האגודה הישראלית לצפייה בירח החדש

The Israeli New Moon Society

Guide to Observing the New Moon from Israel in 5775 (2014/5)

by Roy Hoffman

The commandment (*mitzvah*) of sanctifying the month is the first one that the Children of Israel were commanded with on leaving Egypt. This commandment is of great importance because the dates of the festivals, including over 60 commandments, depend on it.

For over a thousand years, the Hebrew calendar has been fixed by calculation. Today, the Hebrew calendar does not match that fixed by observing the Moon. Even as the gap between the two calendars continues to increase, we do not have the authority to alter the calendar until a new authorized Sanhedrin (religious high court) is reestablished. While sanctification of the month according to observation is not practiced today, it is important to carry out calculations and practice observing the New Moon in order to be ready for when the Sanhedrin is reestablished. Of course, we are not intending to change the current calendar (this is a task for an authorized Sanhedrin, recognized by all) but just to increase involvement in and embellish the Torah.

For many years now, **the Israeli New Moon Society** has been asking the public at large to join us by trying to observe the New Moon at the beginning of each month. The Israeli New Moon Society was founded for this purpose by Rabbi Dr. Nachum Rabinovitch, head of Yeshivat Birkat Moshe, Maale Adumim. The society works with the Institute for Kiddush Hachodesh Studies and includes scientists and rabbis from Universities, Yeshivot and elsewhere. The society presents the subject from the point of view of mainstream (Rabbinical Orthodox) Judaism. Nevertheless, the society welcomes participation from anyone.

Our aims

1. **To practice observing and to improve technique**: For this purpose you need to know when and where to look. To this end, we supply software, diagrams and instructions. Generally, an observer can develop the necessary skill after a few months of practice.
2. **To develop criteria for the limit of visibility**: For this, one has to find the Moon the moment it becomes visible to the naked eye of an experienced observer. The results can be analyzed according to physical, meteorological and physiological considerations to improve existing visibility criteria.
3. **To encourage general awareness of Jewish calendar issues**.

Our achievments

1. Many of our members have become expert observers.
2. We have improved the accuracy of lunar visibility predictions.
3. New software has been developed to predict the appearance of the Moon.
4. We have made a number of important observations.

Important lunar events in 5775 (2014/5)

There is only one partial solar eclipse visible from Israel this year. On Friday 20th March 2015, a small indentation will be visible on the solar disk.

Eclipse	Date	Extent from Israel	Start Time	Mid Time	End Time
Lunar	8th Oct. 2014	Not visible-total	12:25	12:56	13:24
Solar	23th Oct. 2014	Not visible			
Solar	20th Mar. 2015	13%	11:16	11:58	12:39
Lunar	4th Apr. 2015	Not visible-total	14:58	15:01	15:02
Solar	13th Sep. 2015	Not visible			

How to observe and report

In order to determine the moment when the Moon appears, one needs to know where to look. Diagrams and instructions showing how to find the Moon using simple techniques are given below for this purpose. An obvious object such as the Sunset or a bright planet is used to help locate the Moon. The angular distance between the Moon and the object and its height above the horizon is measured using fingers at arm's length, the fist or span (the distance between the thumb and little finger with the fingers outstretched) though more advanced techniques such as using calibrated scales may be to some advantage. The figures below are calculated for Jerusalem. They may be used throughout Israel with an accuracy of five minutes. For observations from elsewhere in the World, the parameters have to be calculated for each place separately. Our program LunaCal available from our Internet site http://sites.google.com/site/moonsoc or other programs: Hazon Shamayim, MoonCalc or Skyglobe, can be used for this purpose. Hazon Shamayim can be bought from Rabbi Tskuni +972 8-9945621, MoonCalc is available free of charge from http://chem.ch.huji.ac.il/nmr/foo/moonc60.zip and Skyglobe is available from http://astro4.ast.vill.edu/skyglobe.htm.

