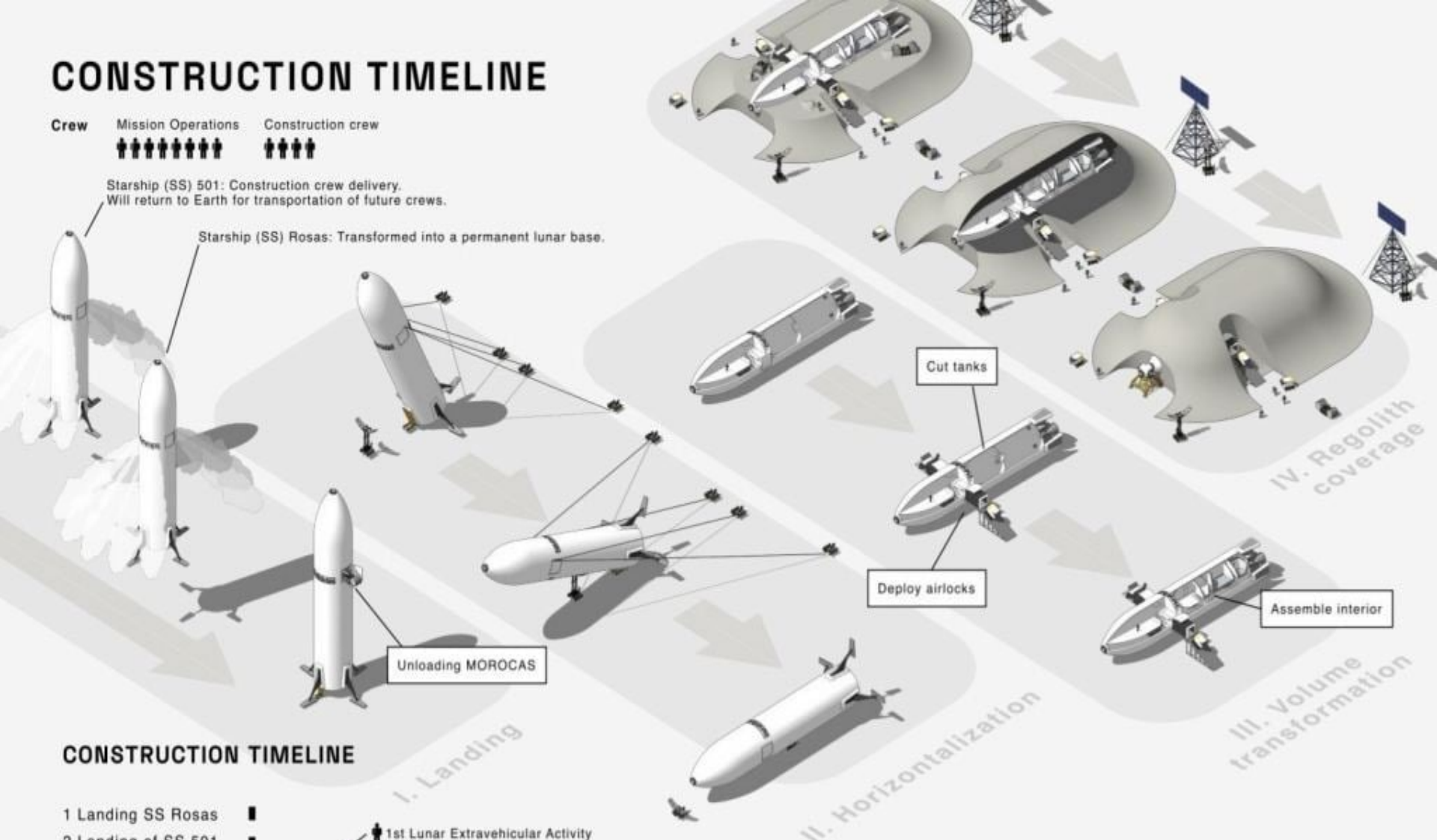
Mission Operations

Construction crew



Starship (SS) 501: Construction crew delivery.  
Will return to Earth for transportation of future crews.

Starship (SS) Rosas: Transformed into a permanent lunar base.



## CONSTRUCTION TIMELINE

1 Landing SS Rosas

2 Landing of SS 501

3 Unloading

4 Horizontalize SS Rosas

5 Volume Transformation

6 Base Installation

7 Rosas Base completed

Time (days)

0

15

37

60

90

120

150

180

1st Lunar Extravehicular Activity (LEVA)

