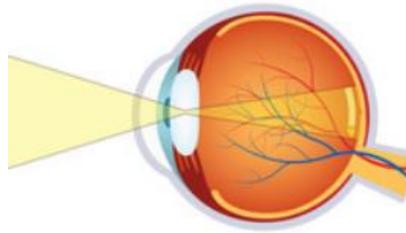


Thursday, March 21, 2024

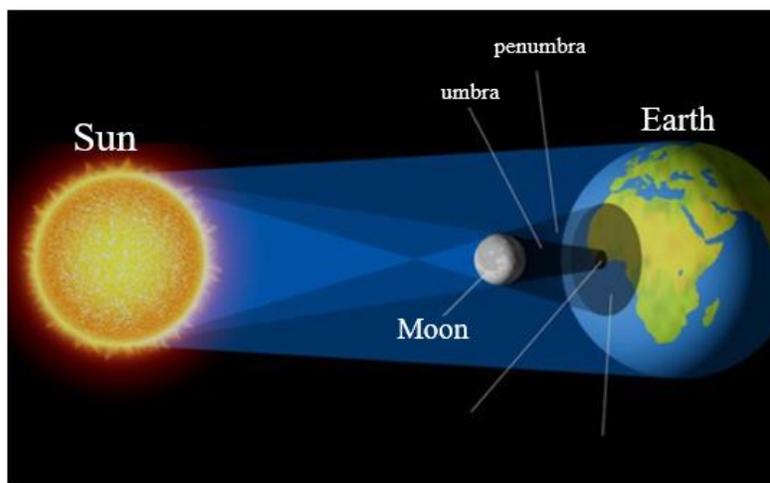
Why is a solar eclipse dangerous for the eye &
How can parents ensure safe viewing?



After 51 years of waiting (July 10, 1972), a total solar eclipse, a fascinating event is back across the skies of Canada, the United States and Mexico. Certainly, this captivating show of the universe will be directly visible from our province of Quebec, which induces a momentum among its population.

What is a solar eclipse?

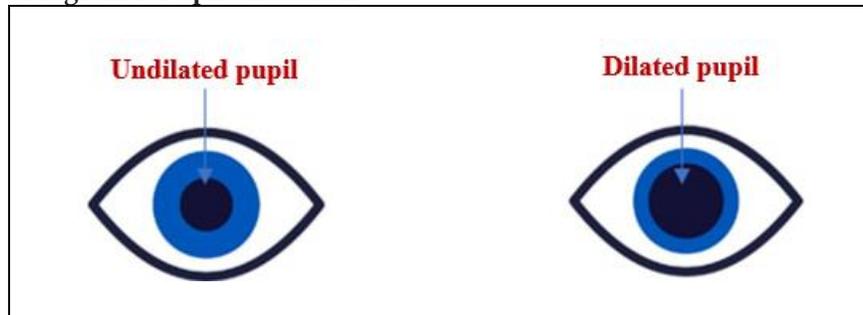
First, the word eclipse derives from the Greek word, ekleipsis , which means: " Not to appear" in reference to a celestial body ¹ . Through the lenses of astronomy, a solar eclipse is the total or partial disappearance of one celestial body (the sun) by another (the moon). Specifically, this occurs when the moon passes between the sun and the earth which becomes obscured by the lunar shadow.



Why is a solar eclipse dangerous for the eye ?

In the absence of sunlight or in the presence of low light, the nervous system naturally triggers a physiological response which causes the pupil of the eye to dilate to let in more artificial light (manufactured, e.g. street lamp, light fixture, light bulb).

Diagram 1. Pupil dilatation



This allows the eye to gather as much light to maintain optimal vision. Thus, the diameter of the pupil can double and reach 4 millimeters to 8 millimeters in total darkness ². During the solar eclipse, it will get darker and darker and, subsequently, the pupil will naturally dilate while the sun will still be present and will continue to emit ultraviolet and infrared rays which will be able to enter in greater quantities into the eye.

LIGHT THOUGHT

During the solar eclipse, it will get darker and darker and, subsequently, the pupil will naturally dilate while the sun will still be present and continue its radiation.

In addition, during the day, it is more difficult to stare at the sun because the visible light from the sun is dazzling, the eye automatically protects itself through blinking reflexes (closing/opening of the eyelids) and a narrowing of the pupil, however during a solar eclipse, the visible light of the sun is gradually blocked by the moon which makes staring possible while there is still emission of invisible radiation (UV and Infrared rays).

On the one hand, it should be mentioned that the majority of UV rays are blocked by the ozone layer and therefore only a fraction reaches the human body. On the other hand, atmospheric gases absorb a small amount of infrared radiation therefore much of it reaches the Earth's surface. Consequently,

when viewing an eclipse, the main danger for the eye comes from infrared radiation which, after a quantifiable number of seconds, can burn the retina³ whose photoreceptors capture visible light to transmit it to the brain. Surely, for eyesight, this causes irreversible damage combined with eye pain (photokeratitis) caused by ultraviolet rays.

LIGHT THOUGHT

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How can parents ensure safe viewing?

Here are 3 non-exclusive ways parents can ensure their children view the solar eclipse safely

1. Watch online

Several scientific or public organizations will broadcast free online and live from the observation point. Indeed, this way is the safest and pleasant to watch in the comfort of your home with the whole family. For the Astrolab broadcast , [CLICK HERE](#)

2. Protective glasses for eclipse

Get safety glasses specially designed for watching an eclipse that are certified and manufactured according to international standards⁴ ISO 12312-2 . Impartially, no mass production of technical objects has a zero risk of defect; therefore, before wearing the glasses it is advisable to examine them carefully and in case a scratch or crack is detected, they should be replaced before viewing the show. Please note that eclipse glasses can, if necessary, be superimposed on your regular glasses if their dimensions allow them to cover your eyes.

3. Use a camera at home

Whether it is placed on a tripod or attached to a wall in your home and controlled by an App, it is possible to use a camera at home to view the eclipse. However, it is imperative to follow the steps below to protect your eyes and your equipment. Purchase a solar filter for eclipse observation from a specialized store and install it correctly in front of your camera lens. It should be noted that looking at the sun through a camera without a filter can also damage your equipment and your eyes, therefore the solar filter is necessary.

ii. Before the eclipse begins, use a pair of certified glasses to position your camera toward the sun; then you could view the eclipse on your App and with your family



from the comfort of your home.

Astronomers predict the next solar eclipse visible in Quebec for the year 2106; which characterizes that of April 8 as rare, but also a unique opportunity for learners to see the harmony between the theory and practice of their science course.

Have Good and safe show!

LMS Advisors Team

About

The mission of the LMS Center is to help students excel or surpass themselves in mathematics and science through continuous improvement in their results. The recognition, at the provincial and national level, of the expertise of its team has allowed it to become the leader in tutoring services and the # 1 Reference in learning strategies !

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Professor of Optometry (University of Montreal); Fellow of the American & European Academy of Optometry
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