The Meaning of Mars

https://www.e-ir.info/2012/09/15/the-meaning-of-mars/

JOANNE IRENE GABRYNOWICZ, SEP 15 2012

Is the *Mars Science Laboratory* (MSL), and its rover *Curiosity*, a display of U.S. technological prowess? Yes, of course it is. A dictionary definition of "prowess" is "skill or expertise in a particular activity or field".[1] *MSL* is a manifestation of skill and expertise in planetary missions. However, *MSL* is, as its predecessors were, more than prowess, they are also scientifically significant. The *MSL* was built on the success of two previous rover missions, *Spirit* and *Opportunity*. Both rovers were highly successful with operating lifetimes more than 15 times the originally guaranteed lifetimes. Together, *Spirit* and *Opportunity* sent back over 100,000 high-resolution, full-color Martian images and detailed microscopic images of rocks and soil. The rovers' instruments gathered all new chemical and mineralogical information and enabled scientists to conduct examinations of the interior of surfaces and rocks. Nonetheless, even though the *MSL* is, and hopefully will continue to be, successful, "prowess" cannot be equated with "easy". Of the 19 U.S. Mars missions, 6 have failed.[2]

The U.S. Mars missions are evidence of national achievement. However, their results have worldwide value. Most intriguingly, some of the data supplied by *Spirit* and *Opportunity* suggests Mars' planetary history may include water, which is information that is relevant to humanity's eternal, and shared, question: does life exist elsewhere in the universe? In the nearer term, data, the information derived from the data, and the experimental results of the Mars missions are shared with the world through the long-standing and well-established methods of open and transparent peer review and publication that is the fundamental foundation of the international scientific community.

Now to the second question, does *MSL* indicate a start of a new space race? Not in my lifetime. The barriers are less in technology and more in politics and economics. A "race" requires multiple participants and each participant has to intend its actions to be a race. They also have to agree on the finish line. China once announced it would place a human on Mars before the U.S.[3] In the U.S. human Mars missions have been studied[4], conceptualized[5], promoted by citizens[6] and Presidents[7] alike. Yet there has never been the political will needed to support such a mission.[8] Unless there is a massive change of public opinion, the U.S. won't choose to be in a race to put humans on Mars. Although some space supporters do advocate a race to Mars they are a vocal minority that has existed for decades, has had little effect in the past and are unlikely to have real influence going forward.

Some point to the Cold War era U.S. – U.S.S.R space race and advocate that can happen again with China. The forces at play in the era of globalization are very different than the forces that were at play during the Cold War. It was crystal clear that the U.S. and the U.S.S.R were deadly adversaries with little or no interrelated common economic and political interests. The competitive playing field was a bipolar world in which each adversary was driven to prove that its respective system was superior to the other's system. The current U.S. – China relationship is much more complicated with each nation having national interests in their intertwined trade relations. Demonstrating national superiority is still part of the relationship, but the competitive playing field is more in the field of macroeconomics rather than in star fields. Each nation has a very challenging national economic and political context for their space activities. The U.S. situation is discussed below. China's situation includes an enormous population with large segments of poverty, a slowing economy, and a massive real estate bubble that some informed observers say has already "popped".[9] If the bubble does "burst", the Red Planet may be less compelling as a national priority than a more balanced Red economy.

A race also requires resources. A number of spacefarers are grappling with this fact. In the U.S., NASA is developing

a long-term Mars exploration program but none of the missions they are considering are currently in the official plan for NASA's Mars Exploration Program.[10] The Executive Branch's proposed planetary exploration budget has been greatly reduced with no Mars missions provided for beyond the 2013 *MAVEN* orbiter. The greatly reduced proposed budget is now trapped by the self-serving political interests of a dysfunctional Congress who is waiting to see who the next President will be before addressing the nation's interest which includes the national budget, the national debt, a tax-code set to automatically usher in major changes at the end of 2012, and massive automatic across-the-board cuts in the defense budget. In this context, Mars seems to be a distant priority, both literally and figuratively.

A week after *Curiosity* successfully landed, India announced a plan for a 2013 Mars robotic mission.[11] In the 1960s Dr. Vikram Sarabhai, the father of the Indian Space Program articulated the reason for a developing country to have a space program: to apply advanced technologies to the real problems of society.[12] This is the rationale for the Indian Parliament funding remote sensing technologies and applying them to India's significant water problems. Within India, some space proponents are taking a more expansive view of Dr. Sarabhai's philosophy. It is far from clear, however, whether the political forces in the Indian government will agree that a Mars mission is the application of technology for societal problems. Additionally, just as the U.S. has its national pressures on legislative priorities, India's experience of suffering the "largest electrical blackout in history" will certainly bring pressure to bear on determining India's legislative priorities.[13]

Europe's impressive *Mars Express* proves that the Europeans have the technological capability for planetary missions.[14] However, the uncertain outcome of Europe's still evolving Euro crisis casts a long shadow over the entire European economy including funding for future space missions.

