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Space as a new frontier : The US Approach Toward Space Activities from Eisenhower to Obama (Emory Elliott Award for Outstanding Paper)

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SPACE AS A NEW FRONTIER:

The US Approach toward Space Activities
from Eisenhower to Obama
(Cooperative or Competitive Approach)

Tensions in the ‘global commons’ gained international attention with Flournoy—undersecretary of defense policy at the US Department of Defense—who referred to it as the source of emerging security challenges in her speech at the Center for Strategic and International Studies (CSIS) in April 2009. Among the global commons, which include Antarctica, oceans, the atmosphere, and outer space, the legacy of success in the use of outer space and the desire to exercise power over it have presented new international challenges, especially among the ‘space powers.’

This article¹ will provide a historical outline of national space policies in the American context—from Eisenhower to Obama—based on frontier theory. The writer addresses the present research core question: would the US approach to directing space activities be cooperative or competitive in order to preserve its leadership and its national security in the space arena? Recognizing the importance of space-based projects to the US national interest, this article discusses the evolution of US national space policy on the basis of National Aeronau-

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1. The hereby presented article by Hedyeh Nasserri is the inaugural Emory Elliott Prize Essay. The Emory Elliott Prize was established to honor the stellar and innumerable contributions to the field of American Studies of the late Professor Emory Elliott. Prize-winning essays are examples of the best American Studies scholarship, exploring new avenues of knowledge and creating new ways to investigate the field, while expanding our understanding of its endless possibilities.

tics and Space Administration (NASA) civilian and exploratory space activities related to US space security.

With America's pioneer heritage, technological preeminence, and economic strength, it is fitting that we should lead the people of this planet into space. Our leadership role should challenge the vision, talents, and energies of young and old alike, and inspire other nations to contribute their best talents to expand humanity's future (US National Commission on Space, 1986).

During the Cold War, the US and the Soviet Union recognized that the unique nature of 'space environment' would make it impractical if not impossible to abide by the terms of 'sovereign jurisdiction.' Therefore, they took the approach that 'it was in their [national] interests to use space to stabilize deterrence, the guiding strategic doctrine of the day, and to support arms control toward that goal' (Johnson-Freese, 2009: 34); however due to the difference between physical environment of space and that of territorial waters and airspace, both countries were forced to accept the right of using space for each other and eventually for other countries.

The history of mankind's exploration of space revives images of a time when the Soviet Union launched Sputnik I as the first satellite to orbit the Earth in outer space on October 4, 1957. This technological success not only opened a new dimension to the human eye but also ignited the 'space race' and warned the US, a great power, about the future. However, it was not the end of the series of achievements; in April 1961, Yuri Gagarin was sent into the Earth's orbit and completed the mission of the first manned space flight. Further, in 1969, Neil Armstrong walked on the moon and became the first man to touch one of the celestial bodies (Blackburn, 2009: 53; Diederiks-Verschoor and Kopal, 2008: 2).

The space race began as a race for prestige and security between the US and the Soviet Union, but, in the post-Cold War era, the growth and development of economy and space-based technologies in the globalized world made it possible for other nations to take the chance to use space. As a result, in 'the now-ubiquitous and interconnected nature of space

capabilities and the world's growing dependence on them' (The White House, 2010), the US needs a comprehensive space strategy to preserve its security and leadership in space.

OUTER SPACE AS A GLOBAL COMMON

'Global commons' refers to any of the earth's ubiquitous and unowned natural resources, such as the oceans, the atmosphere, and outer space. Although global commons generated few questions for jurists and politicians in earlier centuries, tensions have arisen among the powers over getting access to the 'permanent dominion' in an area of global commons.

Historical investigations reveal that international treaties have always been used as a tool to prevent states from violating the international rules regarding the use of global commons and common resources. In the case of outer space—compared to the oceans and Antarctica—the international organizations have just taken the first steps.

Although airspace is subject to any country's sovereign control, claiming national sovereignty in outer space is prohibited since this space is considered a global common. According to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Article II, 'outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation or by any other means' (Wassenbergh, Masson-Zwaan and Mendes de Leon, 1992: 231).

