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## The New Space Order: Why Space Power Matters for Europe

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# The New Space Order: Why Space Power Matters for Europe

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More than fifty years since the dawn of the Space Age and twenty years since the end of the Cold War, space affairs and politics remain interlinked. Space activities are increasingly tied to national power for major world powers, and political objectives are still the driving force for most space activities. Yet in an ever more globalized and competitive multipolar world, status and power that arise from the employment and access to the most advanced technologies are now widely perceived as key to the powers and standings of states. The importance of space activities is increasing, transitioning in terms of perception by today's world leaders from a "nice to have" to a "need to have" status. A sound understanding of the nature and exploitation of space power is critical for Europe as it provides tangible and intangible benefits back on Earth that allow Europe to maintain its position in the global "space hierarchy" in the 21<sup>st</sup> Century.

The world, since the end of the Cold War, is increasingly interlinked and interdependent at many levels. At the same time, the balance of powers across the world is changing and shifting with emerging world powers rising, particularly in Asia. This is complicated by the fact that there exists a renewed emphasis and importance accorded by states on spheres of influence based on geography or on topical issues. In particular, a greater importance is placed on a country's ability to innovate as a source of competitive advantage. The world is becoming at the same time both "flat" and "spiky."<sup>1</sup> Science and Technology (S&T)

proress is one of the key elements of this emerging flat/spiky system of competitive multipolarity. Governments are fully engaged in improving their national economies and overall competitiveness, but also because they realize that it represents for them a means, among others, for achieving national objectives, including foreign policy motives, especially in the domain of "S&T politics," such as nuclear energy, but also in the area of space affairs.

In the early years of the Space Age, the performances of the United States (U.S) and Soviet Union in space activities came to be

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interpreted as a measure of their relative military, economic, and scientific strength on the world stage. During the Cold War, human

and robotic space accomplishments became on the geopolitical level an element of a country's power and influence. Space, since the 1950s, is a key attribute of a state's power. However, since the 1990s, the space context is dramatically evolving. Similar to the process of internationalization of innovation, space activities are expanding beyond the traditional

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<sup>1</sup>A "flat" world implies that the world is more globalized and interconnected. See Thomas Friedman, *The World Is Flat: A*

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*Brief History of the Twenty-First Century* (Farrar, Straus and Giroux, 2005). A "spiky" world suggests that by almost any measure the international landscape is not at all flat. On the contrary, the world is spiky with concentrated centers of power, influence, economic horsepower and cutting-edge innovation. See Richard Florida, "The World is Spiky," *The Atlantic Monthly*, October 2005.

spacefaring countries<sup>2</sup> to new global players, such as China and India, as well as other emerging countries, with changing patterns of international space relations leading to a new space order.

In this evolving geopolitical context, the importance of space power is increasing as space remains a proxy demonstrating power and because more actors are using space. Although there is a great deal of rhetoric about the impact of S&T on international affairs, there is relatively little analytical work on the link between space and national power, as well as between space power and international affairs. This paper aims to provide a preliminary overview of a complex and wide-ranging subject that brings together the important issue of space power and European influence in international relations.

### Towards a New Space Order

Since the pioneering of space activities, the geopolitical context of space affairs changed dramatically.<sup>3</sup> The history of space activities can be structured into three phases, each having distinct features and characteristics: (1) “proto-space age” (pre-World War II); (2) “Space 1.0” (Cold War); and (3) “Space 2.0” (post-Cold War).<sup>4</sup>

Space 1.0 took place from the late 1950s to the late 1980s. For more than three decades, space was viewed as one of the emblematic

elements of the Cold War rivalry between the U.S. and the Soviet Union, principally as a substitute for armed conflict.<sup>5</sup> During this phase, space activities were limited to a small number of other countries, primarily in Europe and Asia, but with more limited capabilities than the two superpowers. Indeed, the technical difficulties and financial burdens associated with the full range of space activities remained prohibitive for most countries; only a limited number of countries were able to benefit from the use of space technologies and activities due to the inherent technical complexity, high costs associated with space activities, and the necessity for a high-skilled workforce.

*...the importance of space power is increasing as space remains a proxy demonstrating power...*

The current space phase, Space 2.0, which started at the beginning of the 1990s as a result of the changing geopolitical context linked to the end of the Cold War, is characterized by a multipolar world and the rise of many new actors with increasing technical capabilities, advancing an internationalization of space.<sup>6</sup> In particular, a technological revolution linked to the development of small satellite technology, the increasing reliability and accessibility of commercial-off-the-shelf (COTS) technology, and the multiplication of commercial services leading to a reduction of the price of access to space facilitate the involvement of non-traditional actors in the space arena.<sup>7</sup> Countries previously unable to pursue space activities now have a greater opportunity to

<sup>2</sup>The term spacefaring country defines a country capable of developing, launching, and operating satellites in space autonomously. This implies the state possesses a fairly robust launch infrastructure and indigenous capabilities to manufacture and operate space systems.

<sup>3</sup>Nicolas Peter, “The Changing Geopolitics of Space Activities,” *Space Policy* 22 (2006): 100-109.

<sup>4</sup>Nicolas Peter, “Space Power and Europe in the Need for a Conceptual Framework,” paper presented at the 59<sup>th</sup> International Astronautical Congress, Glasgow, Scotland, 29 September - 3 October 2008.

<sup>5</sup>Nicolas Peter, “The Changing Geopolitics of Space Activities,” *Space Policy* 22 (2006): 100-109.

<sup>6</sup>Ibid.

<sup>7</sup>Ibid.

enter the space arena; the space environment is no longer the exclusive province of a handful of countries as it was during the Cold War.

