

Total Eclipse Training Resources

If you would like editable PowerPoint (.pptx) versions of these presentations, it is available in a Google Drive folder linked below, which also includes resources about using the training that aren't in this PDF. We encourage you to make your own copy of the folder and its contents. The Google Drive folder contains:

- Instructions with information about the resources in the folder and their intended use.
- A folder containing three editable slide decks with content on eclipse safety, science, and engagement opportunities along with each part's hi-resolution images and videos. (You are welcome to use the presentation as is, adapt it to your needs, or pick and choose content as needed.)
- A Google doc with compiled links to additional resources.
- A Google doc with sample questions to solicit feedback from your participants.
- A Google doc with a link to an eclipse question bank that will help you evaluate your eclipse lessons, and help NASA improve their educational resources.

The link below also includes an optional survey, which Oregon State University, in partnership with the NASA Heliophysics Education Activation Team (NASA HEAT), will use to understand the impact of this training and help guide future development of education and training materials.

Some imagery and activities offered by NASA contain eclipse imagery.

To access the Google Drive folder of Total Eclipse Training Resources and to take the survey, click the following link:

https://oregonstate.qualtrics.com/jfe/form/SV_6fWGZyawC3IuZPo

Part 3:
How to Participate
in Eclipse Activities

Part 3 Lessons



Lesson 3.1: NASA's National and Local Eclipse Partners

Lesson 3.2: Hands-on Activities and Resources

Lesson 3.3: Stay Connected



Lesson 3.1:

NASA's National and Local Eclipse Partners

The Moon is seen as it starts passing in front of the Sun during the August 2017 total solar eclipse above Ross Lake, Northern Cascades National Park, Washington.
Credit: NASA/Bill Ingalls



Lesson 3.1 Learning Objectives

By the end of this lesson, you will be able to answer the following questions:

How can I participate in NASA events along the path of totality?

How will NASA initiatives support eclipse engagement in 2024?

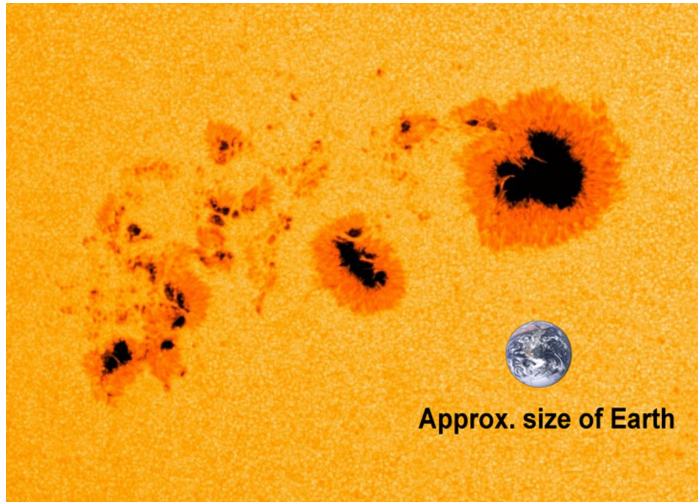
Where can I find resources for my audiences and connect with other educators?

SunSpots: NASA Eclipse Viewing Events on the Path of Totality



What is a sunspot?

Sunspots are cooler spots on the Sun where there is a high concentration of magnetic fields.



One of the largest sunspots in the last decade was seen in early January 2014. An image of Earth has been added for scale.
Credit: NASA/SDO

What is a NASA Solar Eclipse SunSpot?

NASA SunSpots are locations (on Earth) along the path of totality where NASA will support solar eclipse viewing events. Just as sunspots are the coolest places on the Sun, NASA's SunSpots will be the coolest places to view the total eclipse!

NASA will send exhibits, speakers, and eclipse glasses to a dozen of designated SunSpots across the path of totality. These locations will include areas and events that are free to the public.



NASA Solar Eclipse SunSpots

NASA Hosted SunSpot Locations



Credit: NASA/Scientific Visualization Studio/Michala Garrison; Ernie Wright/NASA Goddard Space Flight Center, and NASA HEAT

Along with the NASA-hosted events, there will be many other locations along the path with a NASA presence.



NASA Hosted	Events with NASA-led engagement. Some SunSpots will broadcasting live from the site.
NASA Affiliated	Events hosted by NASA partners, such as the NASA Space Grant Consortium and partnering universities
NASA Speaker	Events with a NASA speaker

If you can't make it to a NASA SunSpot, you can still participate in the magic of totality anywhere along the path. If you can't get to the path of totality, you can still enjoy a partial solar eclipse in North and Central America!

Find out more about SunSpot locations and events at go.nasa.gov/eclipses

NASA Initiatives Supporting Eclipse Engagement



NASA Science Activation

- Engages learners in the 2024 solar eclipse
- Integrates data into science learning
- Empowers learners to be active participants in the scientific process



INSPIRE ENGAGE EDUCATE EMPLOY
The Next Generation of Explorers

NASA Office of STEM Engagement

- Creates opportunities for students to contribute to NASA's discoveries
- Builds a diverse workforce for the future
- Engages students in authentic learning experiences



NASA Office of Communications

- Brings solar eclipse science to audiences via the NASA eclipse website
- Engages audiences with NASA social media



NASA Heliophysics Division

- Provides subject matter experts
- Studies the Sun-Earth connection throughout the Heliophysics Big Year and beyond

NASA's Science Activation (SciAct) Program



The Science Activation Program includes 50 active teams across the country, building partnerships between science experts and the public to help learners of all ages do science to activate minds and promote deeper understanding of our world and beyond.

Anyone can do science by:

- Asking questions
- Making observations
- Collecting data

Several SciAct teams have projects that focus on engaging learners in the 2024 solar eclipse. Here are just a few:

- NASA Heliophysics Education Activation Team
- Eclipse Ambassadors Off the Path
- Nationwide Eclipse Ballooning Project
- Earth to Sky



Find More:
science.nasa.gov/learners

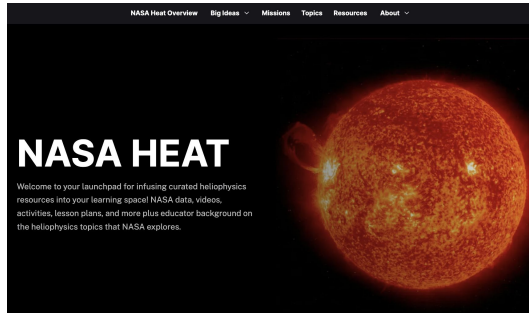
NASA HEAT - NASA's Goddard Space Flight Center



The NASA Heliophysics Education Activation Team, or NASA HEAT, is composed of NASA scientists, engineers, and educators passionate about making heliophysics accessible to multiple audiences and learners of all ages. NASA HEAT brings NASA research from the laboratory to learning spaces to inspire future scientists and spark breakthroughs in heliophysics.

