

November 17, 2009

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Posted: November 13, 2009 02:26 PM

Most Valuable Real Estate in the Solar System

What's Your Reaction?

Today's announcement by NASA of significant water on the south pole of the Moon is scientifically critical, economically astounding and extremely important for the long-term future of humanity. Further, this finding now defines the most "valuable real estate in the solar system."

On October 9th, the LCROSS collision, run by NASA Ames, crashed into the depths of a permanently shadowed crater on the south pole of the Moon. From a scientific point of view, the debris plume resulting from this impact has been analyzed by scientists during the past month, and the results show a significant quantity of water. We now know that the water can be found in the permanently shadowed caters of the Lunar South Pole. This water is probably the remnants of comet collisions with the lunar surface. Likely there may be billions of tons of water, water that can be used to produce rocket fuel or to support future human outposts.

From an economic point of view, water on the Moon is the equivalent of finding "gold in the hills of California." Translation... there is the potential for a California gold rush to hit the space nations in the years ahead. It may be that governments and/or companies will seek to be first to the ice-fields of the Lunar South Pole and make a claim.

So what's so interesting about water on the Moon? After all it's in boundless supplies on Earth. The value of water is its actual physical location on the Moon, a place that is very expensive to travel to. The utility of the water is both as a propellant for rockets and for the maintenance of human life in space. With sufficient water on the Moon, solar energy can be used to split the water into hydrogen and oxygen. The oxygen is of course critical for humans to breath and the water important for us to drink. As it turns out, hydrogen (H2) & oxygen (O2) together are one of the most efficient propellants we know. The Space Shuttle Main Engines (some of the most powerful rocket engines in existence), for example, burn O2 and H2 to blast our astronauts off the Earth into orbit. You can think of water as the petroleum of spaceflight... rather than oil that powers our cars, H2 and O2 powers our rocketships.

Today's launch costs are unfortunately extremely expensive. On the average it costs something on the order of \$20,000 per pound to get supplies into low-Earth orbit (where the Int'l Space Station is located) and, optimistically, 10x to 20x that cost, or approximately \$400,000 per pound to land something on the Moon's surface.

So the cost of transporting water to the lunar surface, or oxygen, or hydrogen is about \$400,000 per pound or \$25,000 per ounce... *about twenty-five times the price of gold today!*

Revealing water in significant quantities on the Moon could truly be a turning point in space exploration. Who will set up the first water mining plants? Given low-cost availability of water, hydrogen and oxygen, what type of off-Earth economies and exploration will this enable? The question is not too dissimilar to those questions asked when oil was discovered buried deep under the Earth or under the oceans. We eventually designed the technology to mine and extract this precious resource. It's what we do as humans and entrepreneurs.

The south pole of the Moon has another very important attribute in addition to water, namely the existence of small mountain peaks that are constantly in sunlight, 28 days out of the Lunar cycle and referred to as the "peaks of eternal light." These peaks which are in the plane of the ecliptic (the plane that the Earth rotates around the sun) will allow for constant illumination of solar panels and heating of the spacecraft. The reason this is important is because the temperature on the Moon plummets from +100 degrees Centigrade to -150 degrees Centigrade as the Moon rotates into and out of direct sunlight.

The proximate location of newly discovered ice-fields, next to these "peaks of eternal light," will allow for the creation of fuel depots where water is mined and then solar energy is used to break it down to Hydrogen and Oxygen for rocket fuel (a process known as hydrolysis). Think of this location as the 'Saudi Oil fields' of the solar system. I could imagine that some governments or corporations will want to race to this real estate and stake their claim in the decade ahead.

I'm particularly excited for all of the teams building vehicles for the Google Lunar X PRIZE. This is a \$30 million competition funded by Google and operated by the X PRIZE Foundation. We've offered up a large cash bounty for the first team to privately build and land a robot on the surface of the Moon that can travel, send back photos and video. Think of these vehicles as a low-cost 'prospector' looking for information and valuable data, as well as the companies constructing the shovels and picks on the bleeding edge of this potential boom.

Thus far, 21 teams from 11 nations have registered to compete. When they are successful they will demonstrate the ability to reliably travel to the lunar surface and explore for less than a tenth of the current costs envisioned by government programs. Everyone will benefit and these Google Lunar Teams will be on the cutting edge of a gold rush.

If you've been wondering where the next Gold Rush is going to take place, look up at the night sky to our closest celestial neighbor. The next economic boom might just be a mere 240,000 miles away on the bella luna.



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