



## On The Analysis of April - June 2022 First Lunar Crescent Behavior In Nigeria

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**Abstract:** We hereby report the first crescent and lag time behaviour of the moon for the months of April to June, 2022 in Nigeria. Our working materials includes, Accurate times version 5.3.7, internet for calibrations, excel version 16.0, Google earth pro and Astrolab computer. We first download accurate times version 5.3.7 by Mohammed Ode from Mohammed Ode official website. The software has only about nine Nigerian states and capital cities which includes, Kano, Lagos, Port Harcourt, Sokoto, Maiduguri, Enugu, Katsina, Jos and Benue respectively. We first obtained all coordinates of the 36 states and federal capital territory of Nigeria using google earth after which we calibrated the software to include all 36 states and federal capital territory using the coordinates of the state capitals obtained from google earth pro. We plotted the graph of each state capitals against Moonset, State capitals against sunset and state capitals against moon lag time using excel 2019 for the months of April to June 2022 to ascertain the cities in Nigeria with the earliest Moonset/sunset and Least Moonset/sunset for the Months of January to March 2022. We also plotted a graph of state capitals against moon lag time to ascertain the time it takes the moon to be in the sky immediately after sunset in all Nigerian cities. For the month of April 2022, the sun set first in Port Harcourt with a lag time of 22mins and lastly in Abeokuta with a lag time of 23mins. For the month of May, the sun will set first in Port Harcourt at about 5:38pm with a lag time of 9mins, and last in Birni Kebbi at 6:57pm with a lag time of 9mins. For the month of June, the sun set first in Yenagoa with a lag time of 8mins and last in Asaba at 7:20pm with a lag time of 9mins.

**Key words:** Lunar, Lag time, Accurate times and sunset.

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### I. Introduction:

In astronomy, the astronomical new moon is the primary lunar phase, while the Moon and Sun have similar ecliptic longitude (Meeus, 1991). At this phase, the lunar disk isn't always seen with the unaided eye, however its presence can be detected as it occults stars in the back of it. The skinny waxing crescent is in very small and faintly seen because the Moon navigates the sky to the western horizon after sunset. The specific time date of the arrival of the astronomical new moon through this definition could be inspired through the geographical position of the observer. The term which describes one new moon to the next in the J2000.0 epoch, with a common duration of a lunation of 29.53059 days (or 29 days, 12 hours, 44 minutes, and 3 seconds) is called lunation, or synodic month, (Seidelmann, 1992). However, the period of a synodic month can range from 29.26 to 29.8 days because of the perturbing results of the Sun's gravity at the Moon's eccentric orbit (Espenak, 2016). The observation and study of first lunar crescent visibility has been projected via way of means as reported in the research work of Schaefer (1988, 1990, and 1996), Schaefer et al. (1993) Ilyas (1994), Loewinger (1995), Yallop (1997), and Fatoohi et al. (1998, 1999).

### II. Methods:

We first calibrated accurate times with the coordinates of the 36 states and Federal capital territory of Nigeria with data obtained from Google earth pro. We obtained the conjunction time for each month of observation and further calibrated the software for future prediction using best time to obtain the moonset, sunset, moon lag time, moon latitude, and moon longitude for all state capitals in Nigeria for the months of April to June 2022. These parameters were obtained for the date and best time of appearance of first lunar crescent for the months of April to June 2022. Accurate Times has a simple, compact interface that is nicely

configured, displaying our location and other data as well as the day's prayer times, (Odeh 2001). The layout slightly resembles a telescope control panel, which (not surprisingly) it is, in a way, since a button labelled Telescope includes a tool to control an astronomical telescope using data from Accurate Times (Odeh, 2004). That impressed us right away since accurate local observations are essential in Astronomy. We started by pressing the Location button, which let us choose our city from a staggeringly extensive list as well as specify our latitude and longitude and time zone manually. We also set our elevation above sea level, fine tune our distance from a default city location in kilometres for accurate moonset and sunset times, and specified the atmospheric refraction in temperature and pressure for good "seeing."

We specified the date, including calculations for future dates; Moon Times, Moon Phases, Crescent Visibility, and Sun and Moon Ephemeris (positions). The program's Preferences included highly accurate settings for twilight, summertime (Daylight Saving) settings, and other options. Accurate Times is extremely quick and easy to use, once you've set it up properly. Accurate Times is based on data from the Astronomical Crescents' Observation Project (Ilyas 1978, 1997). Using Google Earth Pro, we obtained the Longitude and Latitude of all 36 states and Federal capital territory of Nigeria. We used Accurate times software to ascertain the Moonset time, sunset time, Moon lag time (Moonset time – Sunset time), Moon Latitude, and Moon Longitude. These were obtained for 3 months (April to June 2022) as shown in table 1 – 3.

### III. Results/Discussion:

We plotted the graph of each state capitals against Moonset, State capitals against sunset and state capitals against moon lag time for the months of April to June 2022 to ascertain the cities in Nigeria with the Earliest Moonset/sunset and Least Moonset/sunset. We also plotted a graph of state capitals against moon lag time to ascertain the time it takes the moon to be in the sky immediately after sunset in all Nigerian cities.

