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The International Code of Conduct on Outer Space Activities: An Australian Perspective

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Australia in Space



- 1967: 4th to launch satellite from own territory
- 7 active satellites in orbit, at least 4 more planned
- Space Situational Awareness (SSA) Partnership with the US
- deep-space science cooperation
- host to space-related ground facilities
- Compass station, Shenzhou 9 / Tiangong 1 docking



Dependency on Space

- Telecommunications
- weather forecasting
- transport navigation
- environmental management
- precise mapping
- tele-medicine
- stock-markets
- automatic teller machines
- remotely-controlled mining equipment
- smart farming techniques
- Defence Force capabilities

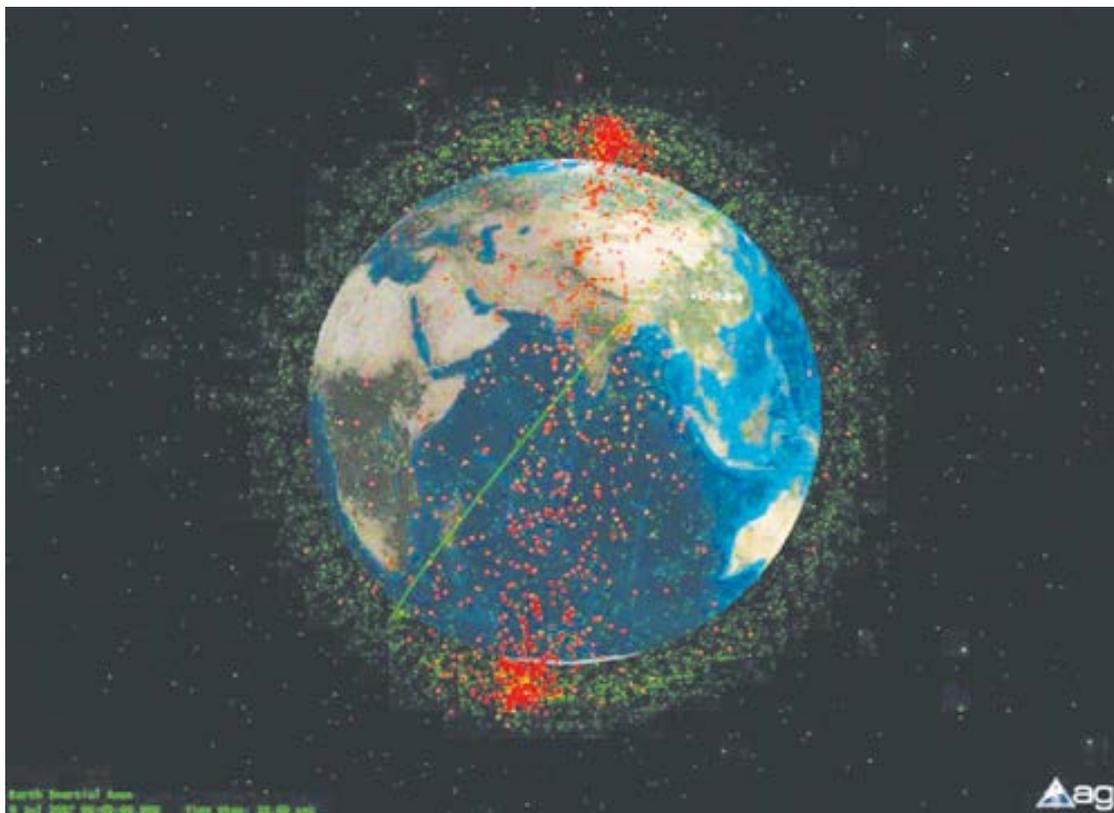


Space Debris Surrounds the Earth



16,000 + trackable
(> 10 cm dia)

Est. 500,000 pieces
(>1 cm dia)



Space Situational Awareness Partnership



- concluded with US in 2010
- US Space Surveillance Network monitors and tracks objects in space
- provides an essential public good by warnings to satellite operators of potential collisions
- Australia's unique geographic location allows for more accurate tracking





Threat of Space Debris

500,000 pieces of space debris of 1 cm diameter or larger (NASA)