Spacefaring powers are joined by other countries that have some degree of space involvement. An increasing number of countries have acquired over the years space capabilities for national reasons (e.g., support national economy and overall competitiveness, public services, and ensure national security), as well as international reasons (e.g., regional influence and prestige). They recognize the advantages of space activities from the tangible aspects of positioning-navigation-timing (PNT), remote sensing, and telecommunications to the more abstract aspects of political influence and prestige. There are tangible benefits that result from investing in space, such as job creation; stimulation of national interest in Science, Technology, Engineering, and Mathematics (STEM); and spin-off technologies resulting from research and development (R&D). There are intangible benefits as well – a successful space program brings heightened global prestige and increased domestic credibility and prowess.

While few countries have independent launch capability (nine total), and even less have human spaceflight capabilities (three total), the number of players controlling their own communications systems have doubled since the end of the 1980s.<sup>8</sup> There are, as of December 2009, 27 countries with satellite-based Earth observation resources compared with three in 1980, not to mention the numerous countries that have their own image receiving stations for remote sensing systems.<sup>9</sup>

<sup>8</sup>Bertrand de Montluc, “The New International Political and Strategic Context for Space Policies,” *Space Policy* 25 (2009): 20-28.

<sup>9</sup>Ibid.

The multiplication of actors in the post Cold War context is accompanied by an emerging globalization of space activities with actors now scattered all over the world and no longer limited to the “North.”<sup>10</sup> The multipolar space environment and the resulting new space order is characterized by the rapid integration of China and India as new space powers, and the entry of countries particularly from the “South,” like Malaysia, Thailand, and Indonesia.<sup>11</sup> New ambitions to create dedicated space agencies are surfacing on all continents and more countries are formulating space policy to guide their domestic and international space activities with the principal aim being to improve their capabilities and competitiveness.<sup>12</sup>

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<sup>10</sup>It is important to note that national organization of space activities and the weight of national budgets differ greatly among countries around the world. Not all countries involved in space activities do possess a national space agency, and the national authorities responsible for space matters vary widely. A first category is composed of countries with their own agencies devoted more or less exclusively to space. In a second category, space affairs are directly handled by a ministry (education, research and technology, industry or trade, defense, etc.) or by an inter-ministerial entity. See Nicolas Peter, “The Changing Geopolitics of Space Activities,” *Space Policy* 22 (2006): 100-109.

<sup>11</sup>The use of the term “South” refers to all developing countries, as well as all Least Developed Countries (LDCs). It rests on the fact that the entire world’s industrially developed countries (with the exception of Australia and New Zealand) lie to the North of developing countries. However, the diversity of countries in the South must be kept in mind. Some countries, such as Argentina, Brazil, China, India, Mexico, South Africa, and South Korea have enviable records of technical and scientific achievements compared to others in the South and even the North.

<sup>12</sup>Nicolas Peter, “Space Power and Europe in the 21st Century,” European Space Policy Institute Perspectives 21, May 2009, <http://www.espi.or.at/images/stories/dokumente/Perspectives/espi%20perspectives%2021%20.pdf> (accessed January 2010).

As a reflection of the international system, the current space environment is characterized by a growing number of countries with varying ranges of space capabilities (e.g., technical and scientific). This, in turn, is leading to more options for international cooperation in the second space phase as there is a growing pool of potential partners to take part in space activities.<sup>13</sup> States around the world are now looking to a variety of partners as they plan their future endeavors since partnerships are helpful to transfer technologies and explicit and tacit knowledge. Those partnerships are driven by scientific and technical motives, often with “high politics” as objectives. There is a mushrooming of bilateral and multilateral cooperation, including regional cooperation, and there is the development of a complex and multidimensional web of relations in the space arena.<sup>14</sup>

A bipolar space world has been replaced by a pluralistic space context marked by a plethora of complex relationships. The early years of international space cooperation were characterized by power asymmetries in the two superpower’s favor vis-à-vis their partners as illustrated with U.S.-European space relations. However, the traditional asymmetry in space activities, while still existing in term of resources, tends to disappear in regard to capabilities with the emergence of spacefaring countries with similar capabilities to the historical two space powers, the U.S. and

<sup>13</sup>International cooperation in space can be defined as any sharing of knowledge or technology between two, or more, states within the context of mutually acceptable conventions for the exchange of that knowledge or technology. It can take many forms, but in general both parties can derive benefits.

<sup>14</sup>Nicolas Peter, “The Changing Geopolitics of Space Activities,” *Space Policy* 22 (2006): 100-109.

Soviet Union/Russia. Roles and relationships in space are being redefined in the new space order. The U.S. and Russia are no longer the only players that can lead cooperative projects. There are now numerous actors with varying degrees of capabilities allowing them to lead cooperative ventures as well.

The patterns of relations in space are fundamentally changing. There is now a variety of cooperation possibilities leading to new relations evolving beyond the traditional “North-North” cooperation and the unilateral “North-South” axes of cooperation of the first space phase. The new axes of “South-South” cooperation has been growing in recent years in many fields, such as in energy, and space is no exception as they are now more countries from the South with mature technical capabilities that are using space to reach out to new partners. This leads to the development of new networks of cooperation as there are cooperation possibilities with new hubs and

*...being involved in space affairs is increasingly being seen... as a necessary element to being, at a minimum, a regional or continental power.*

centers of gravity appearing in Asia and centered on China and India. New axes of cooperation are arising; some are deepening, while others are weakening.<sup>15</sup> The multiplication of space actors and the new relations among institutional entities are leading to the emergence of a new space order that was unforeseeable twenty years ago.