NASA HEAT and its partners are supporting engagement in the 2024 total solar eclipse through educational activities and resources, as well as materials for public engagement:

- My NASA Data solar eclipse phenomena
- UV bead and solar energy experiments
- NASA 2023 & 2024 U.S. eclipse maps
- 2D and 3D pinhole projector maps
- Predict the corona activities
- NASA Helio Club
- And much more...



**Find education resources
and learn more about
heliophysics at:**
science.nasa.gov/learn/heat



Eclipse Ambassadors Off the Path

Eclipse Ambassadors Off the Path, coordinated by the Astronomical Society of the Pacific, will prepare and engage 500 communities off the central path of the 2024 total solar eclipse to enjoy the science and wonder of this natural phenomenon.

Eclipse Ambassadors Off the Path will help to reach thousands of people who reside off of the path of totality in 2024 by:

- Bringing outreach programs to underserved audiences in local libraries, colleges, schools, and other community organizations
- Providing training and resources to undergraduate students and foster partnerships with eclipse enthusiasts and local amateur astronomers (undergraduates will also receive a stipend, plus opportunities to further their involvement in NASA programs)



Credit: Eclipse Ambassadors



Find More: www.eclipseambassadors.org

Nationwide Eclipse Ballooning Project (NEBP)



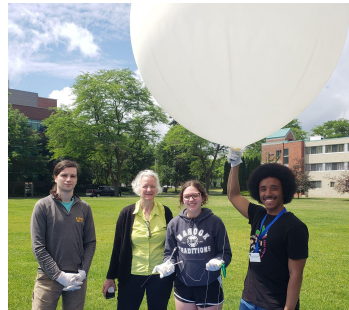
The Nationwide Eclipse Ballooning Project (NEBP) will engage 55 student teams from across the country to learn and take part in stratospheric ballooning campaigns during the 2024 eclipse.

- Teams participate on one of two tracks: atmospheric science or engineering.
- The payloads, built by the engineering students, will include live-streaming cameras, precision GPS for catching atmospheric waves, and individual experiments designed by each team.
- Atmospheric science teams will fly instruments that will measure atmospheric parameters every hour for 24 hours prior to and 6 hours after the eclipse.
- Teams will examine the data for atmospheric changes driven by the eclipse shadow.

The Nationwide Eclipse Ballooning Project is sponsored by the NASA Space Grant College and Fellowship Program, the NASA Science Mission Directorate's Science Activation Program, and the NASA Balloon Program Office.



Credit: NEBP



Credit: NEBP

The goal is for 50% of the students involved to be from historically underrepresented/underserved groups.



Find More: eclipse.montana.edu 11

Earth to Sky

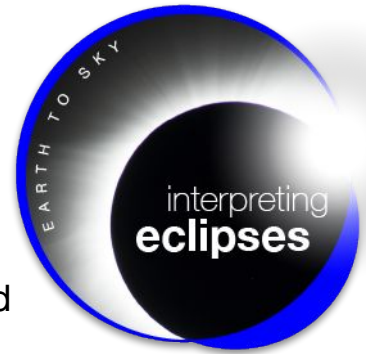


The Earth to Sky community of practice develops interpretive and educational products and programs for use in wildlife refuges, parks, and other sites of place-based education.

Partnerships nurture and support a growing community of interpreters, educators, and scientists learning and sharing science and communication techniques.

For the 2024 total solar eclipse, Earth to Sky will connect frontline interpreters and informal educators with NASA science and eclipse resources by:

- Offering mini-webinars on solar, lunar, and Earth science related to solar eclipses; interpretive connections to solar eclipses; resources available to assist engagement efforts; and citizen science opportunities before/during/after the eclipse
- Maintaining an email list for interpreters to follow updates on eclipse efforts throughout NASA
- Assisting Hot Springs National Park in Arkansas with their outreach efforts



Find More: earthtosky.org

NASA's Office of STEM Engagement



The NASA Office of STEM Engagement (OSTEM) delivers tools for students and educators to learn and succeed. The scope of STEM engagement comprises all endeavors to attract, engage, and educate students and to support educators and educational institutions.

OSTEM will provide opportunities for students and educators to participate in the 2024 total eclipse through:

- Standards-aligned curated content
- Educator community of practice (CONNECTS) and professional development
- Virtual classroom connections
- Connections for classrooms with NASA experts (NASA Engages)



Credit: NASA



INSPIRE ENGAGE EDUCATE EMPLOY
The Next Generation of Explorers

All K-12 Programs:

www.nasa.gov/stem/about.html

Next Gen STEM



Next Gen STEM's mission is to spark and sustain interest in STEM for K-12 students to build the future STEM workforce by connecting students and educators to NASA's endeavors in exploration and discovery.

During the 2023-2024 academic year, NASA's Office of STEM Engagement's Next Gen STEM program will promote the solar eclipses with priority in formal and informal learning environments by:

- Curating an evidence-based, mission focused, national standards-based solar eclipse tool for K-12 that will incorporate existing and new resources
- Serving as the points of contact across field centers for formal and informal education institutions seeking partnerships with NASA in eclipse engagement
- Providing professional development for educators at conferences and events, accessible virtually or in person
- Creating an Eclipse Collection for its online Community of Practice, a platform where NASA and educators can collaborate
- Sharing evaluation data and lessons learned with the wider community



Students get ready to launch a sounding rocket in Puerto Rico.

Credit: NASA



INSPIRE ENGAGE EDUCATE EMPLOY
The Next Generation of Explorers

Find More:

nasa.gov/stem/nextgenstem

NASA CONNECTS Educator Community of Practice



Connecting Our NASA Network of Educators for Collaborating Together in STEM

NASA CONNECTS is an online, professional learning community for educators to collaborate with each other and NASA.

NASA CONNECTS will support educators who want to participate in the 2024 total solar eclipse.



