THE ELUSIVE “WHY” OF SPACE EXPLORATION
(based upon a SpaceNews article co-authored with Sandra Magnus)

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Historical Perspective on Exploration

A Song Dynasty junk ship, 13th century; Chinese ships of the Song period featured hulls with watertight compartments.

U.S. Commodore Perry “visit” to Japan opened a new age of technology & exploration.
Why Do We Explore Space?

“The situation today is like Europe before 1492. Spreading out into space will completely change our future but won’t solve immediate problems.”

Stephan Hawking

John F. Kennedy at Rice University, 1962
How do we explore space?

NASA’s Orion + SLS

SpaceX’s Falcon

SpaceX’s Red Dragon at Mars

Lockheed Martin’s concept of Deep Space Gateway in cis-lunar space

NASA SSERVI Exploration Science Forum 2017
Where do we explore?

The Moon & Its Farside

“Return of multiple rock samples from the South Pole-Aitken (SPA) basin” (e.g., Schrödinger basin): *Planetary Science Decadal Survey*.


Mars & the Search for Life

What are the tools for Exploration?

Astronaut Luca Parmitano (Italy) orbiting Earth on the ISS teleoperates the K10 rover at NASA Ames to simulate deploying a lunar farside radio telescope.


Colorado students Ben Mellinkoff & Matt Spydell
But, it’s about the why!

The Golden Circle – following Simon Sinek

• Very few organizations know why they do what they do. What’s its purpose? Why does the organization exist?
• Example of thinking differently – Apple.
• How about America’s Space Program?
So, let’s be inspirational

- Humans are meant to explore. It is at our core. We explore to gain knowledge, satisfy our curiosity. Space is that next frontier. It is a simple answer to why we explore.
- Next, what should we explore? A single destination is not sufficient nor sustainable. The Moon or Mars alone are dead ends. The destinations need to evolve and expand with the scientific questions and technological capability.
- Ultimate question: is there other intelligent life in the Galaxy?
A Sustainable Space Program

The Moon AND Mars
Exoplanets

Explore first with Space Telescopes

Extreme Extrasolar Space Weather in M-Dwarf Systems

Starshades to characterize exoplanets

Lunar farside low frequency radio telescope to observe exoplanetary space weather

Interstellar travel in the next century?
Closing Thoughts

Ideally, a well-designed and executed, inspirational, sustainable space program will

• Drive advances in science and technology;
• Expand opportunity for everyone, everywhere in space;
• Enhance and expand knowledge, education, innovation, and economic vitality;
• Advance our understanding of Earth and develop technologies to improve the quality of life on our home world.

We must begin with the Why which leads to the How and the What of space exploration. There is room for everyone!