SHIKHAR SPACE SCIENCE

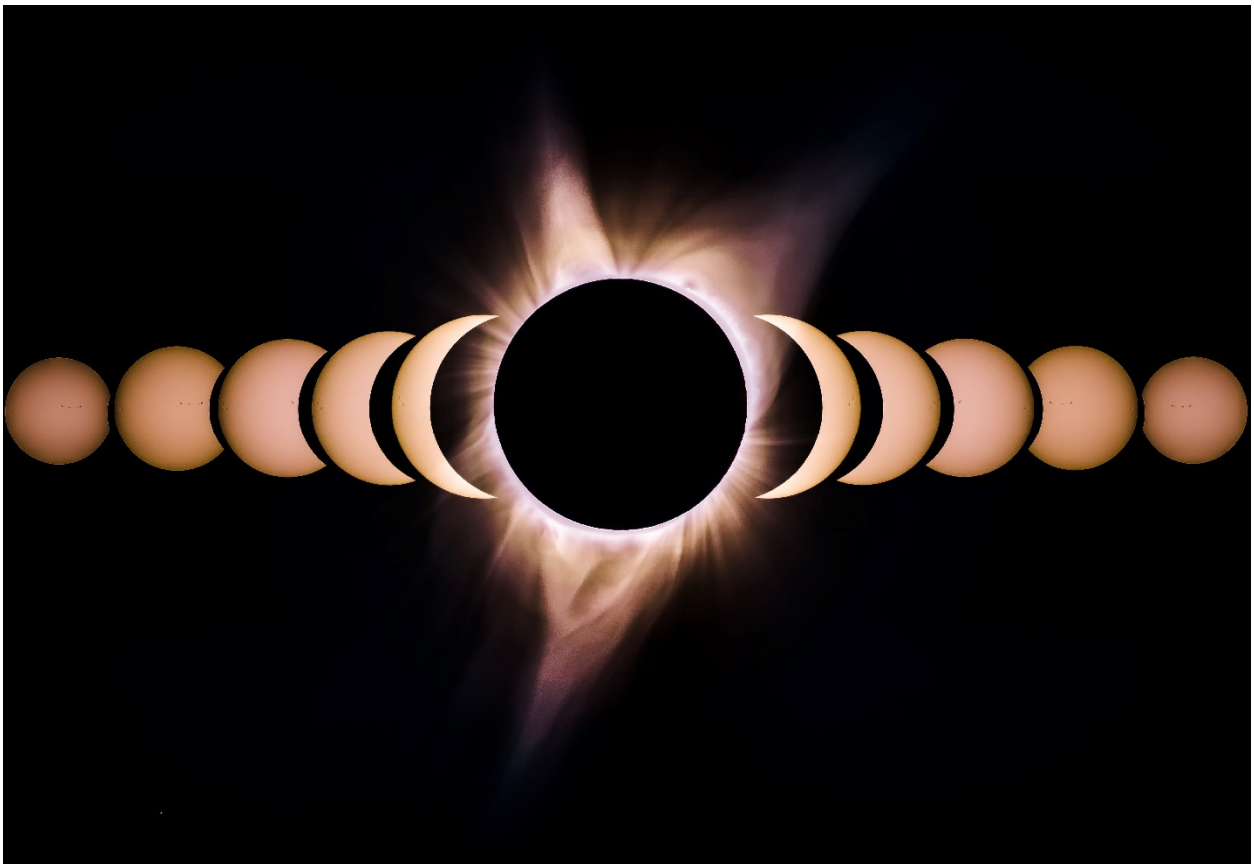
Shikhar Educational Tours..

A

Workshop Event

on

"Solar Eclipse"



"Comparing what you see during an eclipse to the darkness at night is like comparing an ocean to a teardrop"

■ *Wendy Mass*

An Introduction:

Shikhar Astronomy Club is a private organization which is work in India give scientific information about function of space any one can come in our observatory and watch celestial Bodies and observe full night sky. Space related workshop provide by us we also responsible for generate curious and awareness among people.

What is Solar Eclipse?

