Chapter 11

NASA as an Instrument of U.S. Foreign Policy

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Has space exploration, and NASA's role in it in particular, had an effect on society, and, if so, on what aspects of it? And how do we measure any such impact? These are challenging questions indeed. The stakeholders in the huge American space program are multiple and include scientists; engineers; research, development, and launch facilities; industry; administrators; and many government agencies, not to speak of Congress and the U.S. taxpayer. The impacts of spaceflight vary widely, from adding to the stockpile of knowledge and stimulating innovation and industry, to training, education, and creating jobs and—if we move beyond the civilian sphere—to enhancing national security and intelligence gathering. And then there are the intangible, difficult to quantify cultural effects that range from inspiring a young girl to become an astronaut to building national pride and prestige in what are, after all, spectacular scientific and technological, managerial, and industrial achievements.

This paper briefly considers one small, but I think important and often overlooked, corner of this vast panorama: the place of spaceflight in American foreign policy. I do not simply want to insist that NASA's international programs have had an important impact as instruments of foreign policy. I also want to suggest that today they have a particularly significant political and cultural role to play in projecting a positive image of American power and American democracy abroad. In a world increasingly torn apart by conflicts over values—conflicts which history teaches us can seldom be resolved by force—I believe we overlook the potential of NASA as an instrument for American foreign policy at our peril.

International cooperation for peaceful purposes was one of NASA's important missions from its inception, and those who drafted the Space Act that created the organization in 1958 gave it considerable prominence. The range of international activities covered by NASA is truly vast.[1] These are partly a response to the nature

1. Arnold W. Frutkin, *International Cooperation in Space* (Englewood Cliffs, NJ: Prentice Hall, 1965); Arnold W. Frutkin, *Space and the International Cooperation Year: A National Challenge* (Washington, DC: U.S. Government Printing Office, 1965 OL-779-251). Arnold W. Frutkin "International Cooperation in Space," *Science* 169 (24 July 1970): pp. 333–339 surveys NASA's general philosophy on international cooperation and some of the earlier programs of interest to us here.

of space exploration itself, which transcends national boundaries; whether they are launching sounding rockets or astronauts, communicating with satellites or space shuttles, or measuring the properties of the ionosphere or the trajectory of storms, NASA and its sister agencies have to think globally.

However, those who implemented NASA's mandate had a far broader vision of international cooperation than one that was simply subservient to America's national space needs. From its inception, NASA saw its role as fostering the development of space science and technology in other countries. Its officers, in consultation with other parts of the administration (notably the State Department and the Department of Defense), sought to use American scientific and technological preeminence to kick-start and even mould space activities in other countries, notably those of the Western alliance. NASA's international programs were intended to build a world community dedicated to the peaceful exploration of space with American help, under American leadership, and in line with the general objectives of American foreign policy. In brief, as a NASA Task Force put it in 1987, "[I]nternational cooperation in space from the outset has been motivated primarily by foreign policy objectives."[2]

In what follows I shall substantiate these claims by focusing on three space science programs in which U.S. foreign policy has been interwoven, more or less explicitly, with NASA's international initiatives. What makes these cases interesting is that, a priori, many people tend to believe that science is above politics and that international science is conducted independently of foreign policy concerns. This paper will not simply challenge such views but, by picking what is arguably the most difficult case, scientific collaboration, will alert us to the range of areas—some obvious, some less evident—in which NASA has served as a vector of U.S. foreign policy. My aim is to illustrate NASA's impact on strengthening the Western alliance not simply by promoting international scientific collaboration, but also by using it as a platform to consolidate the political and cultural solidarity of the free world. And although my examples are drawn from the cold war and its immediate aftermath, the lessons of history apply just as much today, when new and even more fundamental divisions threaten to tear apart the fragile fabric of Western democracy.