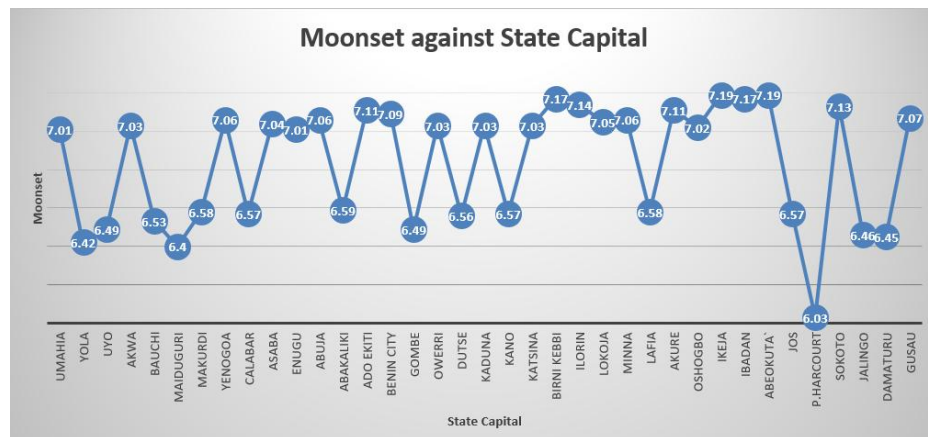


Fig 1. A plot of state capitals against moonset in all Nigerian cities for the month of April 2022.

Figure 1 shows a plot of the state capitals against moonset time in all Nigerian cities for the month of April 2022. The moon set first in Rivers State Port Harcourt at 6.03pm followed by Maiduguri in Bornu State at 6:40pm and Yola in Adamawa State at 6:42pm respectively. The moon also set last in Abeokuta (Ogun State) and Ikeja (Lagos State) at 7:19pm followed by Ibadan in Oyo State and Binin Kebbi in Kebbi State at 7:17pm respectively.

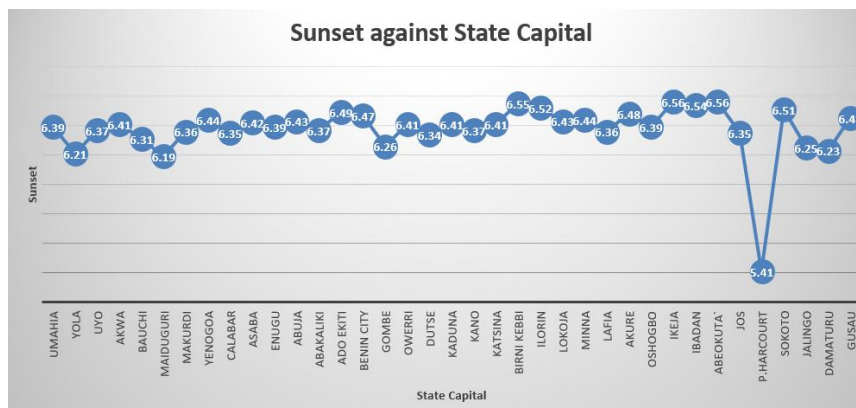


Fig 2. A plot of state capitals against sunset in all Nigerian cities for the month of April 2022

Figure 2 shows a plot of the sunset time against state capitals in all Nigerian cities for the month of April 2022. The sun set first in Rivers State Port Harcourt at 5.41pm followed by Maiduguri in Bornu State at 6:19pm and Yola in Adamawa State at 6:21pm respectively. The sun also set last at Ikeja in Lagos State concurrently with Abeokuta in Ogun State at 6:56pm respectively.

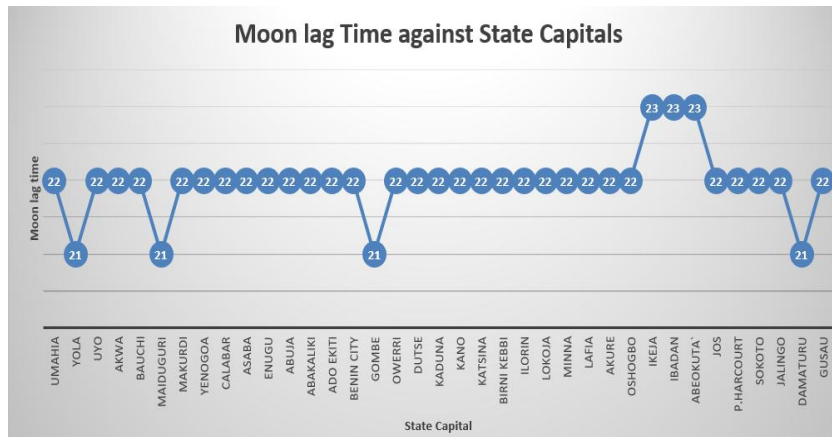


Fig 3. A plot of state capitals against moon lag time in all Nigerian cities for the moon of April 2022

In April 2022, we experienced the longest lag time for Lunar observation at Ikeja (Lagos State, Ibadan (Oyo State), and Abeokuta (Ogun State for a duration of 23 minutes. The Nigerian cities with shortest Moon lag time are Yola (Adamawa State), Maiduguri (Bornu State), Gombe (Gombe State), and Damaturu (Yobe State) for a period of 21 minutes respectively. All other cities experienced a Lunar Lag time of 22 minutes for the month of April 2022.