Regarding the realm of outer space, one of the earliest issues was just how far national sovereignty extends: at what point does airspace stop and outer space begin (Barrett, 1973)? The problem arises from the lack of a clear line between airspace and outer space to determine the sovereignty of states. The lack of a boundary complicates relations between nations who rarely benefit from space scientifically and politically. There are two general viewpoints regarding the need for drawing a clear line between airspace and outer space. The first discusses the necessity to delimit 'the legally binding obliga-

tions' related to exercising authority and performing national activities. The other viewpoint argues that there is no evidence to prove the necessity of drawing a line and explains that, because of 'the rapid pace of space technology and the practical uncertainties regarding the characteristics of feasible and desirable space activities,' trying to set a boundary would risk too high or too low limitation (Barrett, 1973).

THE SIGNIFICANCE OF FRONTIER THEORY

Considering the key role of frontier in American history, Frederick Jackson Turner was the first scholar-historian who made a great attempt to demonstrate the legacy of frontier in shaping the American social and political culture and coined the frontier theory. To Turner, the unique environment of the 'New World' with 'ever-advancing frontier settlement' and the 'existence of an area of free land' gave birth to the 'new product that is American' (Turner and Billington, 1962: vii). He portrayed the future of America as a new and progressive era and encouraged the American spirit to be invoked for the 'new and nobler achievements' (Turner and Billington, 1962: 253). Modern American history has also been affected by Turner's frontier legacy in four successive stages:

1) The rural-land frontier which saw the initial opening, settling and cultivating of the continent. 2) The urban-industrial frontier that witnessed a rapid growth in the number and size of cities and of great centers of industry. 3) The metropolitan-technological frontier which has seen a second industrial revolution, and the urban-cybernetic frontier that is now in its early stages. This frontier has also involved the exploration of new space like the undersea and outer space, and the development of wholly new and exotic technologies (Elazar, 2010).

The frontier's effects in 'perennial rebirth, the fluidity of American life and the expansion westward with its new opportunities' have not been abolished through the history but can be traced through modern Americans who believe that they should expand the borders in order to keep their country moving upright (Elazar, 2010).

In his 1893 essay *The Significance of Frontier in American History*, Turner announced the 'closing of US frontier' in its geographical context while connecting the American spirit with the idea of 'frontier' as an evolutionary and progressive process. He believed that:

Scientific farming must increase the yield of the field, scientific forestry must economize the woodlands, scientific experiment and construction by chemist, physicist, biologist and engineer must be applied to all of nature's forces in our complex modern society. The test tube and the microscope are needed rather than the ax and rifle in this new ideal of conquest (Launius, 1998).

Turner's belief in the myth of science and technology and President John F. Kennedy's emphasis on the concept of new frontier characterize the American spirit in the twentieth and twenty-first centuries. The idea of new frontier set outer space as a new domain for Americans to conquer, a new area that cannot be explored without technological innovations.

SPACE AS A NEW FRONTIER

Beyond that frontier are uncharted areas of science and space, unsolved problems of peace and war, unconquered problems of ignorance and prejudice... All mankind waits upon our decision. A whole world looks to see what we shall do. And we cannot fail that trust. And we cannot fail to try (Schnelle, 2007: 9).

During Kennedy's presidency, the phrase 'new frontier,' the plane for exploring new areas such as space, and the program of sending Americans to the moon, became associated with his name. In 1961, one month before the US sent a man into space, the Soviets finished the program of sending a Russian to outer space. Subsequently, the US determined to beat the Soviets by sending a man to the moon. This competition became known as the 'space race' (Gunderson, 2009: 20).

Historically, the 'dawn of space age' began in 1946 in the aftermath of World War II when the US Air Force leaders decided to lay a foundation for future space programs by establishing 'the first Air Force-sponsored Project RAND (Research

and Development).’ Their strategy was to establish ‘Air Force responsibility for the as-yet-to-be-determined space mission.’ Due to the uncertainty of the postwar, they did not seem intent on developing the missile and satellites projects. To Air Force leaders, these kind of projects were ‘excessively costly, technologically unsound, militarily unnecessary, or simply too fantastic.’ However, during the early 1950s, the US Air Force view toward their space policies changed. The Soviet triumph in launching the first artificial satellite, Sputnik I, on October 4, 1957, compelled US leaders to focus on the development of missiles and satellites for a new and stronger US defense posture (Spire et al, 2002: 1, 14).