You should start searching for the Moon about five minutes (or earlier if using binoculars or a telescope) before it is expected to appear. Use the predicted times as a rough guide (they will only be correct for 95% of observations). At the end of the text at the bottom of each diagram the apparent topocentric illumination and lag time are given. (The simplified geocentric illumination is given in brackets.) The larger these values, the easier the Moon is to see. An observer that is looking hard sometimes tends to imagine that he has seen the Moon. To be sure that you really saw it, divert your gaze for a moment then look back to see if the Moon really is visible. Once the Moon has been found, please fill out an observation form available from our website (http://sites.google.com/site/moonsoc) to report your observation. One should ideally continue looking till the Moon fades or sets.

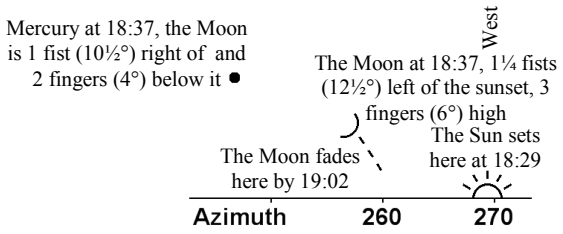
Using binoculars (diameter 50 mm) it is possible to see the Moon 10 to 15 minutes earlier than with the naked eye. In order to see the Moon with the naked eye, it is easiest to start with binoculars in order to locate it and then confirm the sighting with the naked eye. When the observation is difficult, binoculars can confirm that what was seen was the Moon rather than something else. For this purpose one should choose an appropriate pair of binoculars (magnification 7 to 20 ×, diameter 30 to 80 mm).

It is best to find a place to look from where the horizon is unobstructed and where there are no bright lights from that direction. The height of the skyline should be less than 3°, *i.e.*, do not stand in a valley.

Want to join?

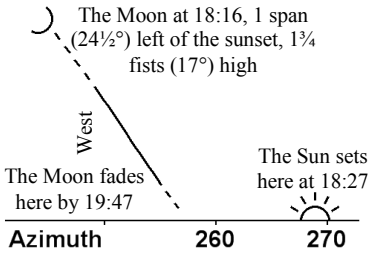
For further details, please contact Gadi Eidelheit, The Israeli New Moon Society, 1 David Eliezer, Givat Shmuel 54032, Israel., Fax +972 722495292, Tel. +972 507325927, Internet site http://sites.google.com/site/moonsoc, Email moonsocil@gmail.com.

The Moon on Thursday 25th September 2014



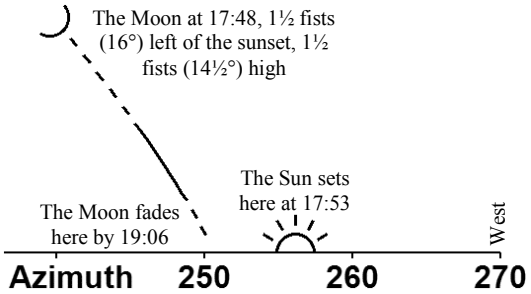
The Moon might appear over the Western horizon between 18:37 and 19:02 on Thursday 25th September 2014, at azimuth 256°, 1¼ fists left of the sunset and 3 fingers (at arm's length) high. This month, Mercury can be used to find the Moon.The Moon will be very difficult to see. Illum. 1.68 (1.84)% Lag 39 m.

The Moon on Friday 26th September 2014



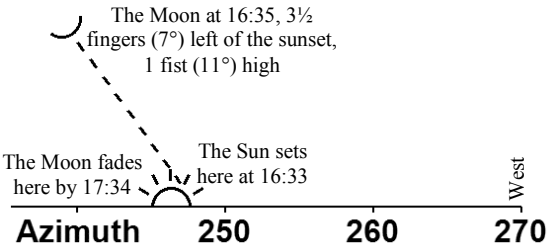
The Moon is likely* to appear over the South-Western horizon between 18:16 and 18:50 on Friday 26th September 2014, at azimuth 246°, 1 span left of the sunset and 1¾ fists (at arm's length) high. The Moon will be very easy to see until it fades between 19:29 and 19:47. Illum. 5.21 (5.47)% Lag 77 m.