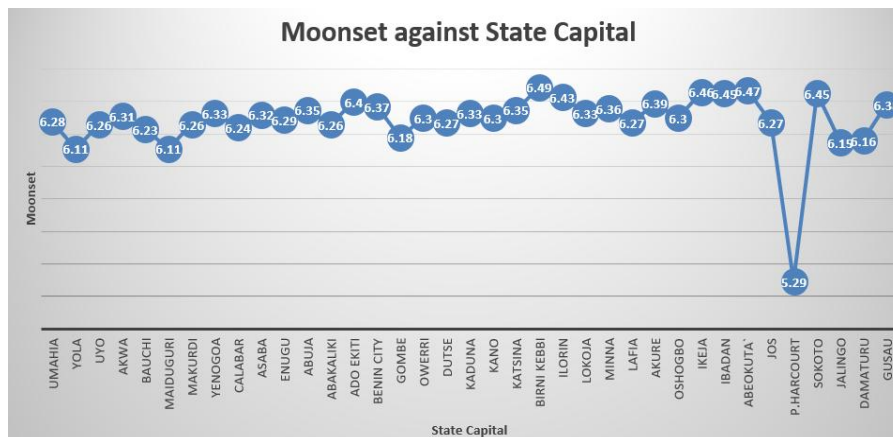


Fig 4. A plot of state capitals against moonset in all Nigerian cities for the moon of May 2022

Figure 4 shows a plot of the moonset time against state capitals in all Nigerian cities for the month of May 2022. The moon set first in Rivers State Port Harcourt at 5.59pm followed by Yola in Adamawa State concurrently at Maiduguri in Bornu State at 6:11pm respectively. The moon set last in Birni Kebbi at 6:49pm followed by Abeokuta in Ogun State at 6:47pm respectively.

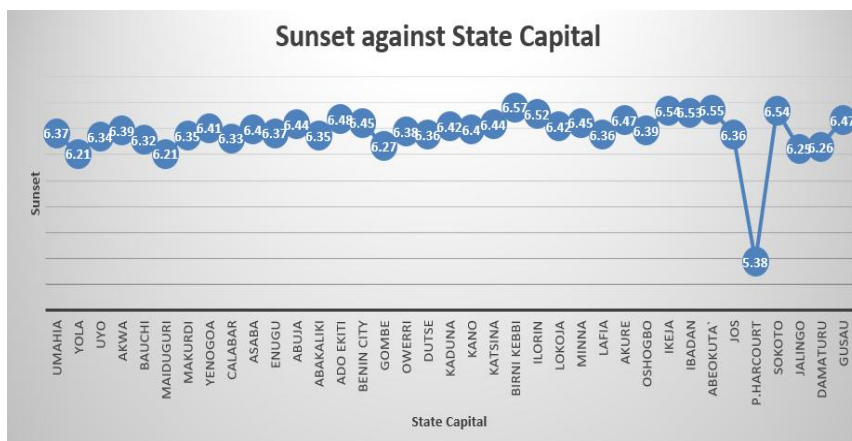


Fig 5. A plot of state capitals against sunset in all Nigerian cities for the moon of May 2022

Figure 5 shows a plot of the sunset time against state capitals in all Nigerian cities for the month of May 2022. The sun set first in Rivers State Port Harcourt at 5.38pm followed by Maiduguri in Bornu State concurrently with Yola in Adamawa State at 6:21pm. The sun set last in Birni Kebbi at 6:57pm followed by Abeokuta in Ogun State at 6:55pm and Sokoto at 6:54pm.

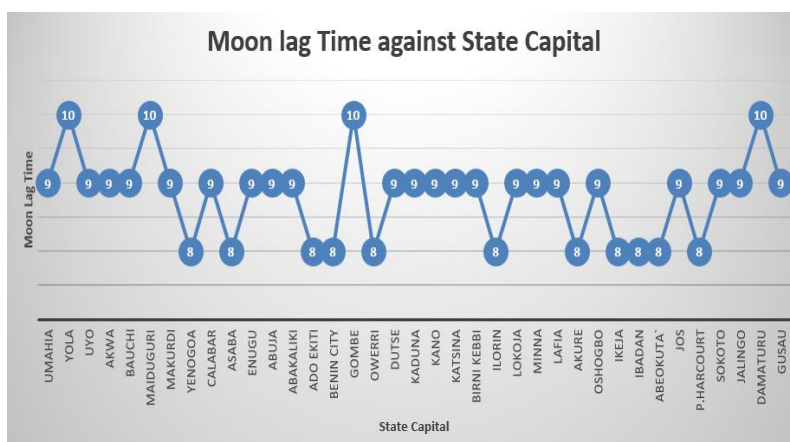


Fig 6. A plot of state capitals against moon lag time in all Nigerian cities for the moon of May 2022

