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**at the European Space Policy Institute/GWU Space Policy Institute  
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Elliot School of International Affairs  
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Let me begin by welcoming Dr. Kai-Uwe Schrogl and his colleagues from the European Space Policy Institute (ESPI) to Washington. While I recently had the pleasure of attending a similar ESPI workshop in Brussels, I'm glad that ESPI has journeyed across the Atlantic to discuss results from some of their recent research projects with experts here in the United States.

I also wish to commend Dr. Scott Pace and the George Washington University's Space Policy Institute (SPI) for hosting this event, which is the latest in a series of collaborations between SPI and ESPI. Such efforts – which have included the release of joint statements on trans-Atlantic space cooperation and the strategic economic importance of space – make important contributions to the policy debate over opportunities for international space cooperation.

While everyone in the space policy community is aware that this year marks the 40<sup>th</sup> Anniversary of the Apollo 11 moon landing, some may be less aware of two other significant 40<sup>th</sup> anniversaries that occur this month. The first was the landing on November 19, 1969, by the Apollo 12 lunar module Intrepid.

Scientists and engineers remember this landing for its deployment of a nuclear powered science package and recovery of hardware from the Surveyor 3 probe. But perhaps the best-remembered part of Apollo 12

occurred when Commander Charles “Pete” Conrad became the third man to walk on the moon. Conrad was a 1.68 meter (5 feet 6 inches) tall naval aviator. This made him roughly 12 centimeters (5 ½ inches) shorter than a certain man who had made “one giant leap for mankind” four months earlier.

So this provides some context for the immortal words uttered after Commander Conrad clambered off of Intrepid’s ladder: “Whoopie! Man, that may have been a small one for Neil, but that’s a long one for me.”

This month also marks the 40<sup>th</sup> Anniversary of the first American broadcast of the television show “Sesame Street.” Official commemorations of this program – which now shows in 140 countries -- included a visit last week by First Lady Michelle Obama to plant vegetables with Elmo and Big Bird. Space policy analysts will undoubtedly recall Sesame Street has also educated its youthful audience on the need for clear space exploration objectives, including Ernie’s musical commentary that “I’d like to visit the moon, but I don’t think I’d like to live there.”

As most of you probably also recall, each episode of Sesame Street is sponsored by a certain letter of the alphabet. So in that 40th anniversary spirit, my remarks regarding the theme of today’s workshop are sponsored by the letter “C,” as in the adjectives “congested,” “complex” and “contested” and the nouns “concept” and “capabilities.”

### ***U.S. Space Policy Review***

But before hearing a few words from our sponsor, it’s important to consider some basic context here in Washington. This includes the fact that the Obama Administration is currently in the process of assessing U.S. space strategies, programs, and options in a comprehensive interagency review of space policy.

One key element of this review is considering approaches to protection of critical government and commercial space infrastructures against “all hazards” – including those posed by the natural environment as well as debris and intentional threats. Other elements of the review include an examination of policy options for more effective space acquisition and the

roles of sectoral and national-level strategies in advancing U.S. national interests in space.

Insights gained from Interagency evaluations of protection, acquisition and strategies are helping to inform a concurrent review of international cooperation in space, which is being conducted in consultation with our friends and allies in Europe as well as key allies in other regions.

The U.S. review of space cooperation includes “blank slate” analyses of options in several areas, including:

- The feasibility and desirability of effectively verifiable arms control measures which support the national security interests of the United States, its allies and all spacefaring nations;
- Potential reforms to the U.S. export control system for space goods and services, as part of a broad-based review of the overall U.S. export control system;
- Coordination with friends, allies and trading partners on common arrangements to prevent the transfer of dual-use space capabilities to unauthorized destinations;
- Expanded cooperation with allies and partners on capabilities to enhance shared security interests
- Enhanced cooperation with established and emerging spacefaring nations on the peaceful exploration and use of outer space for civil and commercial applications

It is premature to predict the specific decisions that will result from this U.S. policy review. However, a recent statement by the United States delegation to the United Nations General Assembly already clearly states enduring U.S. support for a number of long-standing principles, including those in the 1967 Outer Space Treaty, which provides the fundamental guidelines required for the free access to, and use of, outer space by all nations for peaceful purposes. The United States also will continue to:

- Reject any limitations on the fundamental right of the United States to operate in, and acquire data from, space;
- Conduct United States space activities 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;
- Highlight the responsibility of states to avoid harmful interference to other nations' peaceful exploration and use of outer space;
- Take a leadership role in international fora to promote policies and practices aimed at debris minimization and preservation of the space environment; and,
- Support for the inherent right of individual or collective self-defense, as reflected in the UN Charter.