Space Science When the Cold War Was Hot

In March 1959, just a few months after NASA officially came into being, the American delegate to a meeting of the Committee on Space Research (COSPAR) announced that the U.S. would be willing to launch scientific experiments proposed by scientists from other countries on American-built satellites.[3] NASA would help

2. Task Force on International Relations in Space, National Aeronautics and Space Administration, *International Space Policy for the 1990's and Beyond*, (Washington, DC: NASA, 1987), p.18.

3. The text is reproduced in H. Massey and M. O. Robins, *History of British Space Science* (Cambridge, U.K.: Cambridge University Press, 1986), Annex 4; see also pp. 67–69.

integrate the experiment into the payload and would even consider launches entirely dedicated to foreign experiments. The organization also offered to host foreign scientists in U.S. laboratories where they would help them design, build, and test their experiments. Informally, NASA also let it be known that, initially at least, the payload would be launched free of charge using an American rocket.

The British enthusiastically took up this initiative, and in April 1962 NASA launched Ariel I containing instruments that had been designed, prepared, and funded by the British National Committee for Space Research. Ariel II followed in 1964. A year later the British were engineering and building the payload for their own satellite with NASA's help. In September 1962, NASA also launched a Canadian satellite, Alouette I, that had been designed, funded, and engineered by the Defense Research Telecommunications Establishment, inaugurating a fruitful joint venture with the U.S. in studies of the ionosphere. French and Italian space researchers also benefited quickly from the offer made at COSPAR. Indeed, by 1965 Arnold W. Frutkin, who had been put in charge of NASA's international programs in September 1959, could boast that the organization had already entered into collaborative arrangements with no fewer than 69 countries. Apart from providing for NASA's own needs, as explained above, these programs, Frutkin pointed out, were affording opportunities to the best brains abroad to contribute and participate in space research, were stimulating technical development abroad so perhaps reducing some of the gaps that were causing political and economic strains between the U.S. and its partrners, and were providing a framework for other countries to join NASA in complementary and cost-sharing programs—like that with Canada.[4]

Frutkin was never sentimental about the benefits of international collaboration; his experience in the International Geophysical Year had taught him just how easily the high ideals of internationalism could be thwarted by the centrifugal pull of national interest. His roadmap for international collaboration was one that demanded there be no exchange of funds between the partners; that there be clean technological interfaces at the level of hardware; that the project be of genuine scientific interest and, if possible, complement the American space science program; and that the results be published and open to all. It was implicit in this roadmap that political considerations did not determine the choice of projects and that NASA's civilian mandate was respected.[5]

On the face of it, these collaborations were of purely scientific interest and have no relevance to my topic. Yet the more we probe, the more we realize how deeply embedded they were in the cold war struggle and the pursuit of America's foreign policy objectives. I shall identify just two very different dimensions of this that are pertinent to these cases.

4. Arnold W. Frutkin, *International Cooperation* (Englewood Cliffs, NJ, Prentice Hall, 1966), esp. chapter 2.

5. See Frutkin, *International Cooperation*.

First, the determination to help Britain and then Canada orbit their own satellites quickly was provoked, in part, by fears that a communist country, and not a member of the Western alliance, would be the first to launch a satellite after the USSR and the U.S.[6] There was a space race in space science. As early as September 1958, officials hoped to place British instruments on an American satellite launched from the U.K.'s test range in Woomera, South Australia.[7] It soon became clear that even if America's most important ally was putting a national space program in place, it did not yet have the independent capacity to provide an instrument payload. NASA's proposal made to COSPAR in March 1959 was partly a response to the inherent weakness of this and other European space programs. If the British were quick to capitalize on it, it was not only because they valued American help but also because they realized the urgency of the situation, both in terms of national pride and the opportunities provided by cold war rivalry. Ariel I, launched in April 1962, won the race, though it was something of a Pyrrhic victory. Although the instrumentation was British, the satellite was American. It was Canada's Alouette I satellite, launched on 29 September 1962, that had the honor of being "the first satellite to be designed and built by a nation other than the United States or the Soviet Union."[8] Apart from providing valuable information on the ionosphere, it ensured that a country from the Western alliance and not from the Communist bloc was third into space with its own satellite.[9]