In the current phase of space activities, there is also a growing diversity in the types of actors involved in space affairs that influences the overall space context. The involvement of non-governmental organizations (NGOs) and

<sup>15</sup>Ibid.

other non-state actors, like private enterprises, are leading to a multiplicity of actors and stakeholders in the space environment. Dozens of companies offer services in open global markets and states can now meet much of their need for space benefits in the market place due to the wide array of communications, navigation, reconnaissance, weather satellite, and launch services commercially available. Commercial technology and know-how transfers have made possible the global distribution of space technologies. The declining price, widening availability of satellite construction, and space launch capabilities allow an ever growing number of states to establish a presence in space. While to date only a few states have mastered the full range of space capabilities, the proliferation of space products and services are allowing states, and non-state actors, to benefit from the advantages provided by space activities without developing, launching, and operating indigenous space systems. Private companies of traditional space powers are the main drivers in this process. Also, new and emerging actors, as they climb the global “space hierarchy,” are providing new sources of technologies and fostering the proliferation of space technologies worldwide.

While the internationalization of space is not entirely new, it is now taking place at a much faster pace. The space system is now more open and dynamic than during the Cold War. Space is spreading more widely, including to developing countries, and involves more than simply purchasing technologies. This trend is likely to progress even more rapidly over the coming years. This means that a country does not have to be a technologically advanced country to acquire space capabilities and this makes all countries potential space players. The asymmetric advantage the superpowers once enjoyed because of their space prowess is eroding because many countries can now,

by partnering with other states or commercial entities, receive certain kinds of space support.

The space context is evolving towards a new space order where space activities are becoming more widespread. However, space activities are prioritized differently depending on the country, and consequently the objectives of space programs differ accordingly. A growing number of states are using space programs for political and symbolic objectives, such as demonstrating and increasing national pride and to achieve national independence, regional influence, and technological maturity.<sup>16</sup> In the current space phase, being involved in space affairs is increasingly being seen, even by newcomers to the space arena, as a necessary element to being, at a minimum, a regional or continental power. For world powers, space is increasingly perceived as an indispensable element of national power. The importance of being involved in space affairs is growing in the unfolding new space order, and no country can now be regarded as a world power, or remain one, unless it possess cutting-edge and diversified space capabilities.

### **The Growing Importance of Space Power**

In recent years, with the aforementioned evolution of the geopolitical context, traditional bases of national power have been fundamentally transformed. Military and economic metrics are no longer the sole indicators of national power.<sup>17</sup> Other variables are increasingly important, such as S&T prowess, and in the 21<sup>st</sup> Century the overall political, economic, and technological

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<sup>16</sup>Bertrand de Montluc, “The New International Political and Strategic Context for Space Policies,” *Space Policy* 25 (2009): 20-28

<sup>17</sup>Herein, national power is defined as the capacity of a country to pursue strategic goals through purposeful action.

leadership of a country must be shown in many areas, space being one of them.

Having now passed its 50<sup>th</sup> anniversary, the Space Age has attained a great degree of maturity.<sup>18</sup> Space activities are indispensable tools for modern society that have proliferated globally. When a state seeks to garner more power, it is increasingly being involved in space affairs as this is a symbol of technology progress. The range and pervasiveness of activities in space resulted in these activities becoming tied, over the years, to national power. Space activities represent a definitive measuring device for the relative status of countries and an indicator of a state's weight and influence on the global scene.

Concomitantly, the proliferation of space capabilities in recent years has not elevated every country into the spacefaring category. Only a certain number of attributes confer this status: access to space and the ability to pursue activities autonomously. Nonetheless, a sound understanding of the nature and exploitation of space power is necessary because it has consequences and profound implications, both domestically and internationally, and gives additional overall national power to a state as space provides for soft power projection.<sup>19</sup>

The body of space power literature lacks a single comprehensive theory that thoughtfully defines, explains, and predicts the nature, significance, and functioning of space

power.<sup>20</sup> According to Colin Gray, "space power suffers from an unusual malady: an acute shortage of space-focused strategic theory and the lack of a binding organizing concept to aid understanding of what it is all about."<sup>21</sup> Nevertheless, there is no void of space power theory. There are numerous proposed space power theories, but none has achieved consensus in the space community; more than five decades since the first

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steps into space, there is no definitive work on space theory comparable to the writings of Clausewitz, Mahan, and Mitchell among others in their respective fields.<sup>22</sup> Space power still lacks a holistic approach and its elements remain disjointed and embryonic in comparison to other domains of land, sea, and air.

One of the most pervasive elements confronting the space community is the lack of common vocabulary. The need for a solid definitional construct is of pivotal importance to develop a better understanding of the practice of space power, including its potential and its implications. While different definitions emphasize different aspects, no definition covers all aspects of the actors, capabilities, functions, and purposes of space

<sup>18</sup>Nicolas Peter, "Space Power and Europe, in the Need for a Conceptual Framework," paper presented at the 59<sup>th</sup> International Astronautical Congress, Glasgow, Scotland, 29 September - 3 October 2008.

<sup>19</sup>Nicolas Peter, "Space Power and Europe in the 21st Century," European Space Policy Institute Perspectives 21, May 2009, <http://www.espi.or.at/images/stories/dokumente/Perspectives/espi%20perspectives%2021%20.pdf> (accessed January 2010).

<sup>20</sup>Nicolas Peter, "Space Power and Europe, in the Need for a Conceptual Framework," paper presented at the 59<sup>th</sup> International Astronautical Congress, Glasgow, Scotland, 29 September - 3 October 2008.

<sup>21</sup>Colin Gray, "The Influence of Space Power Upon History," *Comparative Strategy* 15 (1996): 293-308.

