

Lunar Top 10 for Backyard Telescopes

The 10 coolest things to see on the moon for beginners

The moon is one of the best targets for beginners with small backyard telescopes. For one thing, unlike many interesting, faint objects, it's easy to find the moon! It shows a riot of detail, so much that it can be overwhelming. The moon is always interesting to see, but it's even better if you know a few things to find.

The requirements for inclusion on this list are pretty simple. The objects have to be visible at 100 power or less in a small backyard telescope (testing was done using a 50 mm Galileoscope and a 3" Edmund reflector that is over 40 years old). They have to be visible by an inexperienced observer, reasonably easy to locate, and visually interesting. In addition to being cool, they have to teach the observer something about the moon.

Lighting conditions at lunar features change with the moon phases. Some may be easy to spot for a couple days when the phase is right, but hard to spot at other times. Each of the Lunar Top 10 is listed with the best times to see them. The dates are given as days after new moon, making it possible to find things in any month. As an example, the best dates to see a particular crater might be listed as "7 and 8 days after new," or "9 to 23 days after new." Different features will be at their best at different times within those periods, and discovering when that might be is part of the fun! Because of the moon's motions, these dates are *approximations*—they can vary by a day in either direction. The slight differences in viewing from month to month are also part of what makes the moon fun!

New Moon



Waxing Half Moon
about 7–8 days
after new moon



Full Moon
about 15 days
after new moon



Waning Half Moon
about 21–23 days
after new moon



New Moon
about 29–30 days after
previous new moon



The date of new moon can be found throughout the year from the U. S. Naval Observatory at <http://aa.usno.navy.mil/data/docs/MoonPhase.php> . Just input the year and click the “get data” button. Doing that returns all the phases of the moon for that year, giving the date and time when the phase occurs. Times are in Universal Time, the time zone used worldwide by astronomers. For the purpose of the Lunar Top 10 list, just use the date for new moon and ignore the hours and minutes. If you get deeply into astronomy, converting from Universal Time is critical knowledge, but not for this list.

Some of the items on the list are so big that they become fully visible only over several nights rather than in one night of observing! Remember that the full moon rises as the sun sets, and phases after full moon rise later each evening—observing the moon more than 17 or 18 days after new moon means going out after midnight to do it (although some of the Top 10 can be conveniently observed in daylight). Remember also that your telescope may turn the moon’s image upside-down, backward, or both. You’ll have to learn to adjust mentally for that when using moon finder images and maps.

As Earth turns, the moon appears to rise on the eastern side of the sky, traverse the sky, and then set in the western side of the sky. Before the Space Age, moon maps often showed the leading edge of the moon (called its “limb”) as “west” (since it was the edge closer to the western horizon) and the trailing limb as “east.” That’s the reverse of the way west and east are marked on Earth maps. Other maps showed south at the top with east and west as they would be on an Earth map. It could be very confusing! As space probes made the moon and planets seem more like destinations than celestial disks, that convention changed and most modern moon maps show north at the top and west on the left. That’s the convention this Top 10 list uses.

Want more moon? Try the Lunar 100 list! Its objects are listed from easiest to toughest, some requiring telescopes 6” to 8” in diameter. Finding them all can be challenging. All 100 are listed at <http://www.skyandtelescope.com/observing/objects/moon/3308811.html> , where you can also buy a nice-sized Lunar 100 Card with both a listing and a moon map to guide you.

Enjoy the moon!