Cultural as well as political spinoffs accrued from the early space race in science. As I mentioned earlier, France also took advantage of America's offer to help build a national space science program. Indeed, in the words of Roger Bonnet, an internationally recognized figure in French and European space science, "[W]ithout the [sic] American cooperation, the French space science programme would not have had any chance to start on a competitive basis." Bonnet's own Ph.D. research on the ultraviolet spectrum of the Sun was made possible thanks to the close contact established between his mentor, Jacques Blamont, and the American

6. John Krige, "'Building a Third Space Power.' Western European Reactions to Sputnik at the Dawn of the Space Age," in *Reconsidering Sputnik: Forty Years Since the First Soviet Satellite*, Roger D. Launius, John M. Logsdon and Robert W. Smith, ed. (Amsterdam: Harwood Academic Publishers, 2000), pp. 289–307.

7. Neil Whyte and Philip Gummett, "Far Beyond the Bounds of Science: The Making of the United Kingdom's First Space Policy," *Minerva* (1997): pp. 139–169.

8. C. A. Franklin, "Alouette/ISIS: How It All Began," IEEE International Engineering Ceremony, Shirley Bay, Ottawa, 13 May 1993, available online at *http://www.ewh.ieee.org/reg/7/millennium/alouette/alouette_home.html* (accessed 15 September 2006).

9. *Alouette's* mission had three components: 1) develop a Canadian space capability; 2) acquire new data for the engineering of high-frequency radio communication links; and 3) acquire a better understanding of the properties of the ionosphere for scattering and deflection of radar beams. See Web site quoted in previous note, and also *http://www.sciencetech.technomuses.ca/francais/collection/space2.cfm* (accessed 15 September 2006). Frutkin glosses over the military origins of Alouette.

space science community, notably at the Goddard Space Flight Center. In fact, Bonnet's first launch in the Sahara desert in 1963 used a French Véronique sounding rocket enhanced with two pointing systems developed for the U.S. military by the University of Colorado. Why is this pertinent? Because Roger Bonnet was raised in a French communist family and as a young man it had been Soviet firsts that inspired him to enter space research. Working with the U.S. forced him to revise his political perspective. As he put it in an interview with me recently:

> . . . We were all impressed by the frantic competition which developed between the Russians and the Americans in the race to space. It was fascinating as far as I was concerned. I was listening to the radio each time the Soviets were launching something new and witnessed vividly all their first steps into space: the first intercontinental ballistic missile, the first Sputnik, and all that followed after. It was fantastic! But very soon we realized that the Americans adopted an open policy of information which we could not always get from the Russians. So, ultimately there was a greater appeal to cooperate with the Americans.[10]

Collaboration with France did not simply kick-start the national space science community. It could also pull French space scientists out of a pro-Soviet or neutralist orbit, thereby strengthening the ideological cohesion of the Western alliance.

All of us remember President Kennedy's commitment in May 1961 ". . . to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to Earth." We can still be inspired by another speech at Rice University a year later, in which he proclaimed "We choose to go to the Moon in this decade and do the other things not because they are easy but because they are hard, and because that goal will serve to organize and measure the best of our energies and skills." For Kennedy, success in space was a barometer of the capacity of America to mobilize its resources and its dynamism to achieve any goal it wanted. The Apollo program was a direct response to the increasing credibility of communism as a viable alternative to capitalism, of which successes on the ground in Indochina and in space with flights such as that of Yuri Gagarin were simply the most manifest examples. Taking on the challenge of putting a person on the Moon was a deliberate effort to regain the initiative by identifying national prestige and good government with a major scientific and technological achievement which tested the mettle of astronauts, engineers, administrators, and industry alike.[11]

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10. Roger Bonnet interview, Geneva, Switzerland, by John Krige, 10 February 2005, Historical Archives of the European Economic Community, European University Institute, Villa Il Pioggiolo, Florence, Italy.

