See a Star Disappear

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Gainesville, Florida area residents should set their alarm clocks for 5:30 a.m. EDT, Friday, 2016 July 29. Dress quickly and go outside, face almost exactly east and watch one of the brightest, nighttime stars dramatically disappear about nine minutes later.

The star is orangy Aldebaran (Alpha Tauri), brightest star in Taurus and 14th brightest looking star on the sky. Aldebaran is a large, cool giant 75 light years away with a surface that would extend halfway to the orbit of Mercury if the Sun were this large. Its core is probably rich in helium, a product of hydrogen fusion that has now mostly ceased allowing its helium core to contract and heat. This should allow the star to expand with increasing luminosity that may double its luminosity in a few million years.

So, why should this star disappear from our skies?

The answer is just a few arc minutes toward the south. Here lies the eastern *limb* (edge) of a waning crescent Moon (23% illuminated). And the Moon is slowly creeping toward Aldebaran as part of its monthly, easterly motion around the celestial sphere. Consequently, at approximately **5:39:30 a.m. EDT** (several minutes different depending on one's location in North Central Florida), Aldebaran will disappear behind the Moon's bright limb, a "lunar occultation." (See **Figure 1** for the Gainesville, Florida area.)

Aldebaran will be well placed on the sky to observe from the Gainesville area. Fortunately, Aldebaran will be almost exactly east at its disappearance (azimuth 89.5 degrees!) and high enough (altitude 34.5 degrees) to be easily visible without extreme neck bending!

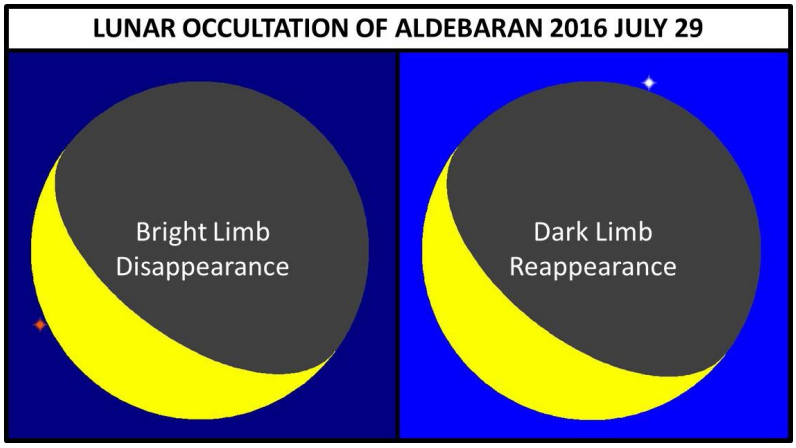

Figure 1. Graphics show bright and dark limb disappearance and reappearance a few minutes before and after occultation for Gainesville, Florida area. Disappearance occurs near end of astronomical twilight but sky will be bright during reappearance since sunrise is imminent.

Aldebaran is the brightest star (apparent magnitude +0.75 to +0.95) that the Moon can occult. Since the occultation will occur about 12 minutes before the start of nautical twilight, the sky should be moderately dark. The bright limb disappearance of Aldebaran should be easily visible but binoculars or a small telescope may help since the lunar limb will be very bright.

An hour and four minutes later (about **6:43 a.m. EDT**), Aldebaran will reemerge from the Moon's western, dark limb but this occurs only about five minutes before sunrise (approximately at 6:48 a.m. EDT) making this observation more difficult but possible with clear, blue skies.

Although this event occurs during Florida's summer rainy season, skies are often clear during early morning hours before the heat of the day produces summer thunder storms.

Aldebaran is the brightest of four 1st magnitude stars than the Moon can occult. The others include Antares (Alpha Scorpii), Spica (Alpha Virginis) and Regulus (Alpha Leonis). However, according to calculations by the Belgian astronomer Jean Meeus, people living in or before the year -116 could have seen the Moon occult a fifth 1st magnitude star, Pollux (Beta Geminorum). However, Pollux now lies too far from the ecliptic to be occulted by the Moon due to the star's *proper motion* on the sky and rotation of the *ecliptic*.

Finally, according to Meeus, this lunar occultation of Aldebaran is the 19th occultation in an 18.6 year long series of 49 occultations occurring in consecutive *sidereal months* (27.3 days) in the northern hemisphere from 2015 January 29 to 2018 September 3.

However, many, if not most of these occultations, are not visible from Florida or occur in daylight. For example, only two more can be observed from Florida in 2016. The next visible at night in North Florida is not until 2016 October 19 (abt. 1:15 a.m. EDT) and the last, December 12 (abt. 11:05 p.m. EST).

So, arise before the roosters, early on the morning of July 29 and watch one of our brightest looking stars disappear from out skies. ☼