Written by **Bruce Walker** on April 25, 2012

New Company Plans to Mine Space for Wealth

A new company, Planetary Resources, intends to go into outer space and mine minerals and even water from asteroids near our planet. The Platinum groups of metals, which include ruthenium, rhodium, palladium, osmium, iridium as well as platinum, are found in small concentrations on Earth, which is one reason that these metals are so valuable, but on asteroids the metals can be found in almost pure form and in huge masses.

As one example, there is a single space rock that is 500 meters wide and which alone contains more platinum than all of that metal mined in human history. Eric Anderson, co-founder and co-chairman of Planetary Resources, said of these space ores: “If you look at space resources, the next step is to go to the near-Earth asteroids. They’re just so valuable, and so easy to reach energetically. Near-Earth asteroids really are the low-hanging fruit of the solar system. We’re going to go to the source. The platinum-group metals are many orders of magnitude easier to access in the high-concentration platinum asteroids than they are in the Earth’s crust.”

Anderson also explained that the development of water resources in space, which does not normally fit into the popular conception of space minerals and compounds, could enable crews in space to extend extensively our reach into the cosmos. He added, “We’re really talking about enabling the exploration of deep space. That’s what really gets me excited.” Already astronomers have identified about 8,900 near-Earth asteroids, and between 100 and 150 are believed to be water-rich bodies. Water will also enable humans to grow food in space, because the other components of horticulture — minerals and sunlight — are already present.

Planetary Resources has already begun to line up customers. Anderson explained: “We’re out there right now, talking to customers. We are open for discussions with companies — aerospace companies, mining companies, prospecting companies, resource companies. We’re out working in that field, to really open up the solar system for business.” The prospecting phase will take a couple of years. Then the actual extraction will be performed largely by unmannered space vehicles. The costs of that process are uncertain, but Caltech’s Keck Institute for Space Studies estimates a 500-ton near-Earth asteroid could be snagged and dragged to the moon’s orbit by 2025, at a cost of about $2.6 billion.

The direction of space mining will also be guided by where the minerals are found in most economical quantities. “We will then, at that time, determine which of these objects to pursue first for resource extraction, and what mission we’ll be facilitating. Before you decide where to put the gas station, you’ve got to understand where the trucks are going to be driving by.” Anderson said.

Planetary Resources may be only the beginning of a huge industrial complex in space which starry-eyed astronomers have been contemplating for many decades. The mineral ores in huge and very pure asteroids, of course, is very attractive. Other uses of space industry, however, may also turn out to be just as valuable. Manufacturing of ball bearings, for example, can produce in the weightless environment of outer space almost perfect bearings — something which simply cannot be accomplished

on Earth. And products other than ball bearings can also be made much better in a weightless factory in space. Different types of insulin, for example, may be able to be made only in space. And certain types of emulsions of great industrial or medical value may also be made in space.

The almost perfect vacuum of space creates other opportunities which cannot be duplicated, or can be duplicated only at exorbitant expense, on Earth. Outer space has a background temperature of 4 degrees Kelvin, which is almost as cold as thermodynamics allows, and therefore a space factory would have a temperature on its shaded side that is far lower than can economically be produced on Earth. The sunny side of the factory, in contrast, would have temperatures that were quite high.

Industrial transportation in space can also be very inexpensive. Although distances are much greater than on Earth, the almost total absence of any friction means that a barge launched on a particular trajectory and velocity would require little, if any, other energy before it reached its destination. Solar wind sails, in fact, may enable these sorts of barges to travel around a complex of space industries scattered over hundreds of thousands of miles with nothing more than the tilting of a sail to catch the solar winds (the sails, however, would need to be very large).

Space today is much like the oceans were 500 years ago. Free men using the minds and hands that God gave them should be able to turn the frigid void of space into a vast treasure trove of wealth.

Photo: 951 Gaspra, the first asteroid to be imaged in close-up photography.