

## When the Moon Meets Regulus

— Howard L. Cohen

*See bright Regulus flicker out behind the earthlit, dark limb of a waxing crescent Moon during evening dusk and then later reappear from behind its bright limb*

Didn't see the beautiful occultation of the bright, vividly colored double star Iota Cancri this past April? You still have another chance to see an occultation but of a different kind. Tuesday afternoon and evening, 2007 June 19 (EDT), observers from coast to coast can witness another special astronomical event. The darkish, but earth lit eastern limb of a waxing crescent Moon will rapidly move across the first magnitude star Regulus (Alpha Leonis) causing this star to disappear quickly from view. Later Regulus will rapidly reappear from behind the bright, opposite western edge of the lunar disk as the Moon glides eastward on the sky.

Although occultations of first magnitude stars are not rare, circumstances may not be optimal. The occultation may not be visible from your location or may occur during daytime, both the disappearance and reappearance may not be visible, the Moon's phase may be near new or full (too bright), etc. For example, the last time Florida saw the Moon occult Regulus was eight years ago (1999 May 22). Observers making accurate timings of lunar occultation help astronomers improve maps of the lunar terrain at the occultation points. Regardless, go outside and enjoy this brief sky show on the evening of June 19.

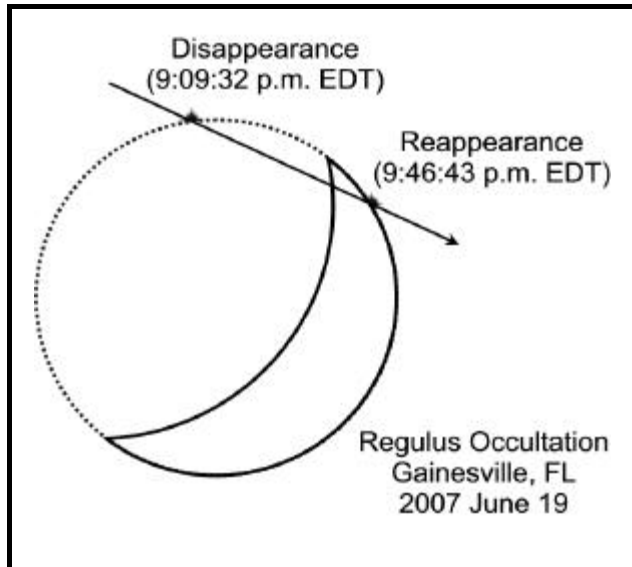
For this June's occultation, most of the United States will need to watch this event against daylight skies since the disappearance of Regulus takes place in the afternoon for locations west of Florida. Therefore, most observers will need telescopes to spot Regulus against the brightness of a daylight sky.

Not so in Florida where this sky show will take place against darkening, twilight skies making this event easier to see and even more dramatic! Not only does the occultation take place at a "convenient time" (early evening) but also the Moon will be well placed for observation in the western sky. Moreover, the lunar phase will be a waxing crescent with both the disappearance and reappearance visible before the Moon sets. Finally, disappearance takes place behind the dark limb making the occultation more vivid and interesting, especially since the gray limb should be dimly visible from reflected earthshine.

The 2007 June issue of *Sky & Telescope* (pp. 56–57) has more information about this occultation including U.S.A. maps showing zones of visibility and approximate times of disappearance and reappearance. A *Sky and Telescope* figure also shows the path of Regulus behind the Moon as seen from various cities. But, Gainesville, Florida is not included so one needs to interpolate a path for North Florida. However, I have compiled a time schedule for Gainesville (Table 1) to help you plan for this event. Also included below is a diagram (Figure 1) showing the path of Regulus behind the lunar disk specific for the Gainesville area. And, unlike the Iota Cancri occultation that required observers to be inside a narrow occultation path, you can experience the Regulus occultation from any Florida backyard if the weather cooperates!

