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## Gambling with geopolitics threatens space station

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*The U.S.-led international space station has been under constant budgetary attack. Now, there are proposals for the wrong kind of cooperation with the Russians. Marsha Freeman reports.*

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On Nov. 1, the National Aeronautics and Space Administration (NASA) will present a report to the White House on the possible options for Russian participation in the space station, an international effort led by the United States. The administration has stated that by the end of the year it will make a decision on the specifics of the Russian contribution to the often-redesigned and down-sized space station. In principle, collaboration with the Russians on the space station and related programs makes a lot of sense. The Russians have had more than 20 years of experience with crews on Earth-orbiting space stations and also the most robust rocket launch capability in the world. They are the only other nation beside the U.S. to have a manned space program and they have many technical capabilities that could augment western space efforts.

And the Russians sorely need support from the West. Since the collapse of the Soviet Union and the disastrous imposition of "shock therapy" economics, the former Soviet space program has been in retreat. The Russian Energia heavy-lift launch vehicle and the Buran re-usable space shuttle are on hold. Facilities both on the ground and in space are deteriorating because of lack of funding.

But the Clinton administration's recent initiatives for cooperation are being proposed for all the wrong reasons. And the most radical proposal—that the Russian Mir 2 space station be the centerpiece of what had been the U.S.-led international space station—would hold the U.S. manned space program hostage to the political stability of Russia and other republics, Russian political intentions, a collapsing

Russian economy, and the geopolitical goals of the U.S. administration.

The recent White House offer of space station cooperation, in addition to \$400 million out of the NASA budget over the next four years for a variety of cooperative programs, was offered to coax the Russians to sign the Missile Control Technology Regime agreement. The effect of the MCTR is not to deter the proliferation of weapons, but to deprive developing nations access to advanced aerospace technology in order to implement a more general policy known as "technological apartheid." The Russians had to cancel a nearly \$400 million rocket engine deal with the government of India in order to agree to sign on to the MCTR: hence the amount of money agreed to for near-term space cooperation.

However, signing international treaties is unlikely to prevent any of the activities they are supposed to curb, and in the past the Soviets did not adhere to military agreements anyway. If the international space station depends upon the Russian cooperation, what will happen if they violate the MCTR? The 1979 Soviet invasion of Afghanistan ended ongoing collaboration in space and other areas.

The administration has based its foreign policy toward Russia on the false premise that supporting Boris Yeltsin means supporting democracy. While it is true that keeping Russian space scientists and engineers employed and working on the frontiers of science can support democracy, this is *not* because it will support the current regime and its anti-democratic policies or shock therapy economics, but because any real economic recovery and growth in Russia will be led

by its reservoir of technical talent and scientific manpower.

It is rarely mentioned that the funds being transferred from NASA to the Russian space program will be used to support Boris Yeltsin's only visible "constituency," the Russian military. Although the funding will go to the new civilian agency, all space launch facilities are run by the strategic rocket forces, and historically more than 80% of space activity has been for military purposes. Funding transferred will initially be to purchase hardware that, for the most part, already exists, from the industrial giant NPO/Energia. What the new American dollars will be used for is unstated. All Russian space hardware and capability is dual-use.

It is admitted that the policy of marrying aspects of the Russian and American space programs might be high risk, but, the argument goes, this is supposed to be balanced by the savings that will accrue through the purchase of existing hardware from the Russians, which the United States would otherwise have to develop itself. Even were it true that cooperation saves money—which it does not—saving money is not a justification for international cooperation. In the case of the current Russian situation, it is unclear how much more money than already agreed to will have to be invested in their program just to enable the Russians to cooperate. As has been pointed out, the contributions made to the space station by Europe, Japan, and Canada are being paid for by those nations. In the Russian case, we are paying them to contribute to the space station, and in some cases to build hardware that the Europeans had expressed interest in providing, free of cost to the United States.

The space station collaboration that is being proposed by the White House could put the Space Shuttle at risk and spell the end of the international space station. If these U.S. space capabilities are diminished, this would be a serious blow to the future of democracy in Russia, because a healthy, thriving scientific and technological capability in the West is crucial to augment the manpower and resources available internally for Russian development.