<sup>22</sup>Nicolas Peter, "Space Power and Europe, in the Need for a Conceptual Framework," paper presented at the 59<sup>th</sup> International Astronautical Congress, Glasgow, Scotland, 29 September - 3 October 2008.

power. The most common definition is one from the work of Lupton. He defines space power as the “the ability of a nation to exploit the space environment in pursuit of national goals and purposes, and includes the entire astronautical capabilities of the nation.”<sup>23</sup>

Yet this definition does not capture some important realities of the emerging space order. Space power can be defined herein as the “total strength and ability of a state to conduct and influence activities to, in, through, and from space to achieve its goals and objectives (security, economic, and political) to affect desired outcomes in the presence of other actors on the world stage, and if necessary, to change the behavior of others by exploiting space systems and associated ground infrastructure as well as political leverage it has garnered.”<sup>24</sup>

*...as long as there is not major conflict, the most important form of space power is non-military.*

This definition is inclusive of the essential elements for any definition of space power. It focuses on states as the main space actors, on national objectives, the use of space as a medium distinct from other media, and the use of capabilities that are required by the space medium. Space power is about the exploitation of the space environment, and the purpose of that exploitation is to achieve some national objectives or purposes. It is the ability to use space to get desired outcomes by influencing the environment and the behavior

of others. In other words, space power is the pursuit of national objectives through the use of space affairs.<sup>25</sup>

Space power has the potential to provide significant contributions to the political and strategic objectives of governments that undertake space activities. It can, for instance, support a country’s overall national power and international standing. Space power alone, however, cannot ensure the attainment of terrestrial political objectives; it must be combined with other power elements. Nonetheless, space power is a major element of national power, and it is becoming a strategic concern for many countries. Space power is not simply satellites and access to space; it is anything and everything a country can achieve through space.<sup>26</sup>

The foundations of space power range from obvious hardware elements (e.g., launch sites; launch vehicles, telemetry, tracking, and communications sites; on-orbit satellites; and other spacecraft), to socioeconomic elements (e.g., human capital), and to political and regulatory elements (e.g., number of seats in international organizations and other relevant bodies).<sup>27</sup> Spacefaring countries possess inherent attributes of space power. Any state’s approach to space power depends on its perception of the strategic environment and its position relative to other space actors, and the inherent value of space power depends on what it allows you to do. Moreover, a spacefaring country can be a major actor in domains linked with space activities (e.g.,

<sup>23</sup>David Lupton, *On Space Warfare: A Space Power Doctrine* (Air University Press, 1988).

<sup>24</sup>Nicolas Peter, “Space Power and Europe in the 21st Century,” European Space Policy Institute Perspectives 21, May 2009, <http://www.espi.or.at/images/stories/dokumente/Perspectives/espi%20perspectives%2021%20.pdf> (accessed January 2010).

<sup>25</sup>Ibid.

<sup>26</sup>Nicolas Peter, “Space Power and Europe, in the Need for a Conceptual Framework,” paper presented at the 59<sup>th</sup> International Astronautical Congress, Glasgow, Scotland, 29 September - 3 October 2008.

<sup>27</sup>Nicolas Peter, “Space Power and Europe in the 21st Century,” European Space Policy Institute Perspectives 21, May 2009, <http://www.espi.or.at/images/stories/dokumente/Perspectives/espi%20perspectives%2021%20.pdf> (accessed January 2010).



technical and scientific activities), but this does not necessarily imply that this actor possesses the complete spectrum of space activities or that this actor can exercise space power to its maximum.<sup>28</sup>

Not all states have developed similar space capabilities (space is also spiky) and there exist gradations of advantage. It is necessary that a country fully demonstrate “political will” and develop the attendant national policy and strategy to exploit the elements of space power. Space policies and programs when well conceived, linked, and executed provide tangible and intangible space power benefits.

There are different elements in the space power continuum with a complex interaction between civilian, economic, and military programs and assets, as well as soft, economic, and hard powers.<sup>29</sup> Space power is multidimensional and demarcated by scientific, political, economic, and geopolitical dimensions. Exercising space power conveys a variety of benefits to space actors, such as national and international prestige, military advantage, economic competitiveness, and scientific and technical prowess. It also demonstrates the willingness of a state to increase its standing in the global “space hierarchy.”

Using the traditional four effects of national power, the impacts of space power can be categorized as: (1) diplomatic; (2) economic; (3) military; and (4) cultural.<sup>30</sup>

1. Space power is a means of impressing the world through the possession of elaborate space capabilities illustrating an assertive

global position that allows influence in the international context.

2. Space power allows for the development of a highly skilled technological workforce and a dynamic industrial base that are both critical for a country’s economic competitiveness.
3. Space power can be used as a pressure point to support political decisions since it can be an element to dissuade targeted players of hostile actions and can also be used to apply force.
4. Space power can help to promote awareness of a common identity among citizens and demonstrate increased confidence in future capabilities.

There is no general hierarchy of these attributes since they do not exist in isolation from one another and various traits are tied together.<sup>31</sup> Space power leverages different elements and is a foundation for a state’s total power capability and, by its very nature, enables the exercise of influence over a broad spectrum of areas. The relative value of space power depends on how much an actor uses them and for what. Space power can be applied in different ways. It can provide direct benefits to the owner of space assets, but it can also be used to encourage and reward others, dissuade targeted players, and ultimately, it can be used to apply force. All of these demonstrate the flexibility and versatility of space power.<sup>32</sup>

While the arguments over possible theories of space power continue, space power is being exercised by all spacefaring countries, purposefully or not. Today, space power is inseparable from all other forms of power due

<sup>28</sup>Ibid.

