

The Space Race:

How One Small Step for Man Sealed the Fate of the Soviet Union

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“Let both sides seek to invoke the wonders of science...let us explore the stars, conquer the deserts, eradicate disease, tap the ocean depths, and encourage arts and commerce” (Kennedy, “Inaugural Address,” 1961). In his inaugural speech in 1961, President John F. Kennedy articulated a lofty agenda for the country, which he was determined to fulfill during his presidential term. To “explore the stars” Kennedy would subsequently devote considerable resources to the United States space program with a specific goal of landing a man on the moon. By the time Kennedy became President, the Space Race between the United States and the Union of Soviet Socialist Republics (USSR) was in full swing. At that time, the Soviet Union and the United States were the two world superpowers with strikingly different governments and economic systems. The two nations were locked in a Cold War based on their nuclear capabilities and deterrents. The race to explore outer space became a safer, yet heated competition between the two countries. The Space Race required physical, financial, and human capital from both countries at an exceptional rate, draining the resources of an inefficient Soviet communist system. The Space Race proxy war of the Cold War between the United States and Soviet Union aided the United States in eventually defeating the Soviets, winning the Cold War, and contributing to the collapse of the Soviet Union by increasing technological competition and fear.

The Cold War and subsequent Space Race began as a result of the end of World War II. The Soviet Union as an entity emerged after World War I and the Russian Revolution. The victorious revolutionaries of the Russian Revolution who overthrew the Romanov czars in 1917, or Bolsheviks, collaborated with Communist leaders in former Russian territories to form the Soviet Union. The USSR, based in Russia, overran surrounding countries, and established communist governments in many Eastern European countries. These countries were dubbed

“behind the Iron Curtain” by Winston Churchill in his 1946 speech at Westminster College. Thus, Eastern Europe was almost wholly controlled or influenced by the Soviets. Despite being Allies in World War II, by the 1940s, both the US and the USSR possessed nuclear weaponry and competed for world influence (“The Missile and Space Race,” *Questia School Gale*, 1994). The United States became the leader of what was known as the “free world,” because it was regarded as a paragon of democracy and capitalism. The Soviet Union gained power and control and became the leader of the “communist” sphere of the world. By dividing the city of Berlin, Germany, and thus the continent of Europe with the Berlin Wall in 1961, the western world was split between the sphere of American influence and democracy and the sphere of USSR influence and communism.

After World War II, both the United States and Russia employed German rocket scientists to help them enhance their nuclear capabilities (“The Space Race and the Cold War,” *US History in Context*, March, 2009). Both countries were also interested in developing intercontinental ballistic missiles (known as ICBMs) to add to their nuclear arsenal. Intercontinental ballistic missiles are essentially weaponized rockets that deliver nuclear missiles. Thus, rocketry was closely linked to the development of nuclear advances and arsenals. The US and USSR engaged in a very public game of nuclear brinksmanship with each side dedicated to deterring the other side from launching a nuclear attack. As technology progressed and space exploration became feasible and realistic, a competition between the two countries developed into the Space Race. Which nation could explore outer space first? Who could land a man on the moon first? Would there eventually be nuclear warfare in space? Space competition was safer pursuit for the advancing rocket technology between the two superpowers.

During President Dwight D. Eisenhower's term from 1953 to 1961, the United States government used the existing National Advisory Committee for Aeronautics (NACA), created in 1915 by President Woodrow Wilson, to develop the United States space program. Meanwhile, the Soviets were clearly building their own space program, and on October 4, 1957, they launched *Sputnik 1*. *Sputnik* was the first unmanned artificial Earth satellite. It was a 58 centimeter long sphere with four radio antennas. This move took the United States by surprise and galvanized the American space effort. *Sputnik* was a seminal moment in both space programs. When *Sputnik* was launched, it made the United States feel vulnerable and as if they were no longer scientifically superior ("The Space Race and the Cold War"). For the Soviets, it embodied a milestone; for the US, it propelled the government to redouble its efforts regarding space exploration. Paul Dickson, the author of *Sputnik: The Shock of the Century* describes his personal experience as a college student when he first saw the Soviet satellite in orbit.

