

Perspectives on Space Sustainability

Space Science & Security: The Role of Regional Expert Discussion Delhi, India

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21 January 2011

- Introduction—The Benefits of Space Activities
- Threats to Space Sustainability
- Reaching Space Sustainability
- Sustainability in COPUOS

- Humanity gains many benefits from activities in outer space, e.g.,
 - Weather prediction
 - Climate monitoring
 - Precision farming
 - Banking transfers
 - Transportation efficiencies
 - Biodiversity monitoring
 - Assists national security

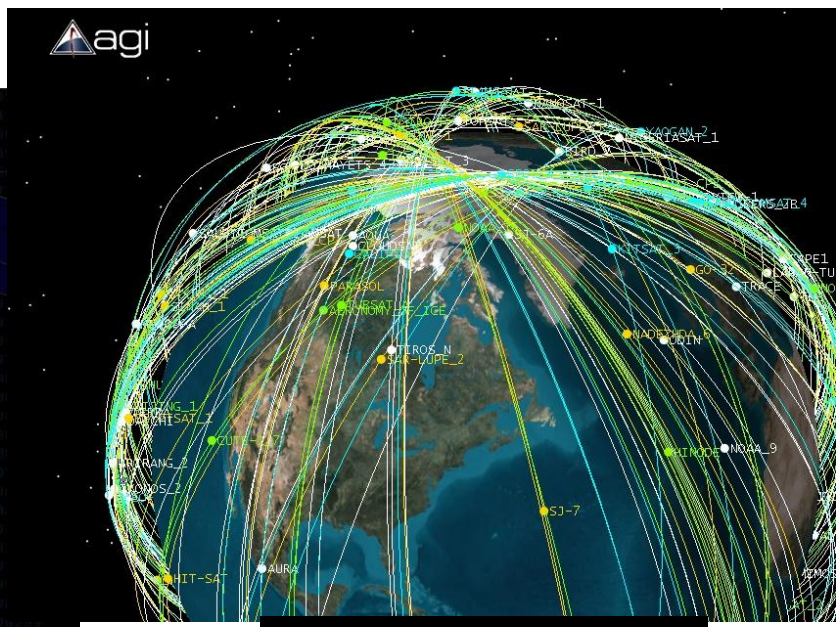
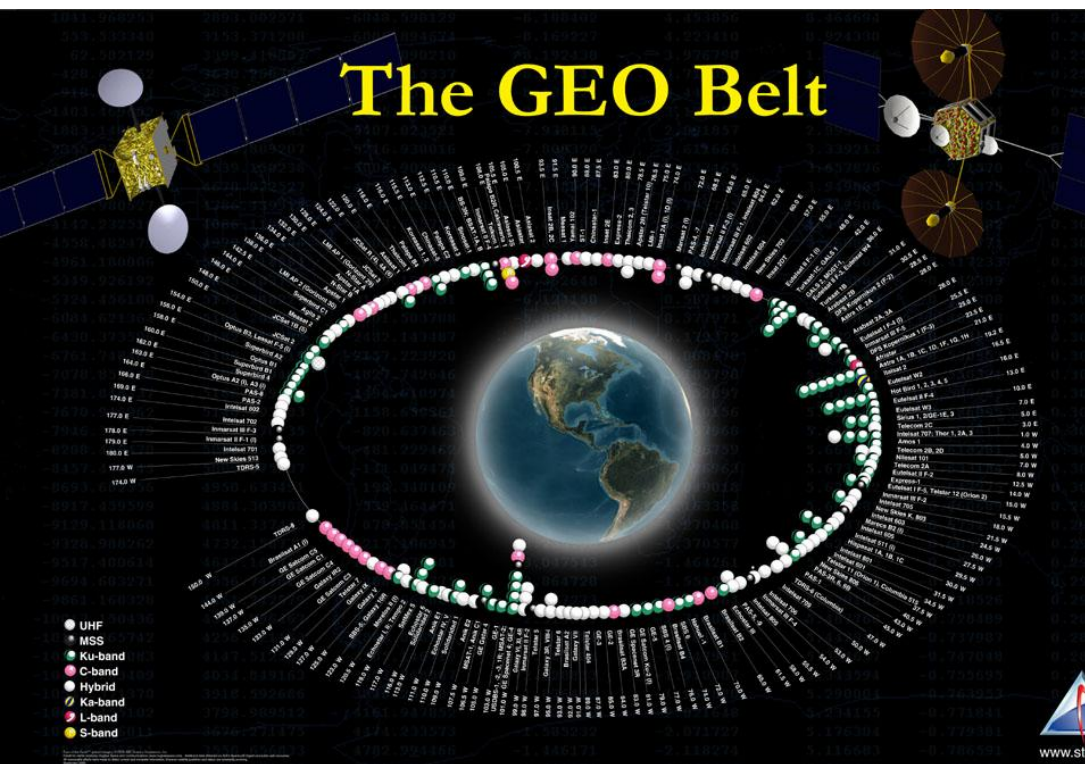
Can we sustain these benefits?

