

Lunar Views: The Man in the Moon

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The Man in the Moon, it is the first thing that most of us notice when we look at the moon when it is nearly full. It is the subject of legend and song. Men and women throughout recorded history, and through all parts of the world have noticed it. But who is this man in the moon, or more importantly, what is he?

When you look at the full moon, you will notice that there are light areas and dark areas. All the light we see from the moon is sunlight that is reflected off its surface, the moon produces no light of its own. So, the light areas result from a surface that is good at reflecting light, and the dark areas are caused by a surface that absorbs some of the light and reflects less than the lighter areas. Thus, the man in the moon is created by these patterns of light and dark that by random chance have been arranged to resemble a face.



The light areas tend to be some of the oldest surfaces on the face of the moon. They are the heavily cratered highlands and cover most of the side of the moon that we see.

The dark areas are actually the newer surfaces. Closer examination of these dark areas through a telescope show that they are in general fairly flat and smooth compared to the lighter areas. Early observers of the moon thought they

were looking at oceans, seas, and lakes, and thus called the darker regions mare (pronounced MAR-eh), a Latin word that means sea. The term mare has stayed with us even as we now understand that these dark regions have nothing to do with water. However, the idea of these maria (the plural form of mare) being liquid does have some form of truth. We now believe maria were formed when molten rock, magma, flowed up through cracks in the crust of the moon and filled in lowered regions. The magma eventually cooled and left the smooth dark patches that we now see.

While we believe that the center of our own Earth is still liquid, and we see this magma ooze through the surface occasionally through volcanoes, it is believed that the moon has cooled enough that there is no longer any liquefied rock present there. The moon's maria were formed a very long time ago when the moon still had a liquid core. Most of the maria formed between 3.3 and 3.7 billion years ago.

How many places on Earth can you go and see a view of what the Earth looked like 3.5 billion years ago? Essentially nowhere! This is one of the things that I find makes the moon so interesting. The forces that formed the planets, and our moon, have been almost frozen in time on the moon, sitting right there almost every night for us to gaze up and look at. On Earth, because of wind, water, ice, and the movements of the Earth's crustal plates, almost all the details of the Earth's early life have been obliterated. Because the moon has no water or atmosphere, because it cooled much quicker than the Earth due to its smaller size, the details of its early life are still right there.

What were the forces that formed the face of the moon? Magma rose up and filled in lower areas to create maria, but what caused the lower areas to begin with? These questions and more will be answered in future issues, so stay tuned.

By the way, we see the man in the moon because most of us go out early in the evening to look at the moon. With the moon in this orientation, the maria appear to paint a face. Now that winter is upon us and the sun rises late in the morning, go out on the next full moon before the sun rises, look to the west as the moon sets, and see if you can still see the old man. If not, what do the patterns of light and

dark reveal to you? Many people see a rabbit that is leaping, his head facing south. Remember, the patterns on the moon haven't changed, it is that relative to our eyes the image appears to have shifted spun through an effect called field rotation. Your mind no longer sees the man, but instead associates something else with the pattern. Now, tilt your head to the right. Does the face suddenly appear again?

You are welcome to contact me by email at doug@ShoestringAstronomy.com, and view some of the astronomical fun I have at www.ShoestringAstronomy.com