

How to Determine the Day of the Next Conjunction, Easily (No. 78)

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Written by the Christian Churches of God
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brackets mine)



The Way of the Most High

“Exalting belief in the Almighty Father **אֱלֹהֵינוּ** (YaHUAH),
through His TaNaK (falsely called ‘Old Testament’).”

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A Brief Note from Sha'ul:

This article is much shorter than the original. It is simply cut and pasted with the most necessary parts. Words in brackets are in place of false words that we do not use in our articles and vocabulary. This makes for a simple article and easy to understand concept of conjunction and how to determine it. It cut out all the talk about azimuth, angles, using a nocturnal dial, and lots of other stuff which are certainly for a more exhaustive study. The copyright notice on the original article stated that brief quotations may be made, and that is what I have done. One does wonder what "brief" means, but it is certainly more "brief" than the original, which is referenced in the Sources at the end. If people want to read the original, they certainly may go to the Sources, but we encourage a simple understanding of what is here, and then going out and getting some practice. We also warn others that if they do go to the original article, they will find an article based on the idea that the moon reflects the sun's light (which science has not proven, but is a theory), and that our globe is between the sun and the moon (which also seems to be theory to us, although it would be hard to say that this cannot be argued as Scriptural either). Lastly, they believe in going by time in Y'rush'lam (Jerusalem), which does not make sense to us at this point in time, especially for areas like Australia which are far behind.

Let's begin:



The modern Islamic and formerly the ancient Jewish community have attempted to estimate the time when a first crescent moon can be seen. With the ancient lists of approved witnesses it proved difficult to predict the day in question and made publishing a Lunar Calendar impossible. Even with modern equipment and available quick computations, regularly knowing the time when a first crescent moon can be seen has proved to be impossible. The conjunction cannot be seen. However, by obtaining the number of centimeters separating the Sun and Moon at sunrise and multiplying this number times two, anyone can easily determine the time and the day of the next conjunction.

Many people will tell us that we need specialized mathematical abilities in order to be able to determine when the conjunctions will occur. Everyone who can multiply times 2 and divide by 24 can determine the day and the hour of the next conjunction - easily!

The Conjunction

We will be speaking below about the conjunction of the sun and the moon and the (globe of our planet). In astronomy, conjunction - or to be conjoined - means there is a meeting of two or more bodies in the same longitude, or right ascension.

The Lunar Cycle

The moon's apparent daily travel around the (globe) takes 24 hours and 50 minutes. This causes the oceans to rise and fall at fairly regular intervals. On the average, the period between two successive high tides is 12 hours and 25 minutes, or one half the time it takes the moon to circuit the (globe). The ocean's tides are caused primarily by the moon's gravitational pull.

At the conjunction the moon is lined up with the sun from outside our point of view on (land). We see the dark side of the moon, or rather, we don't see the moon at all because the extreme brightness of the sun outshines the extremely dim moon.

A new moon occurs when the apparent longitudes of the moon and sun differ by 0° .

As the moon moves eastward away from the sun in the sky, we see a bit more of its (lighted) side each night. So a few days after a new moon we can see a thin crescent in the western evening sky. At this point, and for the next few nights, we can see the dark side of the moon faintly illuminated (with light).

The first quarter moon is the crescent moon continuing to wax, or grow fatter. When half the moon's disc is illuminated we say the moon has reached first-quarter phase. That term comes from the fact that the moon is a quarter of the way through lunation.

At first quarter, the moon is 90 degrees east of the sun along the ecliptic, so we're looking at the (lighted) side of the moon from off to the side. At this time, 50% of the moon's visible surface is illuminated. Because it is 90 degrees from the sun, the first-quarter moon sets approximately halfway through the night.

The waxing gibbous moon continues to wax (grow fatter), but it's no longer a crescent. During this period after first quarter, we say we have a *gibbous* moon.

The full moon is opposite the sun in the sky and we see all of the moon's (lighted) side. The full moon is 180 degrees around the ecliptic from the sun in the sky. At this time 100% of the moon's visible surface is illuminated.

It rises almost exactly as the sun is setting, and sets almost as the sun rises the next morning.