- Space systems are becoming global utilities that provide critical modern infrastructure for all the nations and people on Earth.
- Outer space is the only global commons that borders on every single nation.
- Space systems are at the nexus of security, strategic stability, scientific and technological development, sovereignty and human progress.

Near-Earth Space is a Limited Resource

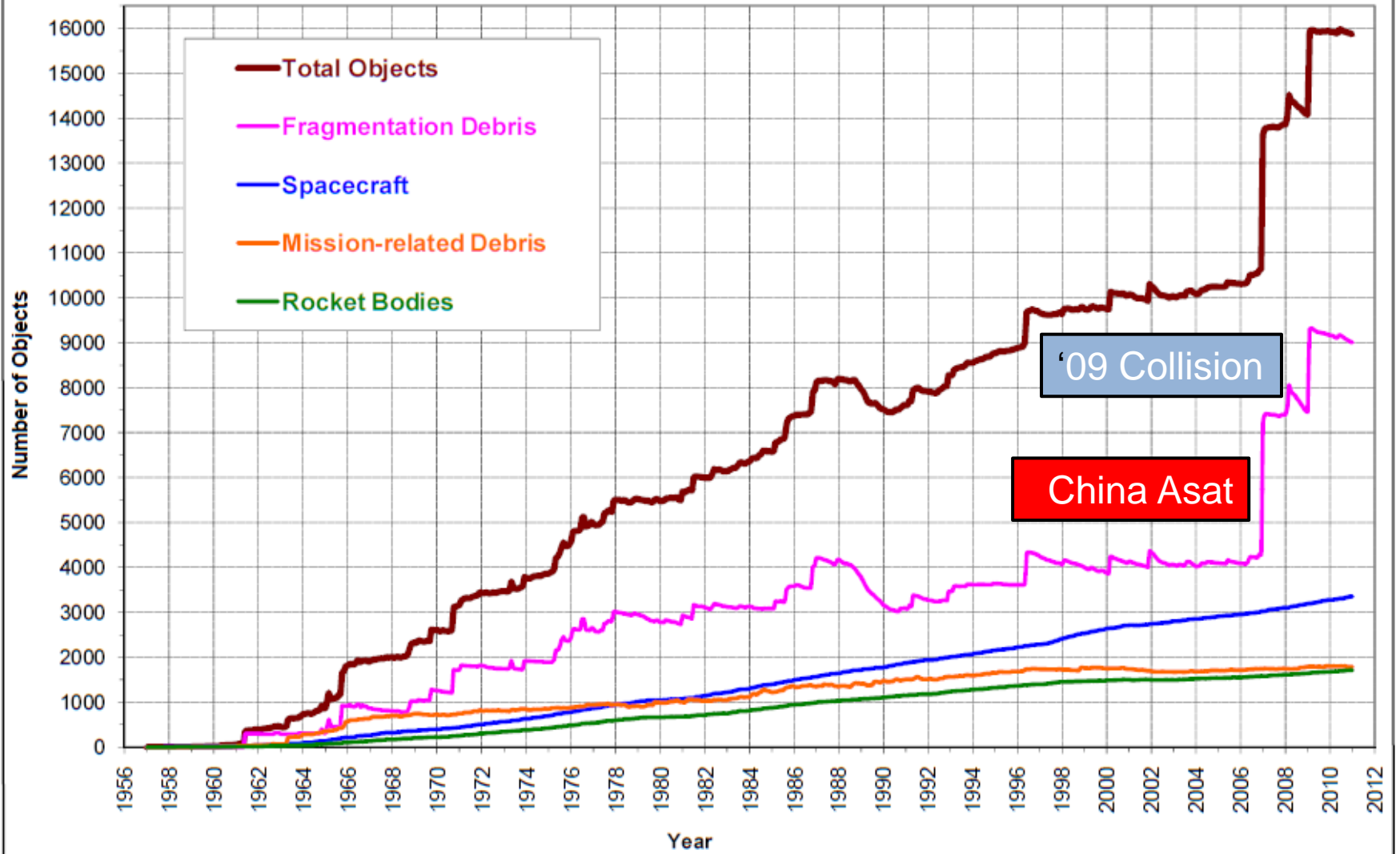
Promoting Cooperative Solutions for Space Security

