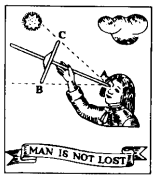
# ASTRONOMICAL INFORMATION SHEET No. 103

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## Earliest Visibility of the New Crescent Moon, 2011 — 2015

This note gives the local date, local mean time and place of the earliest sighting of the new crescent moon between 2011 January and 2015 December, using a telescope.

The earliest time of sighting new crescent moon occurs when the Moon is vertically above the Sun at sunset, so that their azimuths are equal. The calculations have been made at this optimum situation at sunset when $q$ is equal to $-0{\cdot}232$. The quantity $q$ is defined in NAO Technical Note No. 69, *A Method for Predicting First Visibility of the New Crescent Moon* by B.D. Yallop, 1998, April. From the list of 295 observations of first sighting discussed in the Technical Note, this value of $q$ corresponds to the lowest limit for which the new crescent moon has been observed even with a telescope. The curve where $q = -0{\cdot}232$ on the surface of the Earth has a parabolic shape. The place of earliest sighting does not coincide with the most easterly place on this curve. The reason for this is that the sunset lines are tangent to the curve, at the place of earliest sighting, which leaves the most easterly point still in daylight except in the rare situation where the declination of the Sun is zero. The best time for the actual sighting will be during twilight, probably when the depression of the Sun is around 4 to 5 degrees, and $q$ will be around $-0{\cdot}216$.

The table gives the local date, the week day and the local mean time (LMT) of sunset for the earliest sighting, the interval of time from sunset to moonset in minutes (lag time), the longitude and latitude of the best place and the age of the Moon since new. The next column headed "Time Unseen", gives the minimum time that the Moon remains invisible to the unaided eye, i.e. the time in days between the last sighting of the old moon and the first sighting of the new moon from the most favourable places on the Earth. The last column gives a rough indication of the geographical location of the place. The months of Ramadhan are shaded.

### Earliest Date, Time and Place of First Sighting

| Local Date | | Week Day | LMT of Sunset | Time to Moonset | Longitude | Latitude | Moon Age | Time Unseen | Place |
|---|---|---|---|---|---|---|---|---|---|
| **2011** | | | h m | m | ° ′ | ° ′ | h m | d | |
| Jan. | 4 | Tuesday | 17 39 | 35 | W 126 29 | N 17 18 | 17 02 | 1·43 | Eastern North Pacific Ocean |
| Feb. | 3 | Thursday | 17 15 | 45 | W 022 08 | N 42 42 | 16 13 | 1·39 | North east of Azores |
| Mar. | 5 | Saturday | 17 39 | 60 | E 084 17 | N 58 00 | 15 16 | 1·29 | Tomsk Oblast, Russia |
| Apr. | 3 | Sunday | 18 41 | 57 | W 175 30 | N 54 37 | 15 51 | 1·30 | Bering Sea |
| May | 3 | Tuesday | 18 47 | 42 | W 078 43 | N 34 55 | 17 11 | 1·39 | North Carolina, USA |
| June | 2 | Thursday | 18 16 | 34 | E 058 57 | N 08 44 | 17 17 | 1·43 | East of Somalia |
| July | 1 | Friday | 17 36 | 36 | W 104 57 | S 18 01 | 15 42 | 1·34 | Eastern South Pacific Ocean |
| July | 31 | Sunday | 17 03 | 45 | E 135 44 | S 41 28 | 13 20 | 1·16 | South of South Australia |
| Aug. | 29 | Monday | 17 09 | 59 | E 035 57 | S 56 57 | 11 41 | 1·00 | Southern Ocean |
| Sept. | 27 | Tuesday | 18 08 | 58 | W 072 38 | S 56 29 | 11 49 | 0·97 | South of tip of S. America |
| Oct. | 27 | Thursday | 18 30 | 42 | E 138 30 | S 38 26 | 13 20 | 1·07 | South of South Australia |
| Nov. | 25 | Friday | 18 09 | 34 | W 039 30 | S 11 38 | 14 37 | 1·20 | Bahia Province, Brazil |
| Dec. | 25 | Sunday | 17 34 | 35 | E 130 40 | N 16 46 | 14 45 | 1·24 | North east of Philippines |
| **2012** | | | | | | | | | |
| Jan. | 23 | Monday | 17 04 | 45 | W 069 42 | N 41 24 | 14 04 | 1·20 | East of Massachusetts, USA |
| Feb. | 22 | Wednesday | 17 17 | 58 | E 069 43 | N 56 13 | 14 03 | 1·17 | Tyumenskaya Oblast, Russia |
| Mar. | 23 | Friday | 18 19 | 54 | E 176 58 | N 53 15 | 15 54 | 1·28 | Bering Sea |
| Apr. | 21 | Saturday | 18 36 | 40 | W 103 26 | N 33 56 | 18 12 | 1·47 | New Mexico, USA |
| May | 21 | Monday | 18 12 | 34 | W 004 42 | N 08 09 | 18 44 | 1·56 | Côte d'Ivoire |
| June | 20 | Wednesday | 17 33 | 36 | E 140 49 | S 17 50 | 17 08 | 1·47 | North Queensland, Australia |
| July | 19 | Thursday | 16 57 | 45 | W 031 16 | S 40 08 | 14 38 | 1·27 | South Atlantic Ocean |
| Aug. | 17 | Friday | 16 55 | 56 | W 179 56 | S 54 18 | 13 01 | 1·10 | South east of New Zealand |
| Sept. | 16 | Sunday | 17 48 | 53 | E 036 57 | S 53 36 | 13 09 | 1·08 | Southern Ocean |
| Oct. | 15 | Monday | 18 17 | 40 | W 117 12 | S 36 29 | 14 02 | 1·14 | Eastern South Pacific Ocean |
| Nov. | 14 | Wednesday | 18 03 | 33 | E 085 31 | S 10 53 | 14 13 | 1·18 | Cental Indian Ocean |
| Dec. | 13 | Thursday | 17 30 | 35 | W 067 38 | N 16 13 | 13 18 | 1·14 | South west of Puerto Rico |

