

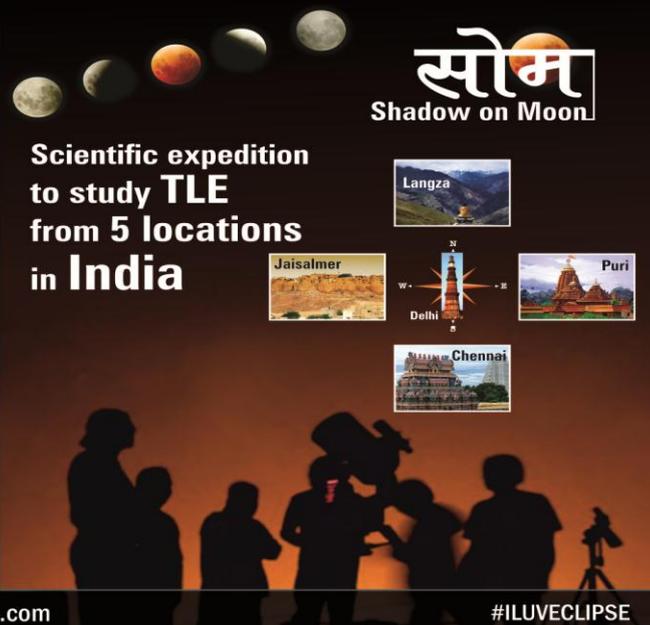
Total Lunar Eclipse 2018

27th July

Longest Total Lunar Eclipse of the Century

- Photography • Data Validation • Crater shadow timings
- Web Cast • Mass Popularization • Myth breaking

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#ILUVECLIPSE

ACTIVITY: MEASURE THE CHANGE IN LUMINOSITY AND HUE DURING TOTAL LUNAR ECLIPSE USING DANJON SCALE

Be a part of an all India effort to measure the luminosity changes and compare the results from different locations

OBJECTIVE

In this activity, the brightness and hue of the Total Lunar eclipse as seen by an observer will be classified using the Danjon scale.

SUMMARY

The brightness of the moon varies widely from one eclipse to another. Many factors can affect the appearance of the Moon during a lunar eclipse including the geometry of the Moon's path through the Earth's umbra. The Earth's atmospheric condition also makes a difference as the atmosphere contains solid particles (dust, debris), and this material refracts some of the Sun's rays into the shadow. Extensive cloud cover along Earth's limb also tends to darken the eclipse by blocking sunlight. Lunar eclipses can thus visually appear different at different occurrences and locations.

Thus, visual estimates and a careful description of the colors seen on the totally eclipsed moon and their changes in different phases is valuable.

Using the Danjon scale, we can match and classify the shadow and hue of the eclipse as observed. In the early 20th century, French astronomer André Danjon introduced the five-point scale of lunar luminosity ("L") for evaluating and classifying the visual appearance and brightness of the Moon during total lunar eclipses. See the description and scale on next page.

WHAT CAN WE EVALUATE: Based on observations and recording of Danjon scale, one can conclude:

- How luminosity changed according to comparison with the Danjon at the phases (1) Beginning of Total eclipse (ii) At Maximum (iii) Just before total eclipse ends. This will give an idea of coverage and to get an impression of both the inner and outer umbrae.
- A compiled set of observations from across different locations in India will give a more comprehensive idea of how luminosity of the eclipse was viewed in different locations. This may point to clouds, atmospheric conditions etc as being causes of observed difference.

MEASUREMENTS:

The assignment of an 'L' value to lunar eclipses is best done with the naked eye, binoculars or a small telescope near the time of mid-totality. It's also useful to examine the Moon's appearance just after the beginning and before the end of totality. The Moon is then near the edge of the shadow and provides an opportunity to assign an 'L' value to the outer umbra.

Examine the moon in comparison to the Danjon scale 3 times during Total Lunar Eclipse phase. Take 1 measurement in each of these stages (1) Beginning of Total eclipse (ii) At Maximum (iii) Just before total eclipse ends. Observe which figure in the Danjon scale the colour of the moon most closely resembles and record it along with time observed. Report it using the reporting section provided.

To judge the Danjon number, you can use your naked eye, binoculars or a small telescope at low power. You can also record a fractional estimate, such as 1.8 or 2.5, as may seem appropriate.

DANJON SCALE MEASUREMENTS:

The **Danjon Scale** of lunar eclipse brightness is a five-point scale useful for measuring the appearance and luminosity of the Moon during a lunar eclipse. An eclipse's rating on the Danjon Scale is traditionally denoted by the letter L.



The scale is defined as follows:

L value	Description
0	Very dark eclipse. Moon almost invisible, especially at greatest eclipse.
1	Dark Eclipse, gray or brownish in coloration. Details distinguishable only with difficulty.
2	Deep red/rust-colour eclipse. Very dark central shadow, while outer edge of umbra is relatively bright.
3	Brick-red eclipse. Umbra shadow usually has a bright or yellow rim.
4	Very bright copper-red or orange eclipse. Umbra shadow has a bluish, very bright rim.

OBSERVATION OF LUNAR ECLIPSE MATCHED TO DANJON SCALE



TLE 2018 – TOTAL LUNAR ECLIPSE – DANJON SCALE MEASUREMENTS:

NAME: _____

INSTITUTE: _____

CONTACT NUMBER/EMAIL: _____

OBSERVATION VENUE (Location and Lat./Lon. if known): _____

Luminosity Recording on Danjon Scale: *(Note the timing and tick on the L value that your visual observation matches best)*

Eclipse Stages	Timing	L= 0	L=1	L=2	L=3	L=4
Just after Total Begins						
Maximum Eclipse						
Just before Total Ends						

you can submit it online here: <https://goo.gl/N9yLR1>

For any other information or query, write to us at: outreach@space-india.com

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