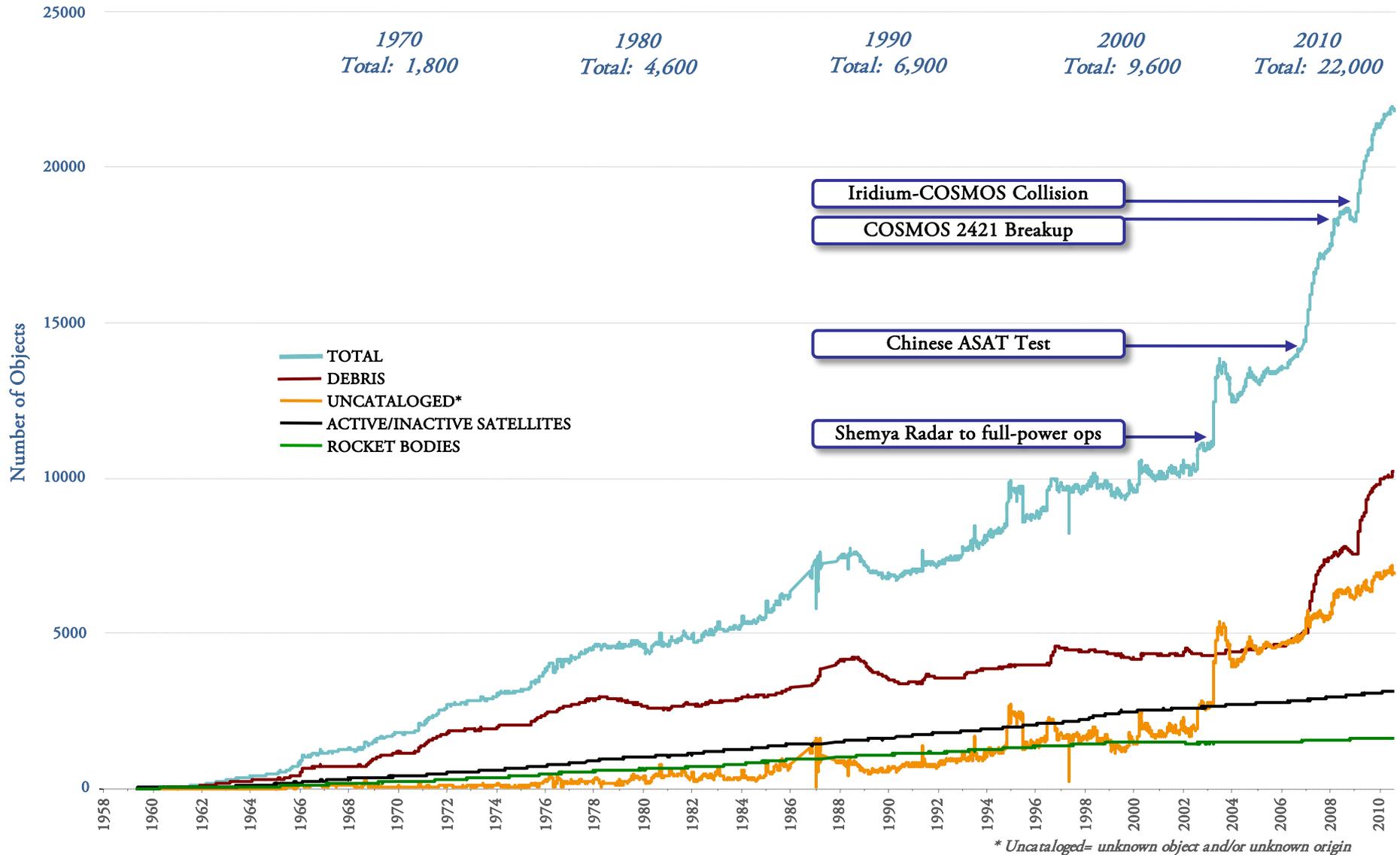# U.S. National Security Space Strategy and Responsible Behavior in Space