The Moon on Saturday 25th October 2014



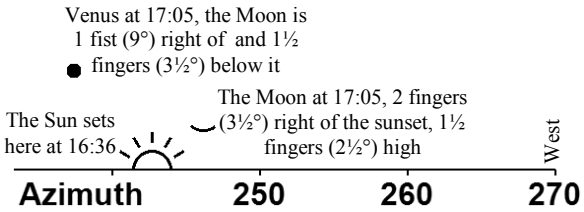
The Moon is likely* to appear over the South-Western horizon between 17:48 and 18:22 on Saturday 25th October 2014 at azimuth 241°, 1½ fists left of the sunset and 1½ fists (at arm's length) high. The Moon will be very easy to see until it fades between 18:47 and 19:06. Illum. 2.92 (3.17)% Lag 72 m.

The Moon on Sunday 23rd November 2014



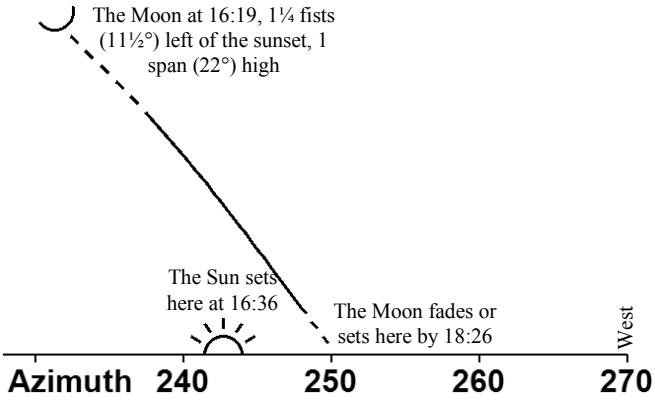
The Moon is likely* to appear over the South-Western horizon between 16:35 and 17:34 on Sunday 23rd November 2014 at azimuth 239°, 3½ fingers left of the sunset and 1 fist (at arm's length) high. The Moon will be not difficult to see. Illum. 1.34 (1.56)% Lag 64 m.

The Moon on Monday 22nd December 2014



The Moon will be impossible to see with the naked eye but may be visible with a telescope or with binoculars on Monday 22nd December 2014. This month, Venus can be used to find the Moon. The best chance of seeing the Moon will be at 17:05. Illum. 0.43 (0.59)% Lag 42 m.

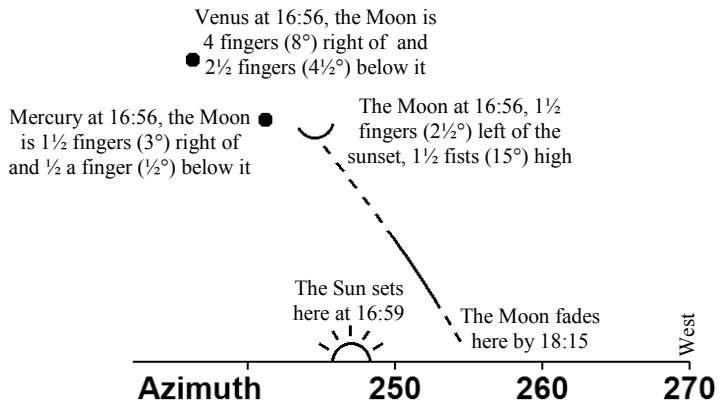
The Moon on Tuesday 23rd December 2014



The Moon is likely* to appear over the South-Western horizon between 16:19 and 16:56 on Tuesday 23rd December 2014 at azimuth 234½°, 1¼ fists left of the sunset and 1 span (at arm's length) high. The Moon will be very easy to see until it fades or sets between 18:08 and 18:26. Illum. 3.11 (3.44)% Lag 106 m.