Find More:

stemgateway.nasa.gov/connects/s/



NASA Engages

**An online tool to connect NASA experts
with engagement activities**

stemgateway.nasa.gov/nasaengages/s/

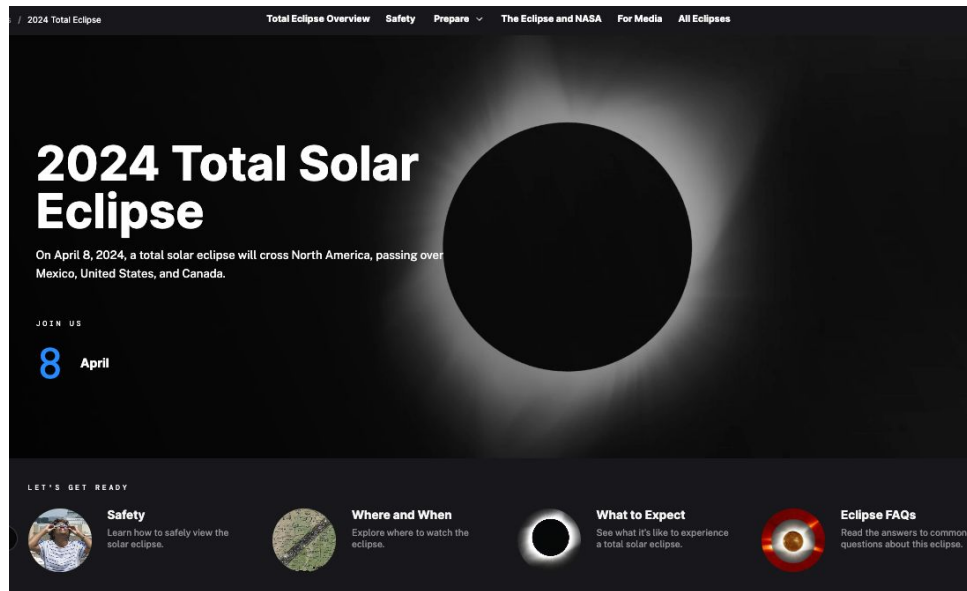
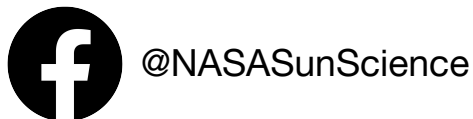
NASA Office of Communications



The NASA Office of Communications tells NASA's story through public engagement, social media, websites, animations, videos, podcasts, visitor center programs, live broadcasts, and more.

For the 2024 total solar eclipse, highlights from NASA's Office of Communications include:

- NASA's official solar eclipse website
- Videos, news stories, and podcasts
- NASA social media campaigns
- Media engagement strategies
- Live eclipse broadcast



Find More: science.nasa.gov/eclipses



NASA's Heliophysics Division

NASA's Heliophysics Division studies the Sun and how it influences the very nature of space - and, in turn, the atmospheres of planets and our technology throughout the solar system. Heliophysics missions are designed to answer these fundamental questions:

What causes the Sun to vary?

How do Earth, the planets, and the heliosphere respond to the changing Sun?

What are the impacts of the changing Sun on humanity?



NASA's Heliophysics Division is leveraging the 2023 and the 2024 solar eclipses across North America to make heliophysics accessible to learners of all ages through the Heliophysics Big Year.

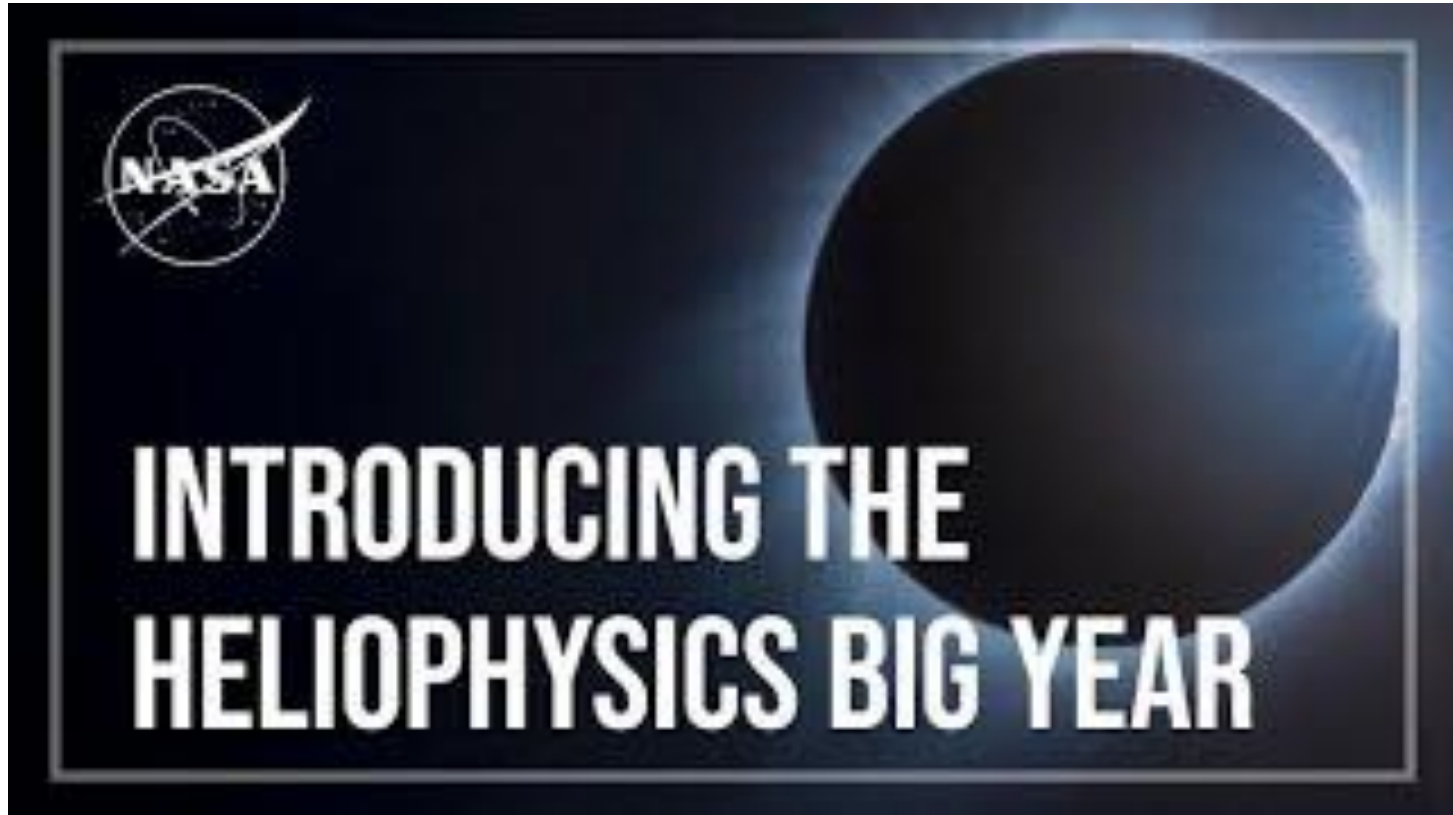
Learn more at go.nasa.gov/HelioBigYear



Find More:

science.nasa.gov/heliophysics

NASA Heliophysics Big Year



Credit: NASA's Goddard Space Flight Center



Lesson 3.2:

Hands-on Activities and Resources


The Moon is seen as it starts passing in front of the Sun during the August 2017 total solar eclipse above Ross Lake, Northern Cascades National Park, Washington.
Credit: NASA/Bill Ingalls

Lesson 3.2 Learning Objectives

By the end of this lesson, you will be able to answer the following questions:



How can I engage my family and community in eclipse events?