Although the Soviet success in sending the first satellite to space imposed a new urgency on the US Army to launch its first satellite, Explorer 1, on January 31, 1958, ‘after several failures of the Naval Research Laboratory’s Vanguard rocket,’ establishing the NASA through the National Aeronautics and Space Act of 1958 (PL 85-568, the ‘NASA Act’) has been considered the symbol of US entrance into the space as an ‘uncharted ocean’ (Smith, 2010: 4). Therefore, despite of a full period since the end of the Cold War to the launching of the first artificial satellite to the space, it was only by the end of 1950s that the US national space programs were identified by military and civilian aspects of space as two different approaches that have characterized the US administrations’ space policies from Eisenhower to Obama alike.

The table presented in the facing page sums up the US national space policies from 1955 to 2010 in seven categories of space freedom for all nations (Act of 1958), space leadership and prestige (new frontier), space scientific and civilian programs, space security policy, space military policy, cooperative policy and competitive policy. In this table, the US presidents’ space priorities are divided through a red color spectrum into two categories to show how the US space policies and objectives have been highlighted in presidential documents from the 1950s up to now.

US Presidents	Space Freedom for all Nations (Act of 1985)	Space Leadership And Prestige (New Frontier)	Space Scientific and Civilian Programs	Space Security Policy	Space Military Policy	Cooperative Policy	Competitive Policy
Eisenhower							
Kennedy							
Nixon							
Carter							
Reagan							
Bush (Sr.)							
Clinton							
Bush (Jr.)							
Obama							

first priority second priority

Table 1. Priorities in the US National Space Policy

The US approach toward space activities, either cooperative or competitive, mirrors the efforts of presidents to serve US national interests in the space arena after the conclusion of World War II. Historical investigations reveal that US presidents have followed a few basic principles that have been more or less consistent in the US presidential space directives and the national space policies since 1955:

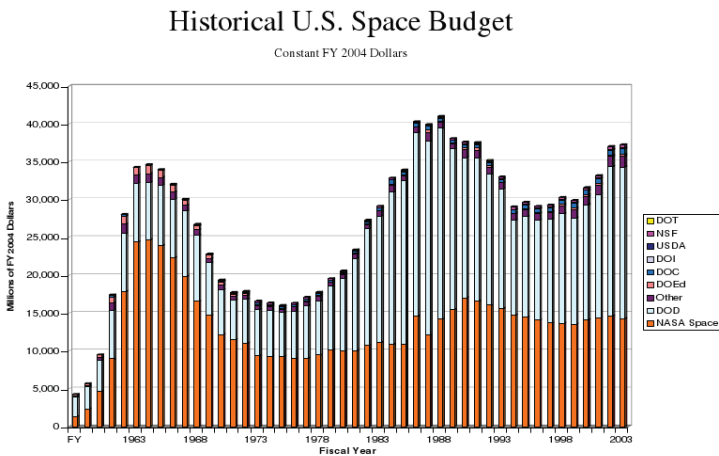
- Freedom of space, which means free access to space for the satellites of any nation;
- Exploration and use of outer space for ‘peaceful purposes,’ which will be beneficial for all mankind. ‘Peaceful purposes in the 1950s was [and remains today] interpreted as allowing defense support and intelligence-related space activities in pursuit of national security’ (Hall, 2010);
- Rejection of any nation’s claim over the outer space or celestial bodies’ sovereignty and ‘any limits on the fundamental right to acquire data from space’;
- Cooperation among the three separate interrelated space branches of the US government: civil, military, and intelligence;
- Respect of any nation for possessing its space systems as national property with the right to operate in space without interference. ‘Purposeful interference with operational space systems is viewed as an infringement on sovereign rights’; and
- Conducting of activities in outer space to support the US right of self-defense (not followed by all presidents) (Hall, 2010).

The past fifty-plus years of the US space history involve cooperation in the era of competition in different areas of civil, military and commercial activities. ‘The Cold War context in which the US civil space program arose in 1958 ensured that foreign policy objectives dominated the nature of the activity. This naturally led to the need for cooperative ventures with other nations’ (Workshop on US Civil Space Policy and Zimmerman, 2009). In this period of bumpy US-Soviet relationship, both countries preferred to use space as a tool for keeping stabi-

lization and learning from each other in developing scientific and technological space programs.