In May 2022, we experienced the longest lag time for Lunar observation in Yola the capital city of Adamawa State, Maiduguri the capital of Bornu State, Gombe the Capital of Gombe State and Damaturu the Capital of Yobe State. Hence the longest time for us to observe the moon immediately after sunset is 10 minutes for the cities listed above. Yenagoa, Asaba, Ado Ekiti, Binin City, Owerri, Ilorin, Akure, Ikeja, Ibadan, Abeokuta, and Port Harcourt maintained the shortest Lag time in the month of May 2022 for a duration of 8 minutes immediately after sunset before the moon finally sets. All other cities in Nigeria maintained a lag time of 9 minutes before the moon finally sets.

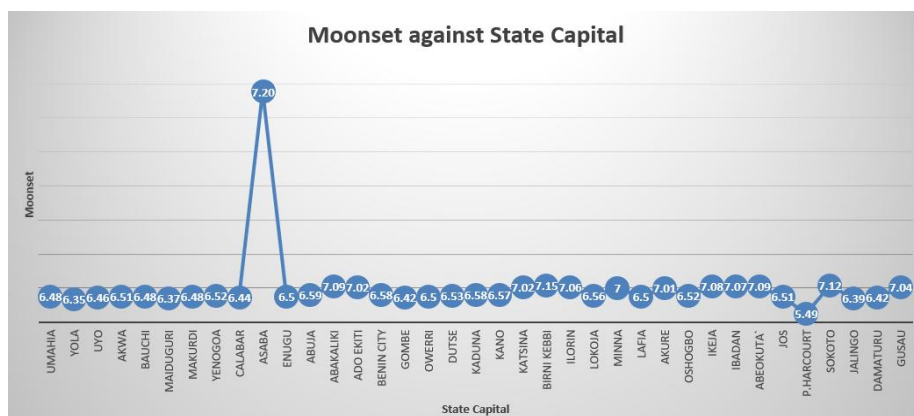


Fig 7. A plot of state capitals against moonset in all Nigerian cities for the moon of June 2022

Figure 7 shows a plot of the state capitals against moonset time in all Nigerian cities for the month of June 2022. The moon set first in Rivers State Port Harcourt at 5.49pm followed by Yola in Adamawa State at 6:35pm and Maiduguri in Bornu State at 6:37pm. Jalingo in Taraba experienced a moon set at 6:39pm while Damaturu in Yobe State both experienced moonset at 6:42pm respectively. The moon set last in Asaba (Delta State) at 7:20pm followed by Sokoto State at 7:12pm respectively.

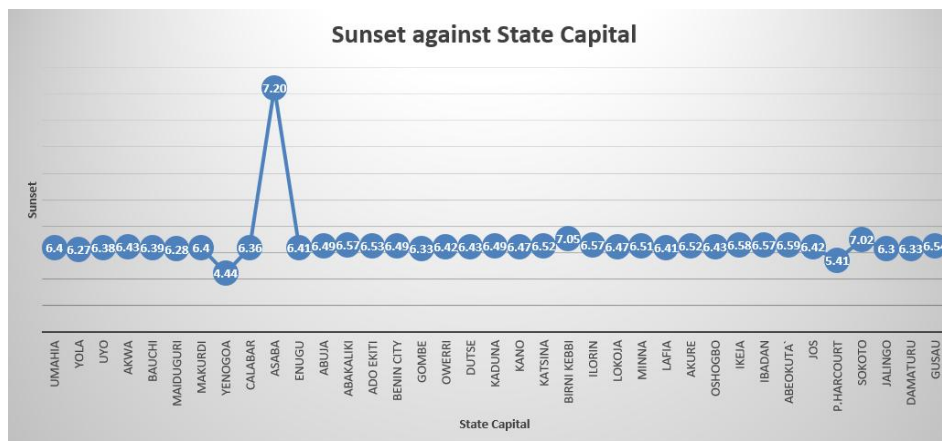


Fig 8. A plot of state capitals against sunset in all Nigerian cities for the moon of June 2022

Figure 8 shows a plot of the sunset time against state capitals in all Nigerian cities for the month of June 2022. The sun set first in Yenagoa (Bayelsa State) at 4:44pm followed by Rivers State Port Harcourt at 5.41pm and Yola in Adamawa State 6:27pm and Maiduguri in Bornu State at 6:28pm respectively. The sun set last in Asaba the capital of Delta State at 7:20pm followed by Bimi Kebbi (Kebbi State) at 7:05pm respectively.

