

Binocular Universe: A Month of Luna-See

July 2009

Phil Harrington

What were you doing exactly 40 years ago this month? For those of us who were around *way back* in July 1969, we were anticipating the greatest technological accomplishment of the age. We were waiting for Apollo 11. It was a moment frozen in time when the world's population joined hands in a collective "can-you-believe-it" moment.

We can recapture some of that excitement by visiting the Moon not just once, but throughout the entire month as we mark the 40th anniversary of Apollo 11.

July opens with a huge waxing gibbous Moon looming in the southeast after sunset. On July 1, sunrise will have just come to the magnificent crater **Copernicus**, lying as an island among the flat lava plain known as **Oceanus Procellarum**, the Ocean of Storms.

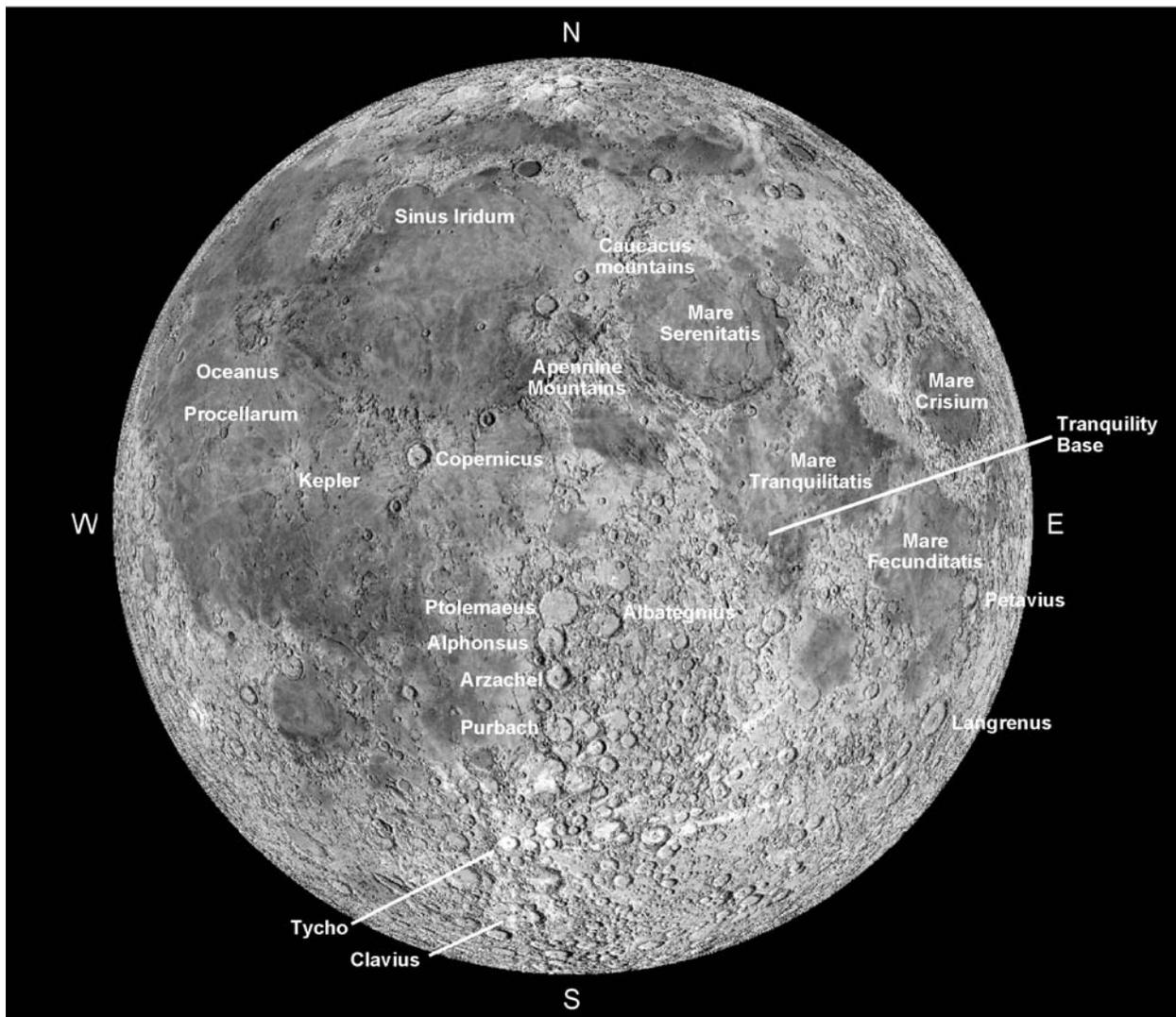
The next night, sunlight awakens **Sinus Iridum**. This crescent-shaped "Bay of Rainbows" is actually half of the rim of a large impact crater flooded by lava from Mare Imbrium more than 3 billion years ago.

