



# **The U.S. Weaponization of Space : Chinese Perspectives**

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# My talk focuses on:

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- **U.S. going space weaponization**
- **China's major concerns about space weaponization**
- **To negotiate a treaty on space weapons ban**
- **China's potential responses**



# U.S. going space weaponization

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*U.S. is pursuing “Space Control” strategy :*

- Long Range Plan (1998)
- Report of the Commission to Assess United State National Security Space Management and Organization (Jan.2001)
- The 2001 Quadrennial defense Review
- The U.S. Air Force’s Transformation Flight Plan (2003;2004)
- Counterspace Operations,Air Force Doctrine Document 2-2.1 (Aug.2004)



## *U.S. is pursuing “Space Control” strategy*

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- ❑ The Jan.2001 report of the Commission to Assess United States National Security Space Management and Organization, ---originally chaired by Defense Secretary Donald Rumsfeld.
- To avoid “Space Pearl Harbor”, stated: “The Commissioners believe the U.S. government should vigorously pursue the capabilities called for in the National Space Policy to ensure that the president will have the option to deploy weapons in space to deter threats to, and, if necessary, defend against attacks on U.S. interests.”

# Counterspace Operations



**Air Force Doctrine Document 2-2.1**  
**2 August 2004**

This document complements related discussion found in Joint Publication 3-14,  
*Joint Doctrine for Space Operations*.

- Achieves and maintains *space superiority*--the "freedom to attack as well as the freedom from attack" in space.