1cm ϕ piece of debris
(5 grams @ 7km/second)

$$k = \frac{1}{2}mv^2 = 2.4E^8(J): \textit{Debris}$$

... compared with an automobile
(1ton @ 60km/hour)

$$= 2.7E^8(J): \textit{Automobile}$$



Cosmos/Iridium Collision

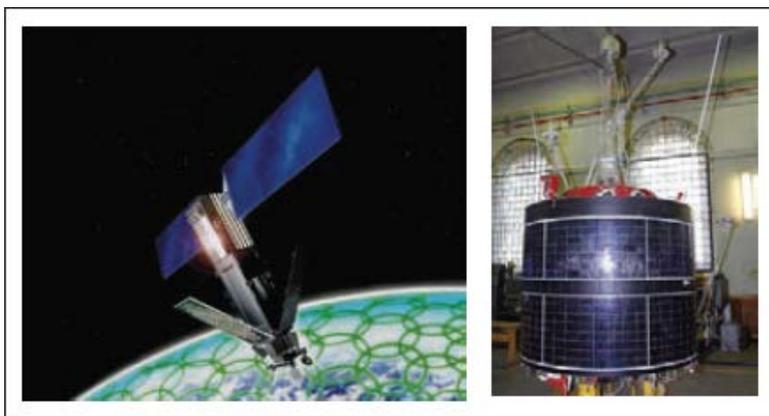
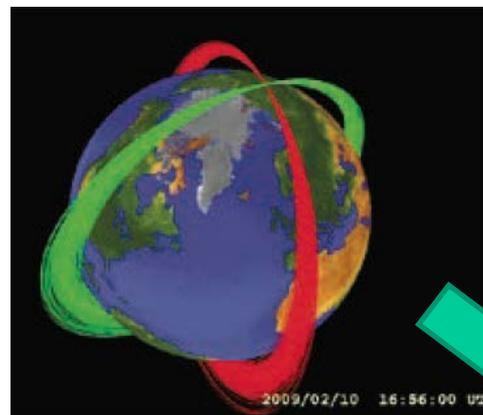


Fig.1 Iridium 33 (left) and Cosmos 2251 (right)
(出典: NASA)

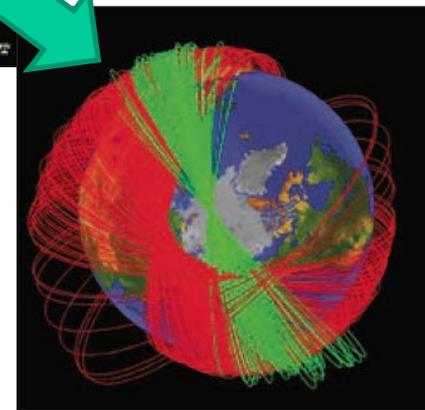
... hypervelocity collision
caused over 2,000
pieces of trackable
space debris

February 2009 accidental
collision between US Iridium 33
and defunct
Russian
Cosmos 2251



