

Hong Kong's Role in Space Commercialisation

Opportunities and Strategic Positioning

Anthony Neoh SC JP

Chairman, Asian Academy of International Law

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The Global Space Economy



Market Overview

The global space economy has experienced significant growth, driven by increased commercial activities, technological advancements, and new applications across various industries.

- Global space economy reached **\$613 billion** in 2024 (Space Foundation)
- Annual growth rate of **7.8%** since 2020
- Commercial sector constitutes **78%** of total space economy
- Projected to reach **\$944 billion** by 2033 (Novaspac)

Key Market Segments

Satellite services, ground equipment, satellite manufacturing, and launch services form the core of the commercial space economy, with government space budgets providing additional support.

Satellite Types and Applications



“T” Communication Satellites

Enable global telecommunications, internet connectivity, broadcasting, and mobile services.

- Television and radio broadcasting
- Internet services and mobile networks
- Maritime and aviation communications

Navigation Satellites

Provide positioning, navigation, and timing services worldwide.

- GPS, BeiDou, Galileo, GLONASS systems
- Transportation and precision agriculture

📷 Earth Observation Satellites

Monitor Earth's surface, atmosphere, and oceans for various applications.

- Weather forecasting and climate monitoring
- Disaster management and response
- Urban planning and environmental protection

📶 Internet of Things (IoT) Satellites

Connect remote sensors and devices globally, enabling data collection from anywhere.

- Asset tracking and fleet management
- Remote infrastructure monitoring
- Agricultural and environmental sensing

🔬 Scientific Research Satellites

Conduct space-based research and astronomical observations.

- Space telescopes and observatories
- Earth science and space weather monitoring

Orbit Types and Characteristics



Key Orbital Characteristics

Orbit selection impacts satellite performance, coverage, latency, lifespan, and operational costs. Each orbit type offers distinct advantages for specific applications.

Characteristic Impact on Operations

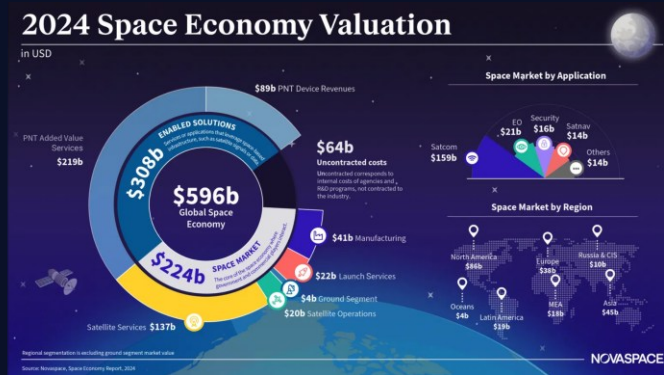
Altitude	Determines coverage area, signal strength, and latency
Inclination	Affects geographic coverage and revisit frequency
Period	Time to complete one orbit; impacts operational planning

Parameter	LEO	MEO	GEO
Altitude	350-1,200 km	5,000-20,000 km	36,000 km
Latency	Low (<60ms)	Medium (80-150ms)	High (~500ms)
Coverage	Small per satellite	Medium	Large (semi-global)
Satellites for global coverage	>300	6-12	3
Lifespan	3-7 years	10-15 years	15+ years
Key applications	Earth observation, IoT, broadband	Navigation, timing	Broadcasting, fixed communications

Emerging Trends

LEO constellations are gaining prominence for low-latency applications, while GEO remains essential for broadcasting and wide-area coverage. Hybrid networks combining multiple orbit types are becoming increasingly common.

Orbit Economics and Operations



Parameter	LEO	MEO	GEO
Launch Cost Range	\$5-67M	\$20-50M	\$70-300M
Cost per kg	\$1,200-10,000	\$5,000-15,000	\$9,000-20,000
Satellite Cost	\$0.1-5M (small) \$0.4M (Starlink)	\$10-50M	\$50-400M
Replacement Cycle	5-7 years	10-12 years	15+ years
Ground Infrastructure	Multiple gateways	10-30 stations	Ground Control Infrastructure

Economic Considerations

Orbit selection significantly impacts satellite economics through launch costs, operational lifespan, replacement frequency, and ground infrastructure requirements.

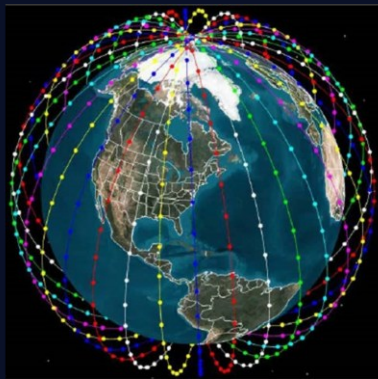
Operational Challenges

Each orbit type presents unique operational challenges, including space debris management, collision avoidance, and end-of-life disposal requirements.

Market Trends

LEO constellations are seeing rapidly decreasing satellite and launch costs, while GEO satellites maintain advantages in longevity and coverage efficiency. Hybrid networks combining multiple orbit types are becoming increasingly common for optimised service delivery.