Indeed, Table 1 shows Florida observers are more fortunate than most since this stellar occultation begins about thirty-eight minutes after sunset and ends almost forty minutes

later. Furthermore, the disappearance of Regulus occurs about ten minutes after Civil twilight ends in North Florida when the brightest stars have become visible. Although Regulus is the faintest of approximately twenty-one “first magnitude” stars (those looking brighter than magnitude +1.5), this whitish star still shines at magnitude +1.36 and so should be easily visible to the naked eye.



**Figure 1.** The path of Regulus behind the dark lunar limb and its emergence from behind the bright limb for Gainesville, Florida.

Observing the reappearance of Regulus will be more difficult since it is a bright lunar limb event and you may not know the exact location on the Moon’s edge where this star again appears. However, the path of Regulus behind the Moon shown in Figure 1 should help. Moreover, darkening evening skies should make the view easier to see.

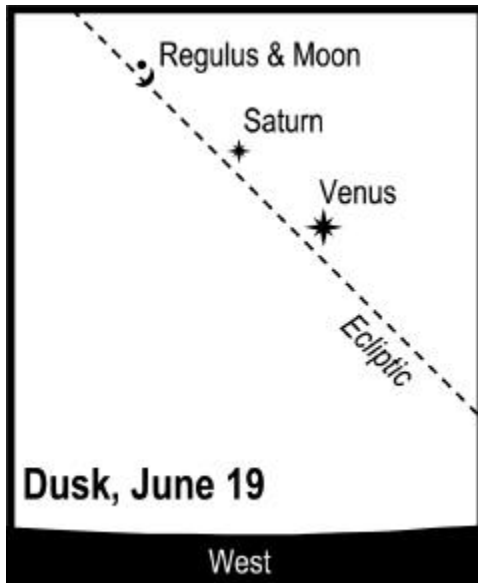
Still, binoculars or even a small telescope will more easily show Regulus winking out behind the dark edge of the Moon. In fact, good binoculars or a small telescope should enhance the drama of this event since optical aid should help you see the dark limb of the Moon still lit by earthshine. A small telescope will also help show the

Moon’s limb creep inevitably toward its eventual meeting with bright Regulus. Then, come back after about a half-hour to see the star’s emergence back into the evening sky. Again, binoculars or a small telescope will especially help you see the star’s reappearance.

### Table 1. Regulus Occultation for Gainesville (2007 June 19)

Moon’s Phase	26% (5 days past New Phase)	
Moon’s Altitude	40° at Disappearance of Regulus	
Moon’s Altitude	32° at Reappearance of Regulus	
Sunset	8:32 p.m.	EDT
Civil Twilight Ends	9:00 p.m.	EDT
<b>Regulus Disappears</b>	<b>9:09:32 p.m.</b>	<b>EDT</b>
Nautical Twilight Ends	9:33 p.m.	EDT
<b>Regulus Reappears</b>	<b>9:46:43 p.m.</b>	<b>EDT</b>
Astronomical Twilight Ends	10:08 p.m.	EDT
<b>Duration of Event</b>	<b>37m 11s</b>	

**Note:** Start observing a few minutes before listed times in case predicted times different for your location.



**Figure 2.** The western, evening sky on the night of the Regulus occultation showing the dramatic lineup of the waxing crescent Moon, Saturn and brilliant Venus.

exquisite sight for all stargazers.

Like the Sun, Regulus is a mature, hydrogen burning main sequence star (technically spectral class B7 V). However, Regulus outputs about 150 times more visual light than the Sun due to a surface temperature about twice as hot and an estimated diameter that is eight times larger. (Regulus is actually distorted by rapid rotation with an estimated spin period of about 16 hours.) Nevertheless, at a distance of 78 light years, the angular size of this star's disk is less than 1/500 of an arc second! Therefore, the Moon, which moves on the sky at a rate of about 0.5 arc seconds every second, will cause Regulus to both disappear and reappear instantaneously as seen by our eyes.

Finally, bright Saturn and enormously brilliant Venus will add to this evening's sky show. The waxing crescent Moon, Saturn (mag. +0.5) and Venus (mag. -4.4) will be nearly equidistant apart (about 8 degrees from each other). These three objects will also make a diagonal line extending downward (from left to right) toward the northwest horizon (Figure 2) producing an