### **Space station at risk**

Since the end of the Apollo program, the United States has had no long-range goals in space. This has meant that each individual program—be it the Space Shuttle, unmanned scientific probes, or the space station—has been seen as an isolated project. It has made any large program a target for budget cutters, congressional micro-managers, and anti-science ideologues because there was no connection of each separate project to larger, more far-reaching goals.

Since President Ronald Reagan announced in 1984 that the United States would build a space station, the program has been scaled back, redesigned, stretched out, and redefined. Soon after President Clinton took office he ordered NASA to do yet another redesign of Space Station Freedom to bring down the projected cost. The redesigned station would have to cost half the \$30 billion that Freedom would

have (including the \$8 billion already spent), cost half as much to operate once on orbit, and have only half the 30-year lifespan of the original Freedom station, the administration stated. The redesign, which began in March, was to be completed by June. Some participation by the Russians in the international space station was assumed in the redesign. As the engineering team started its work, it became clear that there was no way to halve the station cost and still meet the technical and performance requirements. At the same time, Congress was not about to watch the Space Station Freedom, which they had fought tooth-and-nail to build, be redesigned out of existence, to be replaced by some "cheaper" version that would be less capable. On May 20, the chairman of the House Science, Space and Technology Committee, George Brown (D-Calif.) held a press conference informing the administration that "the current Space Station Freedom design offers the only credible basis for redesign, and it is the only program I intend to support when the measure reaches the House floor." The committee bill authorizing the fiscal year 1994 NASA budget included full funding for the space station.

The redesign team presented three options to the White House on June 10, all of them surpassing the funding caps it had dictated. One week later President Bill Clinton announced his decision—a compromise with Congress—opting for a scaled-down Freedom design which was supposed to save about \$5 billion over the next five years. The annual funding would not exceed \$2.1 billion. Neither Congress nor the international partners in western Europe, Japan, and Canada would have supported any other proposed option. The new station proposal, referred to as Alpha, would use a modular design, introducing more flexibility into the sequence and timing of when each module is brought into space. The space agency had until Sept. 7 to put the details of the new station design onto paper.

When the new Alpha design was presented in September, it was one week after Vice President Albert Gore had met with Russian Prime Minister Viktor Chernomyrdin. NASA Administrator Daniel Goldin stated that the Alpha design "is compatible with Russian participation." Alpha now included the Russian Soyuz-TM, used to transport cosmonauts to the Mir, as an emergency crew return vehicle parked at the Alpha space station. It also included the possibility of a Russian Salyut craft as a space tug to be used as an in-orbit propulsion, guidance, and attitude control system.

But, as *Aviation Week* commented on Sept. 13, what the White House really wanted was a "unified" station combining some hardware from Freedom with the Mir-2 space station, which the Russians are now building. Alpha was presented as a design which would remain the same regardless of how much the Russians ultimately contributed to it. While the overall design might remain the same, the marriage of the two stations would mean that the Russian Mir-2 core would be in orbit before the U.S. module, five of the first six flights

would carry Russian hardware, and considerations, such as orbital inclination, would be dictated by Russian requirements.

How much support this Russian-American space station will garner in Congress is dubious. This year the annual amendment to eliminate the funding for the space station was defeated on the House floor by fewer than five votes. "Free market" Republicans teamed up with "austerity Democrats" and freshmen yuppie congressmen to nearly kill the space station. One question being asked by Congress is: How much support will the station garner when it involves giving the Russians money in order to buy space hardware that would have been produced by American aerospace workers who are unemployed?

What would happen if the Russians violated the MCTR agreement, and we ended the cooperation on a space station which depended upon the Russian contribution? What if political accommodation cannot be reached with the government of Kazakhstan, where the launch site at Baikonur is, or with Ukraine, which builds crucial components and launch vehicles? How much money will Congress be willing to invest to keep Russian space assets operating and out of bankruptcy? How feasible would this proposed marriage be between the Freedom and Mir-2 space stations?

### Looking at our partner

There are two principal considerations in evaluating how intimate the cooperation on space technology should be with the Russians. There are technical considerations to determine what the best technology match would be, and how each side could benefit the most from joint work. There are also political considerations—this is not simply a matter of adding yet another international partner to a highly complex project. The breakup of the Soviet Union has had a profound effect on the former Soviet space program. More than a year ago, Soviet/Russian space expert Marcia Smith from the Congressional Research Service began warning that the problems of political uncertainty and funding in the Russian space program made it impossible to forecast what would happen or to make long-term plans. She has consistently warned against underestimating the level of chaos in the former Soviet space program.