In general, an eclipse is when one object blocks an observer from seeing another. In a solar eclipse the Moon passes in front of the Sun and creates a shadow that falls on the Earth. While an eclipse can't be seen everywhere, for those in the shadowed areas the Sun appears dark. Solar eclipses only occur during the new moon phase and based on the position of the Moon, Sun and Earth there are four possibly types of solar eclipses that can be seen. This phenomenon lasts a few minutes and on average occurs every 18 months. The maximum duration for an annular eclipse is 12 minutes 30 seconds.

Solar Eclipse

Importance of Annular Solar Eclipse 2020

This year's first solar eclipse will be visible from India. After this, the next eclipse will be visible only in 2034 which will be visible from Ladakh and Kashmir region. This is also the last annular solar eclipse visible from India in this generation's lifetime. This is an annular solar eclipse with almost 99% of the sun covered by the Moon's shadow making it one of the deepest annular solar eclipses visible from anywhere on Earth in our lifetime. This will also allow us to watch Bailey's beads which are light passing through valleys on the Moon visible at the edge of the eclipse.

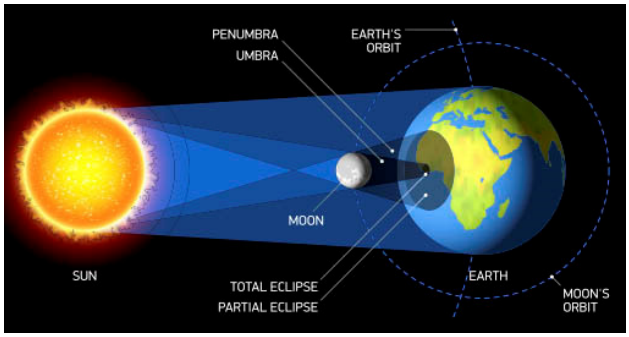
Interesting Fact

Solar eclipses are the product of coincidence. With a diameter of 1.39 million kilometers the Sun is 400 times larger than the moon (with a diameter of 3,474 kilometers). However, the moon is roughly 400 times closer to the Earth than the Sun (384,400 km vs 149.6 million km). Something else to note is that the moon has been gradually moving away from the Earth since its formation billions of years ago. At its current distance, the moon is at the perfect position to appear in the sky as the exact same size as the Sun to block it out. There are actually two types of shadows: the *Umbra* is that part of the shadow where all sunlight is blocked out. The umbra takes the shape of a dark, slender cone. It is surrounded by the *Penumbra*, a lighter, funnel-shaped shadow from which sunlight is partially obscured. During the brief period of totality, when the sun is completely covered, the beautiful corona — the tenuous outer atmosphere of the sun — is revealed. A total solar eclipse typically only lasts for a few minutes, explained NASA solar astronomer Mitzi Adams of the Marshall Space Flight Center in Huntsville, Ala. The longest solar eclipse lasted about seven minutes, she said in a NASA webchat.

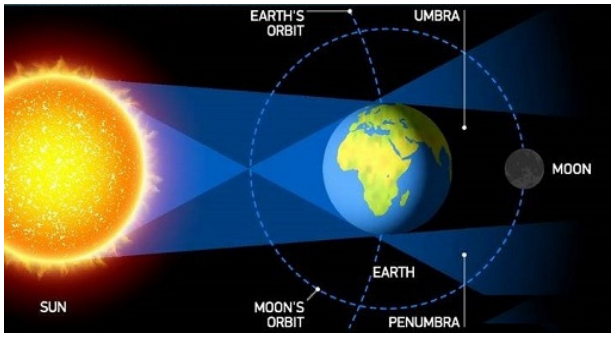
1. Depending on the geometry of the Sun, Moon, and Earth, there can be between 2 and 5 solar eclipses each year.
2. Totality occurs when the Moon completely obscures Sun so only the solar corona is showing.
3. A total solar eclipse can happen once every 1-2 years. This makes them very rare events.
4. The longest a total solar eclipse can last is 7.5 minutes.
5. The width of the path of totality is usually about 160 km across and can sweep across an area of Earth's surface about 10,000 miles long.
6. Almost identical eclipses occur after 18 years and 11 days. This period of 223 synodic months is called a saros.
7. During a total solar eclipse, conditions in the path of totality can change quickly. Air temperatures drop and the immediate area becomes dark.
8. If any planets are in the sky at the time of a total solar eclipse, they can be seen as points of light.

