

## **Space: Teenagers and the Far Out**

By Jeff Krukin

Should we think of space as only a "program"? What sort of space-related careers might you consider? How does space activity connect to our world's survivability? What difference might President Bush's 2004 space initiative make? And where does private industry come in, and NASA get reinvented?

**1) Why Space is More Than a "Program."** Six of seven Apollo missions that sought to place human beings on the moon were successful. A symbol of American power, of the strength of capitalism and democracy, and, Apollo scored big! By proving we could choose difficult goals and succeed it addressed our national weaknesses and helped alleviate our self-doubt.

Apollo, however, was an instrument of foreign policy and a weapon in the Cold War. It had us view space activity through the exclusive lens of government programs. We are only now realizing this is NOT a crystal clear lens, but more like an old, yet comfortable pair of glasses ... one that has become blurry with age and neglect? And like old glasses it does not allow us to see all the possibilities.

NASA's Apollo Program did *not* extend our economy into orbit. Nor did it persuade us we might one day go into space, *really* take up residence in Outer Space. Consequentially, ever since Apollo insufficient attention has been focused on the full potential of space.

When we stop looking at space as a "program" and start thinking of space as just another "place," we discover exciting new personal ways to relate to it. The first step is realizing space is the vast neighborhood in which we actually live. It isn't a distant and impenetrable domain. It is a mere 62 miles above Earth,<sup>(1)</sup> and thus a matter-of-fact continuation of our environment. You don't have to go very far to experience the darkness, the weightlessness, and the magnificence of space as you look down at the rotating Earth and watch your hometown go by.

As you read this, entrepreneurs are busy building reusable space vehicles for commercial passengers (versus government astronauts), foreseeing the day only 10-15 years from now when you will be able to fly into space for a cost of only \$100,000. Ten years later you may be able to stay at an affordable orbiting hotel. Imagine future high school students spending a semester at an orbiting campus!

**2) Career Possibilities.** What are the job possibilities? Numerous and wondrously varied! You could, for example, become the engineer who builds a reusable rocket engine that is more powerful, yet less expensive to operate and maintain than today's space shuttle engines. Or develop space law that accommodates a new space travel industry. Or be the chef who creates gourmet meals for weightless dining. Or design the marketing campaign for a commercial space company. Or be the researcher who invents... what would you like to invent for use in space?

You could be the economist who influences national monetary policies so they support the development of new space businesses. Or write a Pulitzer Prize-winning story about a family living, working, and playing in space, and touch the hearts of millions. Or be the diplomat who leads the United Nations commission that defines a space development plan for the benefit of all mankind.

You could be the chief geologist at the future Asteroid Mining Inc., the first company to capture and own a near-Earth asteroid rich with iron ore. Or organize a conference to define global safety standards for beaming solar energy from satellites to collector farms. Or be the president of a lunar preservation organization dedicated to maintaining a balance between protecting the moon's environment and supporting mining operations. Or lead missions to third-world nations, teaching people how to blend new space technologies into their cultures.

**3) How does Human Activity in Space Connect to the World's Survivability?** As an extension of the human economy, space is a key to humanity's well-being. As long ago as 1970 Kraft Ehrlicke, a lunar colonization visionary, said it very well:

"While civilization is more than a high material living standard it is nevertheless based on material abundance. It does not thrive on abject poverty or in an atmosphere of resignation and hopelessness. Therefore, the end objectives of solar system exploration are social objectives, in the sense that they relate to or are dictated by present and future human needs."<sup>(2)</sup>

In a time of global war against Islamic fundamentalists, in the midst of uncertainty created by global economic integration, it is too easy to believe our opportunities are limited and life is only a me-against-you scenario. Space rebuts this thought, as it contains the infinite resources needed for a global economy able to provide widespread prosperity and unlimited possibility - while minimizing environmental damage.

How can we sustain ourselves - the many billions of us - as the population grows and resource requirements increase? Must we limit ourselves to Earth-bound resources and energy? Helium-3 is fuel for fusion reactors. Available in minute quantities on Earth, it is abundant on the moon. Huge solar arrays in orbit could capture sunlight and beam the energy into Earth's power grids with far greater efficiency than ground-based solar farms. Asteroids containing iron, nickel, and other ores can be maneuvered into orbit and mined. The possibilities are endless!

**4) What is the Relevance of President Bush's Space Initiative?** On January 14, 2004, President Bush announced a new vision for American activity in space, with challenging goals for exploration of the moon and Mars. Referred to as "A Renewed Spirit of Discovery,"<sup>(3)</sup> is this merely a pre-election ploy or will it help create a sustainable Earth-moon transportation infrastructure?

According to a poll conducted for the Associated Press and reported the day before Bush's speech, "Asked whether they favored the United States expanding the space program the way Bush proposes, people were evenly split, with 48 percent favoring the idea and the same number opposing it."<sup>(4)</sup> A *New York Times*/CBS News poll on Jan. 18 reports "...58 percent saying that building a permanent space station on the Moon was not worth the risks and costs."<sup>(5)</sup>

What do you think of the President's space goals? If you view space as just another government program that must compete for limited funds, how likely are you to support new space initiatives? If you view space as vital to our economic and social well-being, how does this affect your support for space activity? If you understand that involving the full strength of the private sector rather than just using the same few aerospace companies can dramatically reduce the cost of space activity, is your attitude changed?