<sup>29</sup>Nicolas Peter, “Space Power and Europe, in the Need for a Conceptual Framework,” paper presented at the 59<sup>th</sup> International Astronautical Congress, Glasgow, Scotland, 29 September - 3 October 2008.

<sup>30</sup>Ibid.

<sup>31</sup>Ibid.

<sup>32</sup>Nicolas Peter, “Space Power and Europe in the 21st Century,” European Space Policy Institute Perspectives 21, May 2009, <http://www.espi.or.at/images/stories/dokumente/Perspectives/espi%20perspectives%2021%20.pdf> (accessed January 2010).

to the ubiquitous and pervasive nature of space activities. There are, however, only a few historical examples of the utilization of space power to date. This short history of space exploitation limits the evidentiary base from which cogent conclusions can be drawn. For example, only since the first U.S.-led Gulf War are there examples of the utilization of space power to support hard power (e.g., crisis in Yugoslavia, and the current conflicts in Iraq and Afghanistan). Despite this limited set of historical evidence, space power is an important reality. Also, as long as there is not major conflict, the most important form of space power is non-military. For space power, soft power and economic power are just as important as hard power. Space power has profound implications both domestically and around the world in terms of the credibility of a country's capabilities, and it provides both symbolic and political advantages that are beyond quantifiable material benefits.

### **Space Power and International Relations**

The competition for status and global influence in many different domains remains a key feature of today's multipolar and heterogeneous international scene. With the recognition in recent decades of the increasing role played by S&T for innovation and economic development, more dedicated policies are implemented throughout the world to reinforce, protect, and enhance national technological capabilities. Governments from all over the world recognize the importance of S&T as a critical element contributing towards the development and implementation of strong economic, political, national, security, and social future of any country. They also recognize that S&T can provide external advantages at the international level as S&T prowess contributes to diplomatic leadership, creates respect in the international community,

and raises the attractiveness of a country for partnerships.

Governments initiate or participate in international S&T cooperative ventures for a number of scientific or technological reasons that have been well documented. International S&T agreements are also used by policy-makers to serve foreign policy purposes; the signing of an international S&T agreement between governments or international organizations can indicate a willingness to improve relations among countries, leading to broader cooperation. S&T activities are often used to establish a network of international partnerships to attract other countries in someone's sphere of influence or reinforce existing relations as there are diplomatic gains to be made through partnerships. Many countries are using S&T as a political tool to reach non-traditional partners to build trusting relationships across political borders as international cooperation in S&T allows countries to engage in a public diplomacy of deeds/actions and not just words.

S&T diplomacy – defined here as scientific and technological cooperation and engagement with the explicit intent of building positive relationships with foreign governments – has played an important, often underappreciated, role in the foreign policy of world powers over the past fifty years. International cooperation in S&T has been growing steadily since World War II and can now be considered the biggest contemporary axis of civilian governmental cooperation.<sup>33</sup> Eugene Skolnikoff notes that these two systems, foreign policy and S&T, operate in an international environment that is increasingly overlapping and this aspect of the relationship continues to converge in recent

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<sup>33</sup>Nicolas Peter, "Towards the Emergence of EU Space Diplomacy," *Space Policy* 23 (2007): 97-107.

years.<sup>34</sup> Increasingly, foreign policy contains issues with a scientific component and science grows more international in space.<sup>35</sup> Large-scale space projects are emblematic domains in which S&T is mobilized to serve foreign policy.

While S&T cooperation developed, until recently, largely independently of formal foreign policy objectives, for space this is a different. Space activities, since the beginning of the Space Age, are a tool for foreign policy used to directly achieve diplomatic objectives and to gather information on geopolitical events of concern (e.g., monitoring a crisis). There is also an element of soft power to reach out to partners and to impress others.<sup>36</sup> With the exception of scientific research or technology development missions, activities in space are no longer an end in-and-of-themselves, but a means for accomplishing other national objectives.<sup>37</sup>

The role of “space in foreign policy” and of “foreign policy in space” is intricate. Space assets are not only the eyes and ears of governments and allow monitoring events around the world, but they also allow

*Space assets are not only the eyes & ears of governments... they also allow governments to influence outcomes.*

governments to influence outcomes. Space activities enable states to wield other instruments of national power with greater precision, timeliness, and effectiveness. Space activities blur the lines between domestic and international affairs due to their very international nature and due to the fact that domestic policies impact the global scene. Space affairs are an extension of the terrestrial political environment.

From a political point of view, space is rich with complex political and strategic relationships. Space affairs are an instrument of superpower status since the launch of Sputnik in 1957, and space power during the Cold War was a key aspect of the international system where countries jockeyed for position and global influence. Space power enhanced, for example, the Soviet Union’s prestige by being first to launch an artificial satellite or the prestige of the United States by being the first to land humans on the Moon. Those achievements suggested that success in space were the luxuries of an advanced state – the product of the intellectual, engineering, and manufacturing elite of the country – and they became landmarks in the Cold War race for prestige and power demonstration.

Space put forward a new criterion to determine the global hierarchy along with nuclear power status. Space affairs, from the dawn of the Space Age, represent a measure of national prestige and are an indicator of a country’s influence on the global scene. The spread of space capabilities and the rise of new spacefaring countries are now factors woven into existing patterns of international affairs. Geography is one of the bedrocks of international politics, like the board of a chess game. Space is bringing a novel redistribution of power, which reduces the importance of proximity and endows non-state actors with high levels of power. It is hard to imagine a strategic actor performing well in the 21<sup>st</sup>

<sup>34</sup>Eugene Skolnikoff, *The Elusive Transformation: Science, Technology and the Evolution of International Politics* (Princeton University Press, 1994).

