



# Space and Security

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# Defining Periods

## ■ Cold War Era

- Bipolar world
- Military activities supported stabilizing deterrence

## ■ 1991 Iraqi War

- Referred to as first 'space war'
- Demonstration of strategic value of space-based technology in warfare

## ■ Present/modern era

- US shift
- Electronic warfare
- International concerns / responses



# Current Space Environment

- Extensive military use of satellites
- ***Force support*** as opposed to ***force application*** ('militarization' vs 'weaponization')
- Increasing number of space actors (States, private sector, non-governmental organisations (NGOs))
- Growing use by military of civilian satellite systems
- Civilian/military distinction increasingly blurred



# Early Multilateral and Bilateral Framework

- Multilateral US-Soviet bilateral arms control agreements
  - Ban specific weaponry in space
  - Seek to increase transparency & predictability
  - Grant protection from interference to specific space systems
  - *ABM and SALT I Treaties 1972, SALT II Treaty 1979, START I 1991, START II, Hot Line Agreement and Accident Measures Agreement 1972*



# Anti-Ballistic Missile (ABM) Treaty 1972

## ■ Art. V

- No development, testing or deployment of ABM systems or components which are...space-based

## ■ Art. XII

- use of 'national technical means (NTMs)' of verification

## ■ Art. XIII

- Standing Consultative Commission (SCC)

## ■ Art. XV

- Parties can withdraw from the treaty
- U.S. withdrew in June 2002



# ABM Treaty / NTM

## ■ Art. XII –

1. For the purposes of providing assurance of compliance with the provisions of this Treaty, each Party shall use **national technical means of verification** at its disposal in a manner consistent with generally recognized principles of international law.
2. Each Party **undertakes not to interfere with the national technical means or verification of the other Party** operating in accordance with para.1 of this Article.
3. Each Party undertakes not to use deliberate concealment measures which impede verification by **national technical means** of compliance...



# CFE Treaty / Art. 16, Multilateral Technical Means of Verification

1. For the purposes of providing assurance of compliance with the provisions of this Treaty, each Party shall use **national technical means of verification** at its disposal in a manner consistent with generally recognized principles of international law.
2. Each Party **undertakes not to interfere with the national technical means or verification of the other Party** operating in accordance with para.1 of this Article.
3. Each Party undertakes not to use deliberate concealment measures which impede verification by **national technical means** of compliance with the provisions of this Treaty. ---



## Effect of these bilaterals

- Establish a limited regime which seeks to protect satellites identified to perform specific function
- Protection extended to 3 types of satellite: early warning systems, reconnaissance satellites, communications satellites
- Protection also extended to corresponding ground stations
- Could set precedents in codifying the norm of non-interference with Earth-orbiting objects
- Issue of widening scope of application





# International Law and Prohibited Military Activities in Outer Space (cont'd)

- Arts. I and II, *ENMOD Convention 1977*
- Art. 2(4) *UN Charter* - hostile acts
- Art. III (2) *Moon Agreement* – threat or use of force
- Arts. 38,45 and 48 *ITU Constitution* and Arts. 4, 15 and 22 *ITU Radio Regulations* - electronic interference
- Arts III,VI,VIII and IX *OST* + general principles of international law – intentional physical interference with space assets of a State without authorization



# International Law and Prohibited Military Activities in Outer Space

- Art. I 1 (a), *Limited Test Ban Treaty 1963*
  - Nuclear weapon or other nuclear explosions in outer space

## Art.IV, *Outer Space Treaty 1967 (OST)*

placement of weapons of mass destruction in orbit around the Earth, on celestial bodies or anywhere else in outer space



# International Law and Prohibited Military Activities in Outer Space (cont'd)

- Art. IV *OST* and Art. III *Moon Agreement 1979*
  - Placing nuclear weapons in orbit around the Earth, on celestial bodies or anywhere else in outer space
  
  - Art. IV (2) *OST* and Art. III *Moon Agreement*
    - Establishment of military bases, installations, testing of any weapon and conduct of military maneuvers on Moon or other celestial body



# Environmental Modification Convention

## ENMOD 1977

- **Article I**

1. Each State Party to this Convention undertakes not to engage in military or any other hostile use of *environmental modification techniques* having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party.

- **Article II**

- As used in Article I, the term "environmental modification techniques" refers to any technique for changing -- through the deliberate manipulation of natural processes -- the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space.



# UN Charter

- **Art. 2 (4)**

- 4. All Members shall refrain in their international relations from the *threat or use of force* against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations.


- **Art. 51** - Nothing in the present charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs...