11. This paragraph owes much to John M. Logsdon, *The Decision to Go to the Moon: Project Apollo and the National Interest* (Cambridge, MA: MIT Press, 1970), and Howard E. McCurdy, *Space and the American Imagination* (Washington, DC: Smithsonian Institution Press, 1997), chapter 4.

One of Kennedy's main concerns in taking that initiative was the many countries that had recently been decolonized; accordingly, he introduced the section of his speech to Congress in May 1961 that gave birth to the Apollo program by identifying the conquest of space with ". . . the battle that is going on around the world between freedom and tyranny, . . . the battle for men's minds, . . . the minds of men everywhere who are attempting to make a determination of which road they should take."[12] Many in Western Europe were also grappling with that choice. According to space historian Walter McDougall, an April 1960 poll revealed that a majority of Europeans in every country expected the USSR to be stronger than the U.S. after 20 years of "competition without war." More to the point, according to a report from the U.S. Information Agency, only one Frenchman in 14, or about 7 percent of those polled, thought the U.S. would prevail over its communist rival in the long run.[13] Collaborating with Blamont, Bonnet, and their colleagues in space science promoted U.S. foreign policy objectives at a cultural level by tangibly demonstrating the values of an open, democratic system over a closed, communist society.

HELIOS: A PLACE IN THE SUN FOR GERMANY

In December 1974 and in January 1976, two German spacecraft, Helios 1 and Helios 2, weighing about 452 lbs (205 kg) each, were launched by American rockets into elliptical orbits about the Sun. They were designed to fly closer to the Sun than any previous spacecraft (approaching to within 25 million miles) and to provide invaluable scientific information about solar processes and solar–terrestrial relationships. This was the most ambitious bilateral scientific project that NASA had undertaken to date. Its estimated cost in 1970 was $100 million, paid by the (West) German Ministry for Science and Education. Germany designed, manufactured, and integrated the two spacecraft, provided the majority of the payload (which also included some experiments from the U.S., Australia, and Italy), and operated and controlled the spacecraft from a national facility. NASA provided the deep space tracking network to support the mission and participated in the Joint Working Group which was responsible for technical implementation. The Helios spacecraft imposed advanced technical requirements on German industry, particularly for the development of the on-board power system, on-board data processing system, and thermal controls which had to survive high levels of solar radiation. It also introduced German engineers and project managers in the Joint Working Group to the way space projects were implemented in the U.S.[14]

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12. Logsdon, p. 128. See also Jeremi Suri, *Power and Protest: Global Revolution and the Rise of Détente* (Cambridge, MA: Harvard University Press, 2003), pp. 15–25.

13. Walter A. McDougall, . . . *the Heavens and the Earth: A Political History of the Space Age* (New York: Basic Books, 1985), p. 241.

14. Frutkin, *International Cooperation*. For an overview, see Niklas Reinke, *A History of German Space Policy: Ideas, Influences and Interdependence*, 1923–2002, translated from the German (Noordwijk, The Netherlands: ESA, forthcoming).

Helios was the crowning achievement of U.S.-German space science collaboration that began in the mid-1960s with sounding rocket experiments and graduated through various smaller satellite projects.[15] It was heavily charged with political content and foreign policy concerns. Just before Christmas 1965, Chancellor Ludwig Erhard made an official visit to Washington. In a brief exchange of toasts with his guest in the state dining room, President Johnson took time to mention their ongoing "mutual adventure in space" and said he looked forward to discussing "more ambitious plans to permit us to do together what we cannot do so well alone," including a probe to the Sun, the eventual Helios.[16] Erhard visited Johnson again in October 1966. Despite the fact that he only came for two days, he was taken down to Cape Kennedy to see the progress there. In an official address in the as-yet incomplete Vehicle Assembly Building, Johnson assured Erhard that the Apollo program was progressing as expected and reaffirmed his commitment to mutual space projects.[17] On the way back to Washington, NASA Administrator James Webb took the opportunity to spend an hour with the German chancellor. The "large on-going effort [at the Cape] made a deep impression" on Erhard, Webb wrote Secretary of State Dean Rusk. He went on: "[I]t seems to me that Erhard had a different attitude when we left the Cape than when we arrived. In fact, he did say that it was impossible to learn from pictures, television, and documents the true scope and magnitude of what was being done and that he had a much better appreciation of its importance."[18]

