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TOTAL LUNAR ECLIPSE OF 10 DECEMBER 2011

Eclipses can take place whenever the Sun, the Earth, and the Moon are aligned or nearly in a straight line. As the Moon orbits the Earth, it reaches points along its orbit where it is in line with the Sun, but usually its orbit is tilted (inclined) with the Earth's orbit around the Sun. When the Moon is between the Earth and the Sun (conjunction) it is called a New Moon, and when the Earth is between the Sun and the Moon (opposition), it is called a Full Moon.

A lunar eclipse occurs when the Full Moon enters the Earth's shadow (umbra) as it orbits the Earth as shown in Figs 1. Lunar eclipses can be observed from all the areas that will fall into the nigh time during a lunar eclipse.

A total lunar eclipse is predicted to occur on Satur**day, 15th Muharram 1433 H** (10th **December 2011**) according to Umm Al-Qura calendar. People around the world can see some stages of the lunar eclipse except North and South Americas and West Africa. Observers in areas located in Alaska, North Canada, Australia, New Zealand, and Central & Eastern Asia can see all the phases of the eclipse). The Moon

Fig (1): Lunar Eclipse: The Figure shows Geometry of a lunar Eclipse (not

rises in the GCC countries and it is already partially eclipsed. The entire eclipse will last for about three hours and thirty two minutes while the total phae lasts for about fifty one minutes. Observers in Saudi Arabia can watch some phases of the lunar eclipse as indicated in the following table.
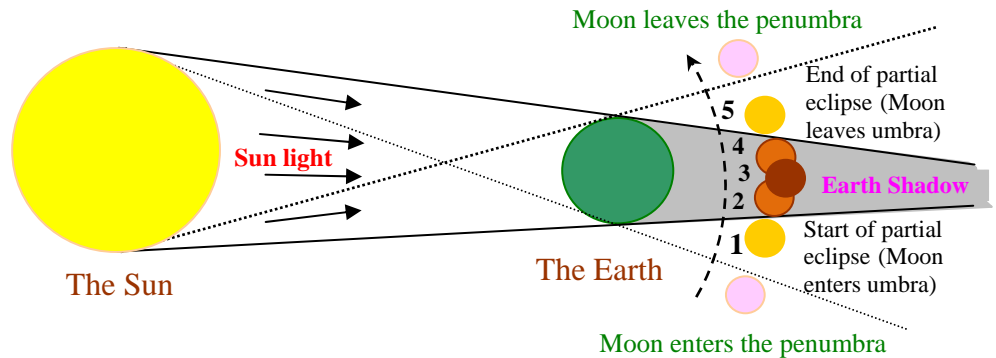
According to the Local Time of Saudi Arabia (GMT+3), the start of the partial lunar eclipse (the instance moon touches the Earth's Shadow, no. **1** in Fig. 1) will occur at about **3:46 p.m.** (The Moon is still below the Eastern horizon in all GCC countries). The totality phase starts at about **5:09 p.m.**, see no. **2** in Fig. 1. The maximum total lunar eclipse, no. **3** in Fig. 1, happens at about **5:32 p.m.** the totality phase, no. **4** in Fig. 1, ends at **5:57 p.m.** and the eclipse ends at about **7:18 p.m**. (the instance the moon completely emerge the earth's shadow and that is the end of the observable lunar eclipse, no. **5** in Fig. 1.

City	Makkah	Madinah	Riyadh	Dammam	Abha	Tubuk	Buraidah
Sunset / Moonrise	5:40 p.m.	5:34 p.m.	5:06 p.m.	4:48 p.m.	5:35 p.m.	5:38 p.m.	5:13 p.m.
Begaining of Partial Phase	3:46 p.m.	3:46 p.m.	3:46 p.m.	3:46 p.m.	3:46 p.m.	3:46 p.m.	3:46 p.m.
Begaining of Totality	5:06 p.m.	5:06 p.m.	5:06 p.m.	5:06 p.m.	5:06 p.m.	5:06 p.m.	5:06 p.m.
Middile of totality	5:32 p.m.	5:32 p.m.	5:32 p.m.	5:32 p.m.	5:32 p.m.	5:32 p.m.	5:32 p.m.
Ends of the Totality	5:57 p.m.	5:57 p.m.	5:57 p.m.	5:57 p.m.	5:57 p.m.	5:57 p.m.	5:57 p.m.
Ends of the eclipse	7:18 p.m.	7:18 p.m.	7:18 p.m.	7:18 p.m.	7:18 p.m.	7:18 p.m.	7:18 p.m.
Duration of Totality	17 min.	22 min.	51 min.	51 min.	21 min.	18 min.	44 min.
Duration of Partial phase (h:m)	1:38	1:44	2:12	2:30	1:43	1:40	2:05

Please remember that Eclipses or any other celestial phenomena are not related to life, death, or destiny or fate of a person. A solar eclipse coincided with the day of the death of Ibraheem, son of our Prophet Mohammad – PBUH (ﷺ) and people believed that it happend because of his death, but our Prophet (ﷺ) said: (what the meaning is) the Sun and the Moon are Signs of Allah and they will NOT be eclipsed for the death or the life of any person, if you see them make dua'a to Allah and pray till it is over. Therefore, do not forget to observe the Eclipse prayer during the eclipse time as directed to us by our Prophet (ﷺ).
The Eclipse Prayer has two lengthy Roka'ahs and threre are two lengthy rokoua and two lengthy sojoud in each roka'ah.

