NASA@ My Library

A National Earth and Space Science Initiative that Connects NASA, Public Libraries and their Communities

NCIL National Center for Interactive Learning

The Parker Solar Probe: How Will Your Library Be Involved?

The webinar will begin at 1:00 p.m. (MT) and will be recorded.

Audio problems? Click and highlight the button at the top of your screen. You can also click "Meeting" > "Audio Setup Wizard". You will not need microphone capabilities.

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Agenda for Today

- Resources, Reminders, and Upcoming Events
- All About the Parker Solar Probe (Dr. Dusenbery)
- Activity #1
  - Sample Program
- Sun-Earth Connections (Dr. Dusenbery)
- Activity #2
  - Eclipse 2.0?
- Q&A

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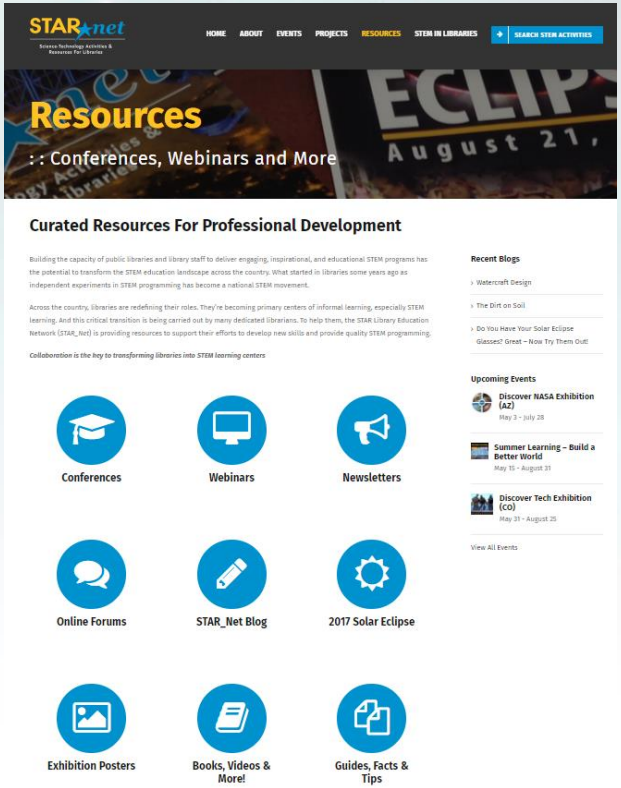
Join the STAR Library Network!



Professional development resources, including webinars, newsletters, blogs, forums, videos, and much more!

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Reaching New Audiences with Community Dialogue - Wednesday, May 23 at 2:00 p.m. MDT

Register Here

Libraries Helping Girls STEAM Ahead with NASA – Wednesday, May 30 at 1:00 p.m. MDT

Register Here

(New!) A Universe of NASA Resources –

Wednesday, June 6 30 at 1:00 p.m. MDT
Register Here

Headed to ALA? Come See Us!

- **NASA Booth #1839**

- **STEM Opportunities, Resources, and Partnerships between Public Libraries and Afterschool Providers**
  - Saturday, June 23; 1:00-2:00 p.m.; Room 288

- **Tech-time Fun with Real-world Connections**
  - Saturday, June 23; 2:30-3:30 p.m.; Room 386-387

- **Lessons Learned from the 2017 Eclipse: What Participation in Charismatic Events Can Do For Your Library**
  - Monday, June 25; 2:30-3:30 p.m.; Room 395-396

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SPACE SCIENCE institute

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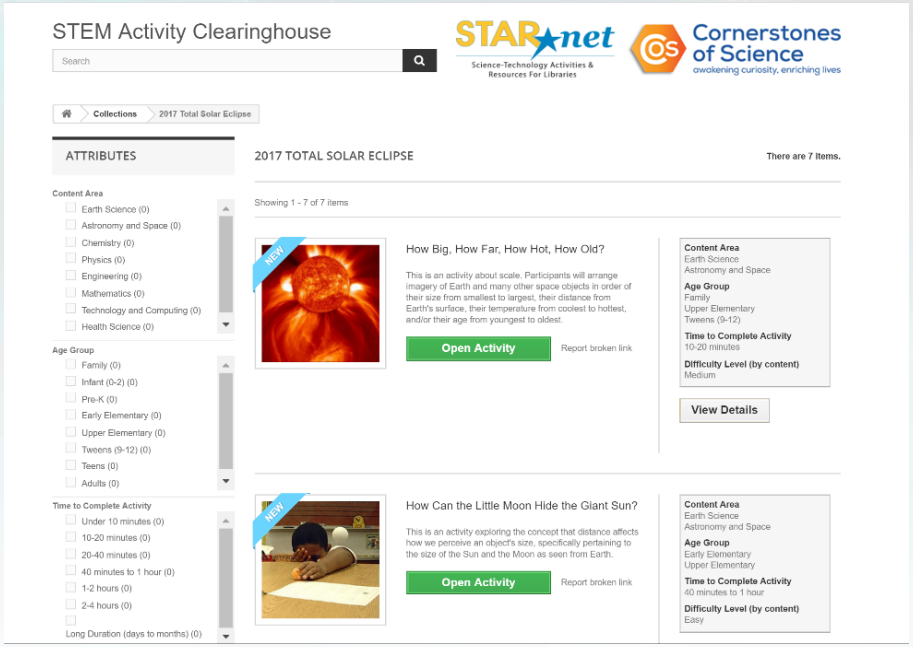
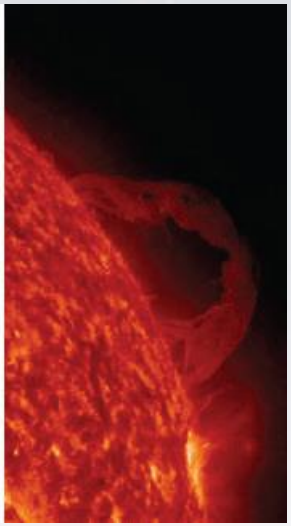
STEM ACTIVITY Clearinghouse