What are some examples of eclipse engagement activities I can use with my audiences?



How can I participate in citizen science projects during the April 8, 2024, total solar eclipse?

Get Involved!



Participate in eclipse events!

- Watch the NASA broadcast or go to an event!

Engage your family and community!

- Facilitate solar eclipse engagement activities with your family or community groups.

Collect and contribute data!

- Participate in a citizen science project.

We need your help to spread the word about eclipse excitement and safety!

Find More: go.nasa.gov/Eclipse2024



A family observes the 2017 total solar eclipse.
Credit: NASA/Shannon Reed

Livestreams with the Exploratorium



The crew at the Exploratorium produced livestreams of the 2017 total solar eclipse. Credit: Exploratorium

The Exploratorium will produce four different livestreams to help you experience the eclipse event with their telescope feeds and educational programming.

All streams will also be available on the Exploratorium's Total Solar Eclipse app for iOS and Android: watch the eclipse on the go!

Find the app and livestream information at exploratorium.edu/eclipse



Eclipse Resources to Reach a Multilingual Population



To meet the needs of an increasingly diverse learner population, NASA and NASA partners have the following multilingual messages and resources:

Eclipse Poster	Will be released in multiple languages
Eclipse Eye Safety Flyer	in English and Spanish - a joint effort with the American Astronomical Society
Eclipse glossary	in English, Spanish, Chinese, and French
NASA Space Place	in English and Spanish - videos, games, activities, and more for engaging younger students in a variety of space science topics
Let's Talk About Solar Eclipses	multilingual postcard

NASA partners also share traditional knowledge:

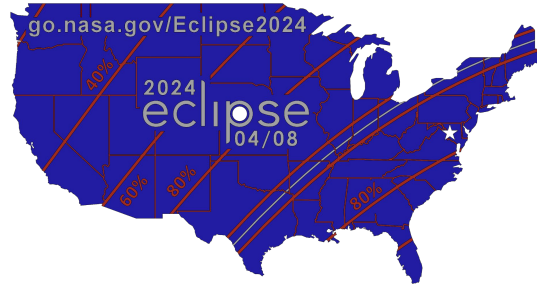
Indigenous Eclipse Teachings	13-minute video featuring Navajo, Cherokee, and Northern Arapaho traditional knowledge of solar eclipses
A Time for Renewal - Navajo (Dine) Knowledge of Eclipses	7-minute video featuring Navajo elders and educators

2024 Solar Eclipse Engagement Activities



Pinhole Projector Activity

Explore the 2D paper cut and 3D printed versions of the annular solar eclipse pinhole projectors and activity.



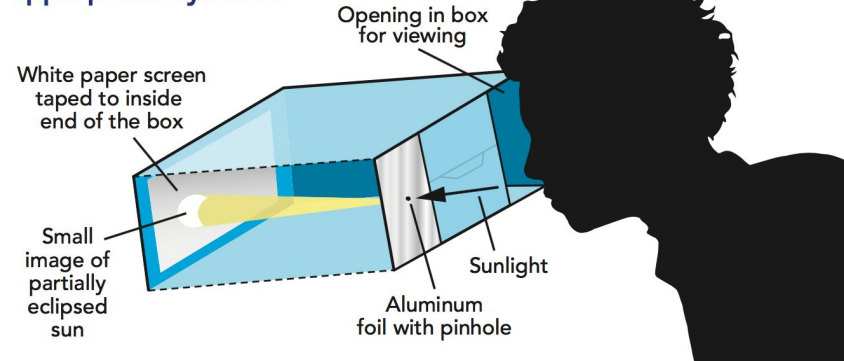
Credit: J. Patrick Haas/NASA HEAT

Eclipse Box Projector Activity

You can make your own eclipse projector using a cardboard box, a white sheet of paper, and aluminum foil. With the Sun behind you, sunlight will stream through a pinhole punched into aluminum foil taped over a hole in one side of the box. Look into the box through another hole cut into the box to see the projected image.

Find More: svs.gsfc.nasa.gov/14391/

NEVER look directly at the sun without appropriate eyewear.



Credit: NASA GSFC/NASA HEAT

National Aeronautics and Space Administration

2024 Total Solar Eclipse U.S. Pinhole Projector Activity

Next Generation Science Standard MS-ESS1-1: Develop and use a model of the Earth-Sun-Moon system to describe the cyclic patterns of lunar phases, eclipses of the Sun and Moon, and seasons.

Figure 1. Left diagram shows the relationship between the height of the projected image (h), projection distance (d), distance to the object (D), and the height (diameter) of the Sun (H). See "Educator Extensions" section for a math equation on how to calculate the Sun's diameter using a pinhole projector. The right diagram shows the shape of the Sun during the partial phase of a solar eclipse through a simple pinhole projector. Credit: NASA

Pinhole projectors allowed early scientists to view the shapes of illuminated objects, like the Sun, by shining the light from the object through a very small hole, projecting the image of the object onto the ground, wall, or other flat surface. Make this easy pinhole projector with your learners, see Figure 2, and have them experiment with the shape and size of the pinhole in this short (25- to 30-minute activity). See educator extensions for more ways to engage your learners.

Figure 2. A 2D paper cut U.S. map for the Monday, April 8, 2024, total solar eclipse. Not to scale. See Learner Handout. Credit: NASA (NAS) Patrick Haas

Your back should always be to the Sun when using a pinhole projector. Do NOT look at the Sun through the pinhole!

Remember to never look directly at the Sun without proper safety equipment.

Credit: NASA GSFC/NASA HEAT

Pinhole projectors allowed early scientists to view the shapes of illuminated objects, like the Sun, by shining the light from the object through a very small hole, projecting the image of the object onto the ground, wall, or other flat surface. These are a great method for safe solar viewing. Don't look directly at the Sun through the pinhole; stand with the Sun behind you to project an image.