China and Russia had a joint Mars mission, *Phobos-Grunt/Yinghuo-1*. It failed. As previously stated, the U.S. also has had failed Mars missions. In the case of the *Phobos-Grunt/Yinghuo-1*, however, the aftermath of the failure included a strained Chinese-Russian relationship the parameters of which are hard to assess in two governments famous for their opaqueness. The stress within Russia became visible however when, after the failure the Russian President posed the possibly of criminally prosecuting the engineers behind the failure.[15]

Now I don't mean to say humans will not get to Mars. I have always been the kind of person that sees the glass as half-full. The litany of problems discussed above only serves to support the case for an international Mars mission. Instead of a competition, getting humans—of any nation—to Mars, requires cooperation. The world's newspapers and space trade publications are filled with many, many stories about nations proposing cooperative missions. There are far too many to list here. However, a quick review of these stories show at different times for different reasons nations recognize cooperation is the way to go. What is needed is a unifying rationale.

The *International Space Station* (*ISS*), with its 15 participating nations[16] stands as stark evidence that, together, we humans are capable of putting humans in space. It is also evidence that we can alter the reasons for cooperation. The *ISS* was conceived for cold war purposes: for the U.S. and its allies to demonstrate technological superiority over the U.S.S.R. These purposes provided the underpinning for the 1988 *International Space Station* (*ISS*) Intergovernmental Agreement (*ISS* IGA)[17]. As the cold war gave way to the globalization era the purpose of the *ISS* also evolved: to provide a peaceful, constructive and civilian outlet for Russia and its significant military space capabilities. Russia became a full *ISS* partner and these revised purposes provided the foundation for the 1998 *ISS* IGA.[18]

All of the nations discussed in this commentary know how to get to Mars technologically. What they need to figure out is why. Why in the globalization era should nations cooperate to get to Mars? Perhaps the most pragmatic reason is because none of them will be able to afford it alone. Here again, the *ISS* might provide some clues including learning how to work with one another in a changing geopolitical environment. All of the participants of an international Mars mission will have to give a little to gain a lot. Politicians will have to define national achievement to include international partnerships. Scientists will have to accept foreign policy funding rationales along with scientific goals. Engineers will have to adopt a form of Buckminster Fuller's engineering philosophy of doing more with less[19] in order to have anything at all. If they do, then the meaning of going to Mars will be clear: to achieve a human goal.

—

Joanne Irene Gabrynowicz *is the Editor-in-Chief of the Journal of Space Law. She is also a professor of space law and remote sensing law and the Director of the National Center for Remote Sensing, Air, and Space Law at the University of Mississippi School of Law. Prof. Gabrynowicz was the recipient of the 2001 Women in Aerospace Outstanding International Award and the 2011 International Institute of Space Law's Distinguished Service Award. She is a Director of the International Institute of Space Law and a member of the American Bar Association Forum on Air and Space Law.*

[1] New Oxford American Dictionary

[2] NASA, Mars Exploration Program, http://mars.jpl.nasa.gov/

[3] The Telegraph, http://www.telegraph.co.uk/news/worldnews/asia/china/1404741/China-will-beat-US-in-manned-Mars-mission.html

[4] Encyclopedia Astronautica, The 90 Day Study, http://www.astronautix.com/craft/90dstudy.htm

[5] Leadership and America's Future in Space, NASA, http://history.nasa.gov/riderep/begin.htm

[6] The Case for Mars: The Plan to Settle the Red Planet and Why We Must, Robert Zubrin, Richard Wagner, Touchstone Books, 1997.

[7] Pres. George H.W. Bush, Remarks on the 20th Anniversary of the Apollo Moon Landing, July 20, 1989, http://bushlibrary.tamu.edu/research/public_papers.php?id=712&year=1989&month=all

[8] Encyclopedia Astronautica, Mars Expeditions, http://www.astronautix.com/fam/martions.htm

[9] China's Real Estate Bubble May Have Just Popped – A Host of Factors Are Set to Undermine the Country's Economic Growth by Patrick Chovanec, Foreign Affairs, Dec. 2011, http://www.foreignaffairs.com/articles/136963/patrick-chovanec/chinas-real-estate-bubble-may-have-just-popped

[10] NASA, Mars Exploration Program, Future Missions http://mars.jpl.nasa.gov/programmissions/missions/future/futureMissions/

[11] The Hurriyet Daily News, http://www.hurriyetdailynews.com/india-announces-plans-for-a-mars-mission-in-2013.aspx?pageID=238&nID=27844&NewsCatID=374

[12] Indian Space Research Organization, http://www.isro.org/Ourchairman/Former/vsbhai.aspx

[13] 2nd Day of Power Failures Cripples Wide Swath of India, NY Times, http://www.nytimes.com/2012/08/01/world/asia/power-outages-hit-600-million-in-india.html?_r=1

[14] European Space Agency, Mars Express, http://www.esa.int/SPECIALS/Mars_Express/SEMKR55V9ED_0.html

[15] Medvedev: Engineers Behind Russia's Failed Mars Probe Could Face Prosecution, Forbes, http://www.forbes.com/sites/alexknapp/2011/12/01/medvedev-engineers-behind-russias-failed-mars-probe-could-face-prosecution/

[16] NASA http://www.nasa.gov/mission_pages/station/cooperation/index.html

[17]http://www.nasa.gov/mission_pages/station/structure/elements/partners_agreement.html

[18] Space Station Agreement Between the United States of America and Other Governments, http://www.state.gov/documents/organization/107683.pdf

[19] Buckminster Fuller Institute, http://bfi.org/about-bucky/buckys-big-ideas/geodesic-domes