Not only could you hear *Sputnik*, but, depending on where you were, it was possible to see it with the naked eye on certain days in the early morning or late evening when the sun was still close enough to the horizon to illuminate it. While standing in the middle of the college football field a week or so after the launch, I first saw the satellite scooting across a dark evening sky orbiting the Earth at a speed of 18,000 miles per hour. Watching *Sputnik* traverse the sky was seeing history happen with my own eyes. To me, it was as if *Sputnik* was the starter's pistol in an exciting new race. I was electrified, delirious, as I witnessed the beginning of the Space Age. (Dickson, excerpt from *Sputnik: The Shock of the Century*, NOVA: *Sputnik's Impact on America*).

As Dickson noted, *Sputnik* was a shot across the bow in the Space Race. The concept of a satellite flying overhead was novel at the time. *Sputnik* was a key turning point in the Space Race, and it was a sign to the United States that they had to catch up to the Soviet Union and send up an even more impressive feat of technology into the sky.

Although there were no literal battles in space, the satellites and spaceships launched by each country served as milestones in the Space Race/Cold War, as well as amazing feats of

human engineering. *Sputnik 2*, with a stray dog named Laika (who died in orbit) launched on November 3, 1957. In response to the launches of *Sputnik* and *Sputnik 2*, President Eisenhower addressed the country on television on November 7, 1957, during which he appointed Dr. James Killian of the Massachusetts Institute of Technology to be his Special Assistant for Science and Technology. The US tried to catch up to the USSR by putting *Explorer 1* into orbit on January 31, 1958. It was the first US satellite, and it led to the discovery of the Van Allen Radiation Belt. The belts are zones of highly charged particles in the magnetic field of Earth's atmosphere. In addition to proving the United States' ability to send a satellite into space, *Explorer 1* advanced our understanding of the Earth and its atmosphere. *Explorer 1* was the first satellite to detect the Van Allen Radiation Belt, which is part of Earth's magnetic field ("The Soviet Lunar Program and The Space Race," *PBS*, September 22, 2005). On February 6, 1958, the United States Senate formed a committee headed by then Texas Senator Lyndon B. Johnson to research how to get humans into space, with the ensuing goal of landing on the moon. On March 17, 1958 the United States launched the *Vanguard 1* satellite, which was designed to obtain geodetic measurements (measurements of the Earth using math and earth sciences) through orbit analysis ("Vanguard 1," *National Aeronautics and Space Administration*, August 26, 2014). These successive accomplishments encouraged both countries to pour increasingly more time, money, people, and focus into the Space Race effort. The competition was heating up. On October 1, 1958, the United States created the National Aeronautics and Space Administration (NASA) to replace NACA. NASA became the proprietor of space engineering and astronomical endeavors for the United States. The creation of NASA as a non-military government body was significant because it took the Space Race beyond its military origins and into the realm of science and civilian technology.

As the decade progressed, the race to the moon between the two countries was extremely close. With each new incredible technological advancement made by one country (such as satellites, rockets, and eventually spaceships that could hold humans), the next month the other country had something equally or more impressive to display to the world. On April 12, 1961, cosmonaut Yuri Gagarin of the Soviet Union became the first man in space. A year later in February 1962, John Glenn of the United States orbited the Earth three times and became the first American to travel out of our atmosphere. When John F. Kennedy was elected to become president in November 1960, he set out to do the unimaginable: put a man on the moon. On September 12, 1962, President Kennedy made a speech at Rice University in Houston, Texas where he told the country how competitive and serious the Space Race was with regard to the outcome of the Cold War.

We choose to go to the moon in this decade and to do other things, not because they are easy, but because they are hard...because the goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too. (Kennedy, "Address at Rice University on the Nation's Space Effort," 1962).