For example:

DIY Sun Cookies



Like an activity and think other library staff should know how great it is? Didn't like an activity or have modifications to make it better? **Make sure to leave a review!**

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New Clearinghouse Feature

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Send to a friend

Print

Solar Energy

Two bottles -- one painted black, the other painted white -- are covered with balloons and placed in bright sunlight.

Open Activity

Write a review

Content Area
Astronomy and Space
Physics
Engineering

Age Group
Upper Elementary
Tweens (9-12)

Time to Complete Activity
10-20 minutes

Time needed to prep Activity
Under 5 minutes

Cost associated with Activity Materials
$1-$5

Difficulty Level (by content)
Medium

Mess Level
Low

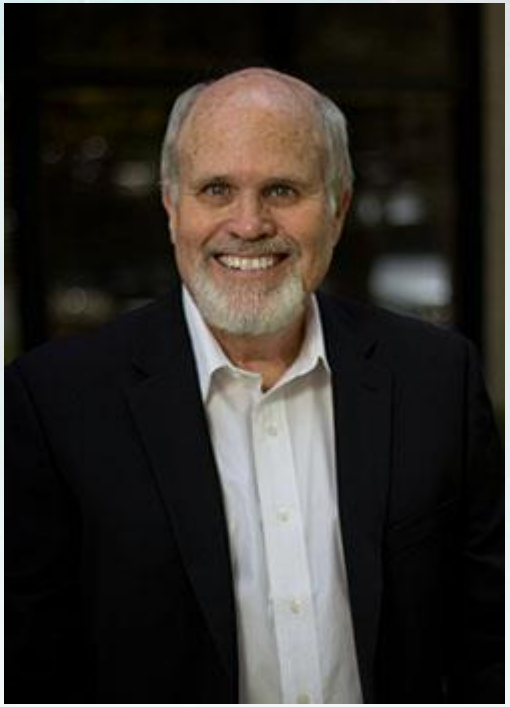
STEM Tools
Optional

Report a broken link

Categorized Incorrectly? Let us know!