Audrey M. Schaffer
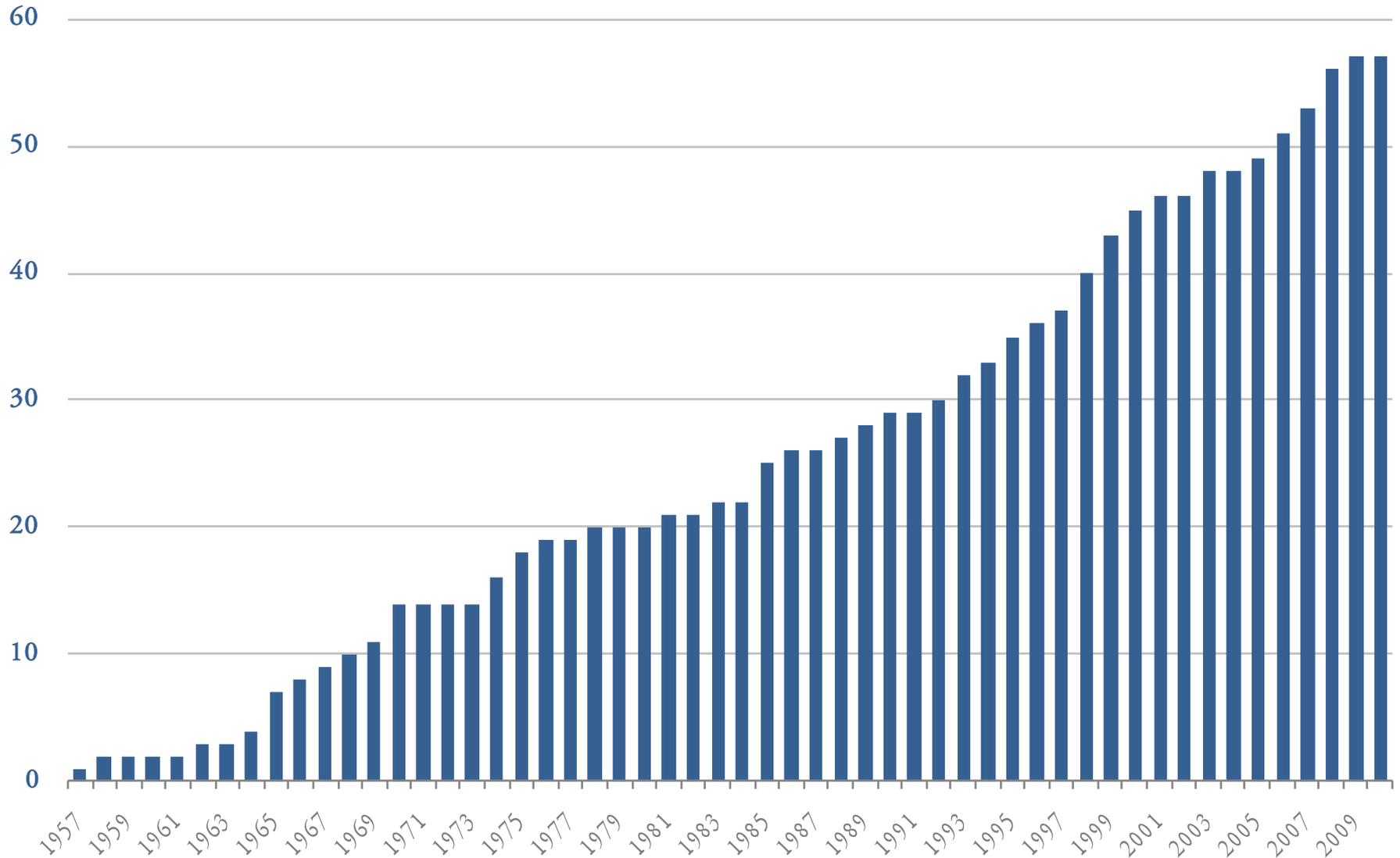**U.S. Department of Defense**

What is the problem?

Space Objects Tracked Over Time

Source: Joint Space Operations Center, as published in National Security Space Strategy

Number of Nations and Government Consortia Operating in Space

How does the DoD intend to address these challenges?

Implement the National Security Space Strategy

❑ *Strengthen safety, stability, and security in space*

  • Nations exercise shared responsibility for space domain

❑ *Maintain and enhance the strategic national security advantages afforded to the United States by space*

  • Meet needs of space users, even if space environment is degraded

❑ *Energize the space industrial base that supports U.S. national security*

  • Improve foundations of space enterprise – people, process, industry

"To promote security and stability in space, we will pursue activities consistent with the inherent right of self-defense, deepen cooperation with allies and friends, and work with all nations toward the responsible and peaceful use of space."   - National Space Policy

Pursue five inter-related approaches

❑ ***Promote*** *responsible, peaceful and safe use of space*

- Lead by example, supporting development of transparency and confidence-building measures (TCBMs), norms, standards, and best practices