# Moon Agreement 1979

- **Art. 3 paras. (1) and (2)**

- 1. The moon shall be used by all States Parties exclusively for peaceful purposes.
- 2. Any threat or use of force or any other hostile act or threat of hostile act on the moon is prohibited. It is likewise prohibited to use the moon in order to commit any such act or to engage in any such threat in relation to the earth, the moon, spacecraft, the personnel of spacecraft or man-made space objects.



# ITU Convention (CV) and ITU Radio Regulations

- **Art. 38 ITU CV**

- Member States retain entire freedom with regard to military radio installations

- **Art. 45 ITU CV**

- All stations must be established so as not to cause harmful interference to radio services or communications of others

- **Art. 48 ITU CV**

- Protection of telecommnications channels and installations

- **ITU Regulations 4, 15 and 22**

- Electronic interference



# ITU Convention, Art. 44

- 1 Member States shall endeavor to limit the number of frequencies and the spectrum used to the minimum essential to provide in a satisfactory manner the necessary services. To that end, they shall endeavor to apply the latest technical advances as soon as possible.
- 2 In using frequency bands for radio services, Member States shall bear in mind that **radio frequencies and *any associated orbits, including geostationary-satellite orbit, are limited natural resources*** and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries.





# More Recent Bilateral Agreements

- Aim at providing information and notification of certain activities = ***confidence building measures (CBMs)***
  - Launch Notification Agreement 1988
  - Joint Early Warning Center Agreement (JDEC) 2000
  - Pre and post Missile Launch Notification System (PLNS) 2000
  - Increasingly, international community is proposing new or 'expanded' CBMs



# Launch Notification Agreement 1988 Prevention of Dangerous Military Activities Agreement 1989

- **1988 Agreement** - Provides for notification, no less than 24 hours in advance, of planned, launch area, area of impact for any launch of strategic missile
- Provide geographic coordinates of impact or reentry area
- **1989 Agreement** – defines terms such as ‘laser’ and ‘interference with command and control networks’ are defined



# Dual-use nature: international controls

- **Missile Technology Control Regime (MTCR)**

- Voluntary arrangement, 34 member States
- Apply common export control policy on agreed list of technologies (such as launch vehicles with missile deployment capability)

## **International Code of Conduct against Ballistic Missile Proliferation**

- restraint in developing, testing, using, spreading BM + advance notification of launch



# Joint Early Warning Center Agreement (JDEC) 2000

- Joint data exchange of information on launches of ballistic missiles and space launch vehicles
- Parties must provide parameters such as launch time, location, missile type, estimated time of payload impact
- Information to be provided if possible in real time
- In future, goal is to include information on ballistic missile and space launches of third parties




# International Institutional Framework: UNGA and CD

- Yearly resolution in the UNGA First Committee on preventing an arms race in outer space (PAROS). Nearly unanimous vote in favour. In 2005 and 2006, US voted against. 2006: 166 for, 1 against, 2 abstentions (Israel, Côte d'Ivoire)
- Conference on Disarmament (CD) deadlock, inability to agree on Formal Programme of Work
- China, Russia drafts on new treaty for PAROS
- US consistent position: **existing legal regime sufficient**



# Conference on Disarmament (CD)


- Development of Arms Control at the CD (name changed in 1984)
- 1982 Issue of prevention of arms race in outer space (PAROS) first discussed
- 1985-1994 each year PAROS ad hoc committee was established
- 1996 last year the work plan of the agenda items of the CD was agreed upon.



## ***ad hoc* PAROS report**

### **Doc. CD/726 (1986)**

- Para.13 - some such military activities have contributed to strategic stability and arms control and thus to the maintenance of international peace and security. They reiterated the view that the first task that required attention was to establish common ground on which activities were permitted and which one were prohibited.




# Past Submitted Proposals 1987

## CD/786, para. 27 (1987)

- 1 Establishment of an international space inspectorate (ISI)
- 2 Ways and means of strengthening the Registration Convention
- 3 Prohibition of activities contributing directly or indirectly to an arms race in outer space by amending the 1967 Outer Space Treaty
- 4 Declarations on non-deployment of weapons in outer space.
- 5 A possible approach for a treaty on ASAT weapons
- 6 Elaboration of a code of conduct
- 7 Possible mandates of an expert group
- 8 Main provisions of a treaty on the prohibition of ASAT weapons and ways to ensure the immunity of space objects






# **Special Report of *ad hoc* PAROS**

## **Doc. CD/833, para.24 (1988)**

- 1** Amendment of Article IV of the 1967 Outer Space Treaty or additional protocol thereto;
- 2** Definition of space weapons;
- 3** Declarations on the non-deployment of weapons in space;
- 4** General treaty on the prohibition of anti-satellite weapons with specific protocols applicable to different categories of satellites;



