

## The Winds of Star Wars

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In 1982, President Reagan proposed a space militarization program that could ultimately cost \$18-27 billion. This declaration of intent, and the swirling controversy left in its wake, marks sharply renewed interest by the U.S. policy system in space programs, interest that had waned considerably, especially when contrasted to the period between Sputnik and the lunar landing (1957-1969). This renewed interest casts in bold relief the policy problems that have cropped up during a period of space policy neglect. Interest, however, is concentrated on antisatellite and space antiballistic missile warfare, rather than on across-the-board human use of outer space, even though technology has continued to advance in the latter area. This lag in policymaking presents problems, but also new opportunities, in the space policy field. During its foundation, national space policy was closely studied by the policy analysis community, but it has now been relegated to relative oblivion. Few serious social-scientific analyses of space policy have been published in recent years, and most of those that we do have are written by lawyers in international and space law or by military officers examining strategy and national security. The most recent policy study of NASA, for example, was published in 1975, despite the dramatic changes that have since occurred in its organization.

With occasional exceptions, as with President Reagan's "star wars" speech, space policy over the past fifteen years has been made on an incremental basis by divisions within the Office of Management and Budget (OMB), the Departments of State and Defense, and an isolated group of political appointees at NASA. Space enthusiasts in Congress are few in number, and their ardor is matched only by their ineffectualness. Yet, the post-Apollo disenchantment with the space program should not dampen the interests of policy analysts; this relative neglect of the space program, combined with technological change, has created fertile ground for policy analysis that could influence the social-scientific understanding of space policy and advance the processes involved in its formulation. Like the government, though, academic institutions also blow hot and cold on

space policy. Not until the "star wars" speech did public policy analysts launch a flurry of activity.

In a recent speech commemorating NASA's twenty-fifth anniversary, Reagan suggested that it was time for NASA to get out of the way and let private enterprise astound the world with what it could accomplish in space applications. This suggestion, in keeping with other as-yet-unrealized suggestions by the administration for privatizing civil space activities, left NASA officials uncertain about their agency's long-term prospects. The bleak outlook is in marked contrast to NASA's spectacular rise to success culminating in the 1969 lunar landing. During its ascent, NASA was strongly supported by the public, the news media, Congress, and the president. This policy "movement" was successful in harnessing a technology to the betterment of national prestige. But NASA's rise has been followed by an equally rapid descent. As some policy analysts have suggested, when public support catapults a program to prominence, that program can just as quickly fall into a state of neglect, disappear altogether, or become the object of censure. After the Apollo mission, when NASA had no new meaningful goal to take its place, the agency suffered from problems of morale and the departure of superior personnel as tightening budgets and the lack of direction deflated organizational *esprit*. The temporary end of manned missions had a widely depressive effect.

Further along the chain of decline, the lack of public support and funding disrupted the network of university laboratories and training grants for space studies as well as the flow of newly trained space scientists. Aerospace contractors have also suffered, with many smaller firms having gone out of business; this in turn reduces the political support that can be marshaled from the private sector for a program in space.

NASA's supporters responded to this state of neglect by pursuing two major strategies. The first was the Apollo Applications Program and a manned orbiting laboratory, both of which met with public indifference, reduced as they were by budget-conscious presidential staffs and congressional leaders. This may illustrate a

Catch 22 in the space policy situation: incremental policy produces modest programs, and these fail to attract the political support necessary for growth. The second strategy was to create imaginative and dramatic goals that would mobilize public and political support for an ambitious space program. In 1969, a White House-level task force, strongly influenced by NASA, recommended a gigantic program involving a moon base and manned Mars missions. Public skepticism about the legitimacy of space exploration and the cost of such a program kept the proposal from going anywhere.

President Nixon, nevertheless, did approve the space shuttle plan on a greatly reduced scale; otherwise, the lack of a significant project would have meant the imminent dissolution of the space program. These launchings have excited public support, but the program is lagging far behind schedule. Further, since the shuttle is absorbing money that could otherwise be spent on planetary and space research, it has become a target not only for NASA's critics but for disaffected groups within the agency. President Carter, although urged to fill the space policy vacuum by setting and supporting NASA goals, went no further than to issue a lackluster policy paper in 1978 which made no commitments. President Reagan's enthusiasm for civilian space programs has not been reflected in increased financial support; indeed, NASA budgets have been pared even more than under the Carter administration. Moreover, owing to the current administration's free enterprise ethos, much of the civilian space program periodically seems in danger of being turned over to private firms.