Find More: [2024 Total Solar Eclipse Pinhole Projector Activity](https://svs.gsfc.nasa.gov/14391/)

Accessible Eclipse STEM Resources

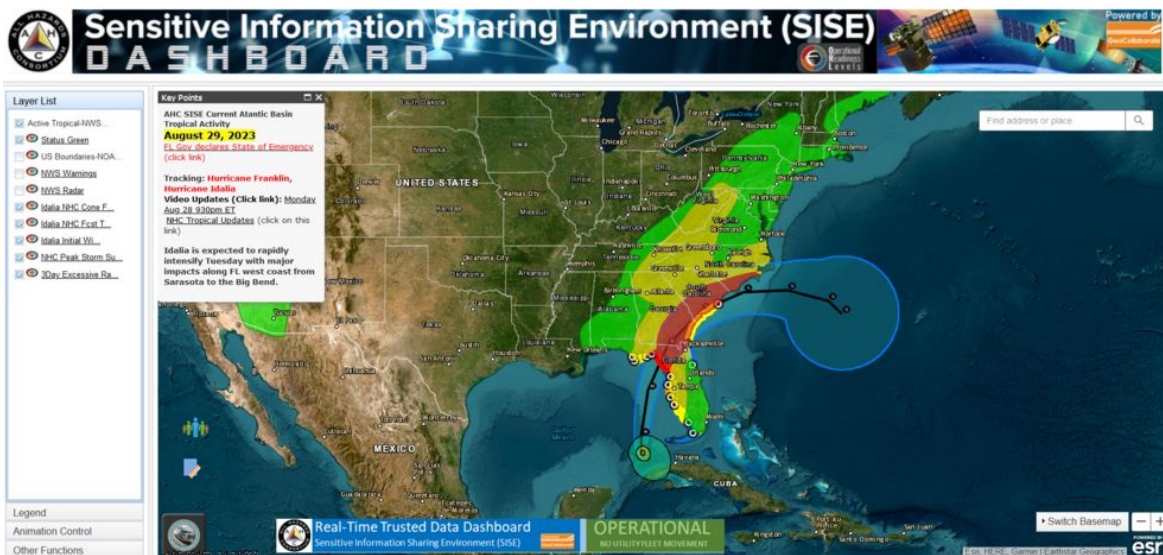
Tactile Eclipse Books

A tactile eclipse book in braille and English is provided by NASA's Solar System Exploration Research Virtual Institute. An updated version includes the 2017, 2023, and 2024 eclipse paths.



Find this and other braille books for Earth and space sciences at lunarscience.arc.nasa.gov/books/eclipses.

GeoCollaborate: Sharing Eclipse Data for Broadcasters and Educators



Credit: StormCenter Communications, Inc.

GeoCollaborate technology that supported response operations for Hurricane Idalia will be used to share heliophysics content to broadcast meteorologists and educators in the classroom, delivering NASA data and information to help inspire the public and the next-generation explorers.

NASA has funded StormCenter Communications Inc. in Maryland to use its GeoCollaborate Dashboard for the upcoming 2024 total solar eclipse.

The dashboard allows sharing of interactive visualizations, video content, and graphics with broadcast meteorologists and educators who can share them with broader audiences. By leveraging existing relationships in the broadcast community, GeoCollaborate will make it much easier for eclipse-related information to be accessed and broadcast to viewers across the nation.

NASA-Funded Citizen Science for 2024



NASA welcomes members of the public to participate voluntarily in the process of science.
No citizenship is required!



This composite image shows the progression of a total solar eclipse in Madras, Oregon, on Aug. 21, 2017. Credit: NASA/Aubrey Gemignani

In addition to the more than 30 existing NASA-funded citizen science projects, NASA has awarded funding for six science teams to conduct citizen science investigations as a total solar eclipse sweeps across North America on April 8, 2024.

In these experiments, volunteers will help study the Sun and its corona, which is revealed when the Moon completely covers the Sun's bright disk.

- SunSketcher 2024: An Eclipse Movie Across America [Western Kentucky University]
- The DEB Initiative: Documenting the Corona Moment by Moment [Southern Illinois University]
- CATE 2024: Capturing Polarized Views of the Corona [Southwest Research Institute]
- Eclipse Megamovie 2024: Recording Dynamics Across the Corona [Sonoma State University]
- "Contest" for Amateur Radio Operators [University of Scranton]

Follow the development of these projects and learn how to get involved at science.nasa.gov/eclipses.

SunSketcher 2024: An Eclipse Movie Across America



Credit: SunSketcher

Led by Western Kentucky University in Bowling Green, SunSketcher 2024 is NASA's newest citizen science project.

Using the SunSketcher 2024 smartphone app (an upgraded version of an app originally developed for the 2017 total solar eclipse), participants will capture their views of the eclipse. The app uses the device's GPS coordinates to determine the exact time when an eclipse phenomenon known as Baily's Beads are visible. Using detailed maps of the lunar surface, this will then allow the shape of the Sun to be determined to find anomalies in the solar interior.



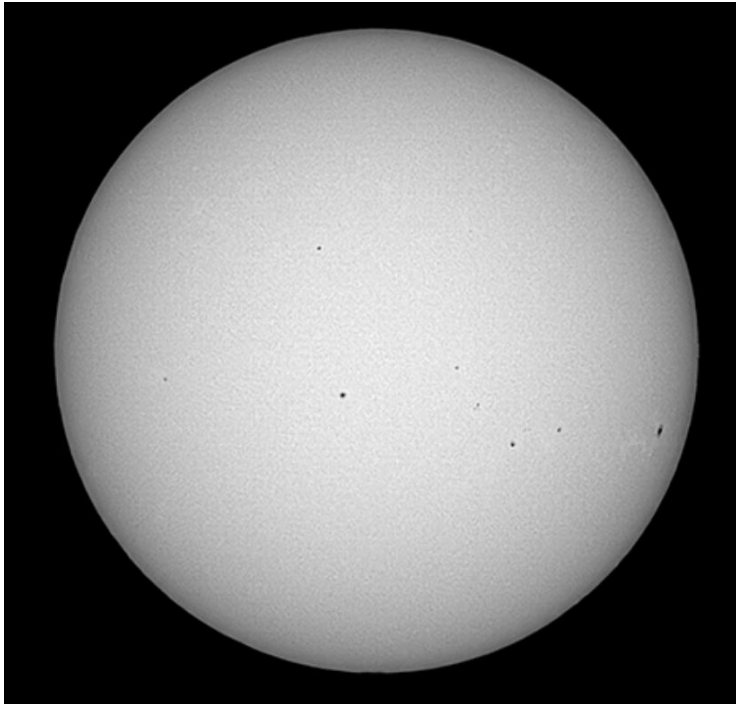
The Baily's Beads effect was seen from Madras, Oregon, during the Aug. 21, 2017, total solar eclipse.