<sup>35</sup>Caroline Wagner, “The Elusive Partnership: Science and Foreign Policy,” *Science and Public Policy* 29 (2002): 409-417.

<sup>36</sup>Space assets have the potential to affect the behavior of an international actor by prestige projection, technology partnerships, access to space services, industry services, information exchange, and legal development among other factors.

<sup>37</sup>While space agencies are not responsible for making foreign policy, they play an important role in foreign policy’s execution through international engagement.

Century without being engaged in space and understanding and taking into account space power. At the same time, the utilization of the space environment presents new vulnerabilities, as well as the opportunities discussed herein, for actors on the international scene.

Given the growing diversity and heterogeneity of the international system, one of the currencies of international relations is legitimacy in the eyes of both governments and citizens across the world. In this context, emblematic and ambitious space activities are an indispensable tool as it projects a high level of S&T capabilities and prowess used to demonstrate national power at home and abroad. With the on-going internationalization and globalization of space affairs, no country will be regarded as a world power, or remain a world power, unless it possesses cutting-edge and diversified space capabilities.

Space affairs are a currency to judge the standing of a state vis-à-vis neighbors and peers, and this is expected to remain so for the foreseeable future. Consequently, the ability to exercise space power will grow in importance. Space power alone cannot, however, ensure the attainment of political objectives. In conjunction with other forms of conventional power, space power can be of strategic value and benefit. Space power is a significant dimension of power in international relations and it is an important reality. Exercising space power on the international scene gives the ability to build international consensus by bringing recognition, by primacy and authority, on the part of other members of the international space community.

*Space is  
bringing a  
novel  
redistribution  
of power...*

## Europe in the Unfolding New Space Order

There is a wide range of reasons why governments engage in space activities. The basic justifications are different among countries at different times. For instance, the “space race” between the U.S. and the Soviet Union was mainly driven by the willingness to demonstrate technological capability for national security reasons and to promote national prestige. In contrast to the two superpowers’ space activities, European space activities were initially driven by scientific common endeavors and motives.

In Europe, space was originally dealt with by individual countries. But as early as 1959, the results of Europe’s nuclear research facility (The European Organization for Nuclear Research, known as CERN) introduced a new model for space activities in Europe.<sup>38</sup> Subsequent discussions among European stakeholders led to the creation of the European Launcher Development Organization (ELDO) in 1964, the European Space Research Organization (ESRO) in 1964, and the European Space Agency (ESA) in 1975 by combining the two aforementioned organizations. Since then, ESA is the intergovernmental agency responsible for coordinating the collective, multinational European space program.<sup>39</sup>

ESA’s contribution to the development of a collective European space capability is fundamental. The European space sector is now entering a new institutional evolution with the emergence of the European Union

<sup>38</sup>Kazuto Suzuki, *Policy Logics and Institutions of European Space Collaboration* (Ashgate Publishing, 2003).

<sup>39</sup>There are several other organizations with limited responsibilities for specific collective activity, including, for example, the European Organization for the Exploitation of Meteorological Satellites (Eumetsat) for operational meteorology.

(EU) as a space actor.<sup>40</sup> The EU realized in the 1990s that space can provide support for a host of its activities, and that space activities serve policy objectives and deliver substantial strategic, social, economic, and commercial benefits to the EU, its member states, and its citizens.<sup>41</sup> European space activities are mainly conducted within a framework of collaborative space endeavors, as well as in the context of national space programs serving particular political, economic, and security purposes.

There is a complex intertwining of national interests together with a growing consciousness of the need for greater cooperation at a continental level. The European space landscape is split into three distinct levels: (1) the overall European level with the EU; (2) intergovernmental organizations, like ESA and the European Organization for the Exploitation of Meteorological Satellites (Eumetsat); and (3) national space agencies. The recent entry (December 2009) into force of the Treaty on the Functioning of the European Union (TFEU), known as the Lisbon Treaty, enshrines space policy as an EU “shared policy.” It gives a clear mandate to the European Commission to exercise its right of reinforcing the momentum of the European Space Policy embodied in Space Council

*The rise of new space actors is reshaping the space landscape.*

resolutions and endorsed by the European Parliament.

For Europe as a whole, independent access to space, space applications for the benefit of citizens and governments, and space science are the traditional reasons for engaging in space activities. But as the EU has become aware of the importance of space activities for achieving a wide range of policy objectives, and as the international political significance of space has grown, space is now taking a high profile in the Union’s dialogues with major partners.<sup>42</sup> The international dimension of civilian space activities is increasingly becoming a major element of the EU’s relations with third parties both to reinforce existing relations and to establish new partnerships through its programs that include: Galileo and Global Monitoring for Environment and Security (GMES); the Framework Program (FP); and space dialogues with the United States and Russia and other international fora (e.g., International Code of Conduct for Outer Space Activities). The space context in which Europe will continue to operate is likely to evolve because of the emergence of new space actors being both users and sources of space technology. This does not necessarily posit a threat to Europe, but it needs to be reckoned with for the specific purpose of managing change in a balanced and effective way.

Since the end of the Cold War, under the influence of the overall process of globalization, sources and distributions of power are being transformed in a profound way, and multipolarity is expected to grow in the future making the space context even more heterogeneous. Consequently, the relative power of various emerging space actors will grow as these actors influence other countries.

<sup>40</sup>Nicolas Peter, “Towards the Emergence of EU Space Diplomacy,” *Space Policy* 23 (2007): 97-107.

<sup>41</sup>In the late 1990s, the EU started its first two major space programs: the global navigation satellite system, Galileo, and the Earth observation system for Global Monitoring for Environment and Security (GMES). These two flagship programs are the cornerstones of the current EU space activities.