*continued*

# ASTRONOMICAL INFORMATION SHEET No. 103

*continued*

| Local Date | | Week Day | LMT of Sunset | Time to Moonset | Longitude | Latitude | Moon Age | Time Unseen | Place |
|---|---|---|---|---|---|---|---|---|---|
| **2013** | | | h m | m | ° ′ | ° ′ | h m | d | |
| Jan. | 12 | Saturday | 16 57 | 44 | E 135 29 | N 39 25 | 12 11 | 1·04 | Sea of Japan |
| Feb. | 10 | Sunday | 17 03 | 55 | W 040 39 | N 52 56 | 12 25 | 1·03 | Western N. Atlantic Ocean |
| Mar. | 12 | Tuesday | 18 00 | 49 | E 112 19 | N 50 08 | 14 39 | 1·18 | Chita Oblast, Russia |
| Apr. | 10 | Wednesday | 18 26 | 38 | W 126 11 | N 32 01 | 17 16 | 1·39 | Eastern N. Pacific Ocean |
| May | 10 | Friday | 18 10 | 33 | W 008 27 | N 07 29 | 18 15 | 1·52 | North east Liberia |
| June | 9 | Sunday | 17 33 | 36 | E 125 10 | S 17 10 | 17 16 | 1·48 | North west Australia |
| July | 8 | Monday | 16 56 | 44 | W 087 24 | S 37 44 | 15 31 | 1·33 | Eastern S. Pacific Ocean |
| Aug. | 7 | Wednesday | 16 50 | 52 | E 063 30 | S 49 59 | 14 45 | 1·23 | West of Kerguelen Islands |
| Sept. | 5 | Thursday | 17 34 | 48 | W 141 48 | S 48 51 | 15 25 | 1·26 | South Pacific Ocean |
| Oct. | 5 | Saturday | 18 05 | 38 | E 023 19 | S 33 12 | 15 57 | 1·31 | South Africa |
| Nov. | 3 | Sunday | 17 58 | 33 | W 150 13 | S 09 31 | 15 09 | 1·28 | Central Pacific Ocean |
| Dec. | 3 | Tuesday | 17 27 | 35 | E 057 42 | N 15 38 | 13 15 | 1·14 | South of Oman |
| **2014** | | | | | | | | | |
| Jan. | 1 | Wednesday | 16 55 | 43 | W 088 05 | N 36 43 | 11 33 | 0·99 | South Kentucky, USA |
| Jan. | 31 | Friday | 16 57 | 50 | E 115 41 | N 48 13 | 11 35 | 0·96 | Eastern Mongolia |
| Mar. | 1 | Saturday | 17 47 | 45 | W 055 11 | N 45 17 | 13 28 | 1·08 | South of Newfoundland Island |
| Mar. | 31 | Monday | 18 17 | 36 | E 121 11 | N 28 44 | 15 28 | 1·26 | Zhejiang Province, China |
| Apr. | 29 | Tuesday | 18 07 | 32 | W 064 50 | N 06 01 | 16 12 | 1·35 | Central Venezuela |
| May | 29 | Thursday | 17 34 | 35 | E 108 52 | S 16 39 | 15 38 | 1·34 | N.W. of Western Australia |
| June | 27 | Friday | 16 58 | 42 | W 091 28 | S 34 49 | 14 56 | 1·27 | Eastern S. Pacific Ocean |
| July | 27 | Sunday | 16 52 | 48 | E 039 03 | S 44 40 | 15 33 | 1·28 | South east of South Africa |
| Aug. | 26 | Tuesday | 17 27 | 44 | E 149 02 | S 42 55 | 17 18 | 1·40 | East of Tasmania |