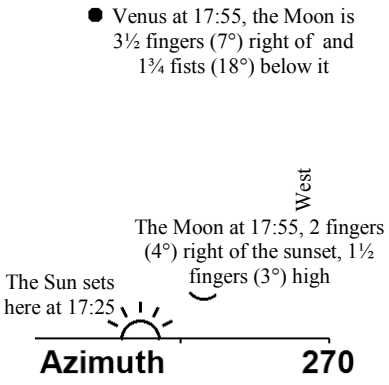
*Assuming that it is not cloudy, there is still a 5% chance that the Moon will appear or disappear before or after the stated time. The times are about as reliable as the weather forecast for tomorrow.

The Moon on Wednesday 21st January 2015



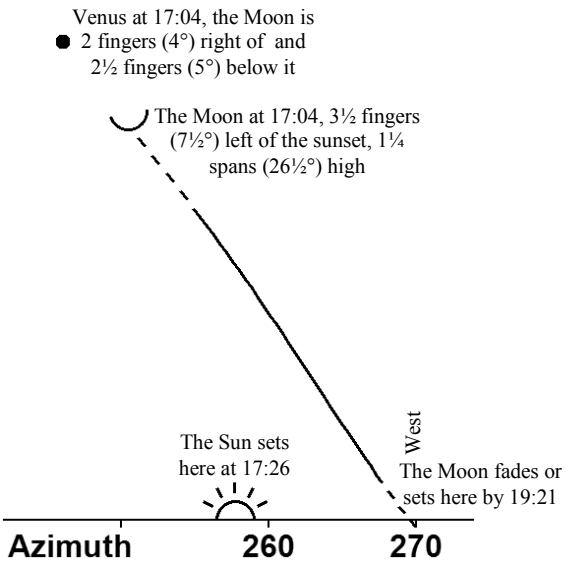
The Moon is likely* to appear over the South-Western horizon between 16:56 and 17:32 on Wednesday 21st January 2015 at azimuth 245°, 1½ fingers left of the sunset and 1½ fists (at arm's length) high. This month, Mercury and Venus can be used to find the Moon.The Moon will be very easy to see until it fades between 17:56 and 18:15. Illum. 1.58 (1.85)% Lag 76 m.

The Moon on Thursday 19th February 2015



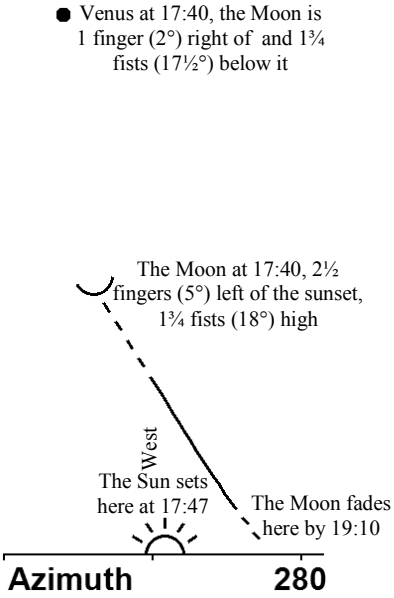
The Moon will be impossible to see with the naked eye but may be visible with a telescope or with binoculars on Thursday 19th February 2015. This month, Venus can be used to find the Moon. The best chance of seeing the Moon will be at 17:55. Illum. 0.53 (0.71)% Lag 43 m.

The Moon on Friday 20th February 2015



The Moon is likely* to appear over the Western horizon between 17:04 and 17:38 on Friday 20th February 2015 at azimuth 253½°, 3½ fingers left of the sunset and 1¼ spans (at arm's length) high. This month, Venus can be used to find the Moon.The Moon will be very easy to see until it fades or sets between 19:07 and 19:21. Illum. 3.76 (4.15)% Lag 111 m.