One concern is the fact that Russia's main launch facility—its equivalent of Cape Canaveral—is at Baikonur in Kazakhstan. In February 1992, hundreds of Russian soldiers at the Baikonur Cosmodrome, 1,500 miles southeast of Moscow, rioted over poor food and bad working conditions, burning barracks and killing three people. The riot followed a strike by technicians at the Cosmodrome. The poor conditions are the result of both budget cutbacks in the Russian space program and the lack of clear lines of responsibility between the Russian and Kazakh republics. Two months later, Russian President Boris Yeltsin, observing a satellite launch at the Russian spaceport of Plesetsk, revealed that

the government of Kazakhstan would not allow the Russian government to launch the satellite from Baikonur. Although there have been proposals to turn the Plesetsk launch site in Russia, which has launched more than half of all Soviet spacecraft, into another Baikonur, this seems unrealistic in terms of the cost and time involved in duplicating the needed infrastructure.

The Aug. 31 issue of *Space News* contains comments by the director of the Russian aerospace design company NPO/Energiya, Yuri Semenov, in response to demands that Kazakhstan have more control over the space launch facility. He appealed for calm and insisted that the Russian military retain control of the complex. The governments of the two republics have agreed that profits from Baikonur would go toward resolving problems in the nearby residential city of Leninsk, including "the renovation of the railroad, the plumbing, and so on." They have *not* agreed on the long-term administration of the launch complex and its facilities.

Since the dissolution of the Soviet Union, the military force operating Baikonur has been reduced from 30,000 to 5,000 men. The Russian military publication *Krasnaya Zvezda* (*Red Star*) reported last July that the defense ministers of Russia and Kazakhstan signed an agreement on July 1 on the stationing of Russian troops on the soil "of a friendly state's territory," but that other issues of joint responsibility for the launch complex and the town of Leninsk remained unresolved. The paper warned: "The present state of the Cosmodrome and of Leninsk is so dramatic that, unless prompt, decisive, and sensible measures are taken, the process of the collapse of a unique scientific and technical complex could become irreversible." So far about 40,000 people have left Leninsk, where the families of Baikonur personnel live. Before 1990 it had a population of 100,000. According to *Aviation Week*, there is a shortage of 2,500 military officers at the Cosmodrome itself.

Another crucial republic in the former Soviet space program is Ukraine, which produces the Zenit rocket, which the Soviets had planned to offer for commercial satellite launches in order to earn hard currency. The Zenit boosters are also used as strap-ons for the large Energiya rocket. Military relations between Russia and Ukraine have been strained due to disagreements over control of the Black Sea Fleet, and in 1992, communications between Russian flight controllers and a Mir crew were cut when a Ukraine-based tracking station refused to cooperate with the flight control center, protesting low wages.

### Cutbacks and political turmoil

The number of space launches this year from all facilities will most likely be half the average 100-plus launches per year of the late 1980s. In 1991 the total number was 59, compared to 75 the year before.

Over the past two years, the Russian manned space program has been dramatically affected by the cutbacks and

political problems in Russia. In 1991, cosmonaut Sergei Krikalev was "asked" to spend an extra six months aboard the Mir space station, when the arrival of his replacement was delayed because two flights had to be combined for financial reasons and a Kazakh cosmonaut was sent up as a political concession to that republic. During that mission, political unrest led to the closure of the tracking station in Tbilisi, Georgia and economic problems led the Russians to call the Mir ship tracking fleet back to port. This created a situation where the crew was out of touch with mission control for 9 hours a day. While the Soviet Union collapsed and talk of raising money by privatizing the space program abounded, the cosmonauts joked from orbit that, should the Mir be sold, they hoped the sale wouldn't include its crew. More recently, on Oct. 16, Reuters reported that the mission of cosmonauts Vassily Tsebliyev and Aleksandr Serebryov, who are aboard Mir now, will be extended from 146 to 195 days because the Russian Space Agency does not have the booster rocket to launch a mission to replace them. According to *Krasnaya Zvezda*, the plant that produces the rockets in Samara, about 560 miles southeast of Moscow, is on the verge of bankruptcy and had temporarily ceased production.

