

Current international space security (sustainability) activities and initiatives

Peter Martinez

National Research Foundation/SAAO

South Africa

Outline

- Space infrastructure
- Space Security and Space Sustainability
- Why this is an international issue?
- Actors

- Space in the UN system
- COPUOS WG on Long-Term Sustainability of Outer Space Activities

- Other related initiatives

Space Infrastructure

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

Space Security

- Security is about being free of danger or threat
- Space security is about preserving the safety of the space environment for space actors, so that they may continue to use outer space for their purposes.
- Driven by the notion that security on Earth is increasingly underpinned by security in space.
 - Concerned with preserving order, predictability and safety in space and avoiding actions that would ultimately undermine freedom of action in outer space.
 - Aims to ensure freedom of threats (ground or space based) to the effective access to and utilisation of space .
 - Concerned about weaponisation of outer space (Although hard to define a space weapon).

Perceived to be the concern of predominantly the space actors, and focusing on security of operations in space.

Space Sustainability

- **Sustainability** is about being able maintain an activity at a certain rate or level
- **Space Sustainability** is about using outer space in such a way that all humanity will be able to continue to use it in future for peaceful purposes and for societal benefit.
- Driven by the realisation that the Earth's orbital environment and EM spectrum are limited natural resources.
 - Concerned with ensuing that the benefits of space will continue to be accessible to future generations.
 - Raises issues about equitable and responsible access to and use of space resources.
 - Seen in the context of wider sustainability discussions.


Concern of all beneficiaries of space applications, including those not active in the space environment, and focuses on development on Earth.

Why is this an international issue?

- Space is a global commons - Res Communis
 - Whether this is true in practice is arguable.)
- Security of space operations is threatened by
 - Debris (deliberate or accidental, + collisions)
 - Interference (deliberate and unintentional)
 - Space weather events (affect space systems as well as their signals)
- No single country can dominate this issue by its own behaviour or by its power alone.
- Large number of emerging space actors
- Multiple stakeholders groups and dimensions
 - Each with own logic, concerns and values
 - Self-interest is the common denominator
- Seen as part of the wider sustainability discussions relating to equitable and sustainable use of limited natural resources.

Who are the actors?

- In terms of international space law States bear international responsibility for all space activities
 - Article VI, Outer Space Treaty (1967)
- In practical terms, space activities are carried out by:
 - State entities
 - Space agencies and other national civilian agencies
 - Military
 - Non-State actors
 - Academic and research institutions
 - Private sector, especially commercial sat. operators
 - Civil society organisations



Number increasing gradually



Number increasing more rapidly

No longer possible to ignore non-State actors

Contribution by civil society

- Civil society is playing an increasing role in the identification and articulation of issues in the space arena.
 - Commercial operators have extensive experience in dealing with space weather and other on-orbit operational issues
- Professional and industry associations
 - IAF/IAA committees and studies
 - Conferences (e.g. IAC)
- NGO's
 - ESPI
 - SWF / Space Security Index
 - Universities

Need to involve civil society contributions to inter-governmental debates

Space in the UN system

- UN COPUOS - Vienna
- UN General Assembly - New York
- ITU - Geneva

- Conference on Disarmament (CD) - Geneva

- Specialised agencies
- UNIDIR - Geneva

UN COPUOS - overview

- 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 by 24 Member States.
 - Currently 69 Member States and a large number of permanent observers
 - The technical work of COPUOS is 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 done for space

- 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
- Three UN Space Conferences (1968, 1982, 1999)
- UN Programme on Space Applications
- Regional Centres for Space Science & Technology Education
- SPIDER (Disaster Management)
- International Committee on GNSS

Activities relating to space security/sustainability

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

Tendency to non-binding decisions. (Does not mean non-legal)

Sustainability of space activities on the COPUOS agenda

- 2005 - Karl Deutsch (Chair STSC 2000-2003) paper on future role of COPUOS
- 2006 - Gérard Brachet highlights this topic as Chairman of COPUOS
- 2006 - 2007 Informal consultations WG established
 - First draft of best practices.
- 2008 - 2009 Informal WG under leadership of G. Brachet (France) develops a comprehensive background paper on this issue for COPUOS.
- 2009 - COPUOS agrees to establish a WG of STSC
- 2010 - Feb, STSC establishes a WG on the Long-Term Sustainability of Outer Space Activities.

Objective & Challenges

WG ON LONG-TERM SUSTAINABILITY OF SPACE ACTIVITIES

OBJECTIVE

- The objective of the Working Group will be to examine and propose 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.

Potential Topics for Discussion: 1/3

WG ON LONG-TERM SUSTAINABILITY OF SPACE ACTIVITIES

Sustainable space utilization supporting sustainable development on Earth:

- The contribution of space science and technology 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;

Potential Topics for Discussion: 2/3

WG ON LONG-TERM SUSTAINABILITY OF SPACE ACTIVITIES

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;

Potential Topics for Discussion: 3/3

WG ON LONG-TERM SUSTAINABILITY OF SPACE ACTIVITIES

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.

Outcomes

WG ON LONG-TERM SUSTAINABILITY OF SPACE ACTIVITIES

- Prepare a report on the long-term sustainability of outer space activities containing a consolidated set of current best practices and operating procedures, technical standards and policies associated with the safe conduct of space operations.
- On the basis of all the information collected, the Working Group will produce a set of voluntary recommended guidelines that could be applied by international organizations, non-governmental entities, individual States and States acting jointly
 - 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 practises

Other related international initiatives

- The CD
 - PAROS
 - PPWD
- EU Code of Conduct on space activities
 - Aiming to convene an international conference
 - A more political level compared the the COPUOS initiative

Evolution of space activities

In the past 50 years, space has underpinned global peace and prosperity.



Our generation must act now to ensure that we preserve the space environment for future generations.