Credit: NASA/Aubrey Gemignani

The DEB Initiative: Documenting the Corona Moment by Moment



The Dynamic Eclipse Broadcast (DEB) Initiative, led by Southern Illinois University in Carbondale, will organize volunteers to capture images of the corona during the eclipse.



- Using identical instruments at more than 80 locations across North America, participants will document the moment-by-moment appearance of the corona throughout the eclipse.
- Comparing these images across locations, scientists will track plumes of solar material in the difficult-to-study inner corona, estimating their speed and rate of acceleration and linking these observations to those from NASA spacecraft.
- Images from locations outside the path of totality will reveal the source of solar material later observed as outflows in the corona, allowing the team to trace these coronal outflows back to their origins on the Sun.

Find More: debinitiative.org/main/what-is-deb/

This DEB sample solar disk image was taken on March 14, 2023.
Credit: DEB

CATE 2024: Capturing Polarized Views of the Corona



The Citizen Continental-America Telescopic Eclipse (CATE 2024) experiment, led by the Southwest Research Institute in Colorado, aims to study structures and changes in the corona and solar wind.



Credit: CATE 2024

Find More: eclipse.boulder.swri.edu/

- A 60-minute high-contrast movie will be created from images of the corona taken in polarized light by 35 volunteer science teams across the U.S. The movie will illustrate the processes that shape the heating, structure, and evolution of the corona.
- CATE 2024 cameras will record light waves in four different polarizations to help measure the solar wind, identify signatures of an explosive process thought to generate the solar wind, and help understand how the structures in the corona are connected.
- Project scientists will compare the data collected with other eclipse observations, including those from NASA space missions.

Eclipse Megamovie 2024: Recording Dynamics Across the Corona



The Eclipse Megamovie 2024 project, led by Sonoma State University in California, is enlisting citizen scientists to explore and characterize how superheated gas (plasma) flows through the corona and chromosphere, as well as through the jets, or tendrils of plasma, in those regions.

ECLIPSE MEGAMOVIE



Credit: Sonoma State University

- At least 100 trained volunteers will take photographs of the total solar eclipse, using cameras on equatorial mounts to compensate for Earth's rotation.
- Afterward, the project will provide over 1,200 eclipse photos to scientists and the public.
- Volunteer photographers and data analysts will be invited to participate in an image-processing competition to uncover plasma flows and jets in the images.
- Data will be compared with the 2017 eclipse megamovie. As the Sun approaches solar maximum, 2024 images will likely capture more activity in the corona and chromosphere than in 2017.

Find More: eclipsemegamovie.org

“Contest” for Amateur Radio Operators

Amateur radio operators (hams) will help us understand Earth’s ionosphere and how it responds to solar eclipses. The Solar Eclipse QSO Party will:

- Start a few hours before the eclipse begins to gather baseline data of how well the ionosphere is reflecting and refracting high-frequency (HF) signals prior to the eclipse.
- Continue through the entire eclipse period to study how HF propagation is affected by the eclipse.
- Conclude a few hours after the eclipse to observe and study the aftereffects of the eclipse, such as ionospheric recovery.

QSO refers to a two-way communication between two amateur radio stations. Ham radio operators do not have to operate the whole time, though that would be most welcome.



The Solar Eclipse QSO Party (SEQP) is an opportunity for amateur radio operators (hams) to help investigate effects of the April 2024 solar eclipse before, during, and after the Moon’s shadow passes over North America.

Credit: HamSCI/University of Scranton

Find More: hamsci.org/seqp-faqs

More NASA-funded Eclipse Citizen Science Projects



Everyone can do science!

“During the (2024) total eclipse, hundreds of volunteers will capture images of the Sun and its corona to help answer real science questions about our star and how it affects us,” said program scientist and eclipse lead at NASA Headquarters, Kelly Korreck.

Thousands more volunteers will contribute data to existing citizen science projects listed below.

Low to Medium Tech (Phone/Laptop)

- GLOBE Observer
- Solar Jet Hunter
- Planet Hunters (TESS)

Medium to High Tech (Additional Software/Equipment)

- Eclipse Soundscapes Project
- Radio JOVE
- Sungrazer Project

GLOBE Observer Eclipse Tool

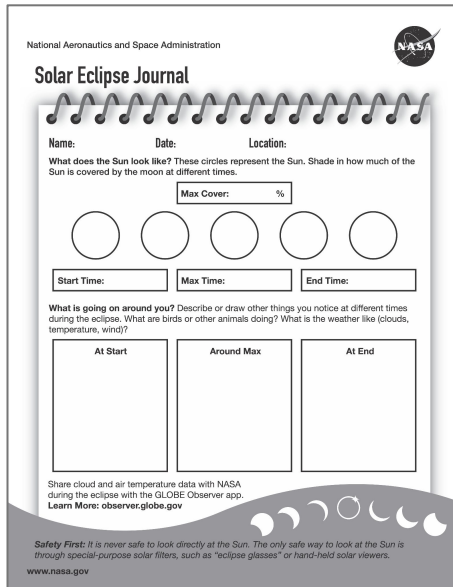
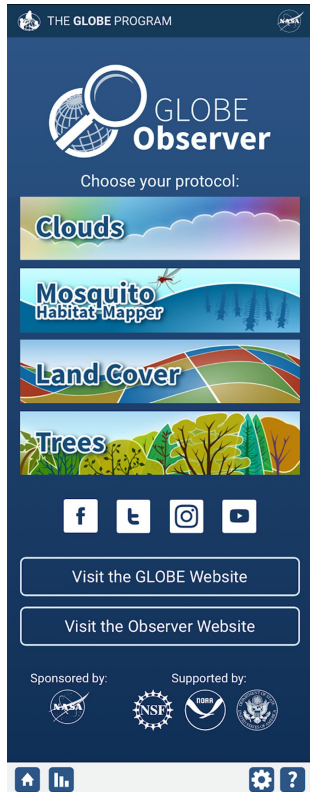


The Global Learning and Observations to Benefit the Environment (GLOBE) Program includes an eclipse tool, the GLOBE Observer mobile application and they need your help to collect data!

GLOBE Observer is an international network of citizen scientists and scientists working together to learn more about our shared environment and changing climate.



THE GLOBE PROGRAM



The program collects data to understand how the total solar eclipse changes atmospheric conditions.

The GLOBE app allows volunteers to contribute observations of cloud and sky conditions, air temperature, and surface temperature during the April 8, 2024, total solar eclipse.