According to opinion polls, Americans believe that a superabundance of capital has already been invested in space exploration, especially in the apparently "wasted" effort of reaching the moon. Some critics have blamed NASA's public relations department for the agency's inability to generate popular support for the space program, not realizing that there are limits to the extent that public opinion can be manipulated by a single group. NASA's decline is the result of many external factors beyond the influence of a public relations department. The space program originated in the Cold War and was sustained by Cold War rationales. Concerns over national security and international competition placed the space issue beyond the manipulation of any one agency. Moreover, much of the early civilian space program was assisted by developments in military programs; the same knowledge needed to develop an ICBM force was also needed for the early space program. Today this kind of overlap is much reduced.

Though competition with the USSR over space exploration reached a low point in 1975 with the Apollo-Soyuz docking, some predict that technological progress and concern over Soviet aggressiveness will create a new climate of rivalry capable of motivating another ambitious space program. But it seems clear that the emphasis in such a U.S.-USSR competition will more likely be on military than on civilian programs.

NASA's current "identity crisis," owing to the lack of a meaningful program and political support, illustrates a kind of reverse technological obsolescence: that of a technology evolving beyond the political and social systems that manage it, instead of falling behind society's demands and uses for it. Technical capabilities in space have outpaced the ability of the nation to pay for them and of the political system to create and define purposes for them. In sum, the external competitive impetus for the original space program, the subsequent incrementally based policymaking system which precludes bold initiatives, and the changed focus for competition with the Soviets seem to have left NASA without a mobilizing purpose.

### Satellites and Antisatellites

Space has become a central pivot of our national defense system. About 70 percent of U.S. military communications are transmitted by satellite. Satellites scrutinize ground activity, such as military installations, radar, and telecommunications; they monitor compliance with arms-limitation treaties and can make on-site inspections unnecessary. While the 1967 Outer Space Treaty banned weapons of mass destruction from space, other military activities have continued, with the focus shifting from "dropping atomic bombs" from satellites to combat between space vehicles, as in the current "star wars" scenario.

The reliance on satellites by both superpowers has made the ability to neutralize them or to launch attacks from them a crucial defense issue. President Reagan recently called for a bold effort to protect America through space-based weaponry—partly because of his fear of Soviet advances in space technology and partly because of American dependence on a vital and highly vulnerable satellite system. If U.S. guidance satellites are destroyed—and the threat to military satellites is no longer hypothetical—our 700 submarine-launched ballistic missiles become debilitated. The Soviet Union has been conducting hunter-killer tests for the past fifteen years and appears to have a quick-reaction killer-satellite system that can rendezvous with and destroy U.S. spacecraft in less than twenty-four hours. U.S. satellites have become this vulnerable as a result of policies and non-policies of the aerospace establishment. Because of the front-end cost effectiveness of satellites, many missions have been assigned to them without either calculating the cost of long-term vulnerability or creating alternative or redundant systems. Plans are under way to phase out the expendable booster, which will leave the United States with only three to five shuttles to get large objects (satellites) into outer space—shuttles, moreover, which are easy targets for antisatellites (ASATs). U.S. ASAT technology has been held back by the optimistic assumption that the Soviets will not take the next step in the space-war race, as well as by ever-present budgetary limitations.

The Soviets' pursuit of ASAT technology has now, however, motivated the United States to push its own program. The primary ASAT system being developed is a warhead-tipped missile fired from an F-15 operating at high altitude. The missile can neutralize a reconnaissance or other satellite in orbit, but it cannot intercept a Soviet ASAT (because the ASAT's orbit cannot be calculated precisely enough). Lasers, operating at the speed of light, may solve this problem; indeed, the Defense Department has spent about \$1.5 billion to develop lasers that can destroy planes and some types of missiles. While the potential of the particle-beam weapon is largely unknown, proponents claim the Soviets are building just such an ASAT weapon system to knock out incoming ICBMs. The Defense Department is also trying to reduce the vulnerability of satellites by means of passive defense.