As time passes toward Full Moon on July 7, watch as the brilliant rays of ejected material surrounding Copernicus appear to almost explode like a burst of fireworks. A smaller display surrounds the crater **Kepler**, west (left) of Copernicus, while a huge skyrocket blasts away from the crater **Tycho**.



The Moon rises later after sunset on each succeeding evening as the terminator sweeps across the disk from lunar east to west. **Tranquility Base**, where Neil Armstrong and Edwin Aldrin left their historic footprints, sees the Sun set on July 12.

By the following night, the terminator will have swept near three prominent craters in a north-south line. The largest, spanning some 93 miles in diameter, is **Ptolemaeus**. To its south, we have **Alphonsus**, at 71 miles across. Smallest of the three is **Arzachel**, 59 miles across. A larger crater, **Albategnius** (82 miles), lies between the three and the terminator, while **Purbach** (71 miles) is just to their south. By the next night, all five will lie in darkness.



The Moon. Map based [Virtual Lunar Atlas](http://www.ap-i.net/avl) software, available for free at <http://www.ap-i.net/avl> Image © Virtual Moon Atlas/JPL. Used with permission. Read more about VMA at http://www.cloudynights.com/item.php?item_id=1811

Come the last week of the month, the Moon rejoins the evening sky. Can you spot the thin crescent of the day-old Moon on July 22? How about July 23? It takes a near-perfect western horizon and haze-free skies to see such a young Moon.

There is more to see than just the slender crescent, however. Look carefully and you will see the entire outline of the lunar disk, including the greater portion not yet illuminated directly by sunlight. This effect is known as earthshine. Were we on the Moon, we would see Earth going through phases just like the Moon, but in reverse order. In other words, when we see a crescent Moon here on Earth, an astronaut on the Moon would see a gibbous Earth.

By July 23, **Mare Crisium** comes into view. Two nights later, **Mare Fecunditatis** has seen the Sun rise. Can you see two craters along its eastern shore, **Langrenus** and **Petavius**? They span 80 miles and 100 miles, respectively.

Mare Tranquilitatis and Tranquility Base see sunrise on July 27. Sorry, you won't see the flag, but the landing site is near the southwestern shore (lower left edge) of the mare's dark gray outline.

First Quarter on July 28 is wonderful through binoculars. That night, sunlight just grazes the **Caucacus** and **Apennine** Mountains that mark the western rim of **Mare Serenitatis**.

But my favorite phase of all comes two nights later, when magnificent **Clavius** sees first light. Clavius, 136 miles in diameter, is large enough to be visible through 7x binoculars when it rides the terminator, as it will that night. Look for it among the rugged highlands near the Moon's southern edge, or limb.

By month's end, the terminator is back where we began, bringing dawn to Copernicus and the Ocean of Storms.

How many of the surface features listed here are you able to identify through your binoculars? Can you spot others not mentioned? Drop me a line at phil@philharrington.net and let me know. I'd like to include them on our next trip to the Moon.

Till next month, remember that two eyes are better than one.