John Lindner: Mars awaits – first the moon

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I can remember gazing at the moon when people lived briefly on its surface, and that memory has inspired me for a lifetime. Reaching the moon was like climbing the tallest mountain, crossing the largest ocean, occupying the farthest frontier, and more, all at once and for the first time. With Apollo 11, scientists and engineers accomplished what poets had imagined.

I was a witness. Hillary and Tenzing stood alone atop Everest; the expeditions of Amundsen and Scott were isolated at the South Pole; but about one in five humans watched or listened as Armstrong and Aldrin walked on the moon. The photographs of Earth from the moon and of a human footprint on its surface became icons of the century.

Although the origin of project Apollo can be traced to cold war tensions between the United States and the Soviet Union, Apollo ultimately transcended its origins in the US/SU rivalry. This is strikingly evident in the Apollo 11 crew patch, designed by the astronauts themselves, which does not include their names. They alone did not attain the moon; rather, we together -- our civilization -- attained it.

Today, Apollo is history. Are we still capable of such accomplishments?

There is a fantastic castle in the sky, built in free fall, brick-by-brick. It derives its energy from sunlight and recycles its water. Sealed against a vacuum, its inhabitants float and glide through its passageways as the sun rises and sets every ninety minutes. In an earlier age, the castle would be the magic of legend, but in ours, it's the International Space Station. Assembled in low Earth orbit, its unique microgravity laboratories are powered by giant solar electric panels that rotate like windmills to track the sun. Arguably the most complex engineering project ever accomplished, the ISS is a model for international cooperation, where former cold-war enemies live and work together.

In learning to live off Earth, we extend our rich heritage in aerospace, exploration, and discovery, but greater challenges await us. We did not return to the South Pole for almost half a century after Amundsen and Scott first attained that goal, but when we did, we returned with better technology, and we have lived there ever

since. Similarly, returning humans to the moon (at a cost of just pennies per American per day) is a goal of NASA's Constellation program.

To take us back to the moon and beyond, NASA is currently designing next generation rockets, the Ares I and Ares V. The rocket names recall the Saturn I and Saturn V rockets of Apollo, but the word "ares" is another name for the planet Mars.

With its Earth-like day-night cycle, abundant water, and diverse geology, our nearest planetary neighbor invites us to become a more robust and diverse multi-planet species. Because the laws of physics limit communication to light speeds, the large distances of the inner solar system mean that humans on Mars cannot have normal conversations with humans on Earth. Martians will talk to Martians and develop their own unique branch of civilization.

Colonizing Mars will be an incredible investment in the future, one whose dividends we cannot fully anticipate. The last time something comparable occurred, Europe colonized the Americas. One result was the United States of America, which later helped to rescue and rebuild Europe in and after World War II.

Mars beckons, but the geometry of the solar system impels us to first master our much closer natural satellite. Developing the infrastructure to maintain humans on the moon lays the foundation for expanding our social, economic, and scientific sphere throughout the solar system. We gain access to all the corresponding resources, including raw materials in asteroids, virtually limitless, free energy (from sunlight), and space enough for everyone. We gain skills to protect against asteroid impacts and solar storms. It's a task worthy of -- and necessary for -- a great civilization, even as it expands the range of human activity.

I have stood atop volcanic mountains, hiked across glaciers, crossed oceans, sailed among the Galapagos Islands, camped on the Serengeti, and climbed Kilimanjaro. I have experienced awesome natural beauty, some of which recalls the "magnificent desolation" of the first moonwalk. Such experiences have enriched me immeasurably. If some humans somewhere, sometime experience Earth from space, live and work in free fall, walk the lunar mare, or trek the Martian mountains, it enriches us all, because it broadens the scope of human possibilities and, like Apollo 11, redefines the impossible.

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