These principles, which are shared by our friends and allies in Europe, Canada and other regions, serve as the foundation for international cooperation with all spacefaring nations. Such cooperation is essential today more than ever as space evolves into an increasingly congested, complex, and potentially contested, domain.

In considering these issues, it may be useful to consider three adjectives starting with letter "C:" congested, complex and contested.

### ***Congested***

When Syncom 2 became the first satellite to operate in geosynchronous orbit in 1963, most space activities consisted of short-lived spacecraft launched by one of two nations – the United States or the Soviet Union – into low earth orbit. As technology and applications have advanced over the past 46 years, there are now over 18,000 man-made objects in various earth orbits. This total includes approximately 1,300 active satellites.

For decades, a number of satellite operators employed a "big sky theory," taking the calculated risk that the immensity of outer space meant that the prospect of a collision was extremely remote. However, attitudes quickly changed last February, when a privately operated Iridium communications

satellite collided on February 10 with an inactive Russian military satellite. In addition to the direct economic impact resulting from a loss of capabilities, the debris generated from this collision adds to the overall level of hazard in low Earth orbit.

As a leading spacefaring nation, the United States takes these issues very seriously. The United States has been, and will continue to be, active in identifying potential hazards and is pursuing new initiatives to preserve safety of flight for both human and robotic space missions.

In particular, last winter's collision highlights the need to improve shared space situational awareness. As part of an effort to prevent future collisions, the United States expanded the number of satellites it monitors for risk of collision with other satellites and space debris. In addition, the United States provides notification to other government and commercial satellite operators when U.S. space analysts assess that one operator's satellite is predicted to pass within a close distance of another spacecraft or space debris.

As Lieutenant General Larry James, the Commander of U.S. Strategic Command's Joint Functional Component Command for Space, announced earlier this month, this notification process already includes 800 maneuverable spacecraft and will soon expand to include the approximately 500 satellites that are active but not maneuverable.

### *Complex*

To help assist in this process, the U.S. Department of State is working closely with United States Strategic Command to facilitate prompt notifications of potential hazards to all spacefaring nations. Through our work with Strategic Command, my colleagues at State and I have gained a new appreciation for the complexity of space operations in the early 21st Century.

Some of the most interesting operational complexities relate to commercial satellite communications service providers who operate fleets of spacecraft controlled from mission control centers located in several countries with transponders operating on radio frequencies licensed by several national

administrations. While I'll leave it to the scholars and analysts here today to analyze all the potential facets of this situation, I can say that the United States Government is already taking pragmatic steps to improve communications among all satellite operators and to ensure that collisions and other unforeseen incidents do not become a cause for misinterpretation or miscalculation.

The United States was in communication with the Russian Federation promptly following the February collision, which was itself a demonstration of a valuable transparency and confidence-building measure (TCBM).

Additionally, four months after the collision, experts from the United States and the Russian Federation met in Vienna to discuss the incident and to commence discussions on opportunities for a broad range of TCBM's. Looking ahead, U.S. experts look forward to continued diplomatic and military space exchanges with Russia in 2010. Concrete actions – such as dialogue on national security space policies and strategies, expert visits to military satellite flight control centers, and discussions on mechanisms for exchanges of information on natural and debris hazards – can help raise practical cooperation to a new level.

In addition to its bilateral discussions with Russia, the United States also provided a presentation to the UN Committee on the Peaceful Uses of Outer Space (COPUOS) on the February collision and its implications. In this presentation, the United States noted that this incident serves as an important reminder of the need for international cooperation with other spacefaring nations on measures to ensure the long-term sustainability of operations in the space environment.