SS 501 Departure to Earth

# Blue Origin Overview

New Glenn orbital launches in 2025  
Reusable booster landings achieved

# 蓝色起源概览

新格伦火箭于2025年实现轨道发射  
成功实现可重复使用助推器着陆

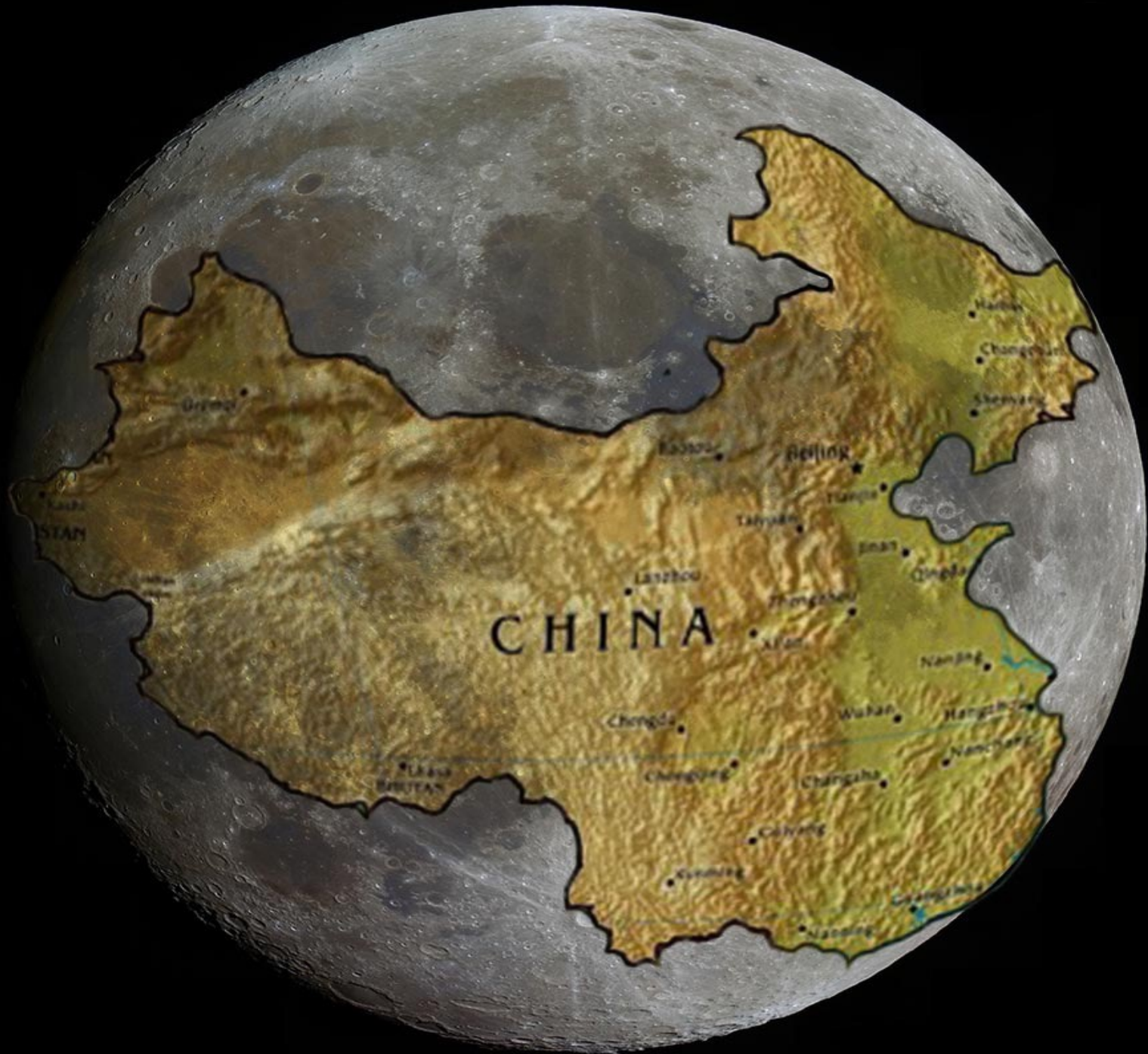
# Blue Moon Lander

Developed for sustained Artemis presence  
National Team partnership

# 蓝月着陆器

用于支持阿尔忒弥斯长期月球驻留  
国家团队合作项目





# Orbital Reef Station

Commercial station with Sierra Space & Boeing  
Planned post-ISS operations

# 轨道礁空间站

由塞拉太空公司与波音公司合作  
计划在国际空间站退役后运行





# Commercial Crew Achievements

Reduced reliance on foreign transport  
Enabled private astronaut missions

# 商业载人计划成就

减少对外国运输工具的依赖  
促成私人宇航员任务

# Commercial Lunar Payload Services (CLPS)

Multiple private lunar landings in 2025  
Firefly Blue Ghost success

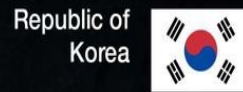
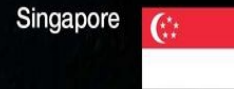
# 商业月球载荷服务（CLPS）

2025年实现多次私人月球着陆  
萤火虫公司“蓝幽灵”任务成功





# ARTEMIS ACCORDS



United for Peaceful Exploration of Deep Space

### Artemis Accords and International Lunar Research Station

-  Countries that are part of the Artemis Accords
-  Countries that are part of the International Lunar Research Station
-  Countries that are part of both the AA and the ILRS

