

Adapted From AAC Newsletter *FirstLight* (2002 Oct & 2004 Apr/May)

## Magnificent, Mysterious Moon

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*Usually the bane of amateur and professional astronomers alike, the Moon is the most exquisite, detailed and educational object on the sky!*

**“The Moon was but a Chin of Gold  
A Night or two ago —  
And now she turns Her perfect Face  
Upon the World below —”**

~ Emily Dickinson

**S**ometime ago a colleague of mine stated that once you’ve seen the Moon, there is no sense having a second look. This is like saying once you’ve seen the Grand Canyon, there is no sense coming back. If this is your thinking too, you need not read any further.



**The First Quarter Moon.** Magnificent even in small telescopes. (Photo by author.)

Gerald North in his popular book, *Observing the Moon*, wrote that, “Interest in the Moon periodically ebbs and flows, like the tides it causes in our oceans.” Certainly interest in the Moon peaked during the Apollo landings more than thirty years ago and it has been on the wane ever since. Today, with many amateur astronomers proud owners of large reflecting telescopes, deep sky observing seems more fashionable. And professional astronomers usually hold star formation, exploding stars, black holes and galactic encounters among the more “fashionable” fields of study. Indeed, when moonlight prevails, astronomers often stow their telescopes and retreat indoors.

Still, our nearest celestial neighbor has attracted attention since earliest times and has influenced our culture in ways unknown to most people. Now ignorance and myths of the Moon prevail including the perception that, if you have seen a moon rock (or crater), you’ve seen it all. Yet, we have been studying our own planet for centuries and we still have more questions than answers!

While new technologies of the twentieth century may have brought the Moon closer, our

nearest neighbor remains shrouded in mysteries. Other small, inner planets like Earth have either no satellites (Mercury and Venus) or just small, captured asteroids (Mars). Why does the Earth have such a large satellite, large enough that we often call Earth a “double planet”? Why does the Moon have such a low average density compared with the other inner planets? Is the Moon really depleted in iron and heavy metals compared to Earth? Why is the far side of the Moon so different from the near side? (The far side has no large maria or relatively flat, smooth looking dark areas.) Is the Moon really a “dead world” or does it still show some geologic activity as some observers have suggested? Although most lunar craters are probably meteoric in nature, are some the result of volcanic action? Do we really understand the many surface features that cover the lunar landscape? Does the Moon contain hidden pockets of frozen water, ice permanently frozen since the early days of our Solar System? What is the composition of the very tenuous and variable lunar atmosphere? What is the exact chemical makeup of the lunar terrain and how does it vary over the Moon’s surface? Does the absence of a lunar magnetic field indicate the Moon has no liquid core? Or is it just the result of slow rotation? Finally, how our satellite came to be is still not completely settled.

In fact, studying our Moon may give us insight into the origin of Earth, the Solar System and the Universe.

For the backyard, beginner or advanced amateur astronomer, the Moon is an ideal celestial object to observe. First, even beginning star gazers will have no difficulty finding this most conspicuous object in the night sky! (Throw away your “Go To” controllers!) Second, even bright city lights hardly faze moonlight—you don’t need to travel miles to find a dark site. Third, even small telescopes can capture enough moonlight to show spectacular detail, even at very low magnification. The Moon, in fact, is the only celestial object whose features we can all easily scrutinize from Earth.

Let’s face facts. Only the most dedicated and advanced amateur can look at a barely visible galactic smudge in a telescope and say wow! Yet the Moon’s “wow factor,” especially for beginners, is phenomenal. Even at 25 power, hundreds of lunar features become visible.

And, if you think the Moon is a dead, unchanging world, you have never really observed the Moon. Changing illumination on the Moon during each 29-1/2 day lunation literally allows Earthlings to see the Moon in a “new light.” Lunar observers know that a quarter moon seems like an entirely different world than when the Moon shows a full face. As shadows slowly creep across the Moon’s terrain, spectacular and small lunar surface features become revealed in ways often not seen before—features that demonstrate principles of our own planet’s geology. Lastly, lunar librations (“moon wobbles”) make limb (edge) formations almost visible allowing us to see features that would otherwise remain invisible from Earth.

Many amateur (and professional) astronomers have become blasé about the Moon. But at star parties, it is the Moon that often attracts the largest crowds and elicits the loudest and most exuberant screams of joy and awe. If you become a dedicated lunar observer, you will spend a lifetime seeking out, identifying and learning about the myriad and marvelous features that cover our magnificent and mysterious Moon.

Early in 2004 President Bush proposed a new and costly space initiative that includes manned missions to the Moon and Mars. But this is years if not decades away while you can do it now and do it with no fear of increasing the national debt. Just take out your scope, aim it at our nearest celestial neighbor and you and your friends will be on the way to the Moon! ☼

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