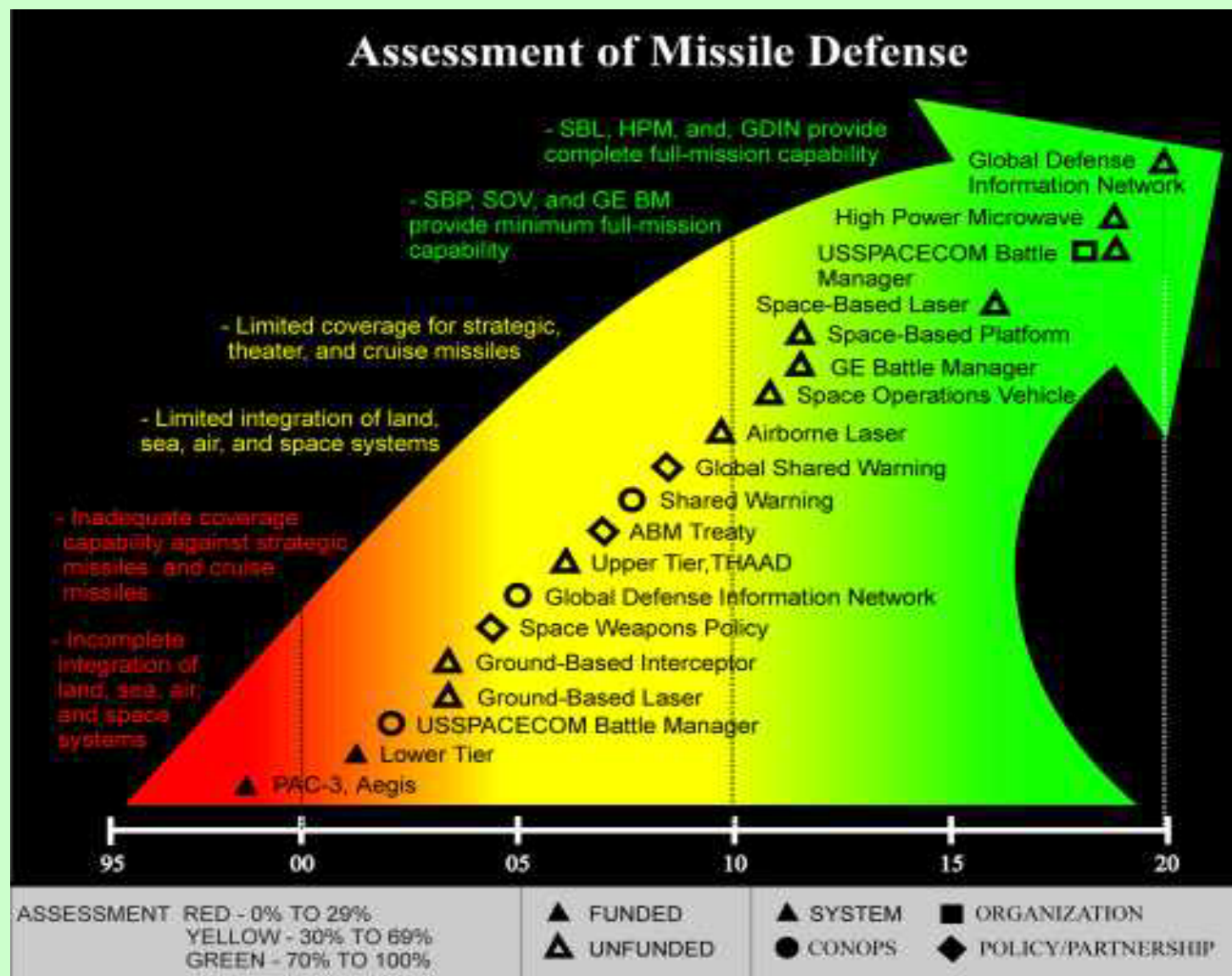


- Includes many kinds of Space weapons, such as:
  - Space based KKV; SBL; Hypervelocity Rod Bundles; SBIRS; Space based radio frequency energy weapons; space maneuver vehicle; Evolutionary Air and space global laser engagement (EAGLE); Space based space surveillance; counter space communications system, etc.

# **Missile defense is one important step toward U.S. control of space**

- ❑ the GMD deployment --- to acquire the ASAT capability for its space control strategy.
- ❑ US is pursuing space-based BMD for global engagement capabilities
  - Near Field Infrared Experiment (NFIRE) satellite,
  - Space-Based Interceptor Test Bed

# Missile Defense under Space Control Plan





# U.S. other space weapon programs

## ❑ ASAT weapons,e.g.

- the Army has the Kinetic Energy Anti-Satellite program;
- the ground-based Mid-Infrared Advanced Chemical Laser (MIRACL)
- research project on smaller satellites—XSS series

## ❑ Space weapons for prompt global force projection,e.g.

- the common aero vehicle (CAV)
- the long-rod penetrator (LRP)



# **U.S. going space weaponization**

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## **U.S. is building operational practice for "Space Control"**

- ☐ **No legal limitation: withdrawal of AMB in 2002**
- ☐ **Established US a space troop of tens of thousands personnel**
- ☐ **Conducted space war games in 2001 & 2003**



# China's major concerns about space weaponization

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## *US real purpose: space domination*

- ❑ Now no threats to US space assets from other countries.
- ❑ The purpose is pursuing space domination---it will offer the US absolute military and strategic superiority ---could be used to intervene in China's affairs, such as the Taiwan issue.
  - In Rumsfeld 2001 commission report, Taiwan issue taken as one threat.
  - In Jan.2001 US space war gaming exercise, China was taken as an assumed enemy

**“It is rather the attempt towards the domination of outer space, which is expected to serve in turn the absolute security and perpetual superiority (many people call this hegemony) of one country on earth. The unilateralism and exceptionalism that are on the rise in recent months also mutually reinforce this.”**

---Hu Xiaodi, Remarks of Panel discussions on “ A Treaty to Prohibit Weapons and War in Space?—Missiles: How can we reduce the dangers they pose?” October 11,2001 by the NGO Committee on Peace and Disarmament, in cooperation with the UN Department for Disarmament affairs, and the UN Department of Public Information.

## *Lead to an arms race in outer space and raise the risk of turning outer space into a battlefield*

- ❑ vulnerability to other cheaper& asymmetric measures--- space weapons have inherent offensive and first-strike capabilities--- U.S. hegemony more aggressive----disrupt the global strategic balance and stability.
- ❑ Other countries would resort to asymmetric methods to counter critical and vulnerable space-based components in low earth orbit, eg. SBI,SBL,sensor satellites.  
  
----These space-based components stay for a long time in their orbit, with known parameters, making them easy to neutralize, overwhelm and even to destroy

## *US missile defense plans pose great threat to China's national security*

- Neutralize China's strategic nuclear deterrent; More freedom to encroach on China's sovereignty(including Taiwan affair).
- China could be the NMD target
  - New NPR shows China could be one nuclear target. ---it mentions the conditions for the use of nuclear weapons over a conflict in the Taiwan Strait and the possible use of tactical nuclear weapons.
- The U.S. agreement on cooperative research and development of advanced TMD with Japan---Defense “surrounding situations,” possibly including Taiwan; etc.
- China opposes any cooperation with Taiwan on TMD issues.