There are many reasons why the American president and his top advisors went to such pains to publicly and personally promote space collaboration with Germany, and Chancellor Erhard, at this particular moment. I shall mention just a few here.[19]

First, it was an attempt to meet European objections that a "technological gap" had opened up between the two sides of the Atlantic that made it impossible

15. "German-NASA cooperation, 9/28/66," record no. 14620, International Cooperation and Foreign Countries, Foreign Countries, West Germany, Folder Germany-U.S., 1963–1984, NASA Historical Reference Collection, Washington, DC.

16. "The White House. Exchange of Toasts" between Johnson and Erhard, 20 December 1965, NSF, Country File Europe & USSR, Germany/Erhard Visit [12-65], folder 12/19-21/65, Johnson Presidential Archives, University of Austin, Austin, Texas.

17. "The White House. Remarks by the President at Vehicle Assembly Building, Cape Kennedy, Florida," 20 September 1966, NSF, Country File Europe & USSR, Germany 9/66, Erhard Visit, folder Papers, Cables, Memos [9/66], Johnson Presidential Archives, University of Austin, Austin, Texas.

18. James E. Webb to Dean Rusk, 14 October 1966, record no. 14465, International Cooperation and Foreign Countries, Foreign Countries, West Germany, folder Germany (West), 1956–1990, NASA Historical Reference Collection, Washington, DC.

19. Thomas Alan Schwartz, *Lyndon Johnson and Europe: In the Shadow of Vietnam* (Cambridge, MA: Harvard University Press, 2003) is a fine analysis of the Johnson's foreign policy in the region. See also John Krige, "Technology, Foreign Policy and International Cooperation in Space," in *Critical Issues in the History of Spaceflight*, Steven J. Dick and Roger D. Launius, ed. (Washington DC: NASA SP-2006-4702, 2006), pp. 239–260.

for European high-tech firms to compete effectively in the world market against their American rivals. This had deep political ramifications since it bred resentment against what was perceived as American domination, and undermined Washington's demand that Europe assume more of the burden for its own defense. Both parties quickly realized that the fault lay within Europe itself, and that its institutions and managerial practices needed drastic reform. The indigenous development of space technology with American help was seen as one useful way to overcome this situation. Thus Webb assured Erhard on the way back from Cape Kennedy that

> [T]he President was, in fact, offering him more than friendship and more than dollars. In fact he was offering a partnership in the development of technology that could permit Germany to increase its own capability, gain a better understanding of its own needs and opportunities for multilateral and bilateral cooperation, establish a basis for leadership in the direction it felt its leadership could be effective in Western Europe, and could set a pattern of university/industry/government cooperation suited to the needs of Germany, benefiting throughout from our own experience. [20]

A second factor of more symbolic than financial significance was the idea that Germany could purchase space technology and space launches from the U.S. as part of its "offset" obligations. West Germany was required to offset with military purchases the approximate costs to the American government of retaining U.S. forces in its territory. These offset payments had become a major political and financial liability for the German government in 1966. For one thing, they were associated in the public's mind with a series of crashes of the F-104G Starfighter jets—10 in the first half of 1966 alone, giving the impression that the U.S. was selling unreliable and unnecessary military equipment to its ally.[21] For another, the next round of payments was due shortly; Erhard had undertaken to place $1.35 billion in weapons orders by 31 December 1966 and to make an additional $1.4 billion in offset payments by June 1967.[22] Writing to Johnson in July 1966, the chancellor said he was willing to accept his offset obligations but that he hoped to do so by "payments and services other than the mere purchase of weapons and military equipment."[23] Purchasing space technology and services was one such way, even though such alternatives would probably not amount to more than about $25 to $50 million.[24]

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20. Webb to Rusk, 14 October 1966.