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



Polar Orbits

Monthly Number of Objects in Earth Orbit by Object Type



'09 Collision

China Asat

Sustainability is Threatened

Promoting Cooperative Solutions for Space Security

- By increasing numbers of space actors with multiple systems in orbit
- By debris from normal operations
- By debris fragmentations
- By the Feb. 2009 accidental collision between an operating Iridium satellite and a defunct Russian Cosmos satellite
- By anti-satellite tests
- By other space weapons
- By frequency interference
- Space weather

- What is Space Sustainability?
 - One definition: Using outer space in such a way that all humanity can continue to use it for socioeconomic benefit and peaceful purposes
- Multiple stakeholders groups and dimensions
 - Each with its own logic, concerns and values
 - Self-interest is the common denominator
- Reaching sustainability of activities in outer space requires
 - International cooperation;
 - Discussion; and
 - International agreements designed to ensure that outer space is safe, secure and peaceful.

- UN COPUOS – Vienna
- UN General Assembly – New York
- International Telecommunication Union (ITU) – Geneva
- World Meteorological Organization (WMO) – Geneva

- Conference on Disarmament (CD) – Geneva
 - UN Institute for Disarmament Research (UNIDIR) -- Geneva

- Specialized agencies

- UN COPUOS (Committee on the Peaceful Uses of Outer Space) is the primary international forum for the development of laws and principles governing activities in outer space.
- A standing committee of the UN, founded in 1959
 - Currently 69 Member States and many permanent observers
 - The technical work carried out by two subcommittees
 - Legal Subcommittee (LSC)
 - Scientific and Technical Subcommittee (STSC)
 - Decisions are reached by consensus
 - Secretariat is the UN Office for Outer Space Affairs (UN Centre Vienna) Does not discuss disarmament-related issues

What COPUOS Has Contributed

Promoting Cooperative Solutions for Space Security

- Five Treaties on Outer Space
- Legal Principles Governing Activities of States, Remote Sensing, Nuclear Power Sources, Direct TV Broadcasting and International Cooperation
- Over 110 Gen Assy resolutions & recommendations on outer space matters
- UN Program on Space Applications
 - Regional Centers for Space Science & Technology Education
 - SPIDER (Disaster Management)
- International Committee on GNSS

COPUOS Activities Relating to Space Security/Sustainability

Promoting Cooperative Solutions for Space Security

- UN COPUOS Space Debris Mitigation Guidelines
- UN COPUOS/IAEA Safety Framework for Nuclear Power Source Applications in Outer Space.
- Working Group on Long-Term Sustainability of Outer Space Activities of the STSC

WG ON LONG-TERM SUSTAINABILITY OF SPACE ACTIVITIES

OBJECTIVE

- To propose and examine measures to ensure the safe and sustainable use of outer space for peaceful purposes, for the benefit of all countries.

CHALLENGES

- Many views of what constitutes “sustainability”.
- Established space actors concerned that any resolutions should not limit their freedom to act in space.
- Emerging space nations concerned that any resolutions should not impose unacceptable barriers to new entrants in the space arena.

- Sustainable space utilization supporting sustainable development on Earth:
 - Contribution of space science and tech. to sustainable development on Earth;
 - The concept of sustainable development extended to the domain of outer space;
 - Technical capacity-building for developing countries;
 - Equitable access to the limited resources of outer space;
- Space debris:
 - Measures to reduce the creation and proliferation of space debris;
 - Collection, sharing and dissemination of data on space objects;
 - Re-entry notifications regarding substantial space objects;
- Space weather:
 - Collection, sharing and dissemination of data;
 - Sustaining a global observation capability;
 - Measures to mitigate the impact of space weather phenomena on operational space systems;

Space operations:

- Collision avoidance processes and procedures;
- Pre-launch and pre-manoeuvre notifications;
- Common standards, best practices and guidelines;

Tools to support collaborative space situational awareness:

- International, multinational or national registry of operators and contact information;
- International, multinational or national data centres for the storage and exchange of information on space objects and operational information;
- Information-sharing procedures;

Regulatory regimes:

- Adherence to existing treaties and principles on the peaceful uses of outer space;
- Regulating space activities of the nationals of Member States;

- Guidance for new entrants in the space arena:
 - Technical standards, best practices and lessons learned for the successful development and operation of space systems, from the pre-launch phase to the end-of-life phase;
 - Microsatellites and smaller satellites.

Working Group Outcomes

Promoting Cooperative Solutions for Space Security

- Report containing consolidated set of current best practices and operating procedures, technical standards and policies on the safe conduct of space operations.
- WG to produce a set of recommended voluntary guidelines for space operations
 - to reduce collectively the risk to space operations for all spacefaring actors and
 - to ensure that all countries are able to have equitable access to the limited natural resources of outer space.
- Recommendations will be non-binding
 - Non-binding does not mean non-legal
 - Translation into national law, licensing practices

Questions?

Thanks!