## China is concerned about US plans for global force projection

- Some space weapons (e.g.CAV) --against hard and deeply buried land targets, and mobile targets, etc.
- Such weapons would pose huge threat to China's future mobile ICBMs.  
---Developing mobile ICBMs is just what current Chinese nuclear modernization is planning to do.
- Indeed, the Nuclear Posture Review (2002) calls for the ability to target mobile missiles. “a US demonstration of the linkage between long-range precision strike weapons and real-time intelligence systems may dissuade a potential adversary from investing heavily in mobile ballistic missiles.”

## Space weaponization would seriously obstruct arms control and disarmament process

- impact FMCT negotiation
- increase difficulty to deeper cut, etc.

US space control could deny or limit China's civilian and commercial space activities.

## ➤ China's Space technology development

### Satellites:

- On April 24, 1970, China launched its first satellite; By October 2000, China had developed and launched 47 satellites of various types.
- Developed four satellite series :
  - "FSW" recoverable remote-sensing satellites,
  - "DFH" telecommunications satellites,
  - "FY" meteorological satellites,
  - The "ZY" earth resource satellite
  - "SJ" scientific research and technological experiment satellites.



# China's Space technology development

## Unmanned & Manned Space flight:

---Initiating its manned space flight program in 1992, China has developed a manned spacecraft and high-reliability launching vehicle.

---Nov.1999 launched unmanned experimental spacecraft “Shenzhou-1”

---Jan.2001, unmanned spacecraft “Shenzhou-2

---25 March 2002, unmanned spacecraft “Shenzhou-3”

---29 December 2002, unmanned spacecraft “Shenzhou-4”

---in Oct.2003, manned Shenzhou-5 mission successful.





## US space control could deny or limit China's civilian and commercial space activities (cont.)

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### ➤Commercial activities

---The global economy is now intimately tied to assets in space. Space provides economic and commercial opportunities. China needs free access to space for its own economic growth.

---Since 1985, when the Chinese government announced putting the "Long- March" rockets into the international commercial launching market, China has launched 27 foreign-made satellites into space, thus acquiring a share of the international commercial launching market.

----*However, the United States pursuit of space control could deny China such access.*

## ***Worsen Space Debris issue***

- The increasing population of space objects poses a considerable hazard to all kinds of spacecraft. Many scientists are already concerned about the space debris issues-- finding approaches to clear these junks.
- The space debris resulting from space weaponization would raise serious hazards for spacecrafts and satellites for any purpose.

## ***Worsen Space Debris issue***

➤ Some senior scientists in China emphasizes that preventing environmental pollution should not only refer to the Earth, but should also include outer space, where human activities are also carried out.

As prof. Du Xiangwan, vice president of Chinese Academy of Engineering, recently points out:

--- *“Indeed prevention of pollution in space should be put on agenda and as time goes by, this problem will become increasingly obvious.”*

--- *“In preventing space pollution, the following two issues are worth noticing: space garbage and weaponization of space”*

--- *“Weaponization of space is more dangerous than ordinary space garbage”, since “it will serious pollute space” and “it will threat peace and stability on the earth”*



## Some measures for space security

### ☐ Space weaponization or space sanctuary?

---Weaponizing space cannot but only worsen the space security—in no one's interest.

*“for ensuring security in outer space, political and legal approaches can still be more effective, while resorting to force and the development of space weapons will only be counter-productive.”*

----Ambassador HU Xiaodi , "Safeguarding Space Security: Prevention of an Arms Race in Outer Space"2005-03-28, Palais des Nationas, Geneva

## **❑ Some technical approaches increase the security of space-based assets, E.g.**

- **hardening and shielding power sources and sensors;**
- **back-up facilities and replacement;**
- **increase maneuverability;**
- **increase stealth capability, etc.**

## **❑ Some “rules of the road” , E.g.**

- **Keep-out-zones;**
- **Non-interference with satellites;**
- **development of safer traffic management procedures ;**
- **Reduce space debris;**
- **Notification of space launch activities;**
- **Crisis hotline between major missile and space powers.**



## Some measures for space security(cont)

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- ❑ However, it should be noted: these above approaches or rules would be not effective enough to secure the space assets for case of space weaponization.
- ❖ Thus, besides taking these rules, the most effective way to secure those space assets would be to take agreements on banning space weaponization.