Difference Between "Solar Eclipse & Lunar Eclipse"

Another type of eclipse that can be seen from space is called the Lunar Eclipse. In a lunar eclipse, the Earth moves between the Moon and the Sun blocking part of the Sun's light from hitting the Moon. When this happens, the Earth's shadow appears on the Moon.



Solar Eclipse



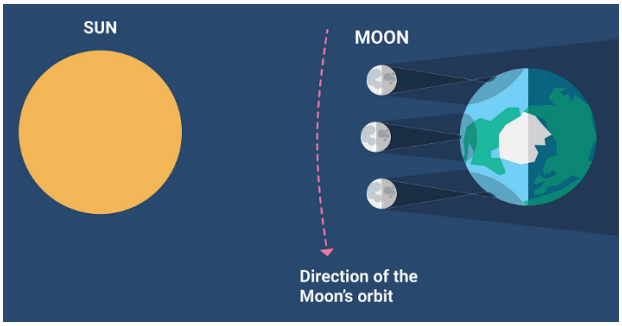
Lunar Eclipse

Lunar eclipses only occur on the night of a full Moon, and can be viewed by anyone on the 'night side' of the Earth. Unlike Solar eclipse, this phenomenon lasts for hours and can be safely seen without eye protection.

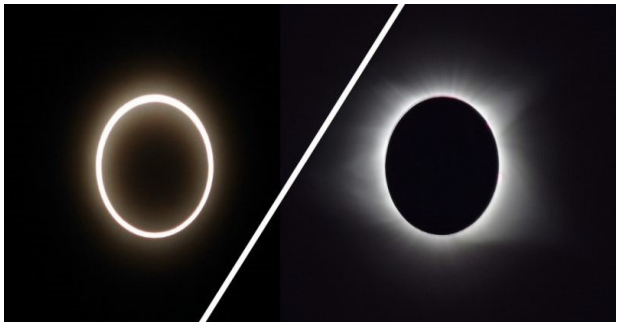
Term – "Hybrid Solar Eclipse"

"A hybrid eclipse is one which is annular when the path first touches the Earth, and/or leaves the Earth, but which becomes total for a period in-between," says Australian astronomer Dave Herald. So how come it becomes total? "The shadow of totality is a cone," he says. "For a total eclipse, the point of the cone passes below the Earth, and for an annular eclipse, the point of the cone passes above the Earth, never touching it.

The difference between a shadow cone passing above and below Earth is slight, making hybrid eclipses unlikely. "Hybrid eclipses are rare because the range for the location of the point of the cone is quite small. That's is the basic reason why it is rare?



