

Space Policy – What is it and Why is it Needed?

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Space Policy In Asia

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- Space issues facing the international community
- Why do States decide to develop a space policy and a space agency?
- Space policy development

- Growth in number of space actors, especially from emerging space States
 - In past decade, spacefaring States increased from 27 to over 50
 - Launching states = 8
 - S. Korea may soon make it 9
 - Increases number of possible partners for cooperation
 - Increases opportunity for beneficial international agreements on management of space activities
 - Increases crowding in key orbits

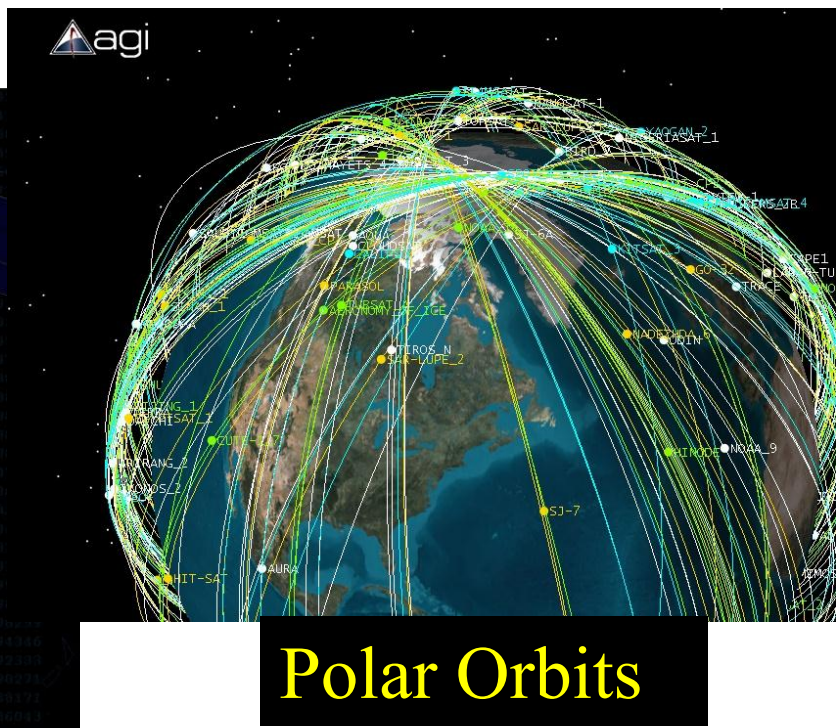
- Rapid expansion of space activities, including space tourism
 - Many more Earth observing systems in low Earth orbit
 - Position, Navigation & Timing (PNT) systems in mid-Earth orbit (MEO)
 - Many more communication satellites in GeoSynchronous Orbit (GSO)
 - Startup space tourism services to near Earth orbit
 - Long term plans for orbital space tourism

- Increased recognition of need to guarantee the sustainability of space activities, given
 - Increasing crowding in key orbits
 - Increasing amounts of debris in space
 - Future threat of debris-causing weapons in space