In particular, the United States looks forward to collaborating with our friends in Europe and with other like-minded nations on a multi-year study of “long-term sustainability” within the Scientific and Technical Committee of the COPUOS. This effort will examine the feasibility of voluntary “best practices guidelines” to help reduce operational risks to all space systems. This study will serve as a valuable opportunity for cooperation with established and emerging members of the spacefaring community and with

the private sector to enhance spaceflight safety and preserve the space environment for future generations.

### *Potentially Contested*

In addition to considering general measures for spaceflight safety, any discussion on the future use of space must directly address the source of mistrust. In particular, the United States believes that China must provide greater transparency regarding its intentions for the development, testing, and deployment of elements of a multi-dimensional counter-space program. The January 2007 test of a direct-ascent anti-satellite (ASAT) weapon demonstrates that the Chinese military's interest in counterspace systems is more than theoretical. This raises the prospect of space becoming a contested environment.

Many spacefaring nations and commercial operators continue to face unnecessary hazards resulting from the orbital debris created by China's ASAT weapon flight-test in January 2007. This test created a pervasive debris cloud of more than 150,000 objects greater than 1 centimeter in size. U.S. experts estimate that many of the objects in this cloud – which accounts for more than 25 percent of all cataloged objects in low earth orbit – will stay in orbit for decades, and some for more than a century.

The United States believes that any decision by the Peoples Republic of China to conduct another intentionally-destructive ASAT weapon test in space would further undermine the credibility of the China's declaratory statements regarding its condemnation of the so-called "weaponization of space." It also would raise new questions about Beijing's commitment both to act responsibly in space and to support the peaceful use of outer space.

In this regard, it is worth noting that a senior Chinese Ministry of Foreign Affairs official provided assurances last year to the United States that China will not conduct future ASAT tests in space. This commitment by China is an important step forward, and the international community expects China to live up to its pledge to act responsibly in outer space.

Looking to the broader questions of space security, the United States believes that bilateral transparency and confidence-building measures such as those now under discussion with Russia could potentially also form the foundation for bilateral TCBMs with China as well as a set of multilateral voluntary TCBMs. As a result, the United States will continue to play a leading role in advancing TCBMs for national security and related space activities.

Pragmatic multilateral TCBMs can help increase transparency regarding governmental space policies, strategies, and potentially hazardous activities. TCBMs can also help to reduce uncertainty over intentions and decrease the risk of misinterpretation or miscalculation.

Over the past two years, the United States has had fruitful and forthright exchanges with European experts regarding the European Union's proposal for a "Code of Conduct for Outer Space Activities." Looking ahead, the United States will continue to work with the European Union and other like-minded nations in efforts to advance a set of voluntary TCBMs that is acceptable to the greatest number of countries.

### ***Concept***

The ongoing collaboration between the United States and Europe in advancing a Code of Conduct isn't the only opportunity for trans-Atlantic cooperation. Our shared interests also can form the basis for focused discussions between and among the nations of North America and Europe as well as the institutions of NATO and the European Union. Such dialogues can enhance the protection posture of our interdependent space infrastructures, and more generally provide for effective development of space-based capabilities, which play increasingly widespread and vital roles in support of defense and other security missions.

In this regard, it is time to consider how space relates to the challenges that the North Atlantic Alliance should address, how to ensure that resources and roles are matched to missions, and how to strengthen partnerships to better

reflect the globalized, networked world in which we live. This brings up two more words from our sponsor, the letter “C:” Concept and Capabilities.

Work on a shared concept should center on NATO and should address several aims, including:

- First, developing a stronger consensus over the challenges NATO should address.
- Second, ensuring that both policy makers and publics understand the necessity of matching NATO resources to NATO missions, and
- Third, strengthening partnerships to maximize NATO’s role as an agent of peace and stability and to better reflect the globalized, networked world in which we live.

The United States is fully committed to a strong and relevant North Atlantic Alliance. As President Obama observed at the Strasbourg-Kehl summit last April, it is a “fundamental truth that America cannot confront the challenges of this century alone” and that “Europe cannot confront them without America.”

But NATO can only be as relevant as it is able to adapt to the current threat environment. This was why NATO leaders at Strasbourg issued a Declaration on Alliance Security tasking the Alliance with rewriting NATO’s Strategic Concept by the next Summit in late 2010. The process offers an opportunity we can’t miss – an opportunity to develop stronger consensus across NATO member states about NATO’s challenges, ambitions, resources, and partnerships.