Concept



Image

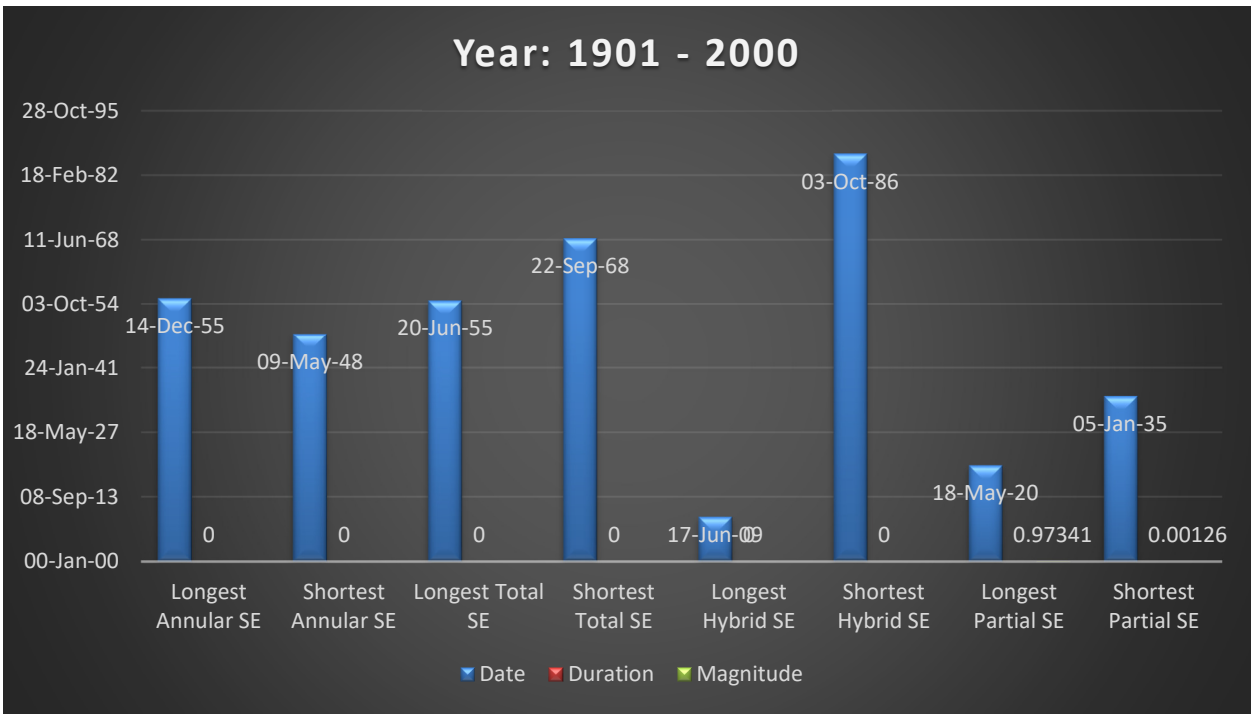
Safe Solar Eclipse Viewing

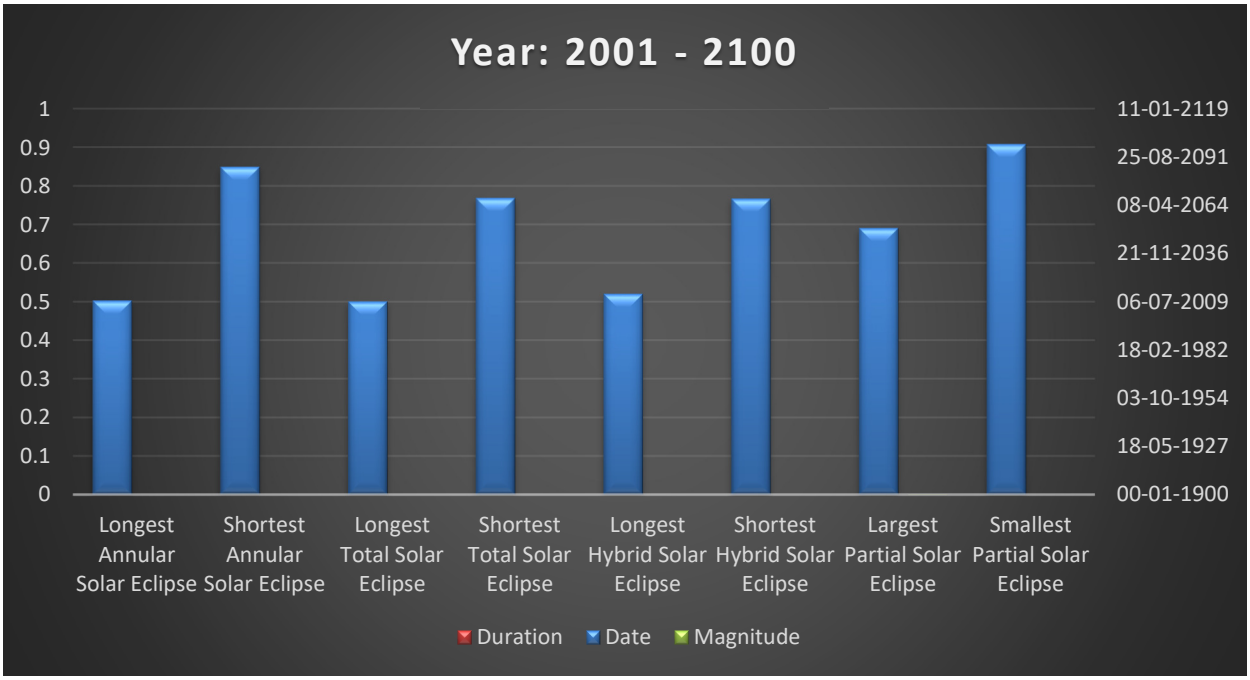
The only safe way to look directly at the sun is through special-purpose solar filters, according to the American Academy of Ophthalmology. These special filters are used in eclipse glasses and hand-held solar viewers. Eclipse glasses are available for purchase at big-box stores, electronics supply outlets and online. Certified Glasses should be ISO123-2. The concern over improper viewing of the sun during an eclipse is for the development of 'eclipse blindness' or retinal burns," said associate professor of optometry Dr. Ralph Chou in an article published by the National Aeronautics and Space Administration. Chou said children and young adults are most at risk as bright light and radiation from the sun can cause heating and cook the exposed tissue of the eye. The aging process can provide a natural filtering effect in older people and reduce risk of retinal damage.