# **Special Report of *ad hoc* PAROS**

## **Doc. CD/833, para.24 (1988) (cont'd)**

**5** Prohibition of dedicated ASAT weapons;

**6** ASAT moratorium;

**7** Multilateral instrument to supplement the 1972 ABM Treaty;

**8** Strengthening of the 1975 Registration Convention

**9** Establishment of a group of governmental experts



# International Institutional Framework: COPUOS

- Space Debris Working Group of the Scientific and Technical Subcommittee (STSC) drafted UN COPUOS STSC Space Debris Mitigation Guidelines to be implemented through national legislation and protocols. Guidelines based on those developed earlier by the Inter-Agency Space debris Coordination Committee (IADC)
- Expanding COPUOS' mandate:militarization of space



# Jurisdiction : CD vs COPUOS

- 1983 UN GA's Special Political Committee (SPC) discussed whether COPUOS should extend its jurisdiction to military use of outer space.
- Strong opposition from certain countries



## Recent Trends / CD

China

Doc. CD/1606 (2000)

- **moratorium** Pending the conclusion of a new multilateral legal instrument---, not to test, deploy or use any weapons, weapons systems or components in outer space.
- Basic obligations: not to test, deploy or use weapons, weapon systems or components.



## Recent Trends / CD (cont'd)

### China and Russia

- Doc. CD/1679 (2006) working paper possible elements of a future international legal agreement
- Basic obligations: Not to place in orbit around the Earth any object carrying any kind of weapons, not to install such weapons on celestial bodies, or not to station such weapons in outer space in any other manner.  
(continued)



## Recent Trends / CD (cont'd)

- Not to resort to the threat or use of force against outer space objects.
- Not to assist or encourage other States, groups of States, international organizations to participate in activities prohibited by this Treaty.



## Recent Trends / CD (cont'd)

### 2007

- 11 January ASAT experiment by China
- 24 January statement by EU at CD

*“The EU is very concerned--- inconsistent with international efforts to avert an arms race in outer space and undermines security in outer space.”*
- Shift in US position





## US Statement, 13 February 2008

- Russia-China submit draft treaty to the CD on *'prevention of the placement of weapons in outer space, the threat or use of force against outer space objects'*.
- White House response: *"Any object orbiting or transiting through space can be a weapon if that object is intentionally placed onto a collision course with another space object"...* *"This makes treaty verification impossible."*
- White House favors *"discussions aimed at promoting transparency and confidence-building measures."*



# Canadian Statement on STM Guidelines

- The split of responsibilities between COPUOS and CD does not reflect current realities.--- Canada has been working in international fora to raise consciousness of the need for rules-based behavior in space, not only as a safety mechanism but also a way to help all actors understand their roles and acceptable practices.
- Statement made before the 44th STS COPUOS, 21 Feb. 2007



# National Legislations and National Security Concerns

- **USA** – Regulations dealing with commercially operated remote sensing systems
  - Shutter control
  - State specific control
  - Licensing restrictions
- France, Germany, China and others also looking into legislation
- **Canada** – Remote Sensing Space Systems Act, 23 November 2004
  - Shutter control, priority access



# Space Security Index (SSI)

- [www.spacesecurity.org](http://www.spacesecurity.org) (partnership between academia, government , NGOs)
- Aims to provide comprehensive and integrated yearly assessment of state of space security
- Starting point: space is a **global commons** (as per *Outer Space Treaty 1967*)



## Space Security Index (SSI) (cont'd)

- Space security defined as the '***secure and sustainable access to and use of space, and freedom from space-based threats***'
- Different indicators used to assess this definition (space environment, laws/policies, global utilities, commercial space, support to terrestrial military operation, protection and negation space systems, space-based strike weapons)



# Space Security Definition

- statement of Canadian delegation at 44th session of the Scientific and Technical Subcommittee (STSC) of the UN Committee on the Peaceful Uses of Outer Space (COPUOS) 21 February 2007
- Canada maintains the necessity of “rules-based behavior in space”.



# Space Traffic Management

- **Space Traffic Management (STM)** means “the set of technical and regulatory provisions for promoting safe access into outer space, operations in outer space and return from outer space to Earth free from physical or radio-frequency interference”.



# Concluding Remarks

- US Policies: continued international concern of perceived shift from 'militarization' to 'weaponization'
- Identification of areas of common concern to all and with impact on secure use of outer space (example Debris Mitigation Guidelines)
- Appropriate forum: where to discuss?
- Small steps (code of conduct, space traffic management, CBMs)
- Public awareness
- Agreement of like minded countries (Ottawa Process?)