21. Schwartz, p. 116.

22. Francis M. Bator, "Memorandum for the President. Subject: Erhard Visit, September 26–27, 1966," 25 September 1966, NSF, Country File Europe & USSR, Germany 9/66, Erhard Visit, folder Papers, Cables, Memos [9/66], Johnson Presidential Archives, University of Austin, Austin, Texas.

23. Schwartz, p.117.

24. "Text of Cable from Ambassador McGhee (Bonn 3361), Subject: The Offset and American Troop Level in Germany," 20 September 1965, NSF, Country File Europe & USSR, Germany 9/66, Erhard Visit, folder Papers, Cables, Memos [9/66], Johnson Presidential Archives, University of Austin, Austin, Texas.

Then there was the hope that Germany would take the lead in strengthening European multilateral cooperation that was being threatened by President de Gaulle's increasing resentment of the limitations placed on French sovereignty by NATO and the European Economic Community (EEC). "The United States has a direct interest in the continuation of European integration," wrote George Ball in the State Department. "It is the most realistic means of achieving European political unity with all that that implies for our relations with Eastern Europe and the Soviet Union." de Gaulle's actions were undermining that unity. "The United States hopes therefore," Ball went on, "that the Federal Republic will continue to exert leadership to preserve the unique character of the European institutions . . . ." [25] In particular, if Germany could become a leading space power in Europe it could play a major role not only in developing European high-tech industry but also in reinforcing European multilateral institutions in the face of the threat posed to them by de Gaulle's affirmation of national sovereignty.[26]

Finally, it must be mentioned that Erhard was a staunch supporter of the war in Vietnam. In fact, Johnson went out of his way in his toast to the chancellor in December 1965 to thank him for "the support which your Government has given to the common cause in Viet Nam, and which you may give in the days ahead . . . . The credible commitment of the United States is the foundation stone of freedom all around the world," Johnson added. "If it is not good in Viet Nam who can trust it in the heart of Europe? But America's word, I assure you," Johnson concluded, "is good in Viet Nam, just as it is good in Berlin."[27] The high-profile offer to collaborate with Germany in space was also a public act of gratitude to a faithful ally and a signal to the Soviets that they had best not challenge the now-established divisions between East and West in Europe.

In replying to Johnson's toast that Christmas Eve in 1965, Erhard, while enthusiastically agreeing that such an ambitious project would "fascinate the imagination of the people," also joked that "Of course, we, the Germans, would not like to get too close to the sun because we wouldn't like to burn our wings . . . ."[28] Actually, it was Helios that survived the journey to the Sun and Erhard who burnt his wings. He resigned after returning from his visit to Washington and Cape Kennedy in October 1966. His failure to achieve a major reduction in offset commitments and his unwavering support for Johnson's policies in Viet Nam were two of the main factors leading to the collapse of his government.

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25. Cable signed Ball from the Department of State to the American Embassy, Bonn, 18 November 1965, NSF, Country File Europe & USSR, Germany, Erhard Visit [12-65], folder 12/19-21/65 Johnson Presidential Archives, University of Austin, Austin, Texas.

26. Krige in Dick and Launius, *Critical Issues*.

27. Johnson, "The White House. Exchange of Toasts."

28. *Space Daily*, 22 December 1965, 295, record no. 14548, International Cooperation and Foreign Countries, International Cooperation, folder US-Europe 1965-1972, NASA Historical Reference Collection, Washington, DC.