Crowding in Key Orbital Regimes

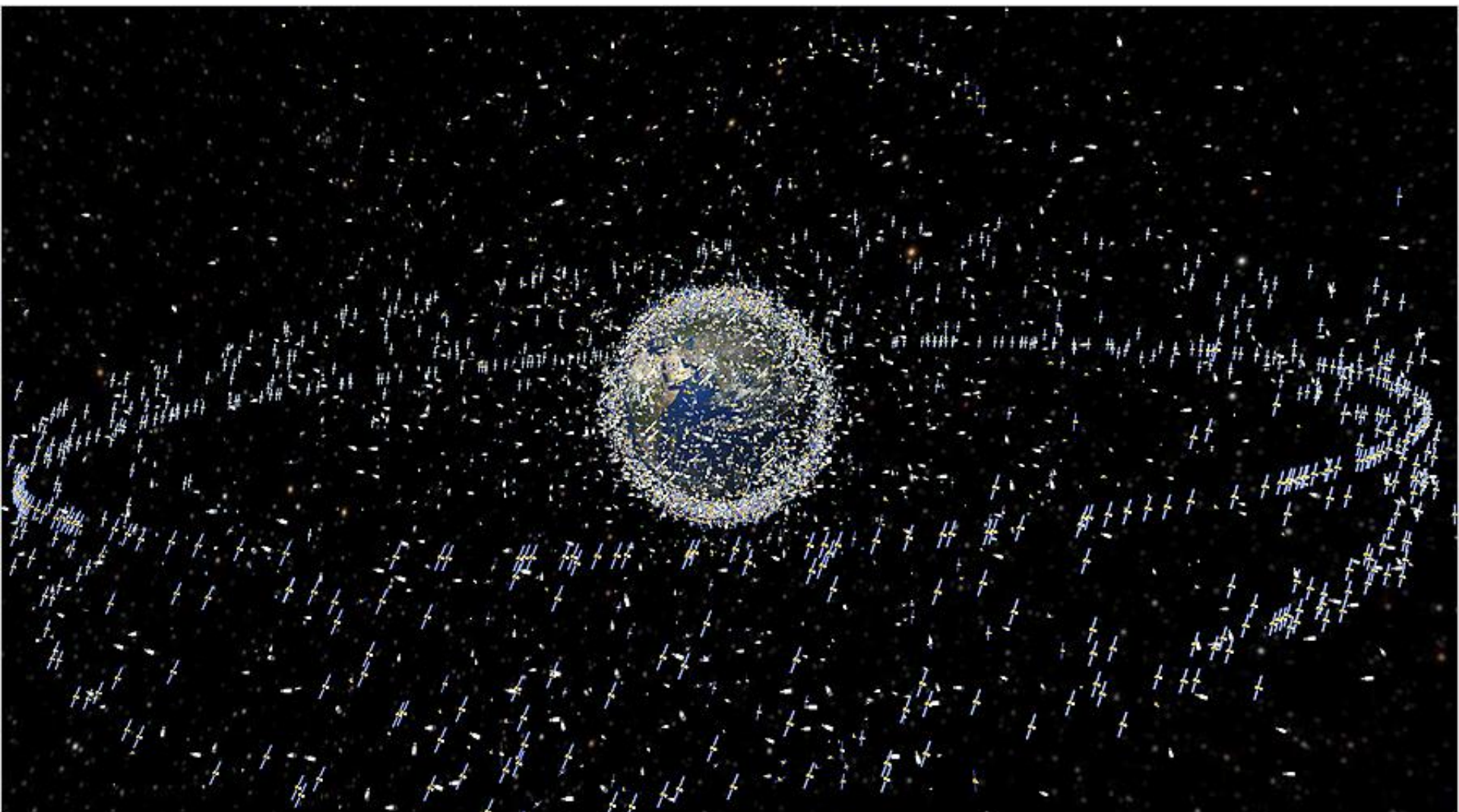
Promoting Cooperative Solutions for Space Security

- Polar orbits (Earth observation satellites)
- Geosynchronous orbits (communications satellites)



Debris in Orbit

Promoting Cooperative Solutions for Space Security



- How to improve use of space resources for the benefit of humanity
 - Broadband internet from space systems
 - Use of satcom for tele-health, tele-education
 - improvement of delivery of public good space benefits to the end user, e.g.,
 - Response to natural disasters
 - Management of natural resources (water, forests)
 - Integration of space data with terrestrially-derived data
 - Position, Navigation and Timing (PNT) services to improve safety of life, economical delivery of services, etc.

- Need for more States to ratify space treaties
- Need for coordinated international approach to the long-term threat of near Earth objects (NEOs)—asteroids, comets

- Advance technological development, e.g.,
 - Information technologies
 - Communication
 - Health
 - Resource management
- Advance in-country scientific capacity
- Improve use and management of State resources
- Advance industrial capacity & economy
- Gain international prestige as part of the “space club”
- Improve national security

States Vary Widely in Resources and Ambitions

Promoting Cooperative Solutions for Space Security

- States with large economies and advanced technology:
 - Develop full range of capabilities, including human spaceflight
 - Russia, United States of America, China
- States with medium to relatively large economies:
 - Generally develop wide range of capabilities:
 - Enhance overall scientific and technological prowess
 - provide a range of benefits to their citizens
- States with modest resources:
 - Cannot match investments of larger States
 - Nevertheless can develop an active, but more narrowly focused, space program

- For success today, space activities require:
 - Long term public and private funding , depending on type of activity
 - Clear focus on policy goals
- Investment in space systems is largely a governmental activity:
 - The scale of the investment
 - Public goods (improved weather forecasting, natural resource management, national security, etc.)
- Important partners:
 - Private sector
 - Universities, other educational entities
 - Other States