The Mir space station was launched to orbit on Feb. 19, 1986, less than a month after the Challenger explosion. Over the past year the cosmonauts have had to spend an increasing amount of their time—up to 80% by some estimates—on repairs, maintenance, and trouble-shooting. Next year the core module will reach the end of its projected lifetime and require significant investments just to continue functioning.

Russian space officials have complained to the press, and their American colleagues, that the programs are receiving less than half the amount of money requested from the government to maintain the infrastructure and capabilities that are the fruit of 35 years of investment in space technology.

Under these circumstances, what kind of space cooperation should we be pursuing?

### Cooperation versus geopolitics

In June 1992, Presidents George Bush and Boris Yeltsin signed a five-year agreement giving the space agencies of each government broad authority to agree to cooperative efforts in space. This had come after two years of pressure on the Bush administration from the scientific community, NASA, the Pentagon, and Congress to reverse the Cold War exclusion of the Soviet Union from the international non-communist space community (see *EIR*, May 1, 1992, "The United States Must Save Soviet Science"). Also during that summit, NASA Administrator Dan Goldin and Russian Space Agency Director Yuri Koptev signed a \$1 million, one-year contract to evaluate Russian space hardware that could be useful to the United States. Also authorized was \$10 million to purchase some Russian hardware, such as the Topaz space nuclear reactor.

The following month, Goldin made a trip to Russia and

Ukraine and stated that flights of U.S. astronauts to the Russian Mir space station could be a "logical stepping-stone" to develop technologies and gain experience for Space Station Freedom. The details for cooperation between the world's only two manned space programs were delineated in an October Human Space Flight Agreement, and included the flight of a Russian cosmonaut on a Space Shuttle mission in late 1993 (the flight has been postponed to early 1994), and a three-month stay of a U.S. astronaut aboard the Mir in 1995, during which the Space Shuttle Atlantis would dock with the Mir. U.S. experiments would be flown on the Mir, to upgrade its scientific research. The projected cost to the United States for this use of the Mir station was estimated at \$100 million.

Eight months later, in March 1993, the Clinton administration came to an agreement with Russia on an element of space cooperation crucial to the Russians, which would bring in hard currency, and which the U.S. used as a bargaining chip in the MCTR negotiations. The United States would allow the Russians to enter the commercial launch market to bid on international satellite launches, with the constraints of eight commercial launches up to the year 2000, no more than two per year, and the agreement that they would not charge less than 7.5% below western launch prices.

Over April 3-4, Yeltsin and Clinton met in Vancouver while NASA was in the throes of the space station redesign. Yeltsin accepted Clinton's invitation for Russia to send a team of space experts to Washington to give advice on the redesign, and a commission for ongoing space cooperations was established. The Russians had begun building the core module for the Mir-2 station, which was designed to replace the aging, seven-year-old Mir. They were clearly concerned about how they would have the resources to launch, operate, and maintain it. A month before the Vancouver summit, Russian Space Agency head Koptev and NPO/Energia director Semenov wrote a letter to Dan Goldin proposing to merge the U.S. and Russian space station. Further, the *Washington Post* reported on April 15, that Goldin invited Russian participation in the station, because as the redesign progressed, he knew the funding constraints from the White House were impossible to meet. The comment was made that, in terms of foreign policy, space cooperation offered almost the only comfortable arena for discussions between equals.

In May, *Space News* reported that the Russians were pressuring the U.S. for closer cooperation on the redesigned space station. The Russians informed a U.S. team visiting Moscow that they would give the Americans until June to decide on Russian space station participation. After that, they warned, they would proceed with their own plans for Mir-2. After months of wrangling, on July 16 the Russians agreed to halt the sale of liquid hydrogen rocket engine technology to India and abide by the MCTR, and in return the U.S. signed agreements that finalized the details of the commercial launch agreement, which promised \$100 million for Russian space cooperation over each of the next four years and which

stated that by Aug. 31 NASA would specify its offer for Russian participation in the space station.

### **The Gore-Chernomyrdin meeting**

On Sept. 2, a week before NASA was to release the detailed design for the Alpha space station, a meeting took place in Washington between Vice President Gore and Russian Premier Viktor Chernomyrdin. The meeting had been delayed for months awaiting agreement on the MCTR. The two co-chairmen of the Intergovernmental Russia-American

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Commission on Cooperation in Space and Energy announced that cooperation would be pursued in accordance with certain principles, including the operation of the U.S.-led space station "in an orbit which is accessible by both U.S. and Russian resources."