Visit observer.globe.gov/eclipse for more details about equipment needed, how to take observations, and answers to frequently asked questions.

Download the app here: observer.globe.gov/about/get-the-app

Solar Jet Hunter



Join the hunt for solar jets, enigmatic bursts of energy from our very own star, the Sun!

Solar Jet Hunter is a citizen science project aiming to find and report solar jets in solar images. Volunteers help construct a database of the jets that will be used by solar physicists to investigate mysteries of the Sun, such as the origin of energetic particles originating from the Sun but found in the whole solar system.



Join the hunt for solar jets here:

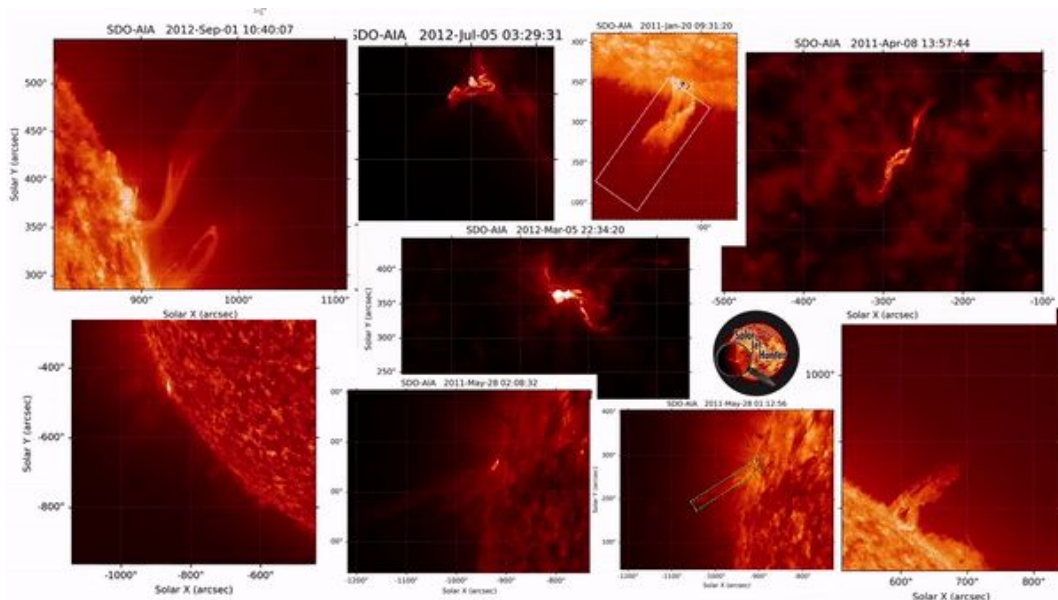
www.zooniverse.org/projects/sophiemu/solar-jet-hunter

More info and news on the Solar Jet Hunter blog!

solarjethunter.wordpress.com/



Follow us on X
@SolarJetHunter



Credit: NASA

Planet Hunters TESS



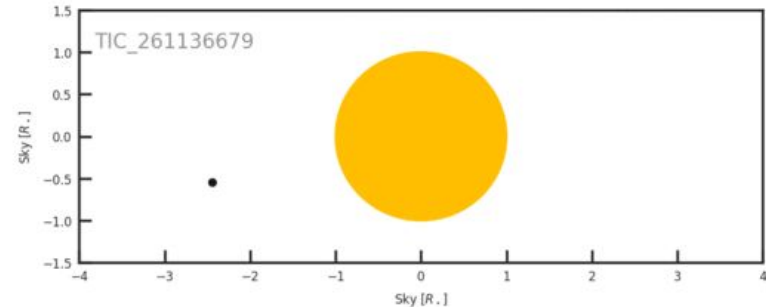
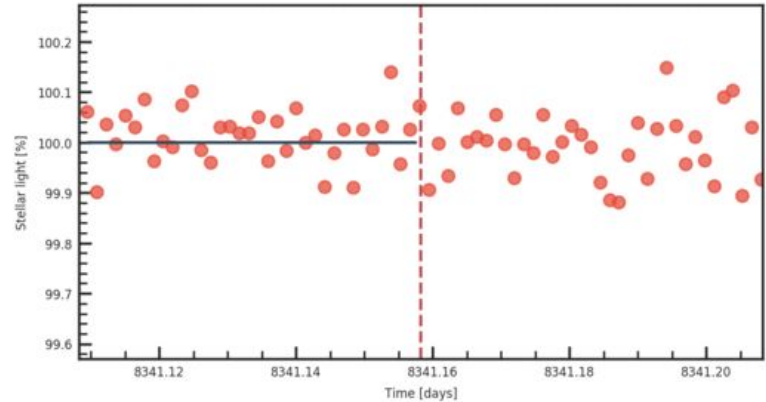
Did you know that “eclipses” happen in other solar systems? Find them for yourself.

Join the planet hunters who use data from the Transiting Exoplanet Survey Satellite (TESS) to find exoplanets, or planets orbiting stars beyond our solar system.

Find more:

www.zooniverse.org/projects/nora-dot-eisner/planet-hunters-tess/about/faq

This short video shows the changes in the brightness of the star. Each red point is a single brightness measurement. When a planet passes in front of the star, it blocks out some of its light.



Eclipse Soundscapes



The Eclipse Soundscapes (ES) Project will study how conditions during the April 8, 2024, eclipse affect life on Earth. Participants can join in this scientific exploration by learning about eclipses on the website prior to the event, collecting multisensory observations and audio data during the total solar eclipse, or analyzing data after the event!

Eclipse Soundscapes Participant Roles



Apprentice

Learn more about solar eclipses via free online learning resources and earn a certificate of completion.



Observer

During the upcoming April 8, 2024, total solar eclipse, along or near the path of totality, go outside and observe with all of the senses available to you. Share your observations with the ES team!



Data Collector

Collect data using an AudioMoth recorder along or near the 2024 total solar eclipse path of totality. Share the data with the ES team!



Data Analyst

Analyze sound data collected during the 2024 total solar eclipse alongside scientists using your computer or mobile device. Opportunities to analyze data are available through 2025.

