CRATER TIMING

FOR

TOTAL LUNAR ECLIPSE

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By

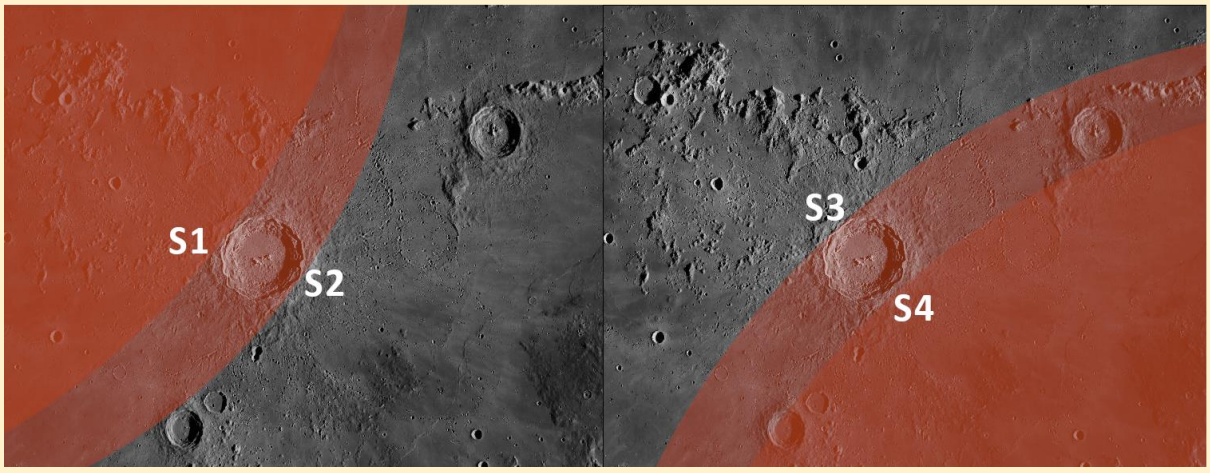
RAVINDRA ARADHYA

PRESIDENT, ABAA

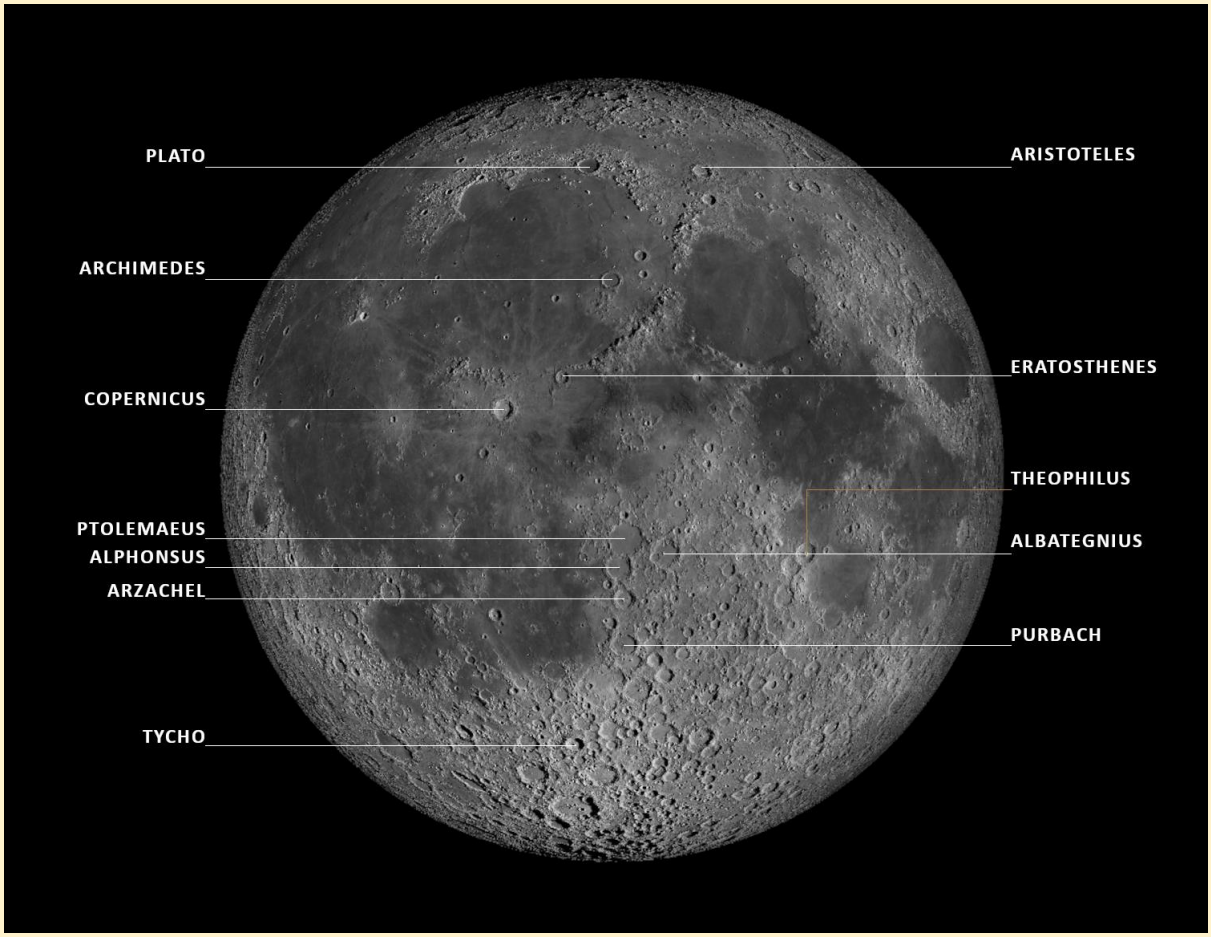
Crater timing during lunar eclipses has been historically used to refine our understanding of the Moon's motion and the shape of Earth's shadow. It will be good exercise for the amateur astronomers, students and science enthusiasts alike to time the Umbral Shadow moving across the lunar surface. Timing can be done as a group activity or individually, either through direct observation or photography. In all cases, the eclipse becomes more interesting and educational.