Key Global Satellite Operators



GEO Satellite Operators

Operator	Founded	Headquarters	Key Services
Intelsat/SES	1964/1985	Luxembourg	Global communications, media
Eutelsat	1977	France	Broadcasting, broadband
AsiaSat	1988	Hong Kong	Asian regional services
APT Satellite	1992	Hong Kong	APAC communications
ChinaSatcom	2009	China	Domestic Chinese services

GEO operators typically focus on broadcasting, fixed communications, and high-throughput data services across large coverage areas with fewer satellites.

LEO Satellite Operators

Operator	Founded	Satellites	Key Services
Starlink (SpaceX)	2019	~9,000	Global broadband
OneWeb	2012	~650	Global broadband
Kuiper (Amazon)	2019	~80	Global broadband
Xing Wang	2022	~40	Chinese broadband
Spacesail	2023	~90	Chinese commercial
Iridium	1997	66	Global voice, IoT

Market Dynamics

LEO operators are rapidly expanding with large constellations focused on low-latency broadband and IoT services, while established GEO operators are adapting with high-throughput satellites and hybrid network strategies.

Strategic competition is intensifying between US, European, and Chinese operators, with increasing government support for domestic space capabilities.

Hong Kong's Established Space Industry



AsiaSat

AS

Founded: 1988

Satellites: 6 in-orbit satellites (AsiaSat 5, 7/8, 6, 9, 4)

Coverage: Asia-Pacific region

Services: Video distribution, DTH, cellular backhaul, enterprise networks, maritime and aeronautical mobility

🏆 First foreign satellite (AsiaSat 1) launched by Chinese Long March 3 Launch Vehicle

🏆 Broadcast support for 8 Olympic Games and 4 Winter Olympic Games

🏆 Carries over 500 international channels reaching 800+ million households

APT Satellite (APStar)

APT

Founded: 1992

Satellites: 6 in-orbit satellites (Apstar 7, 6C/6D/6E, 5C, 9)

Listed: Hong Kong Stock Exchange (Stock Code 1045)

Parent: Subsidiary of China Satellite Communications Co. Ltd.

Hong Kong has been a significant hub for GEO satellite communications for over 30 years, with AsiaSat and APStar playing major roles in providing regional services.

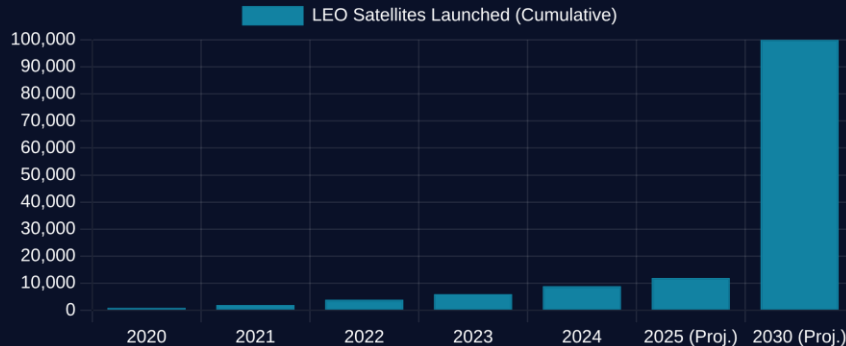
Hong Kong's satellite operators have maintained strong relationships with both Chinese and international partners, serving as a bridge between mainland China and global markets.

Recent developments include new satellite operators like Hong Kong Aerospace Technology Group, which opened a new satellite manufacturing facility in 2023, expanding Hong Kong's space industry capabilities.

LEO Satellite Market Trends



LEO Satellite Growth



Market Drivers

LEO constellations are experiencing rapid growth driven by decreasing launch costs, miniaturization of satellite technology, and increasing demand for global broadband connectivity and IoT services.

Key LEO Constellation Trends

- Rapid Deployment:** Starlink has launched ~9,000 satellites since 2019, with plans for 34,400 by 2030
- Chinese Expansion:** Xing Wang (13,000+ planned) and Spacesail (15,000+ planned) are rapidly developing national LEO constellations. Also, many startups on narrow market segments (sensing, IOT with small constellations).
- Technology Evolution:** Inter-satellite laser links, phased array antennas, and AI-powered collision avoidance systems are becoming standard
- Direct-to-Cell:** New satellites enabling direct connectivity to standard smartphones without specialized equipment
- Challenges:** Space debris concerns, spectrum allocation conflicts, and regulatory hurdles are increasing with constellation density




By 2030, LEO constellations are projected to account for over 100,000 satellites, creating new opportunities and challenges for space traffic management and commercial services.