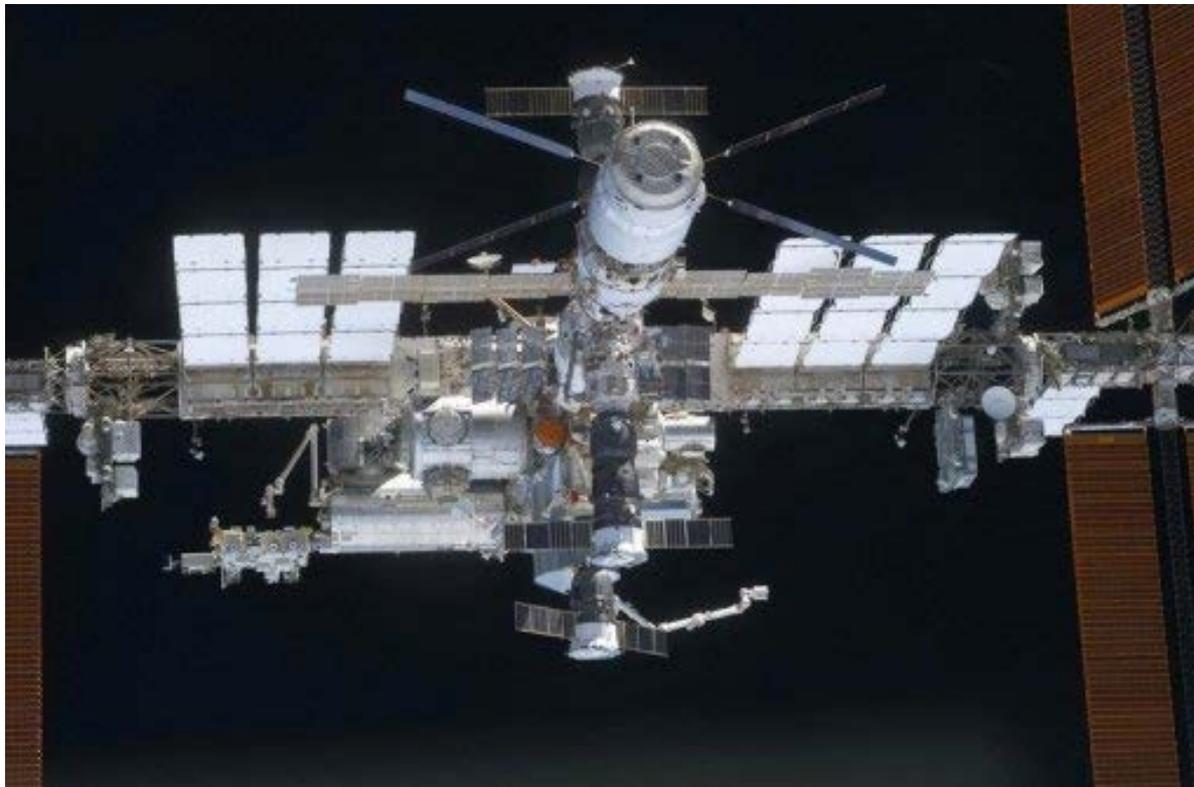
six months after
the collision

Fig.2 The orbital
planes of Iridium 33
and Cosmos 2251
(出典: NASA)



Spacecraft Threatened

International Space Station prepares to evacuate



A-SAT Weapons Testing



Development of kinetic anti-satellite weapons (A-SATs)