I assume that people are familiar with the craters and their positions in the moon. For reference I have included an image of the full Moon with the names of the craters mentioned in the timing list.

The list contains the name of the crater, size of the crater in KM, time of the shadow touching the rim of the crater (S1) , full immersion time (S2), Time of shadow exiting the rim of the crater (S3), time of full exit of shadow (S4).



CRATERS NAMES AND LOCATION



All the craters are visible from 2nd of September 2025 giving good few days to familiarize the location of the craters and the names through the binoculars or telescopes. Spending some time observing the moon when there are windows of opportunities considering the monsoon clouds.

Here are the times of the rise of the moon and the transit time (highest point in the sky) for practice run if the clouds permit.

DATE	RISE	TRANSIT
2/9/2025	2:19PM IST	8:01PM IST
3/9/2025	3:10PM IST	8:55PM IST
4/9/2025	4:00PM IST	9:50PM IST
5/9/2025	4:47PM IST	10:42PM IST
6/9/2025	5:32PM IST	11:30PM IST

On the eclipse day as the Umbral shadow passes on the moon, the timing of the passing can be done. It is always good idea to start observing few minutes ahead of the predicted time and continue until the shadow completely leaves the crater. Knowing the rate of change of moon and the shadow movement in the sky, several parameters can be estimated: the diameter of the umbra, the size of the craters, and the velocity of the shadow

LUNAR DETAILS FOR 7/9/2025

ANGULAR SIZE 32' 44"

DISTANCE 369915KM

DIAMETER OF MOON 3474.8KM

List of the time of Umbral Shadow passing over the craters. The details of the contact of the shadow S1 to S4 at the crater is given on page 2.

CRATER	DIAMETER	S1	S2	S3	S4
COPERNICUS	93	22:16:40	22:18:33	00:48:42	00:50:32
PLATO	100	22:16:58	22:18:33	00:56:40	00:58:12
ERATOSTHENES	30	22:20:15	22:21:10	00:54:14	00:55:14
ARCHIMEDES	83	22:20:46	22:22:25	00:58:22	00:59:42
ARISTOTELES	88	22:25:18	22:26:52	01:05:12	01:06:34
PTOLEMAEUS	154	22:29:20	22:32:25	00:55:12	00:58:02
ALPHONSUS	118	22:30:40	22:32:45	00:54:12	00:56:12
ALBATEGNIUS	136	22:33:12	22:35:32	00:58:12	01:00:22
PURBACH	118	22:34:40	22:37:10	00:52:08	00:54:28
TYCHO	86	22:37:40	22:39:15	00:44:18	00:46:08
THEOPHILUS	100	22:43:10	22:44:40	01:09:28	01:11:08
ARZACHEL	98	22:32:40	22:34:35	00:54:12	00:55:42

Clear skies and Happy Observing