The Moon on Saturday 21st March 2015

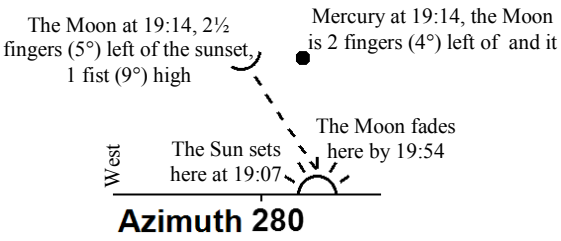


The Moon is likely* to appear over the Western horizon between 17:40 and 18:14 on Saturday 21st March 2015 at azimuth 267°, 2½ fingers left of the sunset and 1¾ fists (at arm's length) high. This month, Venus can be used to find the Moon.The Moon will be very easy to see until it fades between 18:52 and 19:10. Illum. 2.06 (2.36)% Lag 81 m.

*Assuming that it is not cloudy, there is still a 5% chance that the Moon will appear or disappear before or after the stated time. The times are about as reliable as the weather forecast for tomorrow.

The Moon on Sunday 19th April 2015

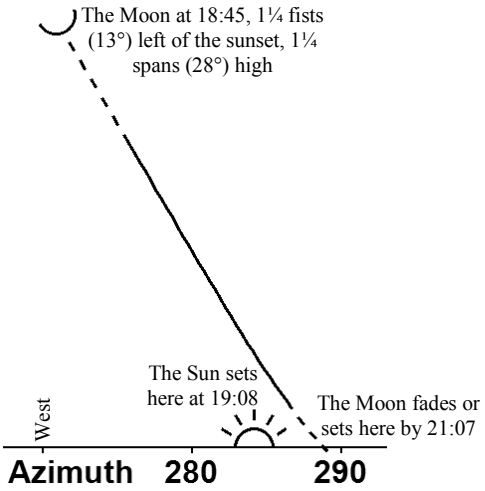
Venus at 19:14, the Moon is 1 finger (2°) right of and 1¼ spans (29°) below it



The Moon is likely* to appear over the Western horizon between 19:14 and 19:54 on Sunday 19th April 2015 at azimuth 278°, 2½ fingers left of the sunset and 1 fist (at arm's length) high. This month, Mercury and Venus can be used to find the Moon.The Moon will be difficult to see. Illum. 0.96 (1.16)% Lag 51 m.

The Moon on Monday 20th April 2015

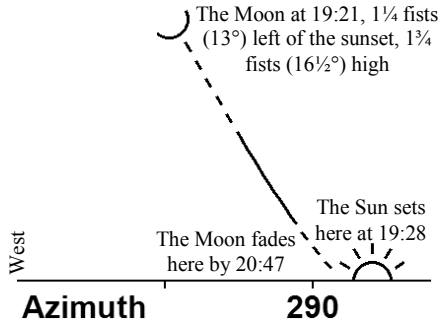
Venus at 18:45, the Moon is 1 finger (2½°) left of and 1¾ fists (17°) below it



The Moon is likely* to appear over the Western horizon between 18:45 and 19:19 on Monday 20th April 2015 at azimuth 274°, 1¼ fists left of the sunset and 1¼ spans (at arm's length) high. This month, Venus can be used to find the Moon.The Moon will be very easy to see until it fades or sets between 20:52 and 21:07. Illum. 4.56 (4.94)% Lag 115 m.

