

WE'RE STILL ON APOLLO'S CHARIOT

Moon program's success ripples through history, from global politics to the phone in your pocket

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Special to USA TODAY

Among ancient Greek deities, Apollo was a jack-of-all-trades. Some know him as the god of sun and light, some as the god of archery. To others, he's the god of poetry or of truth and prophecy. But to Abe Silverstein, the former director of NASA space-flight programs who named the world's most famous manned space program after him in 1960, Apollo's most important role was that of celestial spokesmodel.

"Apollo riding his chariot across the sun was appropriate to the grand scale of the proposed program," Silverstein once said of the Apollo program, which flew 11 manned missions from 1967 to 1972.

According to NASA lore, Silverstein chose the name "Apollo" after flipping through a book of mythology. Haphazard though it sounds, it's hard to imagine a more fitting namesake for the program that successfully landed astronauts on the moon not once, but six times.

Think about it. If Apollo symbolizes light, the moon's glow has been humanity's nightlight for millennia. If he represents archery, the moon was a distant bull's-eye that America expertly hit. If he



Apollo 11 lifts off on a Saturn V rocket on July 16, 1969. The entire assembly was about as tall as a 36-story building. The astronauts rode in the cone-shaped module up top. NASA VIA AP



Top: In an address to Congress on May 25, 1961 — just three weeks after the first U.S. manned spaceflight — President John F. Kennedy sets a goal of landing astronauts on the moon by the end of the 1960s. **Middle:** Shoppers watch the Apollo 11 launch on July 16, 1969, at a Sears store in White Plains, N.Y. **Bottom:** U.S. servicemen in Saigon, South Vietnam, read about the moon landing on July 21. TOP: AP; MIDDLE: RON FREHM, AP; BOTTOM: HUGH VAN ES, AP

embodies poetry, the moon to humanity has been a most prolific muse. And if at heart Apollo is a truth seeker ... well, isn't that what space exploration is all about to begin with?

Space historian Andrew Chaikin thinks so. "When you explore, you end up learning things and finding things you didn't anticipate. That's the whole reason you go — to make discoveries," says Chaikin, author of *A Man on the Moon: The Voyages of the Apollo Astronauts*.

Clearly, extraterrestrial discoveries titillate scientists and scholars. But what about everyday Americans? Fifty years after the fact, one can't help but wonder whether the first manned moon landing still matters to them.

Lunar enthusiasts insist that it should. And they've got four good reasons why.

1. It helped the United States win the Cold War

When President John F. Kennedy set a goal in May 1961 of landing men on the moon by the end of that decade, the United States was losing the Cold War to the Soviet Union. The Russians had launched the first artificial satellite, Sputnik 1, in 1957 and put the first man in orbit six weeks before Kennedy spoke.

"I don't think people fully appreciate it now, but Sputnik 1 ... created quite a panic and frenzy in this country," says James Donovan, author of *Shoot for the Moon: The Space Race and the Extraordinary Voyage of Apollo 11*. "A lot of people thought, 'What's next? An enemy space station orbiting the Earth with the potential to drop nuclear bombs from the sky?'"

From the haunting specter of Soviet space weapons, the U.S. space program was born. "One reason NASA was created was national security, but another ... is national prestige — the country's political strength and reputation," Donovan says. He places the space race within the context of the "global tug of war" between capitalist, largely democratic countries and authoritarian communist countries, led by the Soviets. "There were dozens of uncommitted nations — developing countries in Asia, Africa and Latin America — that were looking for (a form of government) and searching for indications as to which camp they should align themselves with. Technology advances were one of the best indications they had, and the space race was the most visible technology advancement there was."

Although space alone didn't win the Cold War, NASA chief historian William P. Barry says it deserves at least some of the credit. "Indirectly, us beating the So-

viets to the moon was one of the major things that undermined Soviet legitimacy and eventually led the Soviet Union itself to collapse," he says.

Imagine if the Cold War had gone the other way — that if communism had prevailed, and the United States had collapsed. Would there be a McDonald's drive-thru on your way to work? Starbucks in your coffee cup? A Ford F-150 in your driveway? Amazon packages on your doorstep? Netflix movies streaming wirelessly on your smartphone?

"All of those things were created in a capitalist society that is now thriving all over the world," Donovan says. "In a communist society, I don't see that happening. Not at all."

2. It explained existence

Between 1969 and 1972, Apollo astronauts brought back more than 800 pounds of rocks and soil from the moon. Therein, scientists have found pieces to an existential puzzle whose solution will one day answer the most human of questions: How did we get here?

