

## Librarians' Guide to Solar Eclipses: *October 23, 2014*

### What is a solar eclipse?

Every month, the Moon makes one trip, or orbit, around Earth. The Moon's orbit around Earth is tilted ever so slightly ( $\sim 5^\circ$ ), so, for example, from the Sun's perspective, the Moon usually passes a little above or below Earth as it orbits around Earth. Occasionally, the Moon reaches a position where it is in a straight line with Earth and the Sun. When this happens, eclipses occur. A solar eclipse happens when the Moon is directly between Earth and the Sun. Conversely, a lunar eclipse happens when Earth is directly between the Sun and the Moon. There are at least four eclipses each year.

A partial solar eclipse will be visible from most of North America on October 23, 2014. A partial solar eclipse occurs when a portion of the Sun is blocked by the Moon. (A total solar eclipse occurs when the entire Sun is obscured from view.) The exact timing of the eclipse and the amount of the Sun that will be obscured depends on your location. You can find a list of eclipse beginning and ending times for many U.S. cities at <http://eclipse.gsfc.nasa.gov/OH/OHtables/OH2014-Tab05.pdf>.

### Solar Eclipse Safety

If you plan to view any solar eclipse, remember to **NEVER** look directly at the Sun. There are a number of safe ways to view solar eclipses. More information about these methods can be found at <http://www.skyandtelescope.com/observing/how-to-watch-a-partial-solar-eclipse-safely/>.

### Solar Eclipses in Your Library!

Use the resources below to create a program for your patrons to explore solar eclipses. Create a solar eclipse program that fits your library's schedule and needs. Consider fitting solar eclipses into your ongoing programming – lectures for inquisitive adults, family programs, and children's programming. Perhaps design a week-long investigation into solar eclipses with hands-on activities, demonstrations, and video clips, presentations by scientists from local colleges or universities, and a culminating solar eclipse viewing event. Alternatively, pick one activity from the list below for your young patrons to celebrate the solar eclipse and then encourage them to follow the news and explore more on their own!

### Upcoming Events

Find information and resources about upcoming celestial events and NASA mission milestones to share with your patrons at [http://www.lpi.usra.edu/education/look\\_up](http://www.lpi.usra.edu/education/look_up).



### *Selected Books*

Eclipse!: The What, Where, When, Why, and How Guide to Watching Solar and Lunar Eclipses

*Philip S. Harrington, Wiley, 1997, ISBN 978-0471127956*

Whether you're a backyard astronomer, a dedicated eclipse chaser, or a teacher guiding students through their first eclipse experience, Eclipse! provides the in-depth, detailed, practical information you need to make the most of these thrilling celestial marvels of nature. For adult readers.

Totality: Eclipses of the Sun

*Mark Littmann, Fred Espenak, & Ken Willcox, Oxford University Press, 2008, ISBN 9 78-0199532094*

A total eclipse of the Sun is the most awesome sight in the heavens. Totality takes you to eclipses of the past, present, and future, and lets you see – and feel – why people travel to the ends of the Earth to observe them. For ages 15 and up.

Eclipses (The Night Sky: and Other Amazing Sights in Space)

*Nick Hunter, Heinemann, 2013, ISBN 978-1432975203*

For ages 6-8, this book looks at solar and lunar eclipses, providing background information about the Sun, the Moon and our planet. The book covers what an eclipse is, what eclipses can look like, how they happen, the effects on wildlife, what people thought of eclipses in the past, how they are studied today, and about eclipses on other planets.

### *Websites*



@earthskyscience

@NASASunEarth

How to Safely View a Solar Eclipse

<http://www.skyandtelescope.com/observing/how-to-watch-a-partial-solar-eclipse-safely/>

Eclipse Glasses & Safe Solar Viewers

<http://www.rainbowsymphonystore.com/eclipseshades.html>

Solar Eclipse: What You Should Know (YouTube)

<http://youtu.be/HrloqDXrzN4>

Solar Eclipses for Beginners

<http://www.mreclipse.com/Special/SEprimer.html>

Solar Eclipse Pics from Mr. Eclipse

<http://www.mreclipse.com/Special/photo.html#solar>

NASA Eclipse Website

<http://eclipse.gsfc.nasa.gov/OH/OH2014.html#SE2014Oct23P>

NASA's Living With a Star Program

<http://lws.gsfc.nasa.gov/>

[http://www.lpi.usra.edu/education/look\\_up](http://www.lpi.usra.edu/education/look_up)

## Explore solar eclipses with hands-on activities!

### **Moon Phases and Eclipses**

<http://cosmictimes.gsfc.nasa.gov/teachers/downloads/lessons/1919/eclipse.pdf>

Grade Level(s): Middle School

Using a foam ball and a lamp, learners create a solar eclipse, a lunar eclipse, and learn more about why the moon appears differently from one night to the next.

*These activities, and other NASA educational activities, can be found at <http://nasawavelength.org>.*

### **Make a Pinhole Projector to Safely View a Solar Eclipse!**

<http://www.timeanddate.com/eclipse/make-pinhole-projector.html>

One of the easiest and safest ways to view an eclipse is to project its image on a screen using a pinhole projector. This website provides instructions for creating your own pinhole projector.

## Solar Eclipse Viewing

Consider holding an eclipse viewing at your library! For an eclipse viewing, it is highly recommend that you work with someone who has experience viewing the Sun and/or eclipses. Ask your local astronomical society to bring their telescopes for a viewing. Use the links below to locate a local astronomy club and/or speaker.

Night Sky Network

<http://nightsky.jpl.nasa.gov/clubs-and-events.cfm>

The Night Sky Network is a nationwide coalition of amateur astronomy clubs bringing the science, technology, and inspiration of NASA's missions to the general public.

NASA/JPL Solar System Ambassadors

<http://www2.jpl.nasa.gov/ambassador/directory.htm>

Solar System Ambassadors is a nationwide program consisting of volunteers who communicate the excitement of NASA/JPL's space exploration missions and information about recent discoveries to people in their local communities.

## Add a Creative Twist

*"The "why" of space exploration is a matter of emotions and instincts... It takes a variety of languages, including, those of art, music, and literature, to teach."*  
- Piers Bizony, "The Bigger Pictures"

Ever read a good science-fiction book or watch a futuristic movie like "Star Wars," "Star Trek," "Ender's Game" or "The Time Machine?" Science fiction is storytelling that reflects scientific thought and foresees and communicates a future based on the reality of today. Literature, movies, music and works of visual art all have the power to communicate an idea and elicit emotion from an audience.

Encourage your patron to create an artistic interpretation of the Solar Eclipse!

### Solar Eclipse

Jacqueline Moliner is an avid science fan and professional artist. Her enthusiasm for all things Space inspires her to research the science behind celestial events and create her Cosmic Funnies series. This combination of art with science is a great example of a fun way she shares her passion with others. *Solar Eclipse* was motivated by the upcoming October 23, 2014 event.

You can see more of the Cosmic Funnies and follow Jacqueline's other work at <http://cosmicfunnies.tumblr.com/>

