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Gold Rush on the Moon

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Last week brought us the exciting official news of water on the Moon. This news is scientifically critical and, more importantly, economically astounding. From a scientific point of view, we now know that the water is interlaced with the lunar soil in many locations, perhaps as remnants of comet collisions with the lunar surface.

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 community in the years ahead, and the teams building robotic exploration vehicles in the Google Lunar X PRIZE are constructing the shovels and picks on the leading edge of this potential boom.

So what's so interesting about water on the Moon? After all, it's in boundless supply 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 breathe and the water important for us to drink. As it turns out, hydrogen (H2) and oxygen (O2) together are also 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 power 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 International Space Station is located) and, optimistically, 10 times to 20 times 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.

I'm 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 and send back photos and video. Think of these vehicles as a low-cost 'prospector' looking for information and valuable data.

Thus far, over twenty teams from eleven 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.

Stay tuned for the next chapter of the story of water on the Moon, which happens on October 9th of this year. On this day, a NASA mission called LCROSS

will collide (catastrophically) into the Lunar South Pole with the hope of discovering large quantities of water. This LCROSS collision is targeted on one of the permanently shadowed craters. At the same time a lunar orbiting observing satellite will be taking photos and searching for H20 in the plume resulting from the collision.

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*.