US/USSR in '60s/'70s

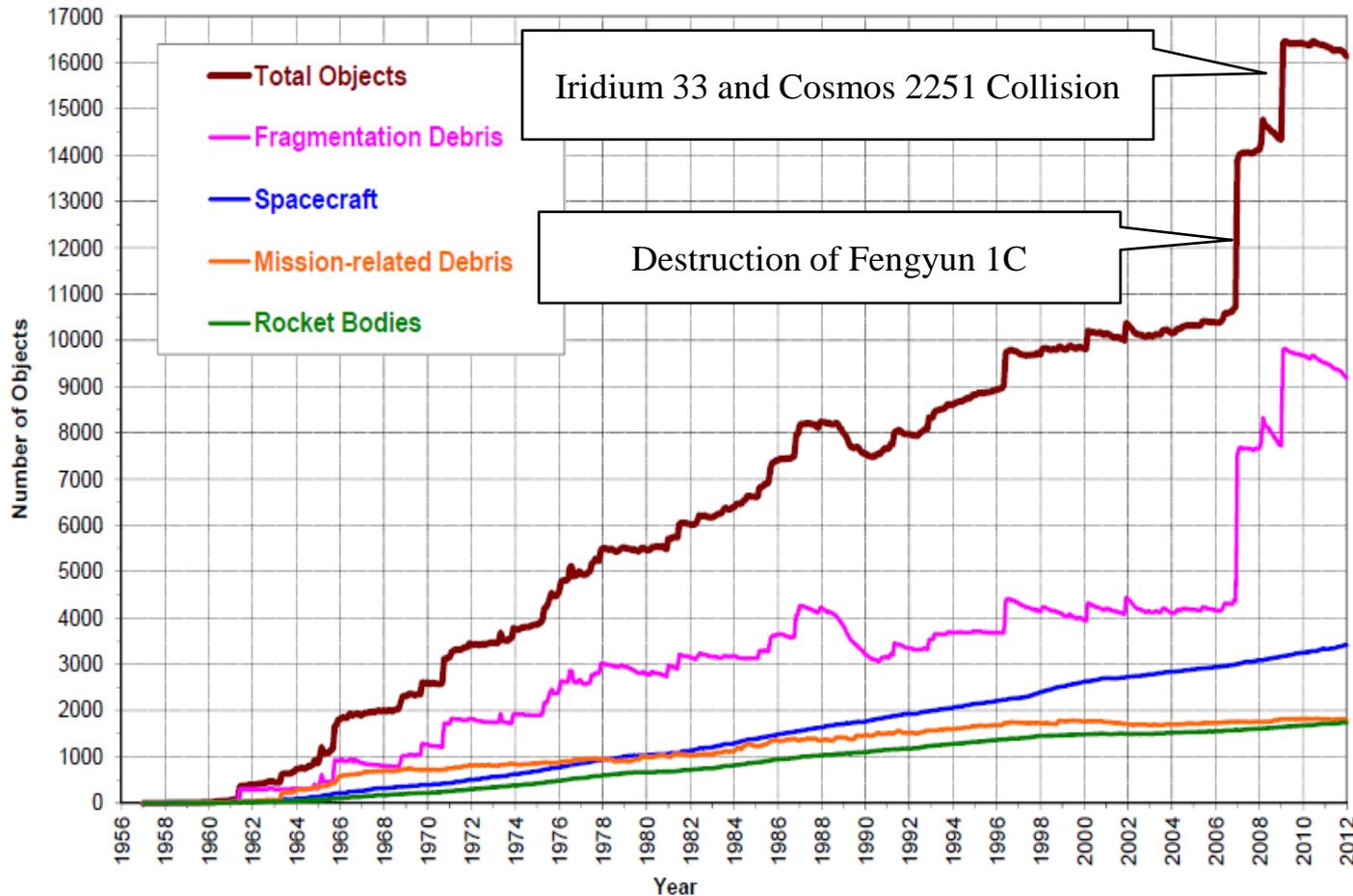
testing moratorium in 80s

new countries developing capabilities





Growth in Orbiting Space Debris



A-SAT Capabilities Spreading



India's Defence Research and Development Organisation discussed integrating BMD/satellite kill vehicle into Agni III

Developing lasers and an exo-atmospheric kill vehicle

BUT: committed not to test weapons in space



Why Australia Decided to Support the Code of Conduct



“Everything from aircraft and ship navigation, to electronic commerce, communications, climate monitoring and disaster management, not to mention many of our defence systems, all rely on satellites. But all that’s being put at risk by the growing possibility of collisions with satellites and space vehicles.”

Australian Foreign Minister Kevin Rudd, 18 January 2012



International Code of Conduct for Outer Space Activities



- concept developed within the European Union
- comments from key space-faring nations
- broadened consultations
- 5 June 2012 draft presented at international launch event in margins of UN COPUOS



Key Features of the Code

- focussed on creating norms of behaviour – agreeing best practices, proscribing irresponsible behaviours
- not legally-binding, a political commitment
- achievable in the near future
- basis for developing future international norms



Preamble of the Code



*Considering that the activities of exploration and use of outer space for peaceful purposes play a growing role in the **economic, social, scientific, technological, and cultural development of nations**, in the management of global issues such as preservation of the environment, expansion of international cooperation, disaster management, strengthening of national security, and in **sustaining international peace**;*

*Considering the importance of the sustainable use of outer space for **future generations**;*

*Taking into account that **space debris** affects the sustainable use of outer space, constitutes a **hazard** to outer space activities and potentially limits the effective deployment and utilisation of associated outer space capabilities;*



Preamble of the Code



*Reaffirming their commitment to **resolve any dispute** concerning another State's actions in outer space **by peaceful means**;*

*Conscious that an international code, including **transparency and confidence-building measures**, could contribute to promoting mutual understandings;*

Without prejudice to future work in other appropriate international fora such as the United Nations Committee on the Peaceful Uses of Outer Space and the Conference on Disarmament;

Subscribe to the following Code of Conduct for Outer Space Activities (hereinafter referred to as the "Code").