China's Space Industry Capabilities

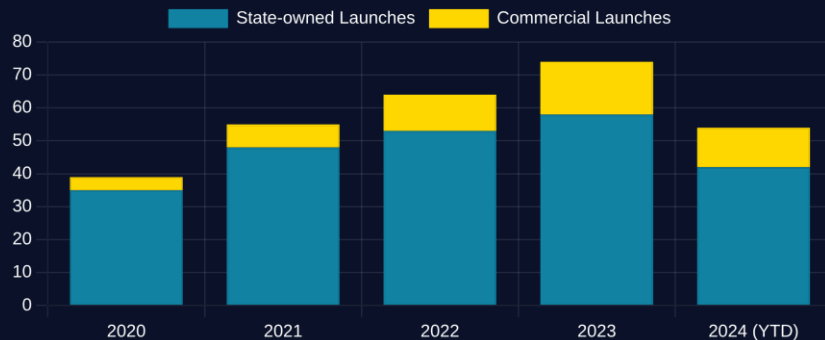


Satellite Manufacturing Capacity

China has rapidly expanded its satellite manufacturing capabilities with over 58 facilities across the country:




-  **37 operational facilities** with combined annual capacity exceeding 2,000 satellites
-  **21 facilities under construction or planned**, adding capacity for 2,000+ additional satellites annually
-  **Key manufacturing hubs** in Shanghai, Wuhan, Beijing, Tianjin, and emerging facilities in Hainan
-  **Notable facilities:** Shanghai Micro-satellite factory (300/year), Geely satellite factory (500/year), Hainan Wenchang super factory (1,000/year)

Chinese Orbital Launches



Launch Vehicle Capabilities

China has developed a comprehensive range of launch vehicles for various mission profiles:

-  **State-owned providers:** Long March family (CZ-2/3/4/5/6/7/8/11/12) covering payloads from 500kg to 25 tons
-  **Commercial providers:** Galactic Energy, Space Pioneer, Landspace, iSpace, Deep Blue Aerospace with growing capabilities
-  **Reusable technology:** Multiple companies developing reusable first stages, with first tests completed in 2023-2024

China's space industry has seen significant commercialisation since 2014, with over 50 commercial space companies established and increasing integration with the global space economy.

Hong Kong's Competitive Advantages



Legal and Regulatory Framework

- ✓ Well-established common law system with strong intellectual property protection
- ✓ Internationally recognized legal arbitration capabilities for commercial disputes
- ✓ Potential to develop specialized space law expertise and arbitration services

International Connectivity

- ✓ Strategic position as a bridge between China and international markets
- ✓ Strong international business networks and multicultural workforce
- ✓ Gateway for Chinese space companies seeking international expansion

Financial Services

- ✓ Global financial center with deep capital markets and investment expertise
- ✓ Sophisticated insurance and risk management capabilities
- ✓ Experience in Series B+ funding for technology companies
- ✓ Potential to develop specialized space insurance and financing products

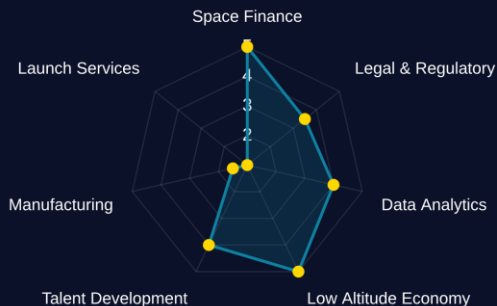
Current Limitations

- Limited access to space technologies due to export control restrictions
- Insufficient specialized technical talent in space engineering
- Lack of comprehensive government policy framework for space industry
- Limited manufacturing supply chain for space hardware
- High cost of living and business operations compared to mainland cities

Strategic Opportunities for Hong Kong



Hong Kong Space Opportunity Assessment



\$ Financial Services

- > **Space Insurance:** Develop specialized insurance products for satellites and launches

Potential: ★★★★★

⚖️ Legal and Regulatory Services

- > **Space Law:** Develop expertise in international space law and arbitration services

Potential: ★★★☆☆

💾 Data Services

- > **Earth Observation Analytics:** Develop value-added services using satellite data

Potential: ★★★★★

✈️ Low Altitude Economy

- > **Urban Air Mobility:** Develop services for drones and air taxis

Potential: ★★★★★

Strategic Action Plan Overview



Phase 1: Foundation Building (2025-2027)



Establishing policy frameworks, developing financial services and insurance capabilities, creating legal frameworks, and initiating talent development programs.

Phase 2: Capability Building (2027-2030)



Developing data analytics and earth observation services, low altitude economy applications, and expanding international collaboration and market access.

Phase 3: Market Leadership (2030-2035)



Advancing into high-value global applications establishing global leadership in space finance and investment.

Strategic Focus Areas

The action plan focuses on Hong Kong's competitive advantages:

- Financial services and space insurance
- Legal expertise and regulatory frameworks
- International connectivity and market access
- Data analytics and value-added services
- Low altitude economy applications

A Phased Approach to Space Commercialisation

This strategic roadmap presents a comprehensive 10-year plan for Hong Kong to establish itself as a key player in the global space commercialisation ecosystem, leveraging its unique strengths while developing new capabilities in targeted areas.