It is theorized that a "cold war" satellite arms race would result in an automated battlefield, involving only robots and remotely guided satellites, thus sparing earth from a nuclear Armageddon. Others argue that an initial conflict in space would be only the prelude to an expanded war on earth. So far, U.S. attempts to establish a treaty prohibiting ASAT weapons have failed. But it now seems that increased ASAT R&D by the Americans and the possibility that the United States might overtake the Soviet advantage in ASATs within five years have made the Soviets more receptive to such a treaty.

One disturbing aspect of the increasing ASAT activity is its potential effect on the fragile but vital deterrent created by each superpower's ability to obliterate the other. A sophisticated ASAT system, with its large military advantage, could destroy that balance, leading to a major escalation of the arms race and spreading it farther into outer space. The increase in ASAT testing is an alarming development not prohibited by international law or agreement, and it is obviously leading to a frantic technology race. A treaty banning all weapons from space, ASAT testing in particular, would seem justifiable. Yet, complete neutralization of space, as some have recommended, seems unfeasible. The technologies involved often serve peaceful uses, as well as military, and can be readily switched from one to the other. Furthermore, many military uses of space add to mutual deterrence capability, thus strengthening world security and stability.

As more nations attain launch capability, they too must be included in agreements designed to preserve space peace. Thus far, however, U.S.-Soviet negotiations have excluded all other countries. France has proposed an international satellite-monitoring agency; Italy has suggested a UN-sponsored multilateral discussion on disarmament and outer space. The nations of the world each have their own perceptions and fears about the space arms race, and these need to be taken into account when devising international space agreements.

Remote-sensing technology began in the 1800s when cameras in balloons photographed the earth by remote

control. Today, the Landsat series and military satellites belonging to the United States and other countries are constantly scanning the globe, both on the visible and the invisible segments of the electromagnetic spectrum. These satellites can detect objects as small as 1 inch, temperature variations of .02 of a degree, trace amounts of minerals and chemicals, and a wide range of the electromagnetic spectrum (e.g., radioactivity, radar, and electronic communications). This technology has been compared to the microscope in its potential revolutionary impact. It permits the survey of pollution emissions, plant disease, building conditions, troop strength and deployments, armaments, ship and aircraft dispositions, and weapon or missile testing. Clearly, there are profound implications for environmental quality, allocation and conservation of natural resources, and surveying human and cultural resources.

This powerful tool has understandably engendered international contention; remote data-gathering presents economic, legal, political, and security threats. Satellites can provide economically useful data on such details as crop conditions, the location of ore deposits, and factory construction. Foreknowledge of agricultural conditions and thus of commodity prices, for instance, can improve a nation's economic viability in the world market when that nation is heavily dependent on sales of certain agricultural products. Satellite-generated data can also affect negotiations for a contract to explore or exploit a country's natural resource. Several nations, including Argentina and Brazil, assert that unrestricted sensing of territorial resources violates the sovereignty of their national wealth and resources, as protected by UN General Assembly resolutions. They define "national wealth" to include *information* about such wealth.

### Freedom of Information?

The United States opposes this position, maintaining that the UN Charter, Article 19, advocates the right of all to "seek, receive and impart information and ideas through any media and regardless of frontiers." Washington has sought to reduce opposition to its practice of comprehensive surveillance by giving any individual, entity, or state—including those with differing political philosophies, such as the Soviet Union and the People's Republic of China—complete access to all data gathered by the Landsat series upon payment of a nominal fee. But the U.S. position is weakened by numerous domestic and international treaties and court decisions that give nations the right to control or prohibit photography in their airspace or into their territory. No definition of "airspace," however, is universally accepted. Some nations would extend the term to include the area of Landsat orbits.