# The need for a new treaty

## ❑ The limitations of current relevant treaties, e.g.

- The 1967 Outer Space Treaty: banning WMD in space or on the moon or other celestial bodies, but not others
- The 1972 ABM treaty (invalid in 2002): prohibits development, testing, or deployment of space-based missile defense systems. The withdrawal from the ABM treaty will further lessen the norm on limiting weapons in space.

## ❖ Loopholes, e.g.

- no existing treaty banning space weapons other than those WMD
- no existing treaty *banning the threat or use of force from the Earth (including from land, sea or air) against outer space objects*





## The need for a new treaty(cont.)

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### **□ The worldwide supports, E.g.:**

**---In each of recent years, the UN General Assembly has consistently adopted a resolution against space weaponization by an overwhelming majority.**

### **□ It is the time to negotiate such a treaty**

**---Preventing space weaponization is the key to prevention of an arms race in outer space.**

# Negotiating a treaty on space weapons ban

## ❑ Some partial arms control measures, e.g.:

- no testing or use of any kind of anti-satellite weapons
- Prohibiting the use, test or deployment of weapons to interceptors of any sort above 500 miles and prohibiting the stationing of weapon in LEO, and permitting non-space-based BMD
- a declaration not be the first to deploy weapons in space or to further test destructive antisatellite weapons

❖ *It should be noted that any international approach to address space security should consider all countries' concerns.*

*---E.g: if it allows space-based BMD, and not ASAT, It would be taken as discriminatory, because ASAT is one effective way to counter the space-based BMD threat.*



# Negotiating a treaty on space weapons ban

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## ☐ Comprehensive arms control in space

To effectively prevent space weaponization and an arms race in space, it should completely ban any kind of space weapon systems.

--- This would include a global ban on weapons against objects in space and from objects in space against any target, including development, testing, and deployment anywhere.

--- Within recent years, the CD has addressed PAROS issue. Various proposals on PAROS have been presented by China, Russia, Canada, and the Group of 21.



# China's proposals on PAROS

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- “China’s Position on and Suggestions for Ways to Address the Issue of Prevention of an Arms Race in Outer Space at the Conference on Disarmament”, working paper , CD/1606, 9 Feb. 2000;
- “Possible Elements of the Future International Legal Instrument on the Prevention of the Weaponization of Outer Space”, working paper, CD/1645, 2001.
- “Possible Elements for a Future International Legal Agreement on the Prevention of the Deployment of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects”, working paper CD/1679 , 28 June 2002 (with Russian and Indonesia, Belarus, Viet Nam, Zimbabwe and Syria).

**Negotiating a treaty on space weapons ban**



# China's proposal

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## The Chinese-Russian initiative (June 2002):

- **Not to place in orbit around the Earth any objects carrying any kinds of weapons, not to install such weapons on celestial bodies, or not to station such weapons in outer space in any other manner.**
- **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.**



# China's proposal--- some definitions

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## The proposals offer the following definitions:

- *Outer space* is the space above the earth's atmosphere, i.e. space 100km above the sea level of the earth.
- *Outer space objects*: could include the traveling ICBM?
- *Weapons* are devices or facilities that strike, destroy or disrupt directly the normal functions of a target by various destructive ways.
- *Weapon systems* are the collective of weapons and their indispensably linked parts that jointly accomplish battle missions.
- *Components of weapon systems* are subsystems that directly and indispensably involved in accomplishing battle missions.



# China's proposal—limitations on US MD

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## ☐ China's possible expectations from the PAROS:

- near-term purpose: limit U.S. MD systems;
- long term purpose: cover strategic balance and military significance on the ground, the peace and tranquility in outer space.

## ☐ The scope of space weapons definition would limit all or some kinds of MD systems and space deployments, e.g.

- for a wide scope of space weapons: include any ABM interceptor(whether space-based or not) targeting space objects (above 100km) including ICBM.
- such scope would prohibit almost all U.S.MD systems.
- for a focus scope : prohibit weapons in space and ASAT. Thus it would exclude non-space-based BMD systems.