In this inspiring speech, Kennedy made it very clear that he would not shy away or back down from challenge, especially during a tense time of relations with Nikita Khrushchev, who was leading the Soviet Union. In fact, Kennedy's aspirations were well articulated and in his "Address to Congress on Urgent National Needs" on May 25, 1961, he said exactly what the goal of the Race was for the United States and positioned the Space Race as a very clear contest between an oppressive communist regime and the free world:

If we are to win the battle that is going on around the world between freedom and tyranny, if we are to win the battle for men's minds, the [Soviet Union's] dramatic achievements in space which occurred in recent weeks should have made it clear to us all...The impact of this adventure on the minds of men everywhere who are attempting to make a determination of which road they should take...We go into space because

whatever mankind must undertake, free men must fully share...I believe this Nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to earth. (Kennedy, "Address to Congress on Urgent National Needs," 1961).

With this speech, Kennedy clearly identified the moon as the "finish line" of the Space Race ("The Space Race and the Cold War"). In November 1963, President Kennedy was assassinated. President Lyndon B. Johnson continued the space effort when he took office and on July 31, 1964 the United States satellite *Ranger 7* sent back the first close range images of the moon. On March 18, 1965, cosmonaut Alexei Leonov took the first spacewalk. Five days later, on March 23, astronauts Gus Grissom and John Young flew in the first *Gemini* spacecraft. On June 3, Ed White performed America's first spacewalk. On February 3, 1966 the Soviet spacecraft *Luna 9* was the first spacecraft to land on the moon. On June 2, American spacecraft *Surveyor 1* landed on the moon. Finally, on July 20, 1969, with Richard Nixon in the White House, Neil Armstrong and Buzz Aldrin took the first steps on the moon. They made sure to secure a United States flag in the ground on the moon before they headed back to Earth to prove to the world that they were first. The New York Times article the next day commented: "a television camera outside the craft transmitted [Armstrong's] every move to an awed and excited audience of hundreds of millions of people on Earth" (Wilford, John. "Men Walk on the Moon," *New York Times*, July 29, 1969).

The international implications of the United States landing a man on the moon cannot be underestimated. Within the Soviet Union space program itself, despite countless Soviet "firsts," putting a man on the moon was seen as a bright-line goal.

Our people were convinced that we would be the first to land on the moon because they were used to the fact that we were always the first, the first, the first. Only we, the cosmonauts, and especially the moon crew, understood that this was not going to happen. It was not character, it was funding that played a role here. We knew that the U.S. had invested \$25 billion.

We had invested 2.5 billion rubles in the entire space program, for both manned and unmanned flights. This was ten times less. The moon crew understood that we had a capability to circumnavigate the moon six months earlier than Frank Borman, but we knew that we would not be able to land on the moon ahead of the astronauts” (Leonov, Alexei. Quoted in from “The Soviet Lunar Program and the Space Race,” *PBS*, September 22, 2005).

As Leonov said, the Soviet Union knew they could not compete with the United States space program forever because of the lack of funding compared to the United States’ seemingly endless flow of money. Leonov expressed his frustration because although they had the technology, will, and man-power, the Soviet Union’s communist economy could not muster the means to fund it all, with a budget of ten times less than the United States. In addition, another driving force in reaching the moon first was the fear that the Soviet space industry would capitalize on its lead and dominate all aspects of space flight (Oberger, James. *Star Crossed Orbits* McGraw-Hill, 2002). The United States dispelled the fear of Soviet domination by essentially “winning” the race to the moon. The goodwill generated by the moon-landing did much to boost the international prestige of the United States: “*Apollo 11*...met with an ecstatic reaction around the globe, as everyone shared in the success of the mission. Ticker tape parades, speaking engagements, public relations events, and a world tour by the astronauts served to create good will both in the US and abroad” (“Project Apollo: A Retrospective Analysis,” NASA). Astronaut Frank Borman summed up the effect of the Apollo program on the world and the Cold War: “I think that the demonstration of the American technology, American management capability—people overlook the fact that the management techniques that were developed in Apollo are extremely important to the country (Borman, Frank. Quoted in from: “The Soviet Lunar Program and the Space Race,” *PBS*, September 22, 2005). This quote proves that the new technological advancements made during the Space Race benefitted the United States throughout the Cold War. The United States showed the world, especially the Soviet Union, that through