Rules

- Do not look directly at the sun
- Do not use homemade filters or ordinary sunglasses, even very dark sunglasses
- Use special-purpose solar filters, such as eclipse glasses or handheld solar viewers, to view the eclipse
- In any stage of eclipse, do not look at the sun through a camera, telescope, binoculars or other optical device, and never use solar filters with these devices, as concentrated solar rays will damage them and can cause serious eye injury
- Inspect your solar filter before use; if it is scratched or damaged, discard the filter.

Extreme Durations and Magnitudes of Solar Eclipses





Workshop Details

- 1st Workshop Date: 18th June 2020
- Time: 04:00 PM

Solar Eclipse Date: 21st June 2020

Time:

- Partial Eclipse Begin: 09H:15M:58S
- Full Eclipse Begin: 10H:17M:45S
- Maximum Eclipse: 12H:10M:04S
- Full Eclipse End: 14H:02M:17S
- Partial Eclipse End: 15H:04M:01S

Highlights of The Event

1. 01 Workshop on Solar Eclipse on 18th June 2020 (11 AM to 01 PM)
2. 01 Session on Solar Eclipse on 21st June 2020 (11:30 AM to 12:30 PM)
3. 01 Presentation and Discussion Session on 23 June 2020 (04:00 PM to 06:00 PM)
4. Interactive Session on 21st June during Solar Eclipse Coverage
5. Learn How to make Solar Viewing Kit at home
6. Do's & Don't s during a Solar Eclipse
7. Logic & Science behind Solar Eclipse
8. E-Magazine for all participants

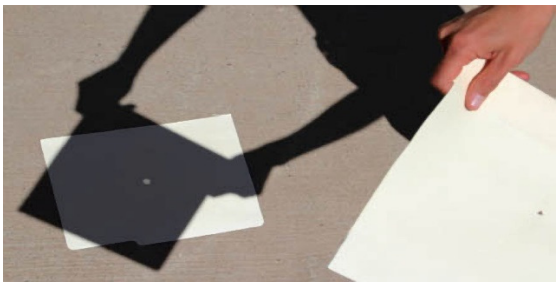
Make your own Solar Observation Kit

Students will learn to make their own solar observation kit using their household material. They will learn how to make a pinhole projector, ball projector, pinhole pattern projector.

Observing the Sun for Yourself

Projecting The Sun

"You can easily, cheaply, and safely observe the Sun by projecting it through a tiny hole onto a white sheet of paper. This simple device is called a "pinhole camera".



Don't ever look directly at the Sun through a telescope or in any other way, unless you have the proper filters

Associated Experts

Mr. Atish Aman

Atish Aman is a recognized Science communicator, amateur astronomer, an educator, an internationally acclaimed award-winning astrophotography, and a celestial phenomenon chaser. He has personally conducted workshops and programs with more than 35000 school students across India and more than 3000 adult's public on astronomy, History of life, and Astrophotography. In the past 10 years, he has also conducted free science and astronomy awareness programs for more than 10000 underprivileged students across the country. He regularly conducts astrophotography master classes workshops which are attended by participants from across India and abroad. On the occasion of International Year of Light, he conducted workshops on the science of light for 5000+ school students of more than 50 government schools.