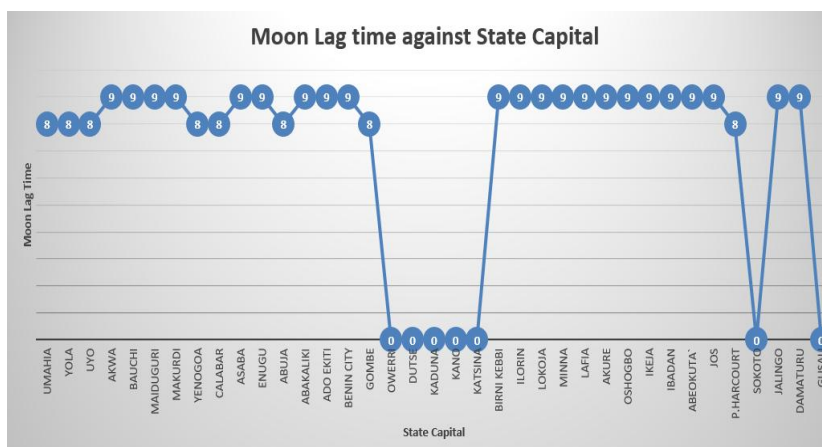


Fig 9. A plot of state capitals against moon lag time in all Nigerian cities for the moon of June 2022

In June 2022, we experienced the longest lag time for Lunar observation in Awka, Bauchi, Maiduguri, Yenagoa, Asaba, Enugu, Abakaliki, Ado Ekiti, Binin City, Birnin Kebbi, Ilorin, Lokoja, Minna, Lafia, Akure, Oshogbo, Ikeja, Ibadan, Abeokuta, Jos Jalingo and Damaturu for a period of 9 minutes respectively. Owerri, Dutse, Kaduna, Kano, Katsina, Sokoto, and Gusau will experience zero lag time. This implies that the Sun and the moon will set at the same time within these months which is a rare phenomenon in astronomy.

#### IV. Conclusion:

In had been a strong argument between the Islamic council of Nigeria (ICN) and the National space research and development agency (NASRDA) science community as regards the best place to first sight the first lunar crescent before Ramadan. While the former argued that the northern Nigerian states is best, the later suggest with scientific research that southern Nigeria offers best position for earliest visibility but bad sky due to rainfall and cloud cover from ocean and industrial carbon flares. The Northern Nigerian states offers clear sky observation advantage due to the elevation and altitude of these northern states above sea level. Our research result suggests clearly that Port Harcourt and Asaba (southern Nigerian states sights the first crescent first for the months of April to June, 2022. The month of April 2022 offers the longest lag time for first crescent observation.

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- [18]. Table 4.1 to 4.3. shows the data of sunset, moonset, moon lag time, moon latitude and moon longitude for the months of April to June 2022.