AND THEN THE WALL CAME DOWN: CASSINI-HUYGENS

As Western European countries gradually put their national and multinational space programs onto sounder footing, they expected to be treated as equals by their American partners. The mantra of Reimar Lüst, the Director-General of ESA (European Space Agency) from 1984 to 1990, was that Europe had to be able to compete with the U.S. in order to collaborate with it from a position of strength. This philosophy was exemplified in the magnificent Cassini-Huygens mission to Saturn and Titan in 2004–2005. In this joint venture, the Jet Propulsion Laboratory built and managed the Cassini orbiter that surveyed Saturn; the Italian Space Agency built Cassini's high-gain communications antennae; and ESA built the Huygens probe that plunged through Titan's atmosphere to its surface. The truly spectacular images of Saturn's rings and of its largest moon will have thrilled many a space scientist, be they at high school or an old hand at the game.

This extraordinary scientific achievement not only called for scientific, engineering and managerial expertise, it also called for diplomacy. Early in 1992, Dan Goldin was appointed NASA Administrator. He resolved to shake up the organization and inaugurated his famous policy of "faster, better, cheaper." Cassini-Huygens was anything but that, and it soon caught his eye; late in 1993 he threatened to cancel the program. The American space scientists and engineers and their European colleagues were outraged. "I remember Carl Sagan calling me on the phone from California asking for help because NASA was trying to stop the mission," Roger Bonnet told me recently. "Three times ESA intervened and asked its ambassadors to interact with the State Department in order to make the Americans understand that they could not stop Cassini, with such a big involvement of Europe . . . ."[29] In June, 1994, ESA Director General Jean-Marie Luton wrote a strong letter to Vice President Al Gore, copied to the Secretary of State and to various senior administrators, including Goldin. In it Luton stressed that Europe regarded

> . . . [A]ny prospect of a unilateral withdrawal from the cooperation on the part of the United States as totally unacceptable. Such an action would call into question the reliability of the U.S. as a partner in any future major scientific and technological cooperation.[30]

Goldin had to back down. The Clinton administration wanted an unambiguous European commitment to what was soon to be the International Space Station and could not afford to alienate ESA. This combination of financial and foreign policy concerns saved Cassini-Huygens from being axed by the NASA Administrator, and avoided a major diplomatic incident.

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29. Bonnet, interview with the author, 10 February 2005.

30. Quoted in Charley Kohlhase, "Return to Saturn's Realm," *The Planetary Report* (March/April 2004), available online at *http://www.planetary.org/saturn/tpr_vol24no2_kohlhase.html* (accessed 16 September 2006).

Luton's unambiguous position was a symptom of the strength of the European space program. It was also fuelled by his determination that joint U.S.–European projects would never again be sacrificed on the altar of NASA's changing national priorities. This had happened some years before, with the International Solar Polar Mission (ISPM). In the late 1970s, NASA and ESA had agreed to launch a pair of satellites out of the ecliptic plane (the plane that contains most of the objects that orbit the Sun) to perform a variety of challenging scientific experiments in domains that included solar physics, cosmic ray studies, and the exploration of the interplanetary environment.[31] NASA canceled its contribution unilaterally in 1982 due to budget constraints caused by the development of the Shuttle and a new, stricter financial regime inaugurated under President Reagan. A political climate dominated by fears that increased economic competition from Japan and Western Europe was undermining American leadership did the rest. Europeans understood the budget difficulties their American colleagues faced, which derived in part from the very different procedures for funding spaceflight on the two sides of the Atlantic.[32] What they bitterly resented was that they were not consulted before the American decision and that NASA was deaf to pleas to reinstate the ISPM program. The huge disparity in space capability between the U.S. and Europe for the first two decades of the Space Age had reduced Europeans to the status of junior partners who could be manipulated almost at will by their dominant ally. The experience with ISPM taught Europeans, in the words of Bonnet and Manno, never again to "accept being considered a subordinate participant" in a joint project.[33]