Astronomy Expert / Award Winning Astro Photographer

Varsha Sharma

A physicist, amateur astronomer, astro-photographer, and STEM expert working as an Instructional Designer. Former Science editor at MBD Group, a contributor to various astronomy, science magazines, also designed the Astronomy & Science Educational programs and curriculum for CBSE & ICSE school students. As a science Communicator, actively promotes and participated in public outreach programs to create science & astronomy awareness and also script write for science video capsules with planetarium, Delhi & merit nation. When not stargazing or traveling I line in Gurgaon with my innumerable foster pets that continue to bug my dog, Baghira immensely.

Instructional Designer / STEM Expert

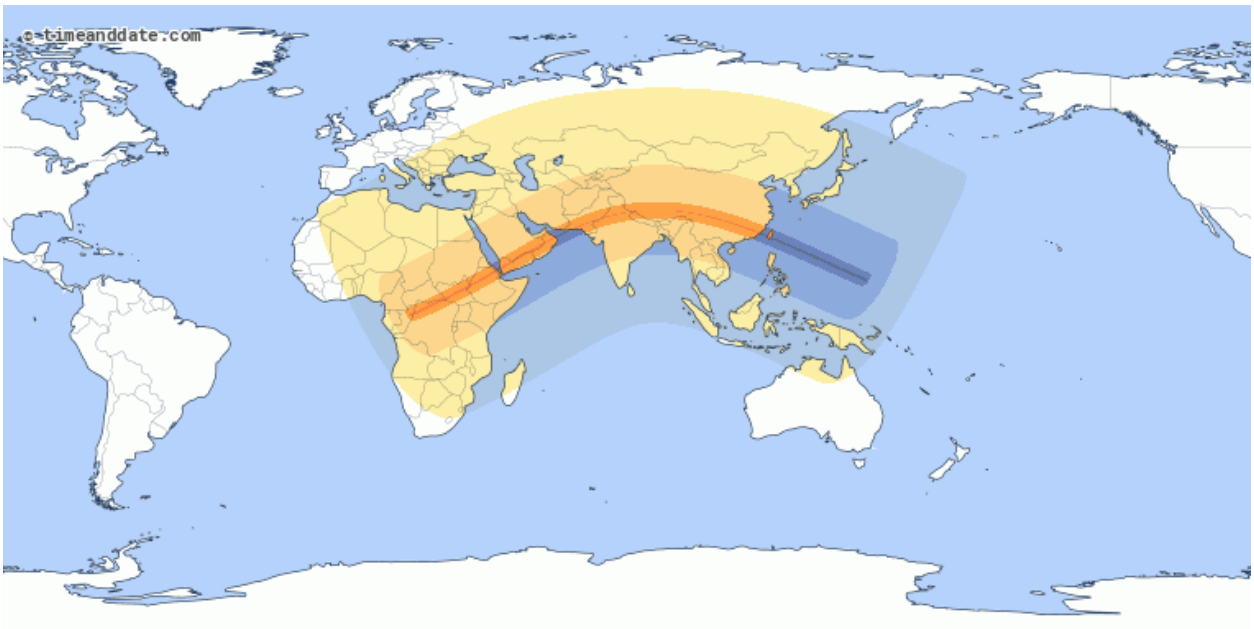
Yuvraj Gautam

An engineer who was more fascinated by night skies than technology and is an amateur astronomer and science communicator. He has conducted numerous public watches showing both adults and students wonders of the cosmos through a wide range of telescopes. He was an educator at India's first private chain of observatories and museums and conducted several hundreds of public shows for both laymen and students. He has also worked as a science communicator conducting various hand on learning STEM workshops at various schools across the Country.

Mechanical Engineer/ Astronomer / Educator at Shikhar Travels Pvt. Ltd.

Path of The Solar Eclipse 2020 over the World

- Impfondo, Congo
- Obo, Central African Republic
- Lalibela, Ethiopia
- Sukkur, Sindh, Pakistan
- Pano Aqil, Sindh, Pakistan
- Gharsana, Rajasthan, India
- Sirsa, Haryana, India
- Dehradun, Uttarakhand, India
- Tehri, Uttarakhand, India
- Xiamen, Fujian, China



Solar Eclipse 2020 over the World on 21st June 2020

Regards:
Shikhar Educational Team
www.shikhareducationaltours.com