better technology, their space program would win the competition. In addition to the public relations victory of landing on the moon, and the military and governmental applications of all the space exploration, the Space Race spurred progress in American technology and medical research. NASA cites approximately 1,800 spinoffs in which technologies originally invented for space exploration were transferred to civilian use. For example, some technology that traces its roots to space exploration and NASA are: laptop computers, memory-foam mattresses, programmable ovens, vacuums, ski apparel, and anti-scratch eyeglass lenses. Some of the many medical advances include: thermoelectric coolers for microchips, refinements in artificial hearts, improved mammograms and laser eye surgery, and remote health monitoring systems (Markovich, Steven. "Space Exploration and U.S. Competitiveness" *Council on Foreign Relations*, December 5, 2014). In addition to adding to the American arsenal of already growing technology and medical research, these advances that stemmed from the Space Race are still used today and have benefitted American society tremendously. Furthermore, the Space Race raised the bar for technology in the entire Cold War. Not only were there technological advances for civilians, but the new rocketry and missiles could potentially be used in more devastating nuclear warfare. The solid fuel rocket was an important technological advance during the Space Race that influenced the technology of missiles later in the Cold War. The rocket's boosters operate in parallel with the main engine, and when the rocket reaches an altitude of 45 kilometers, the boosters detach and parachute down to the ocean. Because these solid fuel rocket boosters can stay in storage for a long period of time, and then launch accurately within short notice, they are the perfect technological candidates for long-range missiles. The solid fuel rocket boosters are one example of how the race to space influenced the technology used later in the Cold War ("Solid Rocket Boosters" *National Aeronautics and Space Administration*).

While the Space Race proved fruitful, though expensive, the race to the moon arguably contributed to the decline and eventual collapse of the Soviet Union and the end of the larger Cold War. The critical difference between the United States' and the Soviet Union's economies during the Space Race was the free market capitalism in the United States compared to the communism and restricted use of scientific research in the Soviet Union (*Children in History*, February 25, 2010). The communist economy of the Soviet Union could not sustain its population as well as fight the capitalist powerhouse of the United States in an expensive Cold War. As the Space Race and Cold War continued even after *Apollo 11* landed on the moon, the Soviet Union started to weaken (Schwab, Allison. "To Infinity and Beyond: The Space Race," Marquette University History Department). In his book, *The Overburdened Economy*, Lloyd Dumas notes that the military spending of the Cold War had economically devastated the United States and the Soviet Union. However, the American economy stayed steady while the Soviet economy fell apart. One reason the American economy did not collapse after the extremely draining Cold War and Space Race was because of its integrated global capitalist market. The United States had the benefit of international trade with a constant flow of consumer goods coming in and going out of the country. The Soviet Union, by contrast, had the direct opposite of a free market system and tried to anticipate and control the supply of consumer goods, which was never effective and caused frequent shortages of food and consumer goods (Dumas, Lloyd. *The Overburdened Economy*, University of California Press, 1987. Quoted in from: "Why Did the Soviet Union Collapse?" *Real USSR*, February 12, 2010). The Soviet Union was interested in developing a new sphere of economic power and trade influence to compete with the United States' and western world's sphere of capitalist economic power and trade influence. However,

the United States government was aware about how it could and would eventually negatively affect the Soviets.