This was quite a shocker for the U.S. Congress. This one little phrase, making the station accessible to Russian resources, could have a profound impact: It would mean placing the space station in a significantly different Earth orbit than the Alpha design had assumed, in order to accommodate Russian launch vehicles. Space hardware launched from Cape Canaveral in Florida obtains an orbit in space that is inclined 28.5° to the equator, allowing the Shuttle to fly over water before reaching orbit, instead of over land, making it safer and allowing the first-stage solid rocket boosters to fall into the ocean and be recovered. This means that while in space, it passes over the region of the planet spanning 28.5° N latitude to 28.5° S.

Spacecraft launched from the Baikonur Cosmodrome, including all manned Russian spacecraft, are generally placed into an orbit that is inclined more than 50° to the equator, in order to avoid flying over Chinese territory. Such a highly inclined orbit enables the spacecraft to view more of the Earth. From the 51.6° orbit which the Russians have suggested for the Mir-Alpha station, nearly all of the inhabited parts of the globe would be visible. Taking advantage of this fact, the Russians have planned to stress Earth remote-sensing as a focus for Mir-2. The U.S.-led international space station has focused on microgravity studies for materials science and the biological and medical sciences, for which it is

irrelevant what parts of the Earth the spacecraft overflies.

The congressional reaction to this proposal to change the orbit of Alpha was immediate. A major reason is that the Space Shuttle cannot carry as much payload to the higher orbit as it can to the one it was designed for. U.S.-built modules for the Alpha station have already gone past the best-case 37,800-pound payload lift capacity of the Shuttle. Moving from a 28.5° orbit to a 51.6° orbit will lose 11,900 pounds in payload capacity. Proposals have been made to change various pieces of Shuttle hardware to accommodate more payload, but all of these—which include an advanced solid rocket motor and a lighter aluminum lithium external fuel tank—introduce new hardware, and therefore, added risk, to the Shuttle program. In early October, Congress cancelled the advanced solid rocket motor program to save money.

The proposed Mir-Alpha station assembly sequence would orbit the Mir-2 core module at least one year before the first U.S. Alpha module. Russian space expert Marcia Smith from the Congressional Research Service described how this would make the U.S. a "tenant" on a Russian space station. Within days of the Gore-Chernomyrdin announcement, veteran Johnson Space Center mission operations director Eugene Krantz and astronaut David Leetsma, who directs flight crew operations, questioned the proposal from the standpoint of operations and safety. Who will be in charge of this Mir-Alpha station? Will mission control be in Houston or Russia? they asked. If the module is Russian and the launch is from Russia, whose space station and responsibility is it, anyway?

The Russians were elated at the announcement. On Sept. 16 Russian Space Agency head Yuri Koptev held a press conference in Moscow. After stating that his agency is receiving only 43% of its required funding from the state budget, Koptev remarked, "I've said before and I'm going to repeat it: It's an open secret that the economic difficulties that we are living through today will not be over soon. . . . The question is, can the state preserve the space sector. . . ? We are confident that if we cannot find worthy and interesting projects that could involve our industry in tasks for the benefit of our partners or joint projects, *which could be duly financed by the partners*, we will not be able to preserve our space sector" (emphasis added). Koptev stated that the first phase of the Mir-Alpha station would be the launch of Mir-2, and that, in the second phase, it would become an international station. Koptev was clearly confident that the United States could not come up with the money to build the Alpha station, and assured the press that all the details could be worked out.

The new concept of the space station made the international partners quite nervous. In a statement issued on Sept. 22 following a meeting in Paris, the European Space Agency stated that at the time of the redesign in early 1993, Europe "identified space hardware and software that are or might be developed by the European partner such as the Ariane-5

launch vehicle, an Automated Transfer Vehicle, an Assured Crew Return Vehicle, and the Earth ground infrastructure.” Now, it was being proposed that the U.S. would buy much of this hardware from the Russians. “It is clear that a consensus among all existing partners is a prerequisite” the statement warned.