**Table 1. MPORTANT DAYS FOR LUNAR AND SOLAR OBSERVATION IN CAPITAL STATES OF NIGERIA FOR THE MONTH OF APRIL 2022**

STATE	CAP CITY	LAT[ ° N]	LONG[ ° E]	MOON	SUN	LAG TIME	MOON	MOON	DATE
				SET	SET	1ST CRE	LATITUDE	LONGITUDE	
Abia	Umahia	05 32	07 29	7:01PM	6:39PM	22M	-02°:59':18"	+17°:42':07"	Apr-22
Adamawa	Yola	09 23	12 46	6:42PM	6:21PM	21M	-03°:00':03"	+17°:31':56"	Apr-22
Akwaiibom	Uyo	05 03	07 56	6:49PM	6:37PM	22M	-02°:59':23"	+17°:41':03"	Apr-22
Anambra	Akwa	06 12	07 04	7:03PM	6:41PM	22M	-02°:59':13"	+17°:43':09"	Apr-22
Bauchi	Bauchi	10 19	09 50	6:53PM	6:31PM	22M	-02°:59':37"	+17°:37':49"	Apr-22
Borno	Maiduguri	11 50	13 09	6:40PM	6:19PM	21M	-03°:00':07"	+17°:31':01"	Apr-22
Benue	Makurdi	07 44	08 32	6:58PM	6:36PM	22M	-02°:59':26"	+17°:40':13"	Apr-22
Bayelsa	Yenogoa	04 55	06 15	7:06PM	6:44PM	22M	-02°:59':07"	+17°:44':43"	Apr-22
C/River	Calabar	04 57	08 19	6:57PM	6:35PM	22M	-02°:59':27"	+17°:40':08"	Apr-22
Delta	Asaba	06 11	06 45	7:04PM	6:42PM	22M	-02°:59':10"	+17°:43':51"	Apr-22
Enugu	Enugu	06 27	07 30	7:01PM	6:39PM	22M	-02°:59':18"	+17°:42':06"	Apr-22
FCT	Abuja	09 03	07 32	7:06PM	6:43PM	22M	-02°:59':08"	+17°:44':30"	Apr-22
Ebonyi	Abakaliki	06 20	08 06	6:59PM	6:37PM	22M	-02°:59':23"	+17°:40':55"	Apr-22
Ekiti	Ado Ekiti	07 37	05 13	7:11PM	6:49PM	22M	-02°:58':54"	+17°:47':28"	Apr-22
Edo	Benin city	06 19	05 36	7:09PM	6:47PM	22M	-02°:58':59"	+17°:46':23"	Apr-22
Gombe	Gombe	10 17	11 10	6:49PM	6:26PM	21PM	-02°:59':50"	+17°:34':54"	Apr-22
Imo	Owerri	05 29	07 02	7:03PM	6:41PM	22M	-02°:59':14"	+17°:43':06"	Apr-22
Jigawa	Dutse	11 44	09 17	6:56PM	6:34PM	22M	-02°:59':30"	+17°:39':17"	Apr-22
Kaduna	Kaduna	10 31	07 26	7:03PM	6:41PM	22M	-02°:59':14"	+17°:43':08"	Apr-22
Kano	Kano	12 00	08 31	6:57PM	6:37PM	22M	-02°:59':23"	+17°:41':02"	Apr-22
Katsina	Katsina	12 59	07 36	7:03PM	6:41PM	22M	-02°:59':13"	+17°:43':13"	Apr-22
Kebbi	Birni Kebbi	12 27	04 12	7:17PM	6:55PM	22M	-02°:58':41"	+17°:50':34"	Apr-22
Kwara	Ilorin	08 30	04 33	7:14PM	6:52PM	22M	-02°:58':47"	+17°:49':11"	Apr-22
Kogi	Lokoja	07 49	06 45	7:05PM	6:43PM	22M	-02°:59':09"	+17°:44':08"	Apr-22
Niger	Minna	09 37	06 34	7:06PM	6:44PM	22M	-02°:59':06"	+17°:44':52"	Apr-22
Nassarawa	Lafia	08 29	08 31	6:58PM	6:36PM	22M	-02°:59':26"	+17°:40':23"	Apr-22
Ondo	Akure	07 15	05 11	7:11PM	6:48PM	22M	-02°:58':56"	+17°:47':13"	Apr-22
Osun	Oshogbo	07 46	04 34	7:02PM	6:39PM	22M	-02°:59':17"	+17°:42':20"	Apr-22
Lagos	Ikeja	06 35	03 20	7:19PM	6:56PM	23M	-02°:58':37"	+17°:51':24"	Apr-22
Oyo	Ibadan	07 23	03 55	7:17PM	6:54PM	23M	-02°:58':42"	+17°:50':16"	Apr-22
Ogun	Abeokuta	07 09	03 21	7:19PM	6:56PM	23M	-02°:58':37"	+17°:51':28"	Apr-22
Plateau	Jos	09 56	08 53	6:57PM	6:35PM	22M	-02°:59':28"	+17°:39':47"	Apr-22
Rivers	P.Harcourt	04 45	07 00	6:03PM	5:41PM	22M	-02°:59':14"	+17°:43':01"	Apr-22
Sokoto	Sokoto	13 04	05 14	7:13PM	6:51PM	22M	-02°:58':50"	+17°:48':22"	Apr-22
Taraba	Jalingo	08 54	11 22	6:46PM	6:25PM	22M	-02°:59':53"	+17°:34':13"	Apr-22
Yobe	Damaturu	11 44	11 57	6:45PM	6:23PM	21M	-02°:59':56"	+17°:33':26"	Apr-22
Zamfara	Gusau	12 10	06 40	7:07PM	6:45PM	22M	-02°:59':05"	+17°:45':06"	Apr-22