Code Recognises Other Processes



Reaffirming their commitment to resolve any dispute concerning another State's actions in outer space by peaceful means;

Conscious that an international code, including transparency and confidence-building measures, could contribute to promoting mutual understandings;

Without prejudice to future work in other appropriate international fora such as the United Nations Committee on the Peaceful Uses of Outer Space and the Conference on Disarmament;

Subscribe to the following Code of Conduct for Outer Space Activities (hereinafter referred to as the "Code").



Public International Law and Space



*“States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the Moon and other celestial bodies, **in accordance with international law, including the Charter of the United Nations**, in the interest of maintaining international peace and security and promoting international cooperation and understanding.”*

Article III of the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies



Purpose and Scope of the Code



- 1.1 The purpose of this Code is to enhance the security, safety and sustainability of all outer space activities.*
- 1.2. This Code addresses all activities conducted by a Subscribing State, or jointly with other States, or by non-governmental entities under the jurisdiction of a Subscribing State, including those activities conducted within the framework of international intergovernmental organisations.*
- 1.3. This Code, in endorsing best practices, contributes to transparency, and confidence-building measures, and is complementary to the normative framework regulating outer space activities.*
- 1.4. This Code is not legally binding. Adherence to this Code and to the measures contained in it is voluntary and open to all States.*



Principles underlying the Code



*the freedom for all States, in accordance with international law, to access, to explore, and to **use outer space for peaceful purposes without interference***

*the inherent **right of individual or collective self-defence** as recognised in the United Nations Charter*

*the responsibility of States to take all appropriate measures and cooperate in good faith to **prevent harmful interference** in outer space activities; and*

*the responsibility of States, in the conduct of **scientific, civil, commercial and military activities**, to promote the peaceful exploration and use of outer space and to take all appropriate measures **to prevent outer space from becoming an arena of conflict**.*



Code Reiterates Existing Treaties



Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967);

Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (1968);

Convention on International Liability for Damage Caused by Space Objects (1972);

Convention on Registration of Objects Launched into Outer Space (1975);

Constitution and Convention of the International Telecommunication Union and its Radio Regulations;

Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water (1963) and the Comprehensive Nuclear Test Ban Treaty (signed in 1996 but not yet in force).



... and Non-Treaty Instruments



- International Co-operation in the Peaceful Uses of Outer Space (1961);*
- Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (1963);*
- Principles Relevant to the Use of Nuclear Power Sources in Outer Space (1992);*
- Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (1996);*
- Recommendations on Enhancing the Practice of States and International Intergovernmental Organisations in Registering Space Objects (2007);*
- Space Debris Mitigation Guidelines of the United Nations Committee for the Peaceful Uses of Outer Space (2007).*



Space Operations and Mitigating Space Debris



4.1. The Subscribing States commit to establish and implement policies and procedures to minimise the possibility of accidents in space, collisions between space objects or any form of harmful interference with another State's peaceful exploration, and use, of outer space.



4.2: Norm Against Destroying Space Objects



... refrain from any action which brings about, directly or indirectly, damage, or destruction, of space objects unless such action is conducted to reduce the creation of outer space debris or is justified by the inherent right of individual or collective self-defence as recognised in the United Nations Charter or by imperative safety considerations, and where such exceptional action is necessary, that it be undertaken in a manner so as to minimise, to the greatest extent possible, the creation of space debris and, in particular, the creation of long-lived space debris;



4.2: Norm Against Destroying Space Objects



*... refrain from any action which brings about, directly or indirectly, damage, or destruction, of space objects **unless such action is conducted to reduce the creation of outer space debris** or is justified by the inherent right of individual or collective self-defence as recognised in the United Nations Charter or by imperative safety considerations, and where such exceptional action is necessary, that it be undertaken in a manner so as to minimise, to the greatest extent possible, the creation of space debris and, in particular, the creation of long-lived space debris;*



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Australian Re-draft of 4.2



refrain from any action which brings about, directly or indirectly, damage or destruction of space objects, unless such action is necessary