<sup>42</sup>Nicolas Peter, “Towards the Emergence of EU Space Diplomacy,” *Space Policy* 23 (2007): 97-107.

This evolution will not radically alter the space context as did China and India recently. Emerging space actors will, however, have higher degrees of freedom to shape their space ties, rather than working only with the current spacefaring countries. New networks will form among states to pursue convergent goals and interests, and in some cases the nucleus will not be the traditional space powers. Emerging space powers will also seek greater leeway and autonomy to exert regional influence. Space has always included both competition and cooperation among states. This will not change and certain areas will not remain conducive to international cooperation. But an increasingly multipolar space order suggests a greater number of actors with whom Europe and others will have to contend with. Consequently, traditional spacefaring countries will probably find it much harder to set the space agenda and shape outcomes to their desired preferences.

The new space order is becoming genuinely global and multipolar with growing strength in emerging economies and a growing specialization in various parts of the world leading to greater overall system complexity. Legitimacy is expected to remain in the foreseeable future the hard currency of international space relations, possibly the most important asset to ensure long-term success of specific initiatives. Needless to say, unilateral action will always be an option for spacefarers, notably in the context of national objectives. Yet spacefaring countries do not, by and large, work in isolation. But the search for agreement in defining the international space agenda might prove more complicated, and thus, in the new space order, partnerships and cooperation will become more important in confronting many of the challenges of the international system. International leadership and cooperation will be necessary to face global challenges (e.g., climate change and to engage in long-term exploration of the solar

system), and consequently, space power is essential for Europe now and in the future.

The rise of new space actors is reshaping the space landscape. The U.S., Russia, and Europe's preeminence cannot be taken for granted. The center-of-gravity for space activities is already starting to shift from West and East to the South, and the expected rise of new space actors will inevitably challenge Europe's position in the global "space hierarchy." Those global developments will entail fundamental changes to the distribution of resources and influence with the emergence of new players forging closer ties at the regional level, leading to a shift of power and influence. The role and position of Europe in this emergent space context will evolve. Europe will still have a great impact on space affairs, but it might have less power in such a multipolar space context than it has enjoyed in the last decades.

There is nothing preordained in the future shape of the space context and in Europe's place therein. It is a matter of political decision, drawing on Europe's comparative strengths and ambitions, and the ability to nurture and use space power more efficiently. A scenario of relative decline in the global "space hierarchy" will lead Europe to lose its flexibility in choosing between cooperative options and autonomy for cooperation, as well as remain the preferred option for partnerships among other states. Today, given the benchmark of Europe's S&T prowess, Europe continues to be viewed as the space partner of choice by existing and emerging space powers, as well as by new entrants in the space sector. For this to persist, multilateralism for Europe may prove as much a necessity as a choice. Working with partners needs, nonetheless, to be turned more explicitly and consistently into a vehicle for achieving effective multilateral solutions for giving Europe more visibility and clout.

The management of international cooperation must change as the geography of space develops new peaks around the globe; if Europe is not positioned to exploit potential links with emerging space actors, it will face significant opportunity costs. But to enable Europe to best exploit its partnerships and opportunities, a better realization of the benefits of space power and clear policy commitments will be needed to be able to shape the directions of those partnerships in the directions of its own preferences.

### Space Power and Europe

Europe is now the second largest civilian power in space in terms of its consolidated budget. Collectively, it maintains launcher, satellite manufacturing, and research facilities in the whole spectrum of space activities except for human spaceflight. The combination of European capabilities coming from different European actors – European member states, ESA, and the EU – provide Europe with the status of a major space actor.<sup>43</sup> Europe possesses collectively critical technical assets (e.g., independent launch site, versatile launch vehicle fleet, diversified spacecraft, solid industry, and dynamic universities) and non-technical assets, such as high visibility in international organizations, like in the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), International Telecommunication Union (ITU), and United Nations Conference on Disarmament (CD), which are all necessary elements to exercise space power.<sup>44</sup>

<sup>43</sup>Nicolas Peter, “Space Power and Europe in the 21st Century,” *European Space Policy Institute Perspectives* 21, May 2009, <http://www.espi.or.at/images/stories/dokumente/Perspectives/esp%20perspectives%2021%20.pdf> (accessed January 2010).

<sup>44</sup>Nicolas Peter, “Space Power and Europe, in the Need for a Conceptual Framework,” paper presented at the 59<sup>th</sup> International Astronautical Congress, Glasgow, Scotland, 29 September - 3 October 2008.

European space programs are successful to date and European citizens embraced space-based services and support into many aspects of their everyday lives. Europe has achieved a number of impressive results (e.g., world class launch services and telecommunications industry, and numerous scientific achievements, such as the farthest landing on an object in our Solar System). Space is now enabling many activities of the European economy and is a critical building block of Europe’s information infrastructure. It could therefore be concluded that because of this relevance and the pervasiveness of space activities a clear understanding of space power exists in Europe.

They are enormous shortcomings in Europe’s ability to understand, develop, and exercise space power.<sup>45</sup> There is no mention of space power in policy or strategy documents. A sound understanding of the nature and exploitation of space power is, however, critical for Europe in the unfolding new space order as Europe’s technical lead could be rendered less important, even where it does not shrink, and because of the expected dilution of its voice in international fora due to the changing space context. If Europe wishes to retain its space power now and in the future, it must better protect its interests in space.