Even after the moon landing in 1969, the Space Race and the Cold War continued. Throughout the 1970s and 1980s, the United States and the Soviet Union continued to build nuclear arsenals and space programs, both of which were extremely expensive. However, the United States economy handled the economic stress better than the Soviet's communist economy did. In the late 1980s, with Ronald Reagan in the White House, the Space Race reached its peak with the Strategic Defense Initiative, also called "Star Wars" by critics of the radical program. This idea was directly linked to the space program. Reagan was interested in pursuing the weaponization of outer space, and he must have suspected that the Soviet Union could no longer keep up with the demands of the Cold War. The Strategic Defense Initiative was described as the "pinnacle of both the Space Race and the arms race between the U.S. and the USSR" ("Did the U.S. Beat the Soviet Union?" *How Stuff Works*). Reagan introduced the idea of the Strategic Defense Initiative on March 23, 1983. The proposal was to use ground-based and space-based technology to form a shield and to protect the United States from nuclear intercontinental ballistic missile attacks from the Soviets. The Soviet Union's failing, state-owned economy could not handle the United States' willingness to spend money during the increasingly tense moments of the Cold War. Many Americans were generally skeptical about the "Star Wars," however they did think that Reagan did not actually expect to shoot down missiles and fight in outer space. They believed Reagan was using the "Star Wars" to scare Moscow into a "bankrupting high technology contest," which is exactly what it did (Schaller, Michael, *Reckoning with Reagan* Oxford University Press, 1992). The Soviet Union spent a lot of money trying to counter the shield that Reagan was so invested in. Critics of President Reagan's "Star

Wars” This ultimately contributed to the downfall of the Soviet economical system (Kurtus, Ron. “Overview of the Strategic Defense Initiative,” *School for Champions*, June 8, 2004). With the fall of the Berlin Wall in 1989 and the subsequent collapse of the Soviet Union in 1991, the United States did not feel the need to continue and actually implement the Strategic Defense Initiative program because the Soviet Union was obviously not going to be able to match the United States’ bold push for “Star Wars.” However, the concept and technology of intercepting missiles and weapons before they can hit the ground is used today in Israel’s Iron Dome defense program, adding to the countless technological advancements from the Space Race that contributed to modern technology used today (“Lasers Are No Longer a ‘Star Wars’ Fantasy” *Wall Street Journal*, June 20, 2014).

The Space Race was a sustained and pivotal campaign of the Cold War between the United States and the Soviet Union from 1957 when Sputnik’s launch sparked the competition, until 1989 when the Berlin Wall came down and the Soviet Union started to crumble and finally collapsed in 1991. Although the Soviet Union blasted ahead in the late 1950s with the surprising launch of Sputnik and continued to be the first one to hit many other major milestones in space exploration, President Kennedy’s definition of landing a man on the moon as an endpoint set a finite goal for the heated rivalry. Once walking on the moon was set as the finish line by President Kennedy, the very public spectacle of United States astronauts getting there first massively influenced the world’s opinion of both countries, and what appeared to be the United States’ technological superiority. Simultaneously, the Soviet economy was struggling to keep up with its internal economic and societal demands as well as the external tension with the United States and the pressure to match or outdo the United States in every aspect of the Cold War and military buildup. President Reagan essentially sealed the fate of the Soviet Union by introducing

the Strategic Defense Initiative. This new technology was the last straw and required the Soviet Union to spend more money than they had, because they were trying to keep up with the American Space Program.

In 1991, the Soviet Union collapsed, leaving Russia and the rest of the former Soviet republics to start over and rebuild their economies and governments. This was the defining moment that officially ended the long, arduous, stressful, Cold War that had been the epitome of nuclear brinkmanship between any two nations in history. The break up of the Soviet Union destroyed one of two world-dominating countries, and consequently left a vacuum alongside the United States, which was left as the sole superpower for the rest of the twentieth and twenty first century. The contributions the Soviet Union made to science, technology, and space exploration should not at all be discounted or discredited, for they started the race and made many impressive advancements in space exploration. In addition, an important aspect of the Space Race was the impact the space technology made on the missile technology of the Cold War. The Strategic Defense Initiative and the Solid Fuel Rockets were important advancements in Cold War nuclear technology. Much of this innovation stemmed from the Space Race, contributing to the fear and panic civilians in both nations felt. Aside from being an extravagant endeavor outside our atmosphere and into the Milky Way, the Space Race proxy war of the Cold War did so much more globally. In conclusion, far from being only about rocket ships and who could get to the moon first, the Space Race was a significant contributor to a seismic shift in world power, balance, and politics.

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