## China's Options for Responding to US Space Weaponization Plans

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- Historically, China's sole purpose for developing its nuclear weapons was to guard itself against the threat of nuclear blackmail.
- China first pursues an arms control agreement to ban space weaponization(as advocating now). If this effort fails and if what China perceives as its legitimate security concerns are ignored, China would very likely develop responses to neutralize such a threat.





# China's Options for Responding to U.S. Space Weaponization Plans

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- China takes a “wait and see” approach at the moment, and follows closely future developments of US plans.  
---Based on the judgment of the threats of these plans posed to China's vital national security interests, accordingly China would take some effective, feasible and affordable military countermeasures in due course to maintain its minimum nuclear deterrence.
- These responses would depend on the specific infrastructure of U.S. MD and space weaponization programs.

# Response: Building up China's nuclear forces

	<b>Current Forces</b>	<b>Modernization without US MD</b>	<b>Nuclear forces with US MD case</b>
<b>ICBMs (Ranges-- 13,000+ km)</b>	About 20s liquid, silo-based, warheads	Likely less than 50s solid, road mobile warheads around 2015.	Depend on the specific MD infrastructure. E.g. for a GMD with 100-250 interceptors: China could need: 100-300s warheads.
<b>MIRV</b>	None	None	?
<b>Penetration Aids</b>	None	Possible	Yes



# Response: Passive countermeasures against missile defense

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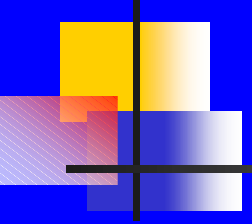
- **Midcourse phase:** deploying decoys and antisimulations, reducing the radar and infrared signature of warheads; etc.;
- These cheaper and effective countermeasures are accessible to China
- **Boost phase:** fast-burn booster; lofting or depressing the ICBM trajectories; spoofing the defender's tracking sensors; launching simultaneously several ICBMs (or with some theater or tactical ballistic missiles) from a compact area; countering SBL by protecting the missile body with reflective or ablative coatings, by rotating the missile.
- **Terminal phase:** maneuverable warheads, etc.



## **Response: The ASAT measures**

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- **Given the inherent vulnerability of those space-based weapon systems(e.g. SBI, SBL)to more cost-effective ASAT attacks, China could resort ASAT weapons as an asymmetric measure.**
- **Ground-based kinetic-energy weapons: E.g. miniature homing vehicles or pellet cloud.**
  - China should be able to develop these low cost & relatively low-technology ASATs.**
- **space-based ASATs: space mine, small satellites.**



## Response: Reconsidering China's commitments to arms control treaties

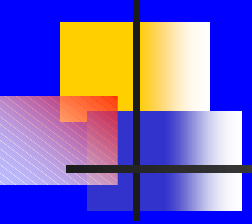
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### **❑ reconsider its participation in Fissile Material Cutoff Treaty(FMCT)**

- may need more fissile material for more warheads to counter for US missile defense.
- In fact, because its concern about US MD plans, China has linked the FMCT negotiation with talks on PAROS for several years. Until Aug.2003, China agreed on FMCT negotiation without linkage with PAROS. However, China is still firmly holding that preventions of space weaponization is an urgent issue.

## **In 2000 China's National Defense white paper:**

**“In view of the fact that the US is accelerating its efforts for the development and possible deployment of a national missile defense system and space weapons, and that the US and Russia still possess nuclear arsenals large enough to destroy the world many times over, it is China's position that continued nuclear disarmament and the prevention of an arms race in outer space are multilateral fora of arms control that should be given more priority than the FMCT negotiations.”**



# Response: Reconsidering China's commitments to arms control treaties

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## **❑ CTBT Ratification?**

- As BMD countermeasures: smaller warheads needed for deploying complicated decoys, MIRVed missiles, etc—could require to resume nuclear test
- In fact, many Chinese scientists and arms control experts believe that China has made significant sacrifices for the signature of CTBT ---the CTBT will put more direct constraints on China's nuclear weapons program than on the weapons programs of other states .
- If U.S. pursues its own absolute security while damaging the security of other nations, and has no interest in international treaties, then why should China, care about an international agreement such as CTBT?



**THANK  
YOU!**