This is an opportunity that follows an important tradition. Since 1949, the Alliance has developed no less than six strategic concepts – four during the Cold War, and two since its end. Each time, the process has permitted the Alliance to discuss and recalibrate its collective approach based on the evolution of the security environment.

As we know, the United States, Canada and Europe today face some very different challenges than they did when we worked on the last Strategic Concept a decade ago. Since that time it has become clear that poor governance and festering extremism far beyond NATO borders can have deadly implications for the security of our own populations. NATO efforts to combat violent extremism and promote stability and security in Afghanistan are closely linked to our own security in North America and Europe. As President Obama said in September after his meeting with Secretary General Rasmussen of our efforts in Afghanistan: this is not an American battle, it is a NATO mission. So any opportunity to provide space support that Allied and coalition forces need to achieve their missions should be pursued accordingly.

Since 1999, it has also become clear that the Alliance is vulnerable in new ways. Cyber attacks against NATO members and the use of energy dependency as political leverage have raised fresh sets of concerns within the Alliance. In response, a new NATO Cyber Defense Center of Excellence in Estonia has been actively addressing cyber security threats, and allies are discussing energy security issues such as critical energy infrastructure protection.

As NATO takes a role in addressing securing networks and protecting critical infrastructures, an Alliance geared toward the 21st century will need to continue to expand on these initial efforts. This should include consideration of threats in what U.S. Undersecretary of Defense for Policy Michèle Flournoy has called the “contested commons” of outer space, as well as the protection of associated ground and cyber infrastructures.

### ***Capabilities***

If NATO is to have the capabilities it needs, and moreover, if it is to play a greater role in space security, then governments on both sides of the Atlantic will have to ensure that resources -- including those allocated to space -- match NATO missions. Satellites may be more expensive than tanks, but

they are needed for the full range of Allied missions, including the collective defense of Allied territory as well as expeditionary missions.

In addition to engaging North American and European publics on the importance of NATO's role in today's security environment, the new Strategic Concept will need to reconsider how the Alliance engages with partners. In this regard, it's important to underscore the importance of NATO's cooperation with the EU, and of combining NATO's military strength with economic and other civilian contributions, including from the EU and other European Institutions.

At the political level, the ideological debate over whether NATO and the European Union are complementary or competitive has ended. As we've seen in the Balkans and are seeing today in Afghanistan, each institution has the ability to bring distinct capacities to crisis management, stabilization operations, and responses to threats to our economic and security interests. The United States supports steps that strengthen the EU's capability to contribute. The U.S. also looks forward in the years ahead to NATO-EU cooperation that is expanded, closer and results-oriented.

The opportunities for such cooperation are also promising in the development of space capabilities, where the adoption of the Treaty of Lisbon will create new mechanisms for consideration of space's role in the EU's Common Security and Defense Policy. As these institutional changes occur, nations on both sides of the Atlantic should look forward to discussion of new opportunities for space security cooperation between NATO and the EU as well as in annual U.S-EU space cooperation dialogues.

At the same time as we pursue discussions on policy and strategy, we can engage in pragmatic discussions on technical issues. The NATO-EU Capability Group has held discussions of space-based support capabilities, for example tactical intelligence, surveillance and reconnaissance, which should be deepened and widened to other capability areas. Meanwhile, discussions on space situational awareness and commercial space

infrastructure protection are already underway between U.S. experts and their counterparts in the European Space Agency and EU.

At the same time, there is certainly no monopoly on expertise within government, so research and analysis by organizations like ESPI and SPI will continue to play an important role in informing policy development. So I will conclude by noting the importance of moving forward despite initial difficulties. Here, we can recall the experience of Apollo 12, which experienced two lightning strikes within a minute after launch from Cape Kennedy. Fortunately, lunar module pilot Alan Bean and John Aaron, an engineer in Houston, remembered which switch to hit and prevented a mission abort. Or, as Commander Conrad later observed, “The flight was extremely normal...for the first 36 seconds, then after that got very interesting.” So while I wish you all an extremely normal journey, it never hurts to be prepared for something very interesting.