There is also opposition to the use of satellite-generated data within the United States. Although U.S. courts have consistently maintained that information is a protected property right, the government consistently ex-

propriates this nonphysical, but still exchangeable, form of property through satellite sensing. No one has litigated on this particular issue, but a legal proceeding has been initiated on the basis of evidence gathered by satellites. Water-borne pollution detected by Landsat has resulted in a court battle over violation of pollution laws. The potential for future legal cases related to satellite-generated data encompasses zoning laws, personal privacy, criminal conduct, and industrial espionage. The legal and constitutional issues of privacy, evidence, and data gathering that result from remote sensing have only begun to be studied. Looming on the horizon are satellite threats to civil liberties. This is not so farfetched as it might seem; during the Vietnam War, satellites were used to monitor antiwar demonstrations.

Many nations tightly control even innocuous information, perceiving its discovery as a needless threat to their stability and security. Other countries' sensitivity to military data gathering can be explained by the fact that satellites can read such details as license plates and uniform insignia. While nations attempt to baffle satellite reconnaissance with various disguise techniques, remote sensing is still the cornerstone upon which strategic arms limitation rests, for it permits the monitoring of treaty compliance.

The use of geostationary orbits is another controversial area. Such orbits (corridors, at about 35,800 kilometers over the earth's equator, where satellites can be placed to maintain a constant position relative to earth) make ideal parking places for satellites in constant contact with a particular ground station. The geostationary orbits over the United States and Canada are already congested, and with increasing demand for telecommunications, broadcasting, meteorological, and (possibly) power transmissions, competition for them is intensifying even more.

The United States argues that space can be freely used by all nations without discrimination, if the purpose is for the "benefit and in the interests" of all countries, but it does not wish to limit the definition of "benefit." Eight equatorial countries (Colombia, Brazil, Congo, Ecuador, Indonesia, Kenya, Uganda, and Zaire) have claimed the segment of the geostationary orbit above their national territory as their sovereign domain, formalizing this claim in the Bogotá Declaration. The declaration, then, seems to contravene the 1967 Outer Space Treaty (upholding free exploration and use of outer space) by making foreign occupation of a nation's geostationary segment tantamount to appropriation. The Bogotá signatories defend their position on the basis of equity, rather than international law. They maintain that, under current practice, only the least desirable locations and frequencies will be left for those countries with the most modest financial and technological resources, and that the 1967 treaty, if applied to geostationary orbits, does not carry out its drafters' intention, which was that space development benefit all nations in order to achieve a more just international order.

The exploitation of space has not followed any ration-

ally developed plan but has evolved gradually. No nation has asked permission before orbiting a satellite, and no official protests were heard until Colombia's in 1975. Thus, a commercial satellite operator in the United States has recently placed one of its satellites in geostationary orbit several years before its service will be needed in order to prevent someone else from taking the space. In 1979, Western Hemisphere nations met to seek equitable distribution of the five available satellite spaces, only to discover that the United States was already occupying four of them.

No specific plan effectively addresses the current dispute, which is now in limbo because the equatorial nations cannot remove or interfere with already stationed satellites. If they should attempt to enforce their claims, action against terrestrial targets (e.g., an embargo or property seizure) is a possibility. The United States should develop policy for dealing with such contingencies.

Added to the controversy over positioning of satellites is a controversy over communications per se. For political, cultural, and economic reasons, some countries want to monitor programs broadcast into citizens' homes, including "cultural" programming that may be distasteful, contain unwelcome information, or invite invidious comparison. Even "open societies" may resist direct broadcasting by satellite, fearing that their national culture might be submerged.

The United States and some other nations maintain that the flow of information should be subject to minimal regulation, such as prior notification and consultation, but not to regulation that would inhibit future technological development and the free exchange of ideas and information. The USSR advocates prior consent, controlled program content, and the prevention of illegal broadcasts. Argentina adds even more restrictions, including a right of reply as well as proscriptions against any telecommunication that threatens the security of the state or family or that "impairs the rights of families or individuals, or is contrary to public law or morality."

Three policy issues are at stake in the direct-broadcasting-from-satellites issue: the free flow of information; recognition of the value of cultural diversity; and a nation's right to determine the character of the television services available to its people. The resolution of one can mean further controversy and bitterness over the other two.

### Exploiting Space

Less-developed countries want to be able to share in nonterrestrial resources, which they feel are the common heritage of all mankind. The technologically advanced countries argue that this attitude would destroy the commercial incentive to exploit the resources of space. Debate over international policies for such space enterprises as moon or asteroid mining centers around the same concerns as these which dominated the Law of the Sea negotiations on sea-floor mining.