During the Cold War, space never changed to be the ‘war-fighting medium’; however, the US historical space budget reveals that spending money for military and security purposes never stopped during this period and even increased in the post-Cold War period. After the Soviet dissolution, the US space policy entered the period of transition from the early era of the Cold War, in which the US competed with an enemy, the Soviet Union, to be the space leader to the current globalized world in which must deal with international partners to save its preeminence in space. To reach this aim, the US has preferred to cooperate with other nations to stabilize its position in space, enhance knowledge of space, and explore unknown areas while preparing for military competition through increasing the Department of Defense budget for security purposes more than the NASA scientific and exploratory budget, as shown in Figures 1, 2 and 3.²

Figure 1.



2. Shawcross, Historical US Space Budget, 2006; Shawcross, DOD and NASA Space Budgets, 2006; Shawcross, National Security Space Costs Are Increasing, 2006

Figure 2.

DOD and NASA Space Budgets FY 1999 – FY 2009

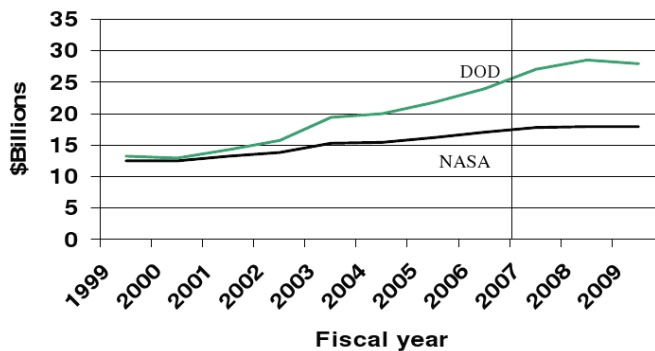
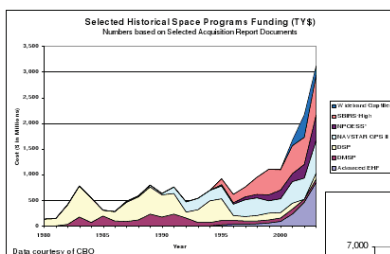


Figure 3.

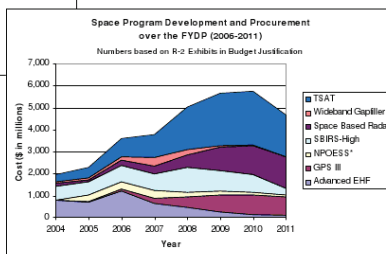
National Security Space Costs are Increasing

Special Issue
*Decoding
American Cultures
in the Global Context*

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Are the large increases in DoD space funding sustainable and executable by the industrial base?



* NPOESS funding is split 50/50 with Department of Commerce only DoD Funding is shown

Table 2. Timeline of US International Cooperation in Exploring the Space³

Launch date	Name	Destination	Country	Current status
10.07.1962	Telstar 1	Earth	USA, UK, France	Telstar 1 went out of service in December 1962 after being overwhelmed by radiation. It was successfully restarted in January 1963 but went out of service again on 21 st February. It is believed to remain in orbit around Earth.
10.11.1974	Helios 1	Sun	USA and (W) Germany	Helios 1 stopped transmitting in 1982 but remains in an orbit around the Sun.
17.07.1975	Apollo-Soyuz Test Project (Apolo 18/ Soyuz 19)	Earth	USA and USSR	The Soyuz craft returned to Earth on 21 st July 1975. The Apollo craft returned on 24 th July 1975.
15.01.1976	Helios 2	Sun	USA and (W) Germany	Helios 2's mission ended in April 1976 but remains in solar orbit.