I urge you to consider that most people who are negative about space activity simply don't want their tax dollars spent on that when there are other pressing needs. They don't realize that space is more than a "program," and that an increase in NASA's budget can be minimal. They don't see how the private sector can create new industries and new jobs as a result of the President's Space initiative.

**5) Finally, What of Private Industry and NASA?** We have the most powerful economy in the world, and yet we are not using this commercial powerhouse to extend the economy into orbit and beyond. NASA has failed to lower the cost of putting payloads in space because our government is not designed to lower the cost of providing products and services. Rather, it is the private sector's profit orientation that may yet take us into space, just as it has led much of the development of our world.

You don't have to look far to discover that the President understands this. The very last sentence of the White House document "Bringing the Vision to Reality" is quite clear: "Pursue commercial opportunities for providing transportation and other services supporting the International Space Station and exploration missions beyond low Earth orbit."<sup>(6)</sup> Inexpensive and reliable transportation is the key, and this can only be accomplished when the private sector is involved.

The first step to accomplishing the President's space vision is to create an Earth-orbit and orbit-moon transportation infrastructure, and operate it in a commercial (for-profit) manner. NASA cannot do this alone. It has tried and failed with the space shuttle.

Did you know that the space shuttle fleet was intended to fly 50 times each year? It never happened, didn't even come close. Did you know that the space shuttle was intended to lower the cost of putting payloads into orbit? Again, it didn't even come close. Government agencies have no incentive to lower the cost of a product or service, nor are they designed to do so. Corporations must do so or they fail to survive.<sup>(7)</sup>

NASA does several things very well; e.g.; unmanned exploration of the planets, manned missions to distant bodies beyond the interest or capability of corporations or universities, and basic research and development. None of these require NASA to own and operate space transportation, a basic service best provided by corporations. These corporations need a market, and Bush's initiative sets the way for NASA to provide a large part of that market. If you want to fly into space in the next 10 years, you are also part of that market.

When NASA purchases launch services from corporations, it doesn't need to spend billions of dollars developing, owning, and operating launch vehicles. Those budget dollars become available for NASA to do what only it can do, rather than be wasted on what others can provide at far less cost.

Properly directed, NASA can help propel the American economy into orbit while it stretches to accomplish the difficult goals given it by President Bush. Corporations can dramatically lower the cost of launches and space vehicle development. Everything we do in space begins with a launch, so lowering launch costs is vital.

Properly directed, NASA can cease doing the mundane (shuttle launches) and return to the exciting (exploring the far frontier). And this isn't an Apollo-style mission where we abruptly stop. This is about the permanent settlement and open-ended development of space. This is you and your children able to live in a world, a Universe, with increasing, rather than limited opportunities.

**Summary.** When NASA's planetary rover *Spirit* successfully landed on Mars in January 2004, did you feel something deeper than "Wow, that's cool?" For thousands of years humans have pondered their place in the Universe. We now appreciate that Humanity is no longer constrained by the box we call Earth. We can truly think "outside the box," for the entire Universe is finally our home.<sup>(8)</sup>

What are the possibilities for you? You can explore your own human-space connection. You can dare to study *both* religion *and* quantum physics in college, and thereby contribute to humanity's awareness of its relationship with the Universe.<sup>(9)</sup> You can create a new comic strip, one that teaches living *without* Earth-restricted boundaries. So much more remains *for you ... endless* possibilities, like space itself.

## Footnotes and Bibliography

- (1) Graham, John F. [www.space.edu/projects/book/chapter3.html](http://www.space.edu/projects/book/chapter3.html), 1995
- (2) The OURS Foundation. [www.ours.ch/spacenews.htm](http://www.ours.ch/spacenews.htm)
- (3) The White House. [http://www.whitehouse.gov/space/renewed\\_spirit.html](http://www.whitehouse.gov/space/renewed_spirit.html)
- (4) Newsday. <http://www.newsday.com/news/politics/wire/sns-ap-ap-poll-space.0.7072530.story?coll=sns-ap-politics-headlines>
- (5) New York Times. <http://www.nytimes.com/2004/01/18/politics/campaigns/18POLL.html>
- (6) The White House. [http://www.whitehouse.gov/space/renewed\\_spirit.html](http://www.whitehouse.gov/space/renewed_spirit.html)
- (7) Commercial aviation provides a wonderful example of a successful government-private sector transportation partnership. The government provides the financial, legal, and safety framework and owns the airports. Corporations own and operate the airplanes.
- (8) Space is a spiritual realm without boundaries, containing and connecting all life. In the television science fiction series *Babylon 5*, Ambassador Delenn stated, "We are the Universe, trying to figure itself out." James Redfield's *The Celestine Prophecy* is a tale of global spirituality within the ultimate setting... the Universe. A bumper sticker I saw years ago said, "God is too big for just one religion." Michael Talbot wrote in *The Holographic Universe*, "Put another way, there is evidence to suggest that our world and everything in it-from snowflakes to maple trees to falling stars and spinning electrons-are also only ghostly images, projections from a level of reality so beyond our own it is literally beyond both space and time."<sup>(9)</sup> Perhaps you draw inspiration from Christian rock music, Judaism's Kabbalah, L. Ron Hubbard's Scientology, or Buddhism. No matter your beliefs, you are a creature of the Universe. The sub-atomic structure of your body is the same as that of the stars. The elements within you may be found throughout the Galaxy. You exist because the Universe was here first. There is no separating you from the Universe.
- (9) Talbot, Michael. *The Holographic Universe*, (New York: HarperCollins, 1991), p.1.