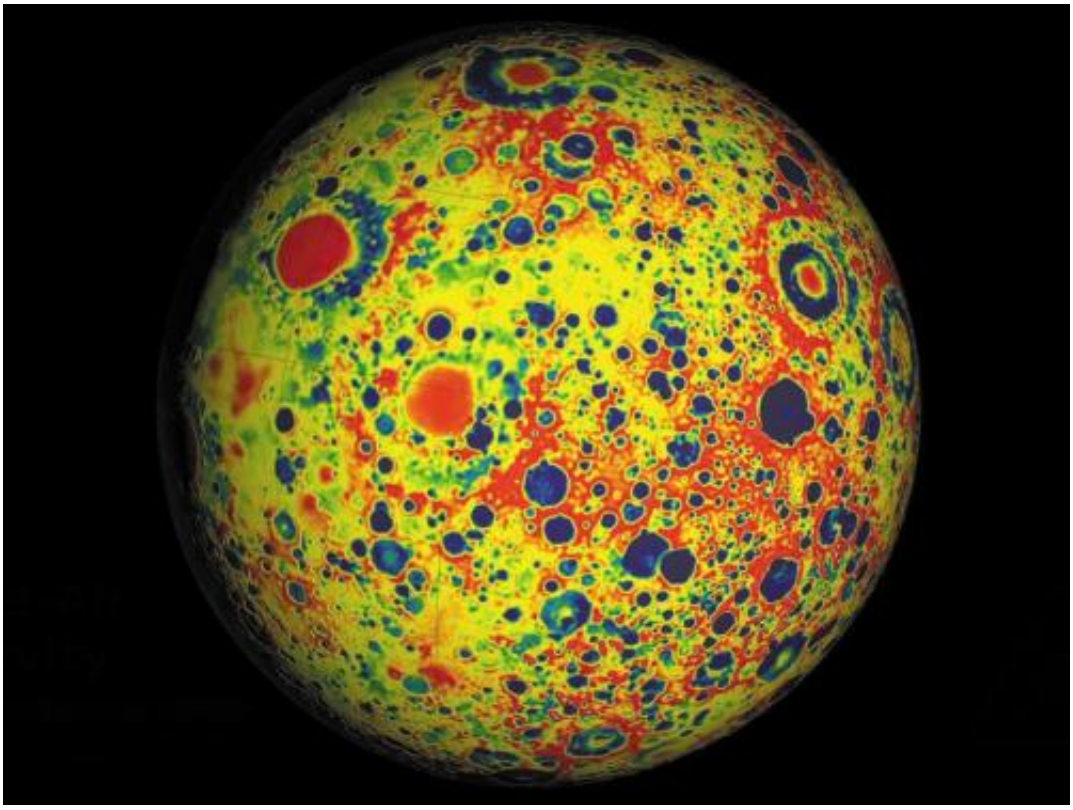
Space scientist suggests mission to Venus might help explain origin of the Moon

December 5 2013, by Bob Yirka



The Moon's gravity field as mapped by NASA's Gravity Recovery and Interior Laboratory. Credit: NASA/JPL-CALTECH/MIT/GSFC

(Phys.org) —Robin Canup, a space scientist with the Southwest Research Institute in Colorado has published a Comment piece in the journal *Nature* proposing that a mission to Venus be considered to help better understand the development of our moon. She suggests that

current theories that describe how the moon came about rely too heavily on Mars data, which could be obscuring the real story. Tim Elliot and Sarah Stewart offer their own opinions on the matter in a companion News & Views piece in the same journal.

The general consensus among modern space scientists is that our moon came to exist as the result of a Mars size planet impacting the Earth—that impact, the thinking goes, would have caused a lot of debris (made up mainly of material from the impactor) being pushed into space which over would have coalesced over time into a disk and then eventually, into the moon as we know it today.

The problem with this theory, as Canup notes, is that evidence is mounting that indicates the moon, at least on its surface, is far more like the Earth than the theory suggests. Silicate samples brought back from manned missions, for example have the same isotope composition as those found here on Earth. It's possible the impacting body had a nearly identical composition to the Earth, but that seems unlikely considering the differences in composition between Earth, and say Mars. That's part of the reason Canup argues, that we need to go to Venus. We don't have isotopic samples from that planet. If we did go there and retrieve samples and then found them similar to those here on Earth, it would go a long way towards explaining why the Earth and Moon seem to be so similar.

Meanwhile, space scientists are left to consider other theories to explain not just how the moon was created and developed but how it and the Earth evolved together resulting in the relationship we have today. Some have suggested that perhaps the impact was actually between two Earth-like bodies, or maybe, the Earth was spinning a lot faster way back when which would have resulted in a small impact causing a lot of Earth debris to be flung into space, leading to the formation of the moon.

The main point Canup seems to be making is that if we want to understand our own planet better, we need to understand the moon as well. And to do that, we need more data—starting with surface samples from Venus, she notes, would be a great way to begin.

More information: Planetary science: Lunar conspiracies, by Robin Canup, *Nature* 504, 27–29 (05 December 2013) DOI: 10.1038/504027a