"Everybody wants to know where we came from; it's part of what makes us human," Chaikin says. "Understanding how the universe works and how the Earth was formed is a fundamental gift that the moon has given us. It's the Rosetta Stone for decoding the earliest history of our solar system because it's the place where that history is most clearly and cleanly preserved."

Thanks in part to samples gathered by Apollo astronauts, scientists now believe Earth collided with a Mars-size planet more than 4.4 billion years ago, the impact of which created the moon and imbued Earth with the essential elements it needed in order to spawn and sustain life.

Even if you don't care about the origin of life on Earth, you probably care about

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This bag, which was used to collect moon rocks and still had lunar dust inside, sold for \$1.8 million at auction in 2017. NASA had accidentally sold it to a private collector, and a judge ruled that the sale was final. RICHARD DREW, AP



As NASA focuses on exploration and science, private companies are picking up more of the “routine” space work. Above, a military satellite rides into space aboard a rocket from the United Launch Alliance in March. CRAIG BAILEY, FLORIDA TODAY

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the future of it. And that, too, is a legacy of Apollo. “Astronauts talk about the sense of fragility they see in the Earth from space,” says Chaikin, who notes that the first pictures of Earth from space provided a new perspective that helped spawn the modern environmental movement. “That’s another one of the great legacies of Apollo — the sense that Earth is a very finite home for humanity, and that it should be protected and cherished for future generations.”

3. It unlocked the Information Age

Modern American life is a patchwork of technological trappings. Powering all of it are semiconductors and satellites, both of which are products of the American space program.

“There are more than 1,700 satellites — communication, military, weather, navigation — orbiting Earth right now, and more than half of them are American. That’s because of NASA, and it af-



Elon Musk, founder of Tesla Motors and SpaceX, has said the Apollo missions inspired him to pursue big dreams. CRAIG BAILEY, FLORIDA TODAY/USA TODAY NETWORK

fects virtually every single area of our everyday existence,” Donovan says.

As for semiconductors, “microchips had just been invented when NASA placed an order for a million of them for

its computers that were being developed at MIT. That kick-started the entire computing industry.”

Indeed, NASA’s first contract for the Apollo program was for the Apollo Guidance Computer, which helped spacecraft navigate. “That shows you how important computing was to the space program,” says Barry, who adds that the company that supplied NASA’s microchips, Fairchild Semiconductor, was an incubator for future Silicon Valley startups like Intel, whose founders were Fairchild defectors. “You can’t necessarily draw a straight line from (Apollo to Silicon Valley), but the contract from NASA for all these chips improved the semiconductor industry by leaps and bounds in its ability to produce high-quality, cutting-edge chips at a bargain-basement price. And the people who learned to make those chips went off to found all these other semiconductor companies that are now the basis of our economy.”

And it wasn’t just microchips. To get the science and engineering talent it

needed for Apollo, NASA granted millions of dollars to universities for the purpose of building new STEM programs and facilities, graduates of which have made immeasurable contributions to the U.S. economy.

“NASA ... built the educational infrastructure that allowed us to continue doing the space program — and lots of other things,” Barry says.

4. It made the impossible seem possible

Studies have concluded that Apollo returned up to \$8 to the U.S. economy for every \$1 spent. When you consider intangibles like inspiration, however, the return on investment is much greater. Consider, for example, the incalculable economic, social and cultural impacts of entrepreneurs like Tesla founder Elon Musk, Virgin Group founder Richard Branson and Amazon founder Jeff Bezos — each of whom has said he was inspired by Apollo to pursue big dreams, including starting their own commercial space ventures: SpaceX, Virgin Galactic and Blue Origin, respectively.

Alongside NASA, whose plans include a permanent lunar presence and sending astronauts to Mars, such companies might soon catalyze a new wave of innovation and discovery like that unleashed by Apollo 11, whose 50th anniversary is a reminder of what’s possible with sufficient resources and resolve.

“As a nation, we funded a giant experiment in how to do hard things with very large groups of people,” Chaikin says.

Although the Apollo model might not work with every problem, its ethos does. Politicians say it all the time: “If we can go to the moon, we can ...” Cure cancer? Solve climate change? Feed the hungry? End injustice? Anything’s possible.

“The phrase, ‘If we can go to the moon, we can ...’ is a throwaway phrase, but I think it does have a psychological impact,” Barry says. “It gives people confidence that big problems have been solved fast before.”

And can be again, says Douglas Brinkley, author of *American Moonshot: John F. Kennedy and the Great Space Race*. “The 50th anniversary of (the moon landing) is a cause for celebration of American can-do-ism,” Brinkley says. “Americans love the idea that we can do big things together — that we can skirt our partisan divide and pull together to do something momentous. I think that’s something people across the country agree on: What we really need right now is another ‘moonshot’ to make Americans feel good about themselves and their country.”