3. Source: 'Timeline of Space Exploration.' <<http://www.bobthealien.co.uk/19551959.htm>> (Accessed June 27, 2010).

Launch date	Name	Destination	Country	Current status
07.07.1988	Phobos 1	Mars	USSR with 14 other countries including the USA	Contact lost late August/early September 1988.
10.1990	Ulysses	Sun and Jupiter	USA and Europe	Craft is still in operation, orbiting the Sun from a distance as far away as Jupiter. The craft is expected to remain operational until 2008.
02.12.1995	SOHO (Solar and Helospheric Observatory)	Sun (from Earth orbit)	USA and Europe	SOHO is still in operation.
15.10.1997	Cassini-Huygens	Jupiter and Saturn	USA, Europe and Italy	Cassini-Huygens left Jupiter early in 2001 and is now orbiting Saturn. The Huygens probe landed on Saturn's moon Titan and lies inactive on its surface, whereas the orbiter is still operational around Saturn.
20.11.1998	International Space Station	Earth	USA, Russia, Japan, Canada, Europe	The International Space Station is now operational but not yet complete. Work was postponed after the Columbia shuttle disaster in 2003 although it is expected that ISS will be completed in 2010 when the space shuttles are retired. ISS itself is expected to remain operational until at least 2016.

Table 3. Old Space Powers, New Emerging Space Powers
Timeline of Space Exploratory Missions 1957-future⁴

YEAR	US	UK	FR	USSR	DE	EU	RU	IT	JP	CA	CN	IN
1957-59	13 M			8 M								
1960-64	13 M	1 M	1 M	12 M								
1965-69	22 M			23 M								
1970-74	12 M			19 M	1 M							
1975-79	8 M			6 M	1 M							
1980-84	7 M			6 M								
1985-89	3 M			3 M		1 M						
1990-94	5 M					1 M			1 M			
1995-99	12 M					3 M	2 M	1 M	1 M	1 M		
2000-04	4 M					2 M						
2005-10	9 M	1 M				1 M			2 M		1 M	1 M
2011-24	4 M				1 M	3 M	1 M		1 M		1 M	1 M

4. Source: 'Timeline of Space Exploration.' <<http://www.bobthealien.co.uk/19551959.htm>> (Accessed June 27, 2010).

CONCLUSION

In an era of ever-changing global challenges and opportunities, rising tension over the global commons—including Antarctica, oceans, the atmosphere, and outer space—is inevitable. Surpassing, more or less, the international challenges over the first two global commons brings the last ones into global consideration. Outer space seems to challenge the world to enter the new age of competition to gain more control over this new domain and to prevent the national and international security from being threatened.

From its inception in 1958, much of US space activity was affected by Cold War fears and threats. Therefore, for the first decades of the space age, the US took the ‘military operations in space as being among [its] prime national security responsibilities and conduct those operations according to the letter and spirit of existing treaties and international law’ (Gibson and Powell, 2010). In the ensuing decades, however, the growth and development of economy and space-based technologies in the globalized world compelled US to apply two kinds of space strategies in parallel: first, to cooperate with other nations in developing the space-based technologies in all branches of civilian, military and commercial space activities, and second, to increase the Department of Defense space budget as a ‘military backbone’ in order to preserve its security and leadership in space.

Fundamentally, the concept of globalization is all about connectivity. According to Thomas P. M. Barnett in *The Pentagon’s New Map*, ‘globalization is a condition defined as mutually assured dependence’ (Barnett, 2004: 122). Therefore, in the globalized world of nations ‘characterized by intertwined economies, trade commitments and international security agreements,’ mutual dependencies are much more important than before. The idea of ‘assured dependence’ and ‘cooperating toward the secure world’ seem to work in the new domain of space, especially through the branch of space civilian activities (Johnson-Freese, 2009: 133). To reach this level of international security and to be the strategic leader in the globalized world,

the US Committee on the Rationale and Goals of the US Civil Space has identified six strategic goals as a basic for planning the US civil space activities:

- To re-establish leadership for the protection of Earth and its inhabitants through the use of space research and technology.
- To sustain US leadership in science by seeking knowledge of the universe and searching for life beyond Earth.
- To expand the frontiers of human activities in space. Human spaceflight continues to challenge technology, utilize unique human capabilities, bring global prestige, and excite the public's imagination. Space provides almost limitless opportunities for extending the human experience to new frontiers.
- To provide technological, economic, and societal benefits that contribute solutions to the nation's most pressing problems.
- To inspire current and future generations.
- To enhance US global strategic leadership through leadership in civil space activities. Because of the growing strategic importance of space, all nations that aspire to global political and economic leadership in the 21st century are increasing their space-faring capabilities. Continued US global leadership is tied to continued US leadership in space (US House of Representative Committee on Science and Technology Subcommittee on Space and Aeronautics, 2009).

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