NASA's and the Reagan's administration's approach were coherent with, and justified locally by, a persistent tendency of the U.S. during the cold war to fail to consult its Western European allies in important foreign policy decisions which affected both parties, the most blatant example being Kennedy's handling of the Cuban missile crisis.[34] Indeed, veteran U.S. diplomat David Bruce described this as "the vicious circle of American predominance, European dependence and mutual resentment [that] operated for half a century,"[35] up to the collapse of the Berlin Wall and the implosion of the Soviet Union. Thereafter, in a global environment no longer dominated by superpower rivalry, and with a new administration in the White

31. What follows is based on Russo's analysis in John Krige, Arturo Russo and Lorenza Sebesta, *A History of the European Space Agency 1958–1987. Vol. II. The Story of ESA*, 1973 to 1987 (Noordwijk, The Netherlands: ESA SP-1235, April 2000), chapter 3.

32. In ESA, once a program is agreed to the participating states agree to fund to completion; in the U.S. projects are subject to the vicissitudes of the annual budget voted by Congress for NASA.

33. Roger M. Bonnet and Vittorio Manno, *International Cooperation in Space: The Example of the European Space Agency* (Cambridge, MA: Harvard University Press, 1994).

34. Frank Costigliola, "Kennedy, the European Allies and the Failure to Consult," *Political Science Quarterly* 110 (1995): pp. 105–123.

35. Costigliola, p. 122.

House, Washington was more willing to take seriously the needs of its European allies—and Cassini-Huygens survived as a joint venture. Today, as the pendulum swings back toward U.S. unilateralism, so the prospects for durable international agreements become bleaker.

CONCLUSION: INTERNATIONAL SPACE COLLABORATION, NASA, AND "SOFT POWER"

In 1998 a Commission of the National Academies pointed out that

> . . . [D]uring the Cold War there was significant political goodwill to be gained by the United States through cooperation with Europe vis-à-vis the former Soviet Union . . . . Competition in space (including the space sciences) was part and parcel of concerted efforts made by the superpowers to convince other countries of their technical capabilities, and hence leadership.[36]

This paper has fleshed out these claims. It has illustrated how international scientific and technological collaboration in space were used to promote American interests abroad, and how it has adapted to the changing balance of power between the American and European space programs. Borrowing the language of Joseph Nye, professor of international relations at the Kennedy School of Government, Harvard University, we can say that NASA's international initiatives have served as agents of "soft," or co-optive power, as opposed to "hard," coercive or command power. Nye puts it thus:

> Soft co-optive power is just as important as hard command power. If a state can make its power seem legitimate in the eyes of others, it will encounter less resistance to its wishes. If its culture and ideology are attractive, others will more willingly follow . . . . If it can support institutions that make other states wish to channel or limit their activities in ways that the dominant state prefers, it may be spared the costly exercise of coercive or hard power.[37]

Echoing Nye, we can say that international collaboration in space is one of a repertoire of instruments the U.S. has at its disposal to legitimate its power in the eyes of others, to promote its culture and its democratic ideals, and to channel the scientific and technological efforts of other nations down paths that cohere with American interests.[38] NASA has played an important role in that process in the past and can continue to do so in the future. The cold war may be over but the struggle for hearts and minds is not.[39]

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36. Committee on International Space Programs, *U.S.–European Collaboration in Space Science* (Washington, DC: National Academies Press, 1998), p. 15, available online at *http://books.nap.edu* (accessed 16 September 2006).

37. Joseph S. Nye, Jr., "Soft Power," *Foreign Policy* 80 (Autumn 1990): pp. 153–171.

38. For more detail, see Krige in Dick and Launius, *Critical Issues*.

39. Joseph S. Nye, Jr., "The Decline of America's Soft Power: Why Washington Should Worry," *Foreign Affairs* 83 (2004): pp. 16–20.