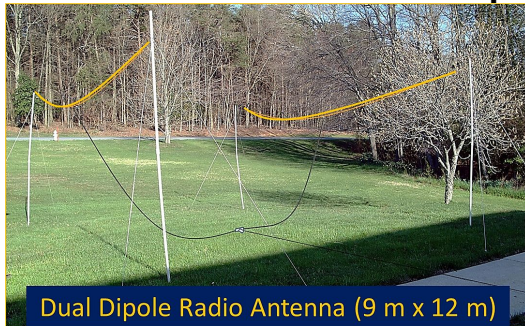
Radio JOVE Solar Eclipse Observing Campaign



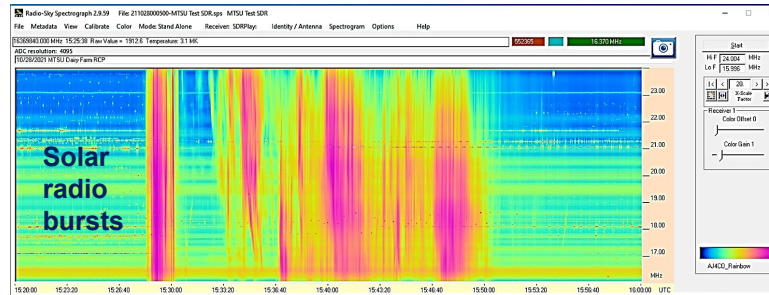
Radio JOVE is planning to use radio telescopes to make coordinated observations of the Sun during the April 8, 2024, solar eclipse. Radio JOVE collects and analyzes the data to determine whether the Moon will occult the radio-emitting regions near the Sun, and whether the umbral shadow of the Moon will significantly affect Earth's ionosphere.

Find More: radiojove.gsfc.nasa.gov

Radio JOVE 2.0 Telescope and Solar Radio Bursts



Dual Dipole Radio Antenna (9 m x 12 m)



Radio-Sky Spectrograph Recording Software

Solar radio bursts were recorded from Murfreesboro, TN, from 15:20 – 16:00 UT on October 28, 2021.

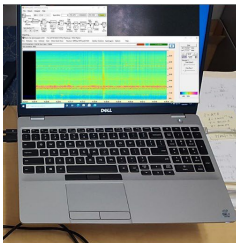
Credit: Radio JOVE/Chuck Higgins



Credit: Radio JOVE

Radio JOVE students and amateur scientists from around the world observe and analyze natural radio emissions from Jupiter, the Sun, and our galaxy using their own easy-to-construct radio telescopes.

SDRplay RSP1A
radio receiver
with computer



Sungrazer Project



THE SUNGRAZER PROJECT

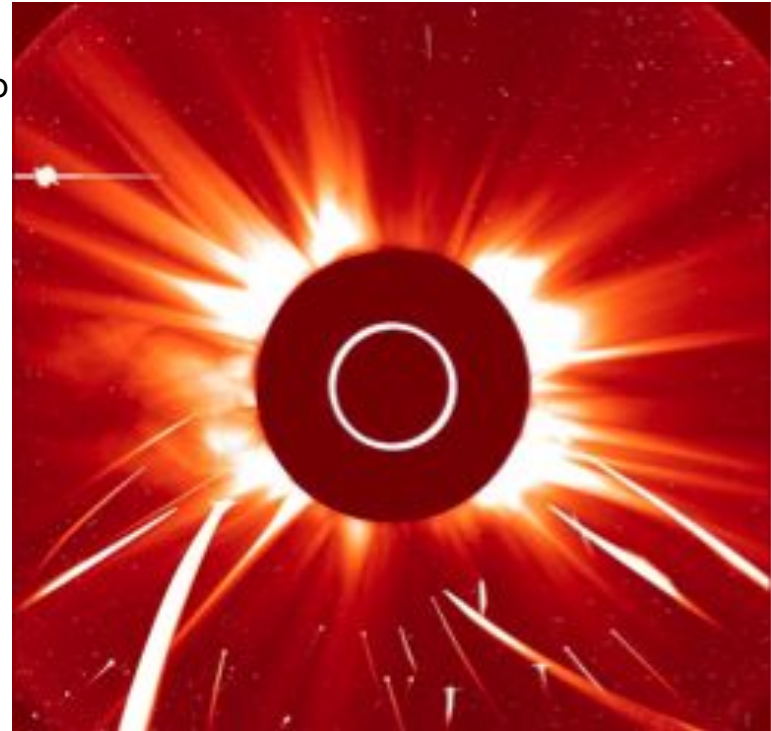
Taking images of the Sun has unexpectedly revealed thousands of new comets. Ready to find your own comets this way?

Objects very close to the Sun's corona can only be seen during a total solar eclipse, or when an occulter disk within an instrument (a coronagraph) creates an artificial eclipse. Both the ESA/NASA SOHO and NASA STEREO spacecraft carry coronagraphs that image not only solar storms but other celestial objects in their fields of view.

The Sungrazer Project is a NASA-funded program that enables the discovery and reporting of previously unknown "sungrazing" comets in SOHO and STEREO images. Anyone can become a "comet hunter" and immediately begin looking for new comets in the spacecraft data. Nearly 5,000 new comets have been found by citizen scientists via the Sungrazer Project!

Scientists use natural eclipses to find sungrazing comets; you can use the SOHO instrument to do the same.

Try the Sungrazer citizen science project: sungrazer.nrl.navy.mil/



A composite of bright "sungrazing" comets
Credit: ESA/NASA SOHO LASCO/Robert Pickard



Lesson 3.3: Stay Connected

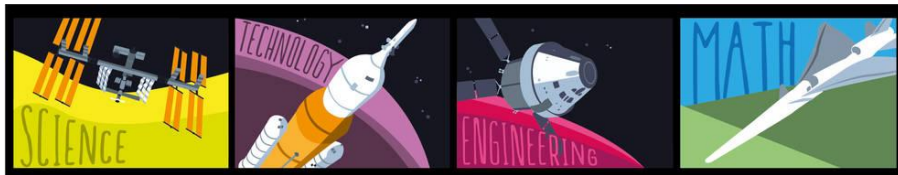
The Moon is seen as it starts passing in front of the Sun during the August 2017 total solar eclipse above Ross Lake, Northern Cascades National Park, Washington.
Credit: NASA/Bill Ingalls

Want to receive periodic updates about NASA's eclipse activities?
Sign up for the NASA eclipse newsletter.



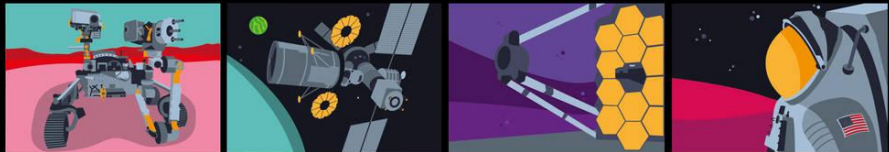
Find More: go.nasa.gov/3oObEDI

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Thank you!



Find More: go.nasa.gov/Eclipse2024