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Physics Department and Sultan Bin AbdulAziz Science & Techology Center (Scitech) invite you to Lunar Eclipse observation at Scitech location on Al-Khobar Cornach from 5:15 to 7:15 p.m. on Saturday 10 December 2011.

Total Lunar Eclipse of 2011 Dec 10

Ecliptic Conjunction = 14:37:28.9 TD (= 14:36:21.4 UT)
Greatest Eclipse = 14:32:56.0 TD (= 14:31:48.5 UT)

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Penumbral Magnitude = 2.1860	P. Radius = 1.2023°	Gamma = -0.3882
Umbral Magnitude = 1.1061	U. Radius = 0.6609°	Axis = 0.3571°

Saros Series = 135   Member = 23 of 71

Sun at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 17h08m35.0s
Dec. = -22°54'38.7"
S.D. = 00°16'14.5"
H.P. = 00°00'08.9"

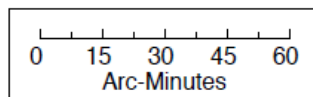## Moon at Greatest Eclipse
(Geocentric Coordinates)

R.A. = 05h08m33.9s
Dec. = +22°33'13.3"
S.D. = 00°15'02.4"
H.P. = 00°55'11.7"

N

Earth's Penumbra

Earth's Umbra

Ecliptic

E — — **W**

P4   U4   U3   U2   U1   P1

Greatest

S
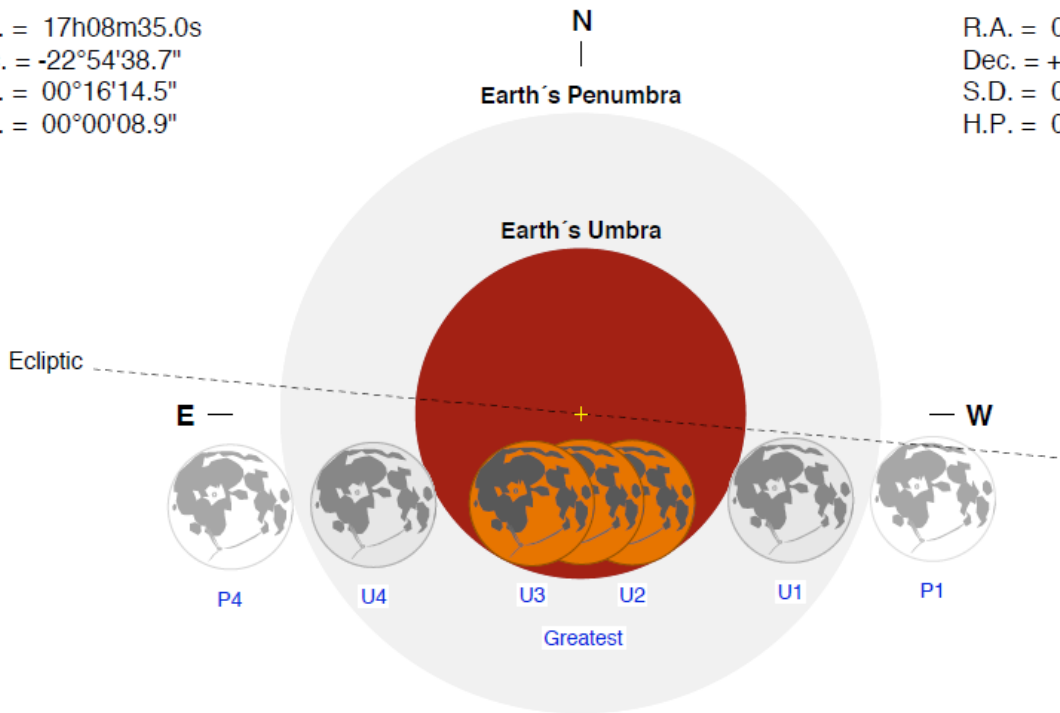
Eclipse Durations

Penumbral = 05h56m28s
Umbral = 03h32m17s
Total = 00h51m08s

ΔT = 68 s
Rule = CdT (Danjon)
Eph. = VSOP87/ELP2000-85

0	15	30	45	60

Arc-Minutes

F. Espenak, NASA's GSFC
eclipse.gsfc.nasa.gov/eclipse.html

Eclipse Contacts

P1 = 11:33:32 UT
U1 = 12:45:42 UT
U2 = 14:06:16 UT
U3 = 14:57:24 UT
U4 = 16:17:58 UT
P4 = 17:30:00 UT

P4 U4 U3 U2 U1 P1   P4 U4 U3 U2 U1 P1

Eclipse at MoonSet

No Eclipse Visible

Eclipse at MoonRise

All Eclipse Visible