- a. to reduce the creation of outer space debris;*
- b. for imperative safety considerations; or*
- c. in the exercise of the inherent right of individual or collective self-defence recognised in the United Nations Charter;*

and where such exceptional action is necessary, that it be undertaken in a manner so as to minimise, to the greatest extent possible, the creation of space debris and, in particular, the creation of long-lived space debris



Australian Re-draft of 4.2



*refrain from any action which brings about, directly or indirectly, damage or destruction of space objects, unless such action **is necessary***

- a. to reduce the creation of outer space debris;*
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and where such exceptional action is necessary, that it be undertaken in a manner so as to minimise, to the greatest extent possible, the creation of space debris and, in particular, the creation of long-lived space debris



Australian Re-draft of 4.2



refrain from any action which brings about, directly or indirectly, damage or destruction of space objects, unless such action is necessary

- a. to reduce the creation of outer space debris;*
- b. for imperative safety considerations; or*
- c. **in the exercise of** the inherent right of individual or collective self-defence recognised in the United Nations Charter;*

and where such exceptional action is necessary, that it be undertaken in a manner so as to minimise, to the greatest extent possible, the creation of space debris and, in particular, the creation of long-lived space debris



Normal Space Operations



4.3 *In order to minimise the creation of outer space debris and to mitigate its impact in outer space, the Subscribing States commit to avoid, to the greatest extent possible, any activities which may generate long-lived space debris. To that purpose, they commit to adopt and implement, in accordance with their own internal processes, the appropriate policies and procedures, or other effective measures, in order to implement the **Space Debris Mitigation Guidelines** of the United Nations Committee for the Peaceful Uses of Outer Space as endorsed by UNGA Resolution 62/217 (2007).*

4.4 *When executing manoeuvres of space objects, for example, to supply space stations, repair space objects, mitigate debris, or reposition space objects, the Subscribing States commit to take all **reasonable measures to minimise the risks of collision.***



Superfluous Paragraph 5



“The Subscribing States commit to promote the development of guidelines for outer space operations within the appropriate international fora, such as the Conference on Disarmament and the United Nations Committee on the Peaceful Uses of Outer Space, for the purpose of protecting the safety and security of outer space operations and the long-term sustainability of outer space activities.”



Transparency and Confidence-Building Measures in the Code



Notify potentially-affected Subscribing States of:

*scheduled **manoeuvres** that could result in dangerous proximity to the space objects of both Subscribing and non-Subscribing States;*

Pre-notification of launch of space objects;

***collisions, break-ups in orbit, and any other destruction** of space object(s) which have taken place generating measurable orbital debris;*

*predicted **high-risk re-entry events** in which the re-entering space object or residual material from the re-entering space object would likely cause potential significant damage or radioactive contamination;*

***malfunctioning of space objects** which could result in a significantly increased probability of a high risk re-entry event or a collision between space objects.*



Transparency and Confidence-Building Measures in the Code



Subscribing States commit to share, on an annual basis, where available and appropriate, information on:

- *their space policies and strategies;*
- *their space policies and procedures to prevent and minimise the possibility of accidents, collisions or other forms of harmful interference and the creation of space debris; and*
- *efforts taken in order to promote universal adoption and adherence to legal and political regulatory instruments concerning outer space activities*



Transparency and Confidence-Building Measures in the Code



Subscribing States commit to share, on an annual basis, where available and appropriate, information on:

- *their space policies and strategies (**including basic objectives for security and defence-related activities in outer space**);*
- *their space policies and procedures to prevent and minimise the possibility of accidents, collisions or other forms of harmful interference and the creation of space debris; and*
- *efforts taken in order to promote universal adoption and adherence to legal and political regulatory instruments concerning outer space activities*



Organisational Matters

- biennial Meeting of Subscribing States
- voluntary consultation mechanism
- ad hoc fact-finding missions
- Central Point of Contact
- Outer Space Activities Database





Issues Raised

- Not content, but rather process
- No competent UN body – COPUOS does civil space, Conference on Disarmament does arms control – but the Code of Conduct combines both
- Precedents for doing outside UN - Land Mine Ban Convention, Cluster Munitions Convention
- Code is not legally-binding



De-weaponisation of Space



- beyond the intended scope of the Code
- non legally-binding TCBMs not appropriate for arms controls
- Conference on Disarmament considering Preventing an Arms Race in Outer Space (PAROS)
- Code complements this work



Weaponisation of Space



Prohibiting weaponisation of space fraught with problems

- Definition of a space weapon (any satellite)
- rapidly developing dual-use technologies
- not currently verifiable

➔ **No progress in Conference on Disarmament for decades**

counter-productive to introduce these stumbling blocks into consideration of a Code

problem of space debris is too important!