- Foster cooperative space situational awareness (SSA) and support safe space operations

❑ ***Provide*** *improved U.S. space capabilities*

- Continue improving space acquisition, technology development, space cadre

- Foster robust, competitive, flexible, and healthy space industrial base

❑ ***Partner*** *with responsible nations, international organizations, and commercial firms*

- Operate in coalitions of like-minded spacefaring nations; pursue opportunities for cost- and risk-sharing

- Explore sharing space-derived information as "global utilities" with partnered nations

❑ ***Prevent and deter*** *aggression against space infrastructure that supports U.S. national security*

- Multilayered approach: shape the international environment, encourage potential adversary restraint, improve our intelligence posture, and develop a range of response options

❑ ***Prepare*** *to defeat attacks and to operate in a degraded environment*

- Improve resilience of systems and constellations

- Develop tactics, techniques, procedures to operate in a degraded or denied space environment

Addressing the challenges of the 3 C's

Congested

Competitive

Promote responsible, peaceful, and safe use of space

Provide improved U.S. space capabilities

Prepare to defeat attacks and to operate in a degraded environment

Prevent and deter aggression against space infrastructure

Partner with responsible nations, firms, international organizations

Norms

TCBMs

Standards

SSA

Information Sharing

Resilient Architecture

Protection

Cross-domain Solutions

Acquisition

Technology

Industrial Base

Space Cadre

Sharing U.S. Capabilities

Collaboration

Contested

Coalitions and Alliances
Attribution
Foundational
Intelligence
Response Options

Active U.S. leadership drawing on all elements of national power

What is the U.S. view on responsible behavior?

Rights and Responsibilities in Space

❑ **National Security Strategy**

- "New and emerging powers who seek greater voice and representation will need to accept greater responsibilities for meeting global challenges."

❑ **National Space Policy:**

- "It is in the shared interests of all nations to act responsibly in space to help prevent mishaps, misperceptions, and mistrust."
- "The U.S. will "strengthen stability in space through … international measures to promote safe and responsible operations in space."
- "Pursue bilateral and multilateral transparency and confidence-building measures to encourage responsible actions in, and the peaceful use of, space."

❑ **Priorities for 21st Century Defense (Defense Strategic Guidance):**

- "Working closely with our network of allies and partners, we will continue to promote a rules-based international order…."
- "The United States will continue to lead global efforts with capable allies and partners to assure access to and use of the global commons … by strengthening international norms of responsible behavior…."

❑ **National Security Space Strategy:**

- "We will encourage responsible behavior and lead by the power of our example."
- "The United States will support development of data standards, best practices, transparency and confidence-building measures, and norms of behavior for responsible space operations."

Top Down		
TYPE	PURPOSE	CURRENT EXAMPLES
Codes of Conduct	Normative framework for appropriate behavior	– International Code of Conduct for Outer Space Activities
Transparency and Confidence-Building Measures	Information sharing to strengthen stability and security	– UN Group of Governmental Experts on Transparency and Confidence-Building Measures
Rules of the Road	Information sharing and maneuver rules to support safety	– USSTRATCOM Space Situational Awareness Services – Space Traffic Management concepts
Guidelines	Best practices for design, launch, operation, and disposal	– UN COPUOS Long-Term Sustainability of Space Activities Working Group – Debris Mitigation Guidelines
Standards	Technical specifications	– ISO Standards – CSSDS
TYPE	PURPOSE	CURRENT EXAMPLES
Bottom Up		

Pursue An Integrated Approach

❑ **Each of these approaches can contribute to the long-term sustainability of the space domain**

❑ **Different approaches operate on different timescales**

❑ **There is a role for all segments of the space community in defining responsible behavior**

❑ **The United States intends to lead international efforts to define and promote the responsible use of space**

Thank you!

Back-up Charts

Top Down

Codes of Conduct

Transparency and Confidence-Building Measures

Rules of the Road

Best Practice Guidelines

Technical Standards

Bottom Up

Codes of Conduct

Description	Benefits
Normative framework describing relevant TCBMs and other key elements of responsible behavior Core elements include measures that are in the interests of all responsible spacefaring nations	Development and negotiation can build international political consensus and understanding around key concepts Most benefit when developed collaboratively by all responsible spacefaring nations
Key Actors	**Examples**
Nation states (diplomatic initiative)	EU-proposed international "Code of Conduct for Outer Space Activities" Hague Code of Conduct Against Ballistic Missile Proliferation (HCOC)