**Table 2. IMPORTANT DAYS FOR SOLAR AND LUNAR OBSERVATION IN CAPITAL STATES OF NIGERIA FOR THE MONTH OF MAY 2022**

				MOON	SUN	MOON LAG TIME	MOON	MOON	DATE
STATE	CAP CITY	LAT[° N]	LONG[° E]	SET	SET	OF 1ST CRESENT	LATITUDE	LONGITUDE	
Abia	Umahia	05 32	07 29	6:28PM	6:37PM	09M	-01°:13':55"	+38°:59':52"	May-22
Adamawa	Yola	09 23	12 46	6:11PM	6:21PM	10M	-01°:14':39"	+38°:51':44"	May-22
Akwaibom	Uyo	05 03	07 56	6:26PM	6:34PM	09M	-01°:14':01"	+38°:58':40"	May-22
Anambra	Akwa	06 12	07 04	6:31PM	6:39PM	09M	-01°:13':48"	+39°:01':06"	May-22
Bauchi	Bauchi	10 19	09 50	6:23PM	6:32PM	09M	-01°:14':07"	+38°:57':43"	May-22
Borno	Maiduguri	11 50	13 09	6:11PM	6:21PM	10M	-01°:14':38"	+38°:51':55"	May-22
Benue	Makurdi	07 44	08 32	6:26PM	6:35PM	09M	-01°:14':00"	+38°:58':56"	May-22
Bayelsa	Yenogoa	04 55	06 15	6:33PM	6:41PM	08M	-01°:13':43"	+39°:02':04"	May-22
C/River	Calabar	04 57	08 19	6:24PM	6:33PM	09M	-01°:14':06"	+38°:57':45"	May-22
Delta	Asaba	06 11	06 45	6:32PM	6:40PM	08M	-01°:13':45"	+39°:01':45"	May-22
Enugu	Enugu	06 27	07 30	6:29PM	6:37PM	09M	-01°:13':53"	+39°:00':13"	May-22
FCT	Abuja	09 03	07 32	6:35PM	6:44PM	09M	-01°:13':35"	+39°:03':33"	May-22
Ebonyi	Abakaliki	06 20	08 06	6:26PM	6:35PM	09M	-01°:13':59"	+38°:59':02"	May-22
Ekiti	Ado Ekiti	07 37	05 13	6:40PM	6:48PM	08M	-01°:13':23"	+39°:05':43"	May-22
Edo	Benin city	06 19	05 36	6:37PM	6:45PM	08M	-01°:13':32"	+39°:04':12"	May-22
Gombe	Gombe	10 17	11 10	6:18PM	6:27PM	10M	-01°:14':21"	+38°:54':56"	May-22
Imo	Owerri	05 29	07 02	6:30PM	6:38PM	08M	-01°:13':50"	+39°:00':46"	May-22
Jigawa	Dutse	11 44	09 17	6:27PM	6:36PM	09M	-01°:13':56"	+38°:59':40"	May-22
Kaduna	Kaduna	10 31	07 26	6:33PM	6:42PM	09M	-01°:13':39"	+39°:02':51"	May-22
Kano	Kano	12 00	08 31	6:30PM	6:40PM	09M	-01°:13':46"	+39°:01':27"	May-22
Katsina	Katsina	12 59	07 36	6:35PM	6:44PM	09M	-01°:13':33"	+39°:03':53"	May-22
Kebbi	Birni Kebbi	12 27	04 12	6:49PM	6:57PM	09M	-01°:12':57"	+39°:10':36"	May-22
Kwara	Ilorin	08 30	04 33	6:43PM	6:52PM	08M	-01°:13':13"	+39°:07':40"	May-22
Kogi	Lokoja	07 49	06 45	6:33PM	6:42PM	09M	-01°:13':40"	+39°:02':40"	May-22
Niger	Minna	09 37	06 34	6:36PM	6:45PM	09M	-01°:13':32"	+39°:04':04"	May-22
Nassarawa	Lafia	08 29	08 31	6:27PM	6:36PM	09M	-01°:13':58"	+38°:59':23"	May-22
Ondo	Akure	07 15	05 11	6:39PM	6:47PM	08M	-01°:13':25"	+39°:05':21"	May-22
Osun	Oshogbo	07 46	04 34	6:30PM	6:39PM	09M	-01°:13':49"	+39°:00':57"	May-22
Lagos	Ikeja	06 35	03 20	6:46PM	6:54PM	08M	-01°:13':06"	+39°:09':02"	May-22
Oyo	Ibadan	07 23	03 55	6:45PM	6:53PM	08M	-01°:13':10"	+39°:08':17"	May-22
Ogun	Abeokuta`	07 09	03 21	6:47PM	6:55PM	08M	-01°:13':04"	+39°:09':19"	May-22
Plateau	Jos	09 56	08 53	6:27PM	6:36PM	09M	-01°:13':58"	+38°:59':23"	May-22
Rivers	P.Harcourt	04 45	07 00	5:29PM	5:38PM	08M	-01°:13':52"	+39°:00':27"	May-22
Sokoto	Sokoto	13 04	05 14	6:45PM	6:54PM	09M	-01°:13':07"	+39°:08':46"	May-22
Taraba	Jalingo	08 54	11 22	6:15PM	6:25PM	09M	-01°:14':28"	+38°:53':44"	May-22
Yobe	Damaturu	11 44	11 57	6:16PM	6:26PM	10M	-01°:14':26"	+38°:54':10"	May-22
Zamfara	Gusau	12 10	06 40	6:38PM	6:47PM	09M	-01°:13':26"	+39°:05':20"	May-22