Australia's Support for the Code



“Australia believes that the Code can make an important contribution to addressing the pressing issue of space debris. We should work towards this goal with the sense of urgency that the space debris challenge warrants. Australia recognises that such a Code will not be a “silver bullet” to solve all issues relating to space security, but it would be a valuable, practical and achievable step forward.”

Australian Statement, Thematic Debate on Outer Space
(Disarmament Aspects), UNGA First Committee, October 2012



Questions?

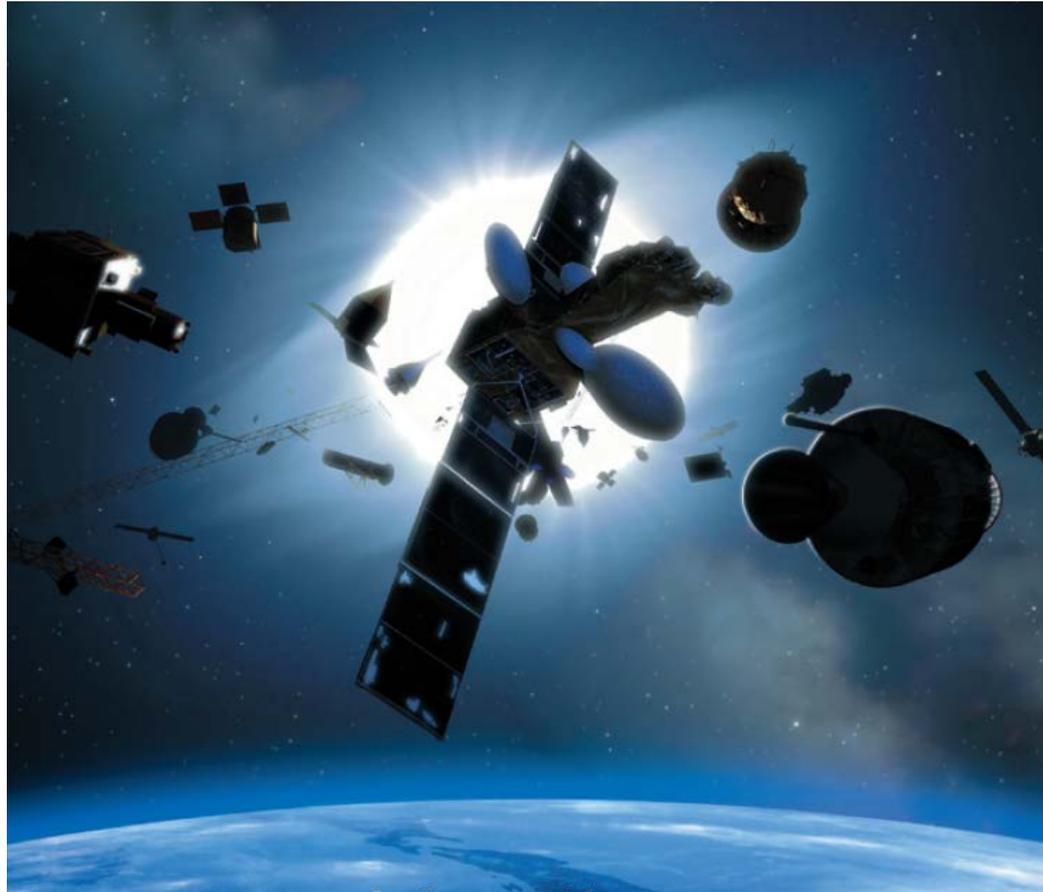


Fig. Space debris (出典: JSF)