Europe currently enjoys a leading position in the global “space hierarchy,” but this might not last, and Europe’s ability to exercise space power could decrease over time. To maintain a leading space role and to be able to exercise space power, Europe must foster more “political will” and develop associated policies and strategies. This further needs to be complemented by a series of programmatic elements facilitating policy implementation. Access to space, a competitive industrial and

<sup>45</sup>*Ibid.*

space services base, global navigation satellite systems (GNSS), space exploration, utilitarian space activities, space science, Space Situational Awareness (SSA), and Space Traffic Management (STM) are important building-blocks covering the whole spectrum of space activities as underlined in the European Space Policy that will allow to improve Europe's ability to translate its space clout into greater global influence.<sup>46</sup> These programmatic elements in combination provide Europe with greater diplomatic, economic, military, and cultural tools that enable Europe to face the challenges presented by the evolving new space order.

So far in Europe, space activities are justified from the point of view of their use for scientific research, technological advance, and economic gains. The time is ripe for a change in the thinking on space and Europe needs to become more aware of the political dimensions of the use of space. Decisions should not be based only on costs and benefits in financial, technological, and economic dimensions, but should also include the political dimension of space, including space power. Space power is also an increasingly important component to Europe's national powers, but often unnoticed. While the uses of space assets as military enablers are recognized in Europe, relatively no attention is given on how space assets can be used as elements of foreign policy and as tools of diplomacy.

European space assets are underestimated and untapped for diplomatic use, and space power in Europe is often an underappreciated factor. Europe needs to better appreciate how its space assets and activities can be used to directly support its diplomatic goals. Space affairs should be better used by policy-makers in Europe to achieve greater diplomatic

advantage, particularly as a projection of soft power. Exercising space power could, for instance, allow Europe to influence the drafting of international regulations, and take the lead in strategic areas, such as environmental research and space exploration;

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it could affect as well the development of global standards and norms.<sup>47</sup> A formalized utilization of space power could also allow Europe to remain a center-of-gravity in international relations by attracting the best

partners to cooperate not only in space, but in other domains, therefore increasing the capabilities and possibilities of European projects.

Space will play a growing role in determining influence, prosperity, technological achievements, and security in the global environment of the 21<sup>st</sup> Century. If Europe does not contribute significantly to space, it abdicates a role as a major actor in world politics. Influence on the future of space, such as in the area of space governance, will be wielded only by those who have real space assets and ambitions. The challenge of space can be met only with a common European effort. Space affairs should also be raised to the highest political level in Europe – heads of State and Government – to initiate major breakthroughs.

Quantitative and qualitative jumps in European space efforts are required to respond to the challenges outlined herein and harness the benefits that lie ahead. Exercising greater

<sup>46</sup>Ibid.

<sup>47</sup>Nicolas Peter, "Space Power and Europe in the 21st Century," European Space Policy Institute Perspectives 21, May 2009, <http://www.espi.or.at/images/stories/dokumente/Perspectives/espi%20perspectives%2021%20.pdf> (accessed January 2010).



space power allows Europe to protect its own interests and strengths, while meeting the challenges of the multipolar space order currently emerging. Europe's presence in space should translate into comparable influence, which has not always been the case. Europe has thus to realize that space power can provide support for a host of its activities and is a tool to serve its interests, including in the domain of foreign policy and soft power projection.

### Conclusions

The unprecedented changes in the last decades have made the world an integrated and complex system in which space is an integral element. From its inception during the Cold War, space activities are driven by opportunities to serve national interests in the global context. With the changing geopolitics of space and the unfolding new space order, linked in particular to the internationalization and globalization of space activities, it is perceived that capacity in space technology has faded as a geopolitical factor as well as an element of national power, especially as space systems are more common and widespread.

Nonetheless, competencies in space activities are not becoming irrelevant to a country's international political position. On the contrary, almost all developed countries, and an increasing number of developing countries, feel it necessary to participate in space activities and develop for economic, military, or prestige reasons independent space capabilities. Space assets can help to directly achieve national objectives, and because of the close relationship between space assets and national power many states seek to improve and advance their space capabilities.

In this context, Europe should avoid being surpassed in the emerging new space order by

making use of space activities to maintain, and even advance, its position in the global "space hierarchy." Europe should not create the impression that it is only a follower and lose its credibility as a reliable partner in space. Space affairs are a highly symbolic representation of power and will undoubtedly continue to be a persuasive method of demonstrating national power to the rest of the world.

The emerging space order will help to determine the structures and functions of the international system in the next decades. Space power will thus be key and it is very important that this is understood, so that it may be taken advantage of in the most desirable and feasible way. The broader geopolitical implications of the space domain are directly dependent on how effective can space power be in the "means-ends" world of international relations. Europe needs to realize

*Europe currently enjoys a leading position in the global "space hierarchy" but this might not last...*

and develop its space power potential because what is at stake is the future agenda-setting power of Europe in the overall international system beyond space affairs, its ability to shape the priorities and timing of events, and its ability to attract the best partners to be able to fully benefit from opportunities wherever these support European space objectives and wider European policy goals.

European governments must accept the fact that Europe's future role and influence in world politics and in global markets may largely depend on Europe's capacity and willingness to use space to develop the necessary technology and to build the required

industrial infrastructure. Europe cannot afford to remain vague about its objectives in the new space order. A strategic reflection on the values, interests, and goals of Europe's space power in the context of its relations with other countries is needed.

There are many impediments the European space community must overcome to create an environment where space power is valued, accepted, and institutionalized. In particular, European space stakeholders have not, up-to-now, addressed the task of developing an integrated strategy for harnessing the benefits of space power on the international scene. The nexus between common values and common interest must be better articulated and in Europe they are all too often disjointed. In order for space power to reach its full potential in Europe and provide greater benefits, space must be recognized as a domain with direct and indirect implications for Europe, particularly at the foreign policy level, which is in a strategic sense no different from land, sea, and air mediums.