Argentina was the first country to propose a treaty on the use of the moon. That treaty—emphasizing exclusively peaceful uses of space, mandating that any resource development promote higher living standards and socioeconomic progress on earth (especially in developing countries), and prohibiting weapons of mass destruction, weapons tests, military installations, and maneuvers—was at first ignored. The general feeling was that the 1967 Outer Space Treaty dealt adequately with the moon and other celestial bodies. But over time the proposed treaty gathered support and was finally passed by the UN General Assembly. Although the United States signed the treaty, during the Carter administration, the Senate refused to ratify it and the Reagan administration quickly withdrew it from further Senate consideration.

The treaty is now moribund. Natural resources and the international regime necessary to regulate their exploitation are the main areas of disagreement. The United States favors development and rational management of the moon's natural resources, expansion of opportunities for the exploitation and use of those resources, and equitable sharing of benefits derived from those resources—all of which are included in the treaty—but the treaty does not define "equitable sharing of benefits."

Some fear that the international-authority model devised to control seabed mining (and which effectively prevents it) will be used to control the exploitation of celestial resources. Some U.S. policy communities do not believe that an international regime would blunt lunar exploitation as the sea authority has marine mining. They further argue that, in any event, such an international regime is necessary only when exploitation of space resources becomes feasible—which may be years away, or never. In the meantime, arrangements can be made for rational experimentation with various organizational approaches in order to develop effective procedures. While the United States feels it has committed itself only to working on the establishment of an international regime, not necessarily to participating in one, some legal authorities say that the treaty makes submission to an international regime a prerequisite to resource exploitation.

Opponents of the treaty believe that it will prevent space settlement and exploration and that it will slow, if not halt, both the development of space technology and the exploitation of vital resources that would elevate world living standards. Some even believe that it constitutes a fundamental abrogation of civil rights. One section of the treaty allows any government to inspect a space station in orbit around any celestial body except earth; a government would not need permission to board and search such a space station. The U.S. Congress believes the treaty may have the same effect as the Law of the Sea; i.e., through international sharing-and-control provisions, extinguish corporate interest in exploitation.

The growth in space technology has prompted a search for institutional arrangements which can guide space exploration and exploitation. The numerous conflicts described above suggest that the current international in-

frastructure is inadequate for outer space. Because technology has developed more rapidly than social institutions, nations are having a difficult time agreeing about the fair and efficient allocation of resources. Thus far, there have been two basic approaches to the problem. One, the "national authority" approach, involves nation-states assuming responsibility and authority for the allocation of resources and, where possible, sovereign control of those resources. The other, "functional eclecticism," calls for the incremental growth of international authority and results in an ungainly mixture giving specialized functions (e.g., telecommunications) to particular institutions (e.g., INTELSAT) while leaving complex, but more general, issues (e.g., allocation of geosynchronous satellite "parking places") unresolved.

One possible institutional solution would be to develop a powerful "outer space projects agency" with an international membership. Such an agency could gradually internationalize capabilities for gathering and assessing information derived from remote sensing and about outer space, leading to a fuller sharing of such information. It could also push for intensive international consultations to resolve contending interests and to develop a wider range of policy choices for the international community. Finally, a space projects agency might limit nationally oriented (i.e., self-interested) activity in outer space by enforcing binding reciprocal obligations that would lead to a mutual accountability network. That such an organization will ever be formed, however, is decidedly remote.

This overview of emerging space policy problems has intentionally shifted across many different areas to show the abundance of issues of concern to policy analysts. This survey reveals a rich quarry for those interested in bureaucratic politics, decisionmaking models, organizational processes in constrained environments, links between public opinion and public policy, links between international and domestic policy, societal development, and even futurology. Moreover, the general neglect of the space policy area has reduced the cacophony of "common sense" rhetoric from politicians and ideologues, leaving a zone relatively free of politics and entrenched interests into which social scientists can venture, armed only with their analyses and theories. But this zone will not long remain tranquil. The "winds of star wars" have begun to blow. As their velocity increases, social scientists will have less and less opportunity to make a difference in policy formulation. □

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