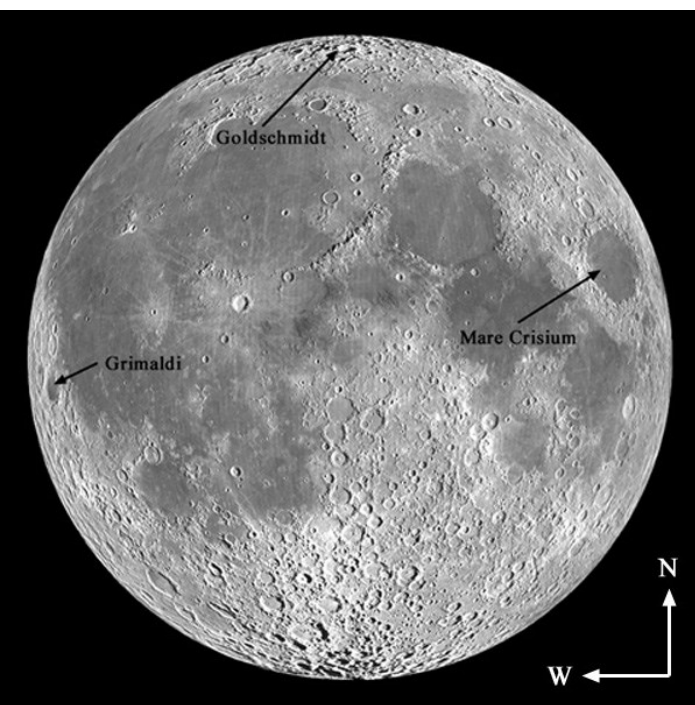


# Libration

## What It Is

Libration is an apparent wobbling of the moon over the course of a month. Features seem to shift left and right as well as up and down. It's very subtle, and easiest to see by making notes about the apparent distance between features near the edge (the "limb") of the moon and the limb itself. It can only be seen by making observations every clear night and spotting the changes.



## Why It's Cool

Libration happens because of the way the moon rotates on its axis and revolves around Earth. The moon's orbit is not a perfect circle, and the moon moves more rapidly when it is closer to Earth than when it is farther away. The moon's rotation, however, does not change. Because the moon's rotation and revolution are not perfectly synchronized, the moon *seems* to rock back and forth during the course of a lunation (the time it takes for the moon to go from any phase to the same phase again). North-south libration happens because the moon's axis is very slightly tilted compared to its own orbit (similar to the way Earth's axis is tilted compared to Earth's orbit). This allows observers to see just a little past the moon's north and south poles. Because of libration earthy observers see about 59% of the moon's surface over the course of a lunation rather than just 50%.

## When To See It

Find Mare Crisium beginning 4 or 5 days after new moon and follow it nightly. Libration is usually noticeable by 8 days after new and can be seen until full moon. As the moon wanes, pick out the dark feature Grimaldi and use that as a landmark for seeing libration. Libration up and down is more subtle and harder to spot. Find the big northern crater Goldschmidt, and use it as a landmark from about 9 to 12 days after new.

## Where It Is

Check the full moon map to see find these features on the disk of the moon.

Mare Crisium is the prominent nearly round dark region near the eastern limb of the moon. Grimaldi is the smaller, very dark spot near the western limb of the moon. Goldschmidt is the hardest of these three to find, located in a jumble of craters near the moon's north pole.

In each case, watch the apparent distance between the crater and the closest limb of the moon. By comparing that distance with the diameter of the landmark, libration becomes noticeable.