| Sept. | 24 | Wednesday | 17 57 | 36 | W 095 40 | S 28 56 | 18 06 | 1·49 | Eastern S. Pacific Ocean |
| Oct. | 24 | Friday | 17 54 | 32 | E 046 43 | S 07 36 | 16 50 | 1·43 | North of Madagascar |
| Nov. | 22 | Saturday | 17 27 | 34 | W 140 34 | N 15 04 | 14 17 | 1·24 | East of Hawaii |
| Dec. | 22 | Monday | 16 57 | 41 | E 046 53 | N 33 23 | 12 13 | 1·04 | Western Iran |
| **2015** | | | | | | | | | |
| Jan. | 20 | Tuesday | 16 58 | 46 | W 125 21 | N 42 24 | 12 06 | 0·99 | West of Oregon, USA |
| Feb. | 19 | Thursday | 17 41 | 41 | E 068 07 | N 39 08 | 13 21 | 1·08 | North west Tajikistan |
| Mar. | 20 | Friday | 18 11 | 34 | W 085 23 | N 24 20 | 14 17 | 1·17 | Gulf of Mexico |
| Apr. | 19 | Sunday | 18 06 | 32 | E 134 57 | N 03 48 | 14 09 | 1·20 | South of Palau |
| May | 18 | Monday | 17 36 | 34 | W 000 27 | S 16 28 | 13 25 | 1·15 | East of St. Helena |
| June | 16 | Tuesday | 17 03 | 40 | W 154 25 | S 31 40 | 13 16 | 1·11 | Central South Pacific Ocean |
| July | 16 | Thursday | 16 58 | 44 | E 010 43 | S 38 45 | 14 51 | 1·20 | South west of South Africa |
| Aug. | 15 | Saturday | 17 26 | 40 | E 136 44 | S 36 17 | 17 26 | 1·40 | South of South Australia |
| Sept. | 13 | Sunday | 17 53 | 34 | W 115 06 | S 24 05 | 18 52 | 1·55 | North west of Easter Island |
| Oct. | 13 | Tuesday | 17 53 | 32 | W 003 05 | S 05 25 | 17 59 | 1·53 | North east of Ascension Island |
| Nov. | 12 | Thursday | 17 29 | 34 | E 121 24 | N 14 20 | 15 36 | 1·35 | North Philippines |
| Dec. | 11 | Friday | 17 02 | 39 | W 108 44 | N 29 23 | 13 48 | 1·17 | Sonora State, Mexico |

The table can be used as a rough guide to tell when the new crescent Moon will first be seen at other places. For places with similar latitudes and west of the location in the table, first sighting should be on the same day. For places in the opposite hemisphere and west of the location in the table, first sighting will probably not occur until the following day. For places east of the location in the table, first sighting will probably not occur until the following day.

This office also supplies times of first visibility for specific places and Muslim prayer times. Please visit our website http://websurf.hmnao.com or participate in our MoonWatch project at www.crescentmoonwatch.org.