

## Spectacular Insights and Opportunities Only Three Days Away

The convergence of an anniversary in world history with a memorial in Washington's National Cathedral has created an unusual opportunity to examine our space exploration policy. In the same week we were recalling President Kennedy's speech encouraging the U.S. to be bold and go to the Moon, we sadly commemorated the passing of Commander Neil Armstrong of Apollo, the man who, with his crew and NASA's supporting teams, fulfilled the President's challenge.

While it is important to reflect on the past, we think it also important to look forward and, more importantly, move forward.

At the moment, we are trapped in low-Earth orbit. We occupy a spectacular International Space Station, but as it has swept around the world, skirting the upper atmosphere for the past fourteen years, we have only been able to dream of the next set of challenges and goals of space exploration. It is time to use that hard-earned experience to move forward. If we are going to explore space, let's reach for the Moon and beyond.

Why the Moon? The Moon is the best and most accessible place in the Solar System for robotic and human assets to address fundamentally important scientific questions while simultaneously providing an opportunity to expand our technological capabilities. We have never been to the far side of the Moon, the western limb of the Moon, or either one of the polar regions. Most of the Moon remains unexplored.

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In 2007, the U.S. National Research Council published a report called "The Scientific Context for Exploration of the Moon," which provided NASA, at its request, scientific guidance for an enhanced exploration program that would provide global access to the lunar surface through an integrated robotic and human architecture. If implemented, this would be a strategic growth in our ability to study the Moon and explore this fascinating world.

Beautiful lunar landscapes are currently being captured by the Lunar Reconnaissance Orbiter, providing glimpses of rocky exposures of the lunar crust that will reveal, if sampled by future missions, the earliest processes associated with the formation of the Earth-Moon system, the evolution of the Moon through a period with a planet-wide magma ocean, and a subsequent period of intense bombardment that repeatedly modified the surfaces of the Earth, Moon, and all other inner Solar System planets. It is also a place of volcanic upheaval that flooded vast expanses of the surface with basaltic seas. Throughout its history, the Moon's surface has collected the solar wind, providing an illuminating record of the Sun through time, including today, and how it may have forced the climate of Earth and other planets to shift. The lunar surface may also provide a platform for astrophysical measurements that peer beyond the bounds of our Solar System and into the universe's past. The Moon provides an extraordinary opportunity to explore these and many other issues while developing the capacity to work in a space environment that will eventually take us beyond the Moon. These types of investments have a proven record of sparking innovation and enhancing economies that generate extraordinary returns that go far beyond science and exploration.

Some complain that the Moon is in our backyard and, thus, too parochial. Its proximity, however, is one of its key attributes. Located just 3 days away, the Moon is the best and most accessible location in the Solar System to study fundamentally important planetary science issues.

In an era of limited budgets, the Moon is the obvious hot target. Not only can spectacular science be done on the lunar surface, an exploration initiative that takes us there will greatly expand our capabilities beyond low-Earth orbit.

The world's recent loss of Commander Neil Armstrong reminds us of his advice. In the last year of his life he told the United States Congress "The larger human exploration goals, however, lie beyond LEO: Luna, the lunar Lagrangian points, Mars and its natural satellites, and Near Earth Objects including meteoroids, comets, and asteroids. Last year I testified to this committee on the rationale for selecting Luna and its environs as the preferred

initial option for America’s exploration beyond Earth orbit. All that I have learned in the past year has just reinforced that opinion.”

Let’s hear and act on those words. Rather than endlessly exploring options, let’s begin building the hardware, selecting the landing sites, training the crew, and planning the details of missions that take us to the Moon and a future of new discoveries.

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**For fact-checking:** The quote from Commander Armstrong (September 22, 2011 – written testimony before the Committee on Science, Space, and Technology, United States House of Representatives) can be verified with the on-line records of the United States House of Representatives at [http://science.house.gov/sites/republicans.science.house.gov/files/documents/hearings/092211\\_Armstrong.pdf](http://science.house.gov/sites/republicans.science.house.gov/files/documents/hearings/092211_Armstrong.pdf) . The words are from the ninth paragraph of the Commander’s testimony.