Transparency and Confidence-Building Measures

Description	Benefits
Information sharing and mutual assurances to reduce the chances of mishaps, misperception, and mistrust	Increases understanding Fosters trust Enhances stability and security Can be bilateral or multilateral
Key Actors	**Examples**
Nation states (diplomatic initiative)	UN Group of Governmental Experts on Space TCBMs - Measures to enhance transparency - Notifications regarding hazards - International consultations to prevent incidents and minimize interference

Rules of the Road

Description	Benefits
Commonly-followed operational practices that enhance safety for all	Grow, over time, out of shared operational experience
	"Operator-agnostic"

Key Actors	Examples
Government operators (civil and national security) Commercial operators Academic operators	Rules of the road at sea
	USSTRATCOM SSA Sharing
	Future Space Traffic Management Concepts (ISU SSP '07 report)

Best Practice Guidelines

Description	Benefits
Guidelines to ensure safety of all space activities throughout space system lifecycle (design/development, launch, operations, and end-of-life) "Rules of the road" beyond operations	Very inclusive process resulting from shared interest in safety Grow out of successful experience
Key Actors	**Examples**
Government developers and operators Commercial developers and operators Academic developers and operators	IADC / UN COPUOS Orbital Debris Mitigation Guidelines UN COPUOS STSC Working Group on Long-Term Sustainability of Space Activities (LTSSA)

Technical Standards

Description	Benefits
Specifications to ensure consistent application of design, manufacturing, management, or operational processes or principles	Rigorous process, based on technical analysis Usually developed by consensus
Key Actors	**Examples**
Government Industry Academia	International Organization for Standardization (ISO) National standards bodies Consultative Committee on Space Data Systems

EU Draft of International Code of Conduct

❑ **Abide by General Principles:**

- Freedom to access, explore, and use space for peaceful purposes without interference
- Take all appropriate measures, cooperate in good faith to prevent harmful interference
- Prevent outer space from becoming an area of conflict
- Inherent right of individual or collective self-defense (UN Charter)

❑ **Comply with existing space legal framework**

❑ **Follow General Measures on space operations:**

- Refrain from actions that damage or destroy space objects unless reducing debris or acting in self-defense
- Minimize risk of collision; promote guidelines for long-term sustainability

❑ **Notify, in a timely manner, to greatest extent feasible and practicable, all potentially affected Subscribing States of:**

- Scheduled maneuvers which may result in dangerous proximity to space objects of other states
- Launch of space objects
- Collisions, break-ups, debris creation; high-risk reentries; and malfunctioning space objects that could cause a collision

UN Group of Governmental Experts

❑ **Established by UN General Assembly Resolution 65/68**

❑ **To study space transparency and confidence building measures, similar to 1991-1993 study of space TCBMs**

❑ **15 experts with equitable geographic distribution**

❑ **2012 - 2014; first meeting to be in July 2012**

❑ **United States believes group should consider:**

- Measures to enhance transparency
- Notifications regarding hazards
- International consultations to prevent incidents and minimize interference

USSTRATCOM SSA Sharing

❑ **Conjunction assessment**

- *Warn of potential collision based on pre-defined safety thresholds*

❑ **Launch, deorbit/reentry, and disposal/end-of-life support**

- *Recommend windows to avoid collisions*
- *Assess and confirm satellite successfully placed in target location (i.e. operational orbit, successful reentry, or disposal orbit)*

❑ **Collision avoidance support**

- *Provide operators with information to avoid collisions when maneuvering*

❑ **Anomaly resolution**

- *Figure out what's wrong*

❑ **EMI resolution**

- *Help locate and resolve sources of electro-magnetic interference*

Long-Term Sustainability of Space Activities

❑ **COPUOS working group of national experts to examine long-term sustainability of space activities**

❑ **To prepare a report with a consolidated set of current practices, operating procedures, technical standards, and policies associated with the long-term sustainability and safe conduct of outer space activities**

❑ **Four expert sub-working groups:**

A. Sustainable space utilization supporting sustainable development on Earth

B. Space debris, space operations, and tools to support collaborative space situational awareness

C. Space weather

D. Space regulatory regimes and guidance for actors in the space arena

Space Standards

❑ **International Organization for Standardization**

- Space system design
- Space safety systems, requirements, procedures
- Space operations
- Orbital debris mitigation
- Program management

❑ **Consultative Committee for Space Data Systems**

- Communications
- Information management
- Networking and interfaces
- Conjunction summary message