The Moon on Tuesday 19th May 2015

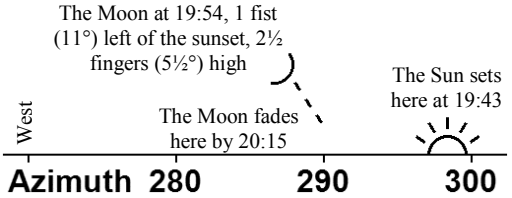
Venus at 19:21, the Moon is 2 fingers (4½°) right of and 1¼ spans (26½°) below it



The Moon is likely* to appear over the Western horizon between 19:21 and 19:58 on Tuesday 19th May 2015 at azimuth 281½°, 1¼ fists left of the sunset and 1¾ fists (at arm's length) high. This month, Venus can be used to find the Moon.The Moon will be very easy to see until it fades between 20:28 and 20:47. Illum. 2.77 (3.04)% Lag 78 m.

The Moon on Wednesday 17th June 2015

Venus at 19:54, the Moon is 1½ fists (15°) right of and 1¼ spans (29½°) below it

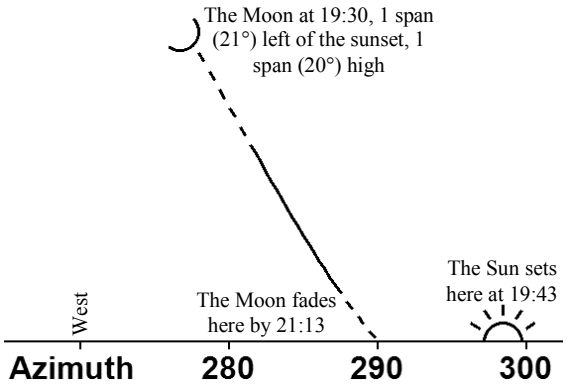


The Moon might appear over the Western horizon between 19:54 and 20:15 on Wednesday 17th June 2015 at azimuth 286°, 1 fist left of the sunset and 2½ fingers (at arm's length) high. This month, Venus can be used to find the Moon.The Moon will be very difficult to see. Illum. 1.44 (1.60)% Lag 39 m.

*Assuming that it is not cloudy, there is still a 5% chance that the Moon will appear or disappear before or after the stated time. The times are about as reliable as the weather forecast for tomorrow.

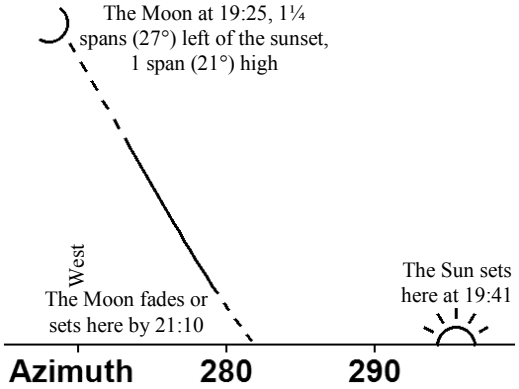
The Moon on Thursday 18th June 2015

● Venus at 19:30, the Moon is 4 fingers (8½°) right of and 1 span (20°) below it



The Moon is likely* to appear over the Western horizon between 19:30 and 20:08 on Thursday 18th June 2015 at azimuth 279°, 1 span left of the sunset and 1 span (at arm's length) high. This month, Venus can be used to find the Moon.The Moon will be very easy to see until it fades between 20:54 and 21:13. Illum. 4.79 (5.08)% Lag 86 m.

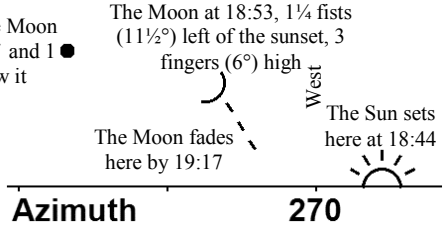
The Moon on Saturday 18th July 2015



The Moon is likely* to appear over the Western horizon between 19:25 and 20:02 on Saturday 18th July 2015 at azimuth 270½°, 1¼ spans left of the sunset and 1 span (at arm's length) high. The Moon will be very easy to see until it fades or sets between 20:53 and 21:10. Illum. 6.56 (6.84)% Lag 85 m.