On Sept. 27 the ranking majority and minority members of the House committees that authorize and appropriate funding for NASA wrote a strongly worded letter to the administration, insisting that the U.S. “maintain an independent capability to complete and operate the space station at all times.” This would not be possible with the White House proposal. They criticized the idea of putting up the Russian Mir-2 module first and urged a compromise on the question of orbital inclination. At a series of hearings by the space subcommittee of the House Committee on Science, Space and Technology Oct. 6 and 14, congressmen and witnesses expressed opposition to this proposed marriage of the U.S. and Russian space stations.

### Whose space station is it, anyway?

Two space experts, in particular, expressed serious reservations of this radical plan. Aerospace engineer James Oberg, who has authored numerous articles and books on the Soviet space program, warned that the Russians may be offering things they do not or will not have. He made clear that he is not ideologically opposed to joint work and had in fact been advocating closer cooperation “long before it was politically correct.” But he cautioned that the recent physical and political state of the Baikonur Cosmodrome facility in Kazakhstan was quickly deteriorating and that it “would be an unreliable basis on which to plan future joint activities.” He has described the very poor living conditions in Leninsk, and expressed his doubt that Baikonur’s technical personnel were able to concentrate their thinking, when they have to worry about an unreliable supply of hot water and electricity, or the growing problem of street crime. Oberg also emphasized his finding that, due to budget constraints, the Russians had dropped the practice of preparing two Soyuz spacecraft for launch at the same time for manned missions, in order to keep one at the ready, if needed, to carry out “rescue missions.”

Marcia Smith presented the most straightforward summary of the NASA options being considered. The first option she described as the American/Russian option, where Russia supplies hardware, such as a Salyut spacecraft as an in-orbit space tug, and a Russian Soyuz spacecraft parked at the space station as an Assured Crew Return Vehicle for emergencies. The most controversial option is what she called the “Russian/American,” or Gore-Chernomyrdin option, which she described as “a Russian space station built on a partnership with the United States and presumably” with the other international partners. The most important issue, she said, is that the Russian/American option “was fundamentally a foreign

policy decision, not a choice based on space policy.” The major objective was to induce the Russians to sign the MCTR, and “other objectives apparently included ways to support Russia economically.”

Smith pointed out that the \$400 million promised to the Russians so far did not include any portion of the over \$3 billion of what the Russians estimate Mir-2 will cost, for which they have stated they would like the U.S. to pay half. She stated that there are “significant disadvantages” to the proposal: One is what will happen if the Russians violate the MCTR, and in terms of adhering to military treaties, she said, the “precedent is not encouraging.”

Another concern is the political instability in both Russia and Kazakhstan, which “is not a given there,” she cautioned. Third, she echoed Oberg’s concerns about the physical deterioration at the Cosmodrome “raising concerns about the health and physical infrastructure needed to accomplish the program” into the next century.

Smith summarized for Congress the alternatives she presently sees: “If the goal is to build a space station, the simplest choice, clearly, is to proceed with Alpha. Russian space hardware could be purchased whenever it presents a better value. . . . These technical and cost choices would be within NASA’s sphere of control, relatively independent of foreign policy considerations.”

She continued: “An alternative would be to cancel the U.S. space station program and let NASA become an anchor tenant on a new Russian space station,” which is essentially what has been proposed. She stressed that there are other avenues through which support can be given to the Russian space effort, such as the hardware purchases that have already been agreed to, but that “merging NASA’s space station with Russia’s, and more importantly with U.S. foreign policy issues, seems to be a path with notable obstacles and questionable chances of success.”

During the Oct. 14 hearing on U.S.-Russian space cooperation, NASA Administrator Dan Goldin mistakenly described as “geopolitical” the “space race” between the U.S. and the Soviet Union in space technology and exploration from the 1957 launch of Sputnik through the collapse of the Soviet Union. One could more aptly describe that period as a politically motivated competition between the two superpowers to demonstrate each nation’s prowess in this new field, especially to other nations. Each country strove for superiority in science and technology, and built up its own industrial and technology base through its investments in aerospace technology.

The proposal today to reward Russia for good behavior on military treaties through space cooperation, which *subordinates* U.S. science, technology, and economic considerations to supposed foreign policy goals, and puts at risk the most important technology-driver for the U.S., European, and Japanese economies, *is* geopolitics. This kind of gambit could destroy the U.S. space station.