**Table 3. IMPORTANT DAYS FOR SOLAR AND LUNAR OBSERVATION IN CAPITAL STATES OF NIGERIA FOR THE MONTH OF JULY 2022**

				MOON	SUN	MOON LAG TIME	MOON	MOON	DATE
STATE	CAP CITY	LAT[° N]	LONG[° E]	MOONSET	SUNSET	MOON LAG TIME	LATITUDE	LONGITUDE	
Abia	Umahia	05 32	07 29	6:48PM	6:40PM	08M	+01°:46':12"	+72°:08':57"	Jun-22
Adamawa	Yola	09 23	12 46	6:35PM	6:27PM	08M	+01°:45':37"	+72°:02':12"	Jun-22
Akwaibon	Uyo	05 03	07 56	6:46PM	6:38PM	08M	+01°:46':05"	+72°:07':38"	Jun-22
Anambra	Akwa	06 12	07 04	6:51PM	6:43PM	09M	+01°:46':20"	+72°:10':22"	Jun-22
Bauchi	Bauchi	10 19	09 50	6:48PM	6:39PM	09M	+01°:46':09"	+72°:08':23"	Jun-22
Borno	Maiduguri	11 50	13 09	6:37PM	6:28PM	09M	+01°:45':42"	+72°:03':13"	Jun-22
Benue	Makurdi	07 44	08 32	6:48PM	6:40PM	09M	+01°:46':11"	+72°:08':44"	Jun-22
Bayelsa	Yenogoa	04 55	06 15	6:52PM	4:44PM	08M	+01°:46':22"	+72°:10':55"	Jun-22
C/River	Calabar	04 57	08 19	6:44PM	6:36PM	08M	+01°:46':01"	+72°:06':43"	Jun-22
Delta	Asaba	06 11	06 45	18:53PM	18:44PM	09M	+01°:46':23"	+72°:11':00"	Jun-22
Enugu	Enugu	06 27	07 30	6:50PM	6:41PM	09M	+01°:46':16"	+72°:09':36"	Jun-22
FCT	Abuja	09 03	07 32	6:59PM	6:49PM	08M	+01°:46':37"	+72°:13':45"	Jun-22
Ebonyi	Abakaliki	06 20	08 06	7:09PM	6:57PM	09M	+01°:46':09"	+72°:08':24"	Jun-22
Ekiti	Ado Ekiti	07 37	05 13	7:02PM	6:53PM	09M	+01°:46':45"	+72°:15':20"	Jun-22
Edo	Benin city	06 19	05 36	6:58PM	6:49PM	09M	+01°:46':35"	+72°:13':26"	Jun-22
Gombe	Gombe	10 17	11 10	6:42PM	6:33PM	08M	+01°:45':55"	+72°:05':39"	Jun-22
Imo	Owerri	05 29	07 02	6:50PM	6:42PM	10M	+01°:46':17"	+72°:09':49"	Jun-22
Jigawa	Dutse	11 44	09 17	6:53PM	6:43PM	10M	+01°:46':21"	+72°:10':45"	Jun-22
Kaduna	Kaduna	10 31	07 26	6:58PM	6:49PM	10M	+01°:46':36"	+72°:13':29"	Jun-22
Kano	Kano	12 00	08 31	6:57PM	6:47PM	10M	+01°:46':31"	+72°:12':35"	Jun-22
Katsina	Katsina	12 59	07 36	7:02PM	6:52PM	10M	+01°:46':45"	+72°:15':16"	Jun-22
Kebbi	Birni Kebbi	12 27	04 12	7:15PM	7:05PM	09M	+01°:47':18"	+72°:21':39"	Jun-22
Kwara	Ilorin	08 30	04 33	7:06PM	6:57PM	09M	+01°:46':57"	+72°:17':29"	Jun-22
Kogi	Lokoja	07 49	06 45	6:56PM	6:47PM	09M	+01°:46':30"	+72°:12':25"	Jun-22
Niger	Minna	09 37	06 34	7:00PM	6:51PM	09M	+01°:46':40"	+72°:14':21"	Jun-22
Nassaraw	Lafia	08 29	08 31	6:50PM	6:41PM	09M	+01°:46':15"	+72°:09':26"	Jun-22
Ondo	Akure	07 15	05 11	7:01PM	6:52PM	09M	+01°:46':43"	+72°:14':52"	Jun-22
Osun	Oshogbo	07 46	04 34	6:52PM	6:43PM	09M	+01°:46':21"	+72°:10':43"	Jun-22
Lagos	Ikeja	06 35	03 20	7:08PM	6:58PM	09M	+01°:47':00"	+72°:18':14"	Jun-22
Oyo	Ibadan	07 23	03 55	7:07PM	6:57PM	09M	+01°:46':58"	+72°:17':45"	Jun-22
Ogun	Abeokuta	07 09	03 21	7:09PM	6:59PM	09M	+01°:47':03"	+72°:18':42"	Jun-22
Plateau	Jos	09 56	08 53	6:51PM	6:42PM	09PM	+01°:46':17"	+72°:09':52"	Jun-22
Rivers	P.Harcourt	04 45	07 00	5:49PM	5:41PM	08PM	+01°:46':14"	+72°:09':19"	Jun-22
Sokoto	Sokoto	13 04	05 14	7:12PM	7:02PM	10PM	+01°:47':10"	+72°:20':02"	Jun-22
Taraba	Jalingo	08 54	11 22	6:39PM	6:30PM	09PM	+01°:45':47"	+72°:04':02"	Jun-22
Yobe	Damaturu	11 44	11 57	6:42PM	6:33PM	09PM	+01°:45':53"	+72°:05':22"	Jun-22
Zamfara	Gusau	12 10	06 40	7:04PM	6:54PM	10PM	+01°:46':51"	+72°:16':25"	Jun-22