The Moon on Monday 14th September 2015

Mercury at 18:53, the Moon is 1 fist (10°) right of and 1 ● finger (2½°) below it

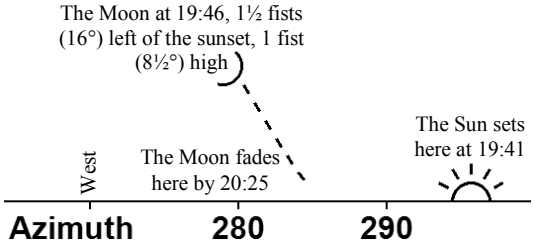


The Moon might appear over the Western horizon between 18:53 and 19:17 on Monday 14th September 2015 at azimuth 262°, 1¼ fists left of the sunset and 3 fingers (at arm's length) high. This month, Mercury can be used to find the Moon.The Moon will be very difficult to see. Illum. 1.52 (1.68)% Lag 39 m.

The Moon on Friday 17th July 2015

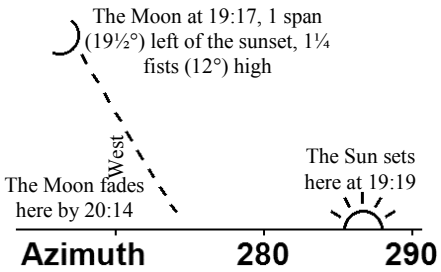
Venus at 19:46, the Moon is 1¼ fists (11½°) right of and 1¼ fists (12½°) below it ●

Jupiter at 19:46, the Moon is 2½ fingers (5°) right of and ● 1¼ fists (12°) below it



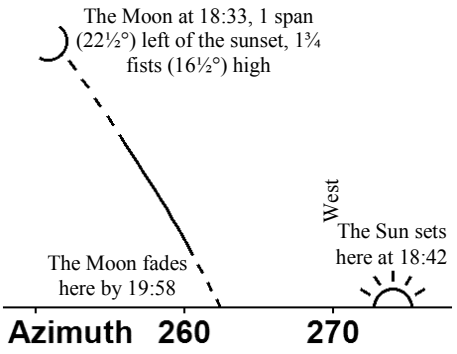
The Moon is likely* to appear over the Western horizon between 19:46 and 20:25 on Friday 17th July 2015 at azimuth 279°, 1½ fists left of the sunset and 1 fist (at arm's length) high. This month, Venus and Jupiter can be used to find the Moon.The Moon will be not difficult to see. Illum. 2.62 (2.81)% Lag 47 m.

The Moon on Sunday 16th August 2015



The Moon is likely* to appear over the Western horizon between 19:17 and 19:52 on Sunday 16th August 2015 at azimuth 267°, 1 span left of the sunset and 1¼ fists (at arm's length) high. The Moon will be very easy to see until it fades between 19:57 and 20:14. Illum. 3.67 (3.88)% Lag 56 m.

The Moon on Tuesday 15th September 2015



The Moon is likely* to appear over the Western horizon between 18:33 and 19:06 on Tuesday 15th September 2015 at azimuth 253°, 1 span left of the sunset and 1¾ fists (at arm's length) high. The Moon will be very easy to see until it fades between 19:40 and 19:58. Illum. 4.71 (4.95)% Lag 73 m.

Table of Moon visibility parameters from Jerusalem for advanced observers.

OR Orech Rishon or ecliptic elongation 20 minutes after geometric sunset.

KR Keshet Reiyah, time between Geometric sunset and moonset divided by four.

KR+OR The sum of orech rishon and keshet reiyah. According to Maimonides, the Moon may be visible if orech rishon > 9° and KR+OR > 22°

Illumination Apparent topocentric illumination in % at geometric sunset. (The simplified geometric illumination is given in brackets.)