The second half of the moon's journey is the inverse of the first. Now the moon is waning, or growing slimmer, and it's once more described as gibbous.

A waning gibbous moon is the second half of the moon's journey, and is the inverse of the first. Each evening it rises later and later, after sunset.

The third quarter moon is three-quarters of the way around its journey, and the moon once again shows us one side of its disc illuminated and the other in darkness. However, the illuminated side we see now is the one that was in darkness at first-quarter phase. **The last quarter** occurs when the apparent longitudes of the moon and sun differ by 270° . At this time, 50% of the moon's visible surface is illuminated.

The moon rises around midnight, and crosses the local meridian around sunrise. As it approaches new moon, the phase of the moon is a waning crescent, until we can't see it at all. It then becomes a new moon and then repeats the cycle.

We won't see the last crescent moon much after an age of maybe 28 days or so. We seldom see the new crescent moon until it has an age of more than 24 hours.

How to Determine the Day

For our purposes we will use a one metre (100 centimetre) tape measure, as it is inexpensive and easy to carry. Using it does not need much practice, just (clear) weather and (clear) vision.

When the sun is rising, take a measurement in centimeters between the center of the sun and the center of the waning crescent moon. Record the day, and the correct local time to the minute and the number of centimeters showing (Keep a decent foot stance that is firm but not too far apart. Stretch out your arms completely straight. Stand as straight as possible towards the direction of sun and moon).

The moon moves close to .5 cm per hour, so we multiply the number of centimetres shown by 2. This measure will give us the approximate number of hours, which we must convert into the number of days until the next conjunction.

We do this by dividing the above number of centimeters by 24 hours to provide the whole days. Then add the remaining hours and we will know which local day and approximate local time the next lunar New Moon occurs.

This measurement can be done anytime after the full moon, but in the third quarter with 7.4 days remaining until the conjunction is easiest.

The 7.4 days equates to 177 hours and 36 minutes. Seven full days are 168 hours and .4 of 24 hours is 9 hours and 36 minutes.

This measure will give us the number of hours that we must convert into the number of days until the next conjunction in our local time. If this puts the conjunction close to dark in Jerusalem, then do the calculations below, that is divide by $.51^\circ$, to get a more precise result.

For most days multiplying by 2 is adequate.

The moon moves relative to the sun by an amount almost equal to the moon's diameter every hour, which equals the $.51^\circ$ or .5 cm. This equates closely to a movement of 12.2° every twenty-four hour day, for the monthly journey.

(The following is an example from) the crescent moon on 4/14/2004 (Roman false date) at 06:46 local time in Southern Ontario, Canada. Sunrise was at 06:40 with daylight savings, which had commenced on April 4th at 2:00 AM, added. This was day 24 of the cycle, with a waning crescent moon in the third quarter phase.

The measure on the tape was gauged to be 62 centimetres. 62×2 will indicate 124 hours. 124 divided by 24 (hours) is 5 days with 4 remaining hours. Adding four hours to 06:46 gives us an estimated 10:46 on 4/19/2004 for the projected local time of the conjunction.

If we needed a more precise time then we would divide 62 by $.51$. This gives us 121.6 hours.



A Final Note from Sha'ul:

I pray that this has been helpful to understand and determine conjunction for you. I pray that you will be one of the few who actually goes out and does it, so that we can share our calculations regarding conjunction through email and on our website. We are not always able to see the crescent due to weather or other problems, and so we have a wide body of believers that talk with us. There are several websites that report New Moon crescent sightings such as ours. We combine their findings with our own.

Seeing the moon in the last half or last 7 days of the moon cycle, measuring and determining when conjunction will be is a great help to us all. We have been sharing our determination of conjunction on our website Monthly Calendar update for quite some time, although we have yet to see others determining conjunction for themselves and sharing it with us. We encourage you to do this, as this may well mark the dawn of a new age of believers coming together to observe the calendar of YaH, the way it was meant to be. Between determining conjunction and watching for the first visible crescent, we should be able to have unity and understanding.

Shalom,
Sha'ul

Sources

<<http://www.ccg.org/english/s/p078.html>>