Policy is shaped by coalitions stakeholders

	SCIENCE	TECHNOLOGY	COMMERCE	SECURITY	AUTONOMY	FINANCE
STAKE-HOLDERS	Scientists	Engineers	Business	Defense & Intelligence	Politicians	Treasury
VALUES	Shared knowledge	Innovation, Competitiveness	Competitiveness, Profit	Stability predictability	National security, Prosperity	Fiscal discipline, Priorities
VIEW SPACE ACTIVITIES AS	Object of Scientific exploration	Opportunity to improve quality & technological Capability	A growing business opportunity	Space for intelligence, Force enhancer	National prestige, foreign policy tool, Intl negotiating power, regional autonomy	In cost vs. benefit terms
FUTURE TRENDS	Global science	Sharing costs & risks	Global supply chains	Situational awareness	Regional cooperation	Cost sharing

A space agency is not sufficient

- A policy (or group of policies) allows government to focus its investments and to shape the evolution of the space arena
- Without a formal policy, activities tend to evolve in an ad hoc manner among different agencies and may lack coherence and long-term sustainability
- A well-structured space policy can assist capacity-building and sustainable development
 - Science and technology education
 - Technology development

- All space activities are ultimately funded by individuals - but expectations of risks and rewards differ:
 - Public sector: tax payers (many, low individual risk)
 - Private sector: investors (fewer, higher risk)
- Private sector can, and should be, a major partner in executing space policy
- The policy challenge is to establish the “right” level of investment in publicly-funded space activities

Ad hoc policy making can result in regulatory and political inconsistencies and creates industry and market uncertainty

- Ongoing tension between –
 - Government promoting certain public good activities for long term societal benefit and
 - Market forces that promote short to medium term investment decisions
- U.S. examples of conflicting policies
 - Commercial launch policy in 1980s
 - Commercial remote sensing policy in 1980s

- Technology development:
 - Governments are generally not good at picking “winners” in marketplace and can waste lots of taxpayer funds on dead-end projects
 - Governments can help with funding more basic and generic research
- Public policy must confront issues of:
 - Public safety
 - Resource allocation (e.g. spectrum; comparative investment)
 - Environmental protection (Earth and space)
 - Technology transfer

REDUCE MARKET RISK

- Targeted R&D programs for key technologies
- Supportive regulatory environment
- Low-interest loans or loan guarantees
- Direct subsidies for development of beneficial new technologies or systems
- Liability indemnification

IMPROVE RETURN ON INVESTMENT

- Tax relief for risky investments
- Patent licensing
- Provision of infrastructure
- Guaranteed government contracts

- The public is generally poorly informed about the benefits of space technology and the value of investing in space activities.
 - Important to invest in public awareness programs about the value of space activities to individual and collective welfare
 - E.g., in U.S., the heavy emphasis on human spaceflight reduces appreciation of benefits from Earth observations,
- Space-related non-governmental organizations (NGOs) can play a significant role in building awareness, e.g.,
 - Space Generation Advisory Council (SGAC)
 - Planetary Society
 - World Space Week

- Increasing numbers of space actors means greater opportunities for cooperative activities
- Developing partners creates the potential for expanding capacity beyond the capabilities of any one country
- International forums assist capacity building
 - Global Earth Observations System of Systems (GEOSS)
 - Committee on Earth Observation Satellites (CEOS)
 - UN Committee on the Peaceful Uses of Outer Space (COPUOS)
 - UN Office of Outer Space Affairs (OOSA)
 - Scientific unions , professional societies

- Ability to continue to use space for its benefits not guaranteed
 - Increasing crowding in some key orbits
 - Increasing amounts of orbital debris
 - Use of space weapons threatens space environment
 - Anti-satellite weapons
 - Jamming of satellite signals

New Entrants Should Consider

Promoting Cooperative Solutions for Space Security

- Ratifying the 1967 Treaty on Outer Space and the later international agreements
 - Also, incorporating treaty provisions in State law, regulations
- Taking active part in COPUOS and its subcommittees
- Contributing constructively to other international space-related organizations
- Taking an active role in assuring the long term sustainability of outer space.
 - Adherence to the Orbital Debris Guidelines
 - Membership in technical committees focused on sustainability

THANK YOU!

QUESTIONS?