LagTime The time between sunset and moonset (geometric)

Dist. Distance from observer to center of Moon at apparent sunset over sea level horizon

DALT Topocentric difference in altitude between the mid-crescent of the Moon and center of the Sun, at 0.6 of the lagtime after geometric sunset

Width Apparent width of crescent, at 0.6 of the lagtime after geometric sunset

Ease The ease of visibility: <-0.7 impossible, <0 requires binoculars or telescope, <1 might be visible to naked eye, >1 definitely visible unless cloudy.

Date	*KR*	*OR*	*KR+OR*	*Lagtime*	*Illumination*	*Dist./km*	*DALT*	*Width*	*Ease*
2014/09/25	*9°37′*	*15°44′*	*25°21′*	*38m28s*	*1.68(1.84)*	*396062*	*8°07′*	*31″*	*0.2*
2014/09/26	*19°05′*	*27°11′*	*46°17′*	*76m22s*	*5.21(5.47)*	*392152*	*15°49′*	*97″*	*2.5*
2014/10/25	*17°58′*	*20°29′*	*38°27′*	*71m52s*	*2.92(3.17)*	*384084*	*14°27′*	*56″*	*1.8*
2014/11/23	*15°53′*	*13°53′*	*29°45′*	*63m30s*	*1.34(1.56)*	*375108*	*12°11′*	*27″*	*1.0*
2014/12/22	*10°34′*	*7°27′*	*18°01′*	*42m15s*	*0.43(0.59)*	*366795*	*7°56′*	*9″*	*-0.3*
2014/12/23	*26°25′*	*21°01′*	*47°26′*	*105m40s*	*3.11(3.44)*	*363477*	*20°04′*	*64″*	*3.0*
2015/01/21	*19°04′*	*15°16′*	*34°20′*	*76m16s*	*1.58(1.85)*	*358058*	*14°52′*	*33″*	*1.6*
2015/02/19	*10°46′*	*9°29′*	*20°15′*	*43m03s*	*0.53(0.71)*	*356120*	*8°45′*	*11″*	*0.0*
2015/02/20	*27°47′*	*23°39′*	*51°26′*	*111m08s*	*3.76(4.15)*	*356285*	*22°49′*	*79″*	*3.7*
2015/03/21	*20°10′*	*17°52′*	*38°02′*	*80m41s*	*2.06(2.36)*	*358994*	*16°38′*	*43″*	*2.1*
2015/04/19	*12°48′*	*12°14′*	*25°01′*	*51m11s*	*0.96(1.16)*	*364993*	*10°17′*	*20″*	*0.5*
2015/04/20	*28°44′*	*25°36′*	*54°20′*	*114m54s*	*4.56(4.94)*	*368178*	*22°47′*	*93″*	*3.8*
2015/05/19	*19°32′*	*19°43′*	*39°15′*	*78m08s*	*2.77(3.04)*	*376668*	*14°52′*	*55″*	*1.9*
2015/06/17	*9°44′*	*13°49′*	*23°33′*	*38m55s*	*1.44(1.60)*	*386035*	*7°24′*	*27″*	*0.0*
2015/06/18	*21°34′*	*25°48′*	*47°22′*	*86m17s*	*4.79(5.08)*	*389235*	*16°08′*	*91″*	*2.5*
2015/07/17	*11°52′*	*19°05′*	*30°57′*	*47m30s*	*2.62(2.81)*	*397099*	*9°16′*	*48″*	*0.7*
2015/07/18	*21°20′*	*30°20′*	*51°40′*	*85m20s*	*6.56(6.84)*	*399049*	*16°32′*	*120″*	*2.9*
2015/08/16	*14°07′*	*22°51′*	*36°58′*	*56m29s*	*3.67(3.88)*	*403658*	*11°33′*	*67″*	*1.4*
2015/09/14	*9°39′*	*15°02′*	*24°41′*	*38m36s*	*1.52(1.68)*	*405542*	*8°10′*	*28″*	*0.2*
2015/09/15	*18°14′*	*25°50′*	*44°03′*	*72m55s*	*4.71(4.95)*	*404309*	*15°12′*	*85″*	*2.3*