# Artemis Accords – Core Principles (1/2)

Peaceful purposes

Transparency

Interoperability

Emergency assistance

Registration

# 阿尔忒弥斯协定核心原则（上）

和平目的

透明度

互操作性

紧急援助

登记

# Artemis Accords – Core Principles (2/2)

Scientific data release

Preserving heritage

Space resources

Deconfliction (safety zones)

Orbital debris mitigation

# 阿尔忒弥斯协定核心原则（下）

科学数据发布

保护人类遗产

空间资源

解除冲突（安全区）

轨道碎片减缓

# The future

New technologies: no one sees them coming

Global Context and Cooperation Opportunities

Future Outlook and Implications

# Conclusion

US commercial space leads through innovation

2026 is pivotal for operations and exploration

Thank you – questions welcome

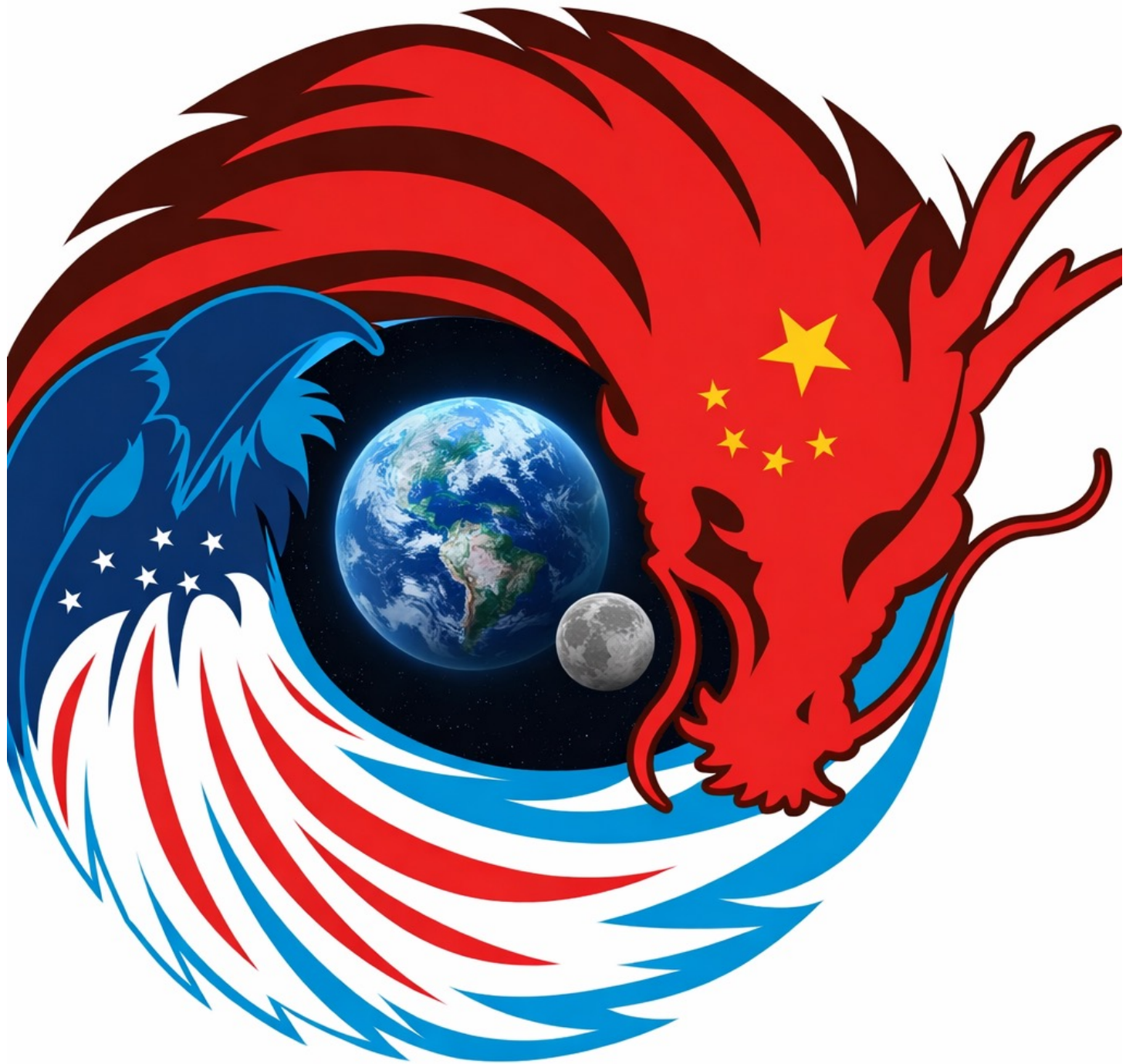
美国商业航天通过创新引领全球

2026年是运营与探索的关键节点

谢谢，欢迎提问

# Q&A

Questions?



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