



Armstrong speaks at the Rotary National Award For Space Achievement dinner on March 11 in Houston. Photo Credit: NASA

The first man to set foot on the moon says the new Vision for Space Exploration has "substantial merit and promise."

Apollo 11 Commander Neil Armstrong recently reflected on the history of the Space Age and looked ahead to future exploration plans, noting that "our economy can certainly afford an effort of this magnitude."

Armstrong made the speech in Houston on March 11, 2004, where he was awarded the National Space Trophy by the Rotary National Award for Space Achievement

(RNASA) Foundation. He was introduced by famed NASA Flight Director Christopher Kraft.

Armstrong's Remarks:

Thank you very much. Thank you so much. It's very special for me to have Christopher Columbus Kraft be the presenter for this award. We go back a long way, sometime back in the middle of the last century when we were both young engineers working with the National Advisory Committee for Aeronautics. NACA was strictly a research agency with no operational role, but they were certainly trying to solve the problems of going higher and faster.

The new jet engine permitted remarkable increases in aircraft performance, but their thrust decreased at altitude, and their top speed was limited. Rocket engines had neither of these disadvantages. Americans take a great deal of pride in Robert Goddard's development of liquid propellant rockets, but the reality is, at the time, his work was ridiculed by some, including the New York Times, and only lightly supported.

Most people could not see much practical use for a rocket. It didn't run for very long, had the world's worst fuel consumption, and it seemed to be prone on destroying itself one way or another. After World War II, the NACA, along with the Air Force and the Navy, pursued high-speed aerodynamic research using small rockets and rocket powered experimental aircraft. The Army, with the help of the German rocketeers from Project Paperclip, continued research using the V2 and its derivative rockets.

The possibility of artificial satellites was really fairly widely discussed within the scientific community, but still it was a great shock to most Americans when, in October of 1957, Sputnik sailed across the night sky, and people could actually watch it.

The space age had begun, and we weren't a part of it. Americans were embarrassed, and for the first time ever, people began talking seriously about people going into space.

One and a half weeks later, researchers gathered at a long-planned conference to consider the best successor for the X-15, a hypersonic, rocket powered research aircraft, which was, at the time, still under construction. The competing configurations were a highly swept delta wing, a flat-topped lifting body, and a flat-bottomed lifting body.

But Sputnik had changed the world. Hypersonic was being pushed aside in favor of sending a man all the way into orbit. All of the configurations that had been competing were too heavy to be lifted to orbit by existing rockets, products of the Cold War, which were designed to carry warheads over oceans.

Max Faget and Paul Purser of Langley argued that if we were to get a man into orbit soon, the only choice, the only reasonable choice, was a ballistic shape lifted by an ICBM booster. The Soviets had reached the same conclusion.

One obvious configuration was the sphere. It had no instability problems at any Mach number, and its aerodynamic characteristics were very predictable. But depending on its entry angle into the atmosphere, it might produce deceleration forces which are beyond human tolerance.

Russians went the spherical route, and the Americans, using the work of Harvey Allen and Al Eggers at Ames, developed modified warhead shapes. And so it happened that the Vostok on the A1 booster and the Mercury on an Atlas, were created and launched, and human beings found themselves circling the Earth high above the atmosphere.

Soviets were soon flying multiple crews, and we wanted to also. We wanted the ability to do more. The Gemini added onboard rocket propulsion so we could maneuver in space, and it had an onboard digital computer. Digital computers weren't so highly regarded in those days.

They could be accurate, but they were interminably slow. This one didn't have any gigs or any megs; it had 4K of memory. No screen, just one seven-digit register for input and output. But Gemini crews could navigate.

And, for the first time, knew how to get to a destination without asking for directions. Using all this computing power, they took great pride in controlling their entry into the atmosphere, the trajectory, and landing precisely close to the ship that was awaiting them. And as Chris said, I landed (Gemini 8) near Okinawa, but my intended target had been the Caribbean. I doubt the record will ever be broken.

Apollo had a crew of three and more propulsion and more computing power, and Apollos, for the first time, were on boosters that were designed and built for them and had enough juice to leave Earth orbit. Apollo proved that humans were not forever a prisoner of Earth's gravity. We could leave our own planet and go to other celestial destinations, and Americans were no longer second best.

Space stations emerged in the 70s with Skylab and Salyut, and Apollo and Soyuz rendezvoused and docked in the 70s, paving the way for international participation in later stations, and here on the ISS.

After Apollo, NASA conjured a grand plan to expand human presence in space and include one or more permanent terminals in Earth orbit, craft to depart from and after return to the terminal from various places in the solar system, and reusable craft to service the entire enterprise by shuttling back and forth between Earth orbit and the Earth's surface.

Advocates were unable to persuade the establishment that that was all doable with the resources available, and only the last piece, the shuttle orbiter, was funded. The shuttle has now been operating for a couple of decades, with occasional time-outs for good reason. And, although it never came close to reaching the original planned flight rate, and, consequently, the economies of scale, it has done a remarkable job of performing a very wide range of mission types.

From time to time, new grand plans have been announced, only to decay and dissolve from an inadequate level of public support, as interpreted by their elected officials. Now our president has introduced a new initiative with renewed emphasis on exploration of our solar system and expansion of the human frontiers. This proposal has substantial merit and promise.

The success of that endeavor will be dependent on overcoming principle concerns of cost and risk. Our economy can certainly afford an effort of this magnitude, but the public must believe that the benefits to society deserve the investment. Noted the advancement of knowledge, the rate of progress is proportional to the risk encountered. The public at large may well be more risk-adverse than the individuals in our business, but to limit the progress in the name of eliminating risk is no virtue.

The success of the endeavor will also be dependent on the degree to which the aerospace community, all of us -- government, industry, and academia -- can coalesce their forces and converge on a common goal.

So that's an eight-minute retrospective of the beginning of the Space Age. And the remarkable thing, to me, is that many of us here tonight happen to be living in a time when we could watch the entire process occur. And be involved in a substantial part of it.

So I am extremely pleased to receive the National Space Trophy. I want to thank Chris Kraft, the man who I have depended on many times, in many ways, for honoring me as presenter. And I'd like to thank another man upon whom I have depended, Floyd Bennett, and the Board of Advisors of RNASA for the honor of the selection. And I'd like to thank all of you for being here and sharing the evening with the Space Communicator award winner, the Stellar award winners, and with me. Thanks.