

Towards a theory of spacepower

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Abstract

There is as yet no widely accepted theory of spacepower, although links to the development of seapower theory are generally acknowledged. An ongoing NDU study is building a framework to explicate the fundamental aspects of spacepower and its relation to the pursuit of a variety of objectives. Two distinct “ages” of the current space era can be discerned, the first based on Cold War competition and the need for prestige, the second based on the requirement for information in a globalized world. The most important features of future space activity are likely to be economic development, and national and international security. Developing a spacepower theory will provide an opportunity to maximize the benefits of space for global society.

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1. Introduction

Humanity has been pondering its relationship with the cosmos for millennia and has been actively using space for more than 50 years. Yet there is not a comprehensive and widely accepted theory for how best to derive utility from this interaction. The National Defense University’s Institute for National Strategic Studies (INSS) is conducting a study that seeks to develop a theory of spacepower—that is, a conceptual framework for explicating the fundamental aspects of spacepower and its relation to the pursuit of national security, economic, informational, and scientific objectives in a fashion that provides insight into the behavior of spacefaring actors. The resultant theory will provide policy specialists and space professionals from any nation—whether in the national security, civil, or commercial space sectors—with an intellectual foundation upon which to assess the conduct and impact of space-related activities.

The development of spacepower theory can be related to the development of seapower theory by Alfred T. Mahan in

his work *The Influence of Sea Power Upon History, 1660–1783* [1]. Mahan emphasized the importance of economic trade for the American nation and the role of maritime and naval activity in advancing its prosperity. A “Mahanian theory” for spacepower should consider the role of space activity in relation to the larger strategic and international environment.

Spacepower theory is not simply a military theory, it is a strategic theory based upon human activity as applied to the space domain. Although the history of space activity is limited, drawing from theories about human behavior in a variety of disciplines provides a sufficient evidentiary base. Accordingly, the INSS study examines theories of science, philosophy, human nature, politics, economics, and geopolitics in addition to theories of war and military affairs.

2. Spacepower through the space ages

Since the launch of Sputnik in 1957, the world has seen two identifiable space “ages,” each distinct in its significance and influence on human affairs. The history of space offers signposts that point to potential space ages of the future.

2.1. The first space age (1957–1991)

The first space age is often associated with the shorthand term “the space race.” Space activity became a microcosm

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of the global geostrategic environment that defined the era. The imperatives of the bipolar Cold War accelerated the advancement of space technology and activities in space. For both the USSR and the USA, this competition played out as a way to showcase technological, economic, and military power; a public civil competition to explore near-Earth space and ultimately the Moon; a (largely) hidden military and intelligence competition for strategic advantage; and a slowly developing economic enterprise.

The primary commodity of the first space age was *prestige*. Both the USSR and the USA viewed their space programs through the larger geostrategic competition. The prestige associated with the civil space programs afforded a new type of moral power to both nations as they vied to establish dominance of their cultural, political, and economic systems.

2.2. The second space age (1991–present)

Just as the Cold War was the defining context for the first space age, the fall of the USSR marks the beginning of the second space age. The 1991 Gulf war, sometimes referred to as the “first space war,” is another defining event for this era. Predominant features of the second space age include the rise of globalization, with greatly increased communications and information flows enabled by the global perspective of satellite technology; a shift in military emphasis from using space to enhance strategic capabilities to using space to gain operational and tactical advantages in terrestrial warfare; and a declining and changed emphasis on civil space.

The primary commodity of the second space age has been *information*. While some new players entered the space arena to enhance their prestige, advanced spacefaring actors developed and used space to enable the transition into the “information age.” Today’s emphasis on information from space has greatly enhanced the military, economic, and political power of those actors, with the USA as the dominant power in the space-enabled information area.

2.3. The next space age

It is unclear what factors will dominate the next space age or when they will emerge. Ongoing developments suggest that the shift to the next space age will occur within the scope of this theory (i.e. within the next 50 years). A shift away from the unipolarity of today’s international system toward a multipolar environment with a much broader and more diverse set of actors is likely. As power is diffused among these actors, the nature of power in space will begin to change. Other potential features of the next space age might include great technological advancements that significantly lower the barriers to entry for spacefaring actors, a shift from a geocentric perspective to a solar system perspective, and renewed strategic competition in space.

A primary commodity of the next space age may well be *wealth*. The dominant paradigm in space could become an economic one, as activities in space move from enabling wealth creation on Earth to wealth creation in space. The economic value of space is currently but a small fraction of its potential and the next space age could be marked by a boom in the economic value of space itself. Alvin and Heidi Toffler have suggested that the development of wealth creation in space would be revolutionary and signify a “fourth wave” of human development [2].

2.4. Why go to space?

A brief look at the history of space activity suggests that humans go to space for a variety of reasons: geopolitical, military, economic, scientific and “human destiny.” Regardless of the reasons for going to space, such activity conveys a variety of benefits to spacefaring actors: prestige, military advantage, economic competitiveness, and scientific prowess. Benefits accrued to the larger society have included the advancement of scientific knowledge; stimulation of global economic activity; enhanced communications and information flows; and awareness of the global environment.

3. The sociocultural power of space

For a current and emerging space superpower, its “space program” in the public eye will be synonymous with its ability to explore beyond the Earth and unlock the secrets of the universe. Such a capability proves a nation’s technological prowess and single-minded ability to achieve lofty goals. Indeed, becoming a space superpower is about vying for superpower status on the larger stage. Two general principles can be derived from the limited history of civil space activities: prestige is the primary motivation for developing a civil space program and spacefaring societies seek to extend their cultural values into space.

Civil space activities can be categorized into four main areas of current or future emphasis: *space exploration*, *space science*; *environmental security* (both earth and space environments); and *human habitation*. In looking at these areas, it is notable that: (1) space exploration attracts nations and societies that have expansionist traditions, expansionist aspirations, or both; (2) space science is a strategic asset that supports a science-based society, demonstrates capability and vision, ensures technological independence, and promotes cultural identity; (3) space provides an opportunity to address common global problems holistically; and (4) space settlements may one day be the key to the survival of the species.

Civil space activities must balance supporting national interests while advancing global interests. Of all the sectors, civil space activities are most likely to be cooperative in nature in order to achieve the goals of such programs, yet the programs themselves are subordinate to an actor’s broader goals.

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