

# Meteor showers to light up November nights

November will offer skywatchers two meteor showers and a close approach of Mars to the earth. The amount of sunlight we receive continues to decrease this month. On Nov. 1 the sun rises at 7:09 a.m. and sets at 5:26 p.m. This allows for a possible 10 hours and 20 minutes of sunlight. On the 31st these times are 7:15 a.m. and 5:01 p.m., allowing for

a possible nine hours and 20 minutes of sun. This is a decrease of exactly one hour.

Of the five naked-eye planets, only three will be visible. Jupiter will be in the pre-dawn sky; Mars and Saturn will be visible after sunset. Mercury and Venus are too close to the sun to be seen.

Venus is at superior conjunction on the morning of Nov. 1. Venus is located behind the sun, as seen from the earth.

The first of this month's two meteor showers reaches its maximum in the pre-dawn sky on the 2nd. This is the Taurid (TOR-uhd) meteor shower, so named because the "falling stars" appear to radiate from the constellation of Taurus the bull. Looking toward Taurus will be easy because the moon will be within that constellation on the 2nd.

FIND THE MOON and you will be looking toward Taurus. Unfortunately,



skywatch  
**Raymond E. Bullock**

ly, the light scattered by the moon will wash out the fainter members of the Taurid meteor shower. Even under ideal observing conditions, this is not one of the year's best showers. You can expect an average of only 15 meteors to be visible each hour.

Full Moon is at 4:48 p.m. on Nov. 2. The moon is fully lit by the sun and will rise in the northeast as the sun sets in the southwest. The moon will be visible all night. Directly to the left of the moon is the Pleiades (PLEE-uh-dees), a star cluster. This star group marks the shoulder of Taurus. Seeing the Pleiades will be difficult because of the proximity of the bright full moon.

Look for an interesting grouping with the moon, Mars and Aldebaran (al-DEB-uh-ran), the "eye" of Taurus, on the evening of the 4th. The object will be rising in the east northeast around 7:30 p.m. The moon is easy to identify; the bright red star below and to the right of the moon is Mars. Below and to the right of Mars is Aldebaran.

Mars and Aldebaran are very similar in color and, usually, similar in brightness. We are approaching the time when Mars will be quite close to the earth (astronomically speaking), and that will cause Mars to be

at its brightest. It will easily outshine Aldebaran.

(There is a major difference between Mars and Aldebaran. Mars, a planet, reflects the light of the sun. Aldebaran, a star, produces its own light.)

The moon will move from Taurus into Gemini on the 4th and 5th and will form a triangle with the stars Castor and Pollux on the 6th. Look toward the east northeast about five hours after sunset on the 6th. To the left of the moon is Castor. Below Castor is Pollux. These "twin" stars each mark a "head" of one twin.

LOOK FOR the moon on the morning of Nov. 8. To the right of the moon is Pollux and to the right of Pollux is Castor. To the left of the moon, in Cancer, is Jupiter. Jupiter is the third brightest object in the night sky. Only Venus and the moon are brighter. Jupiter is 1.6 degrees north of the

moon at 2 a.m. on Nov. 9. Later that same morning, at 8:02 p.m., the moon is at Last Quarter phase.

The moon is three degrees below Regulus (REE-uh-lus) on the morning of the 10th. Regulus is the "heart" of Leo the lion.

Mars is six degrees to the north (right) of Aldebaran at 5 a.m. on the 13th. You will see the red planet and the red star high in the west, with Mars easily outshining Aldebaran.

The bright star to the east (left) of waning (fading) crescent moon on the morning of the 14th is Spica, the brightest star in the constellation of Virgo. On the next morning the moon is 10 degrees below Spica.

Raymond Bullock is the former coordinator of the observatory and planetarium at the Cranbrook Institute of Science, Bloomfield Hills. He now works for a Troy company which specializes in laser displays and effects.

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