RELATED PROGRAMMING RESOURCES

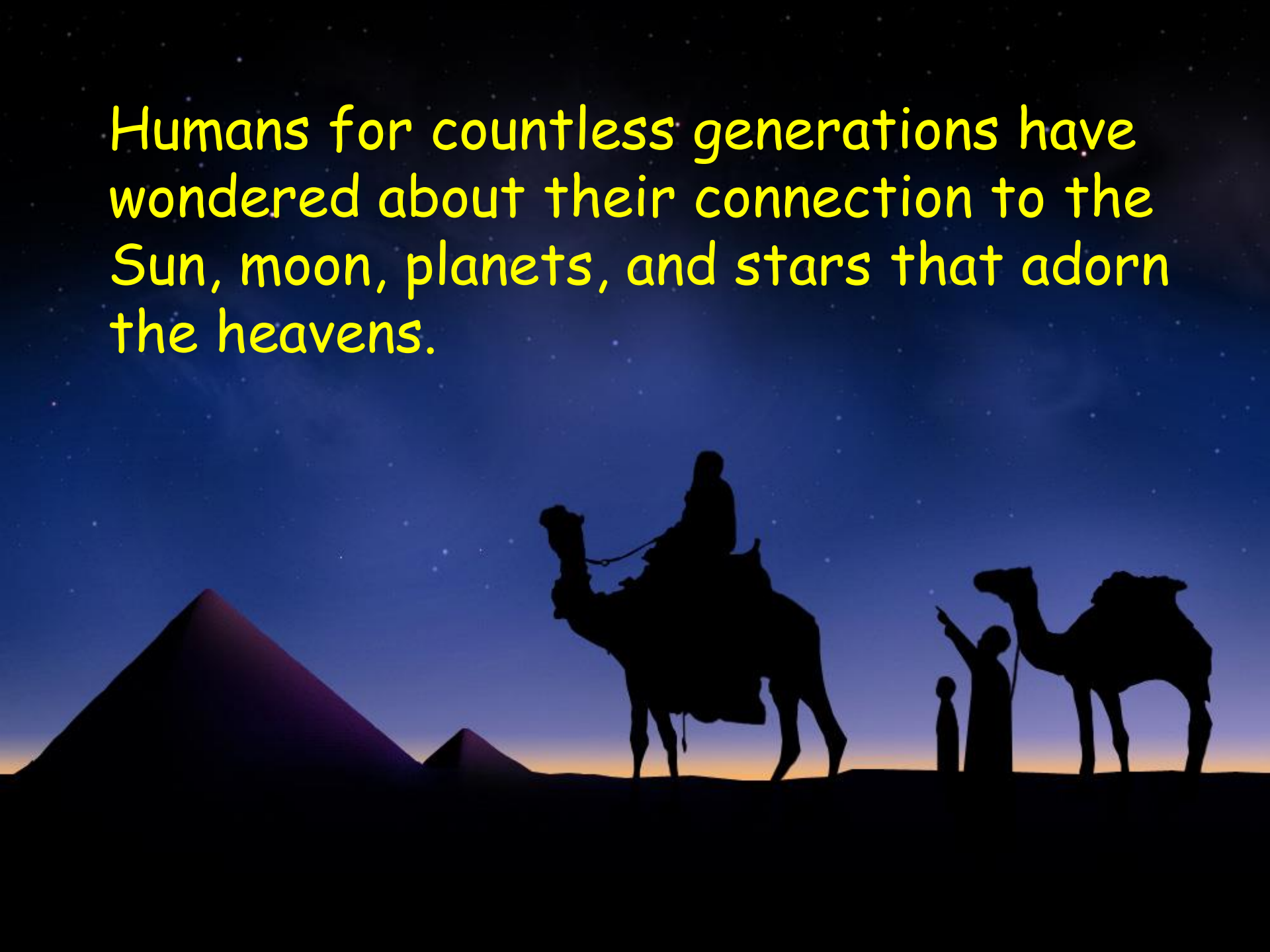
Add a Tech Twist	Try using an infrared thermometer or even an infrared camera to visualize the different temperatures.



Dr. Paul Dusenbery

- Director, National Center for Interactive Learning at the Space Science Institute
- Founder, Space Science Institute
- Former Program Director of the Magnetospheric Physics Program at the National Science Foundation
- Ph.D., Physics, Univ. of New Hampshire, 1978
- M.S., Physics, Univ. of New Hampshire, 1975
- B.A., Physics, Whitman College, 1972

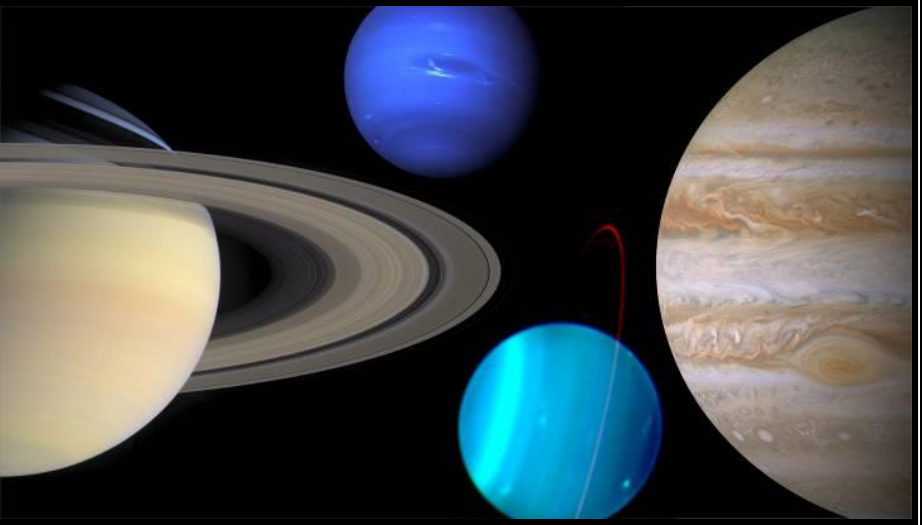
Humans for countless generations have wondered about their connection to the Sun, moon, planets, and stars that adorn the heavens.



3. Stars and star systems orbit the centers of galaxies

1. Moons orbit planets

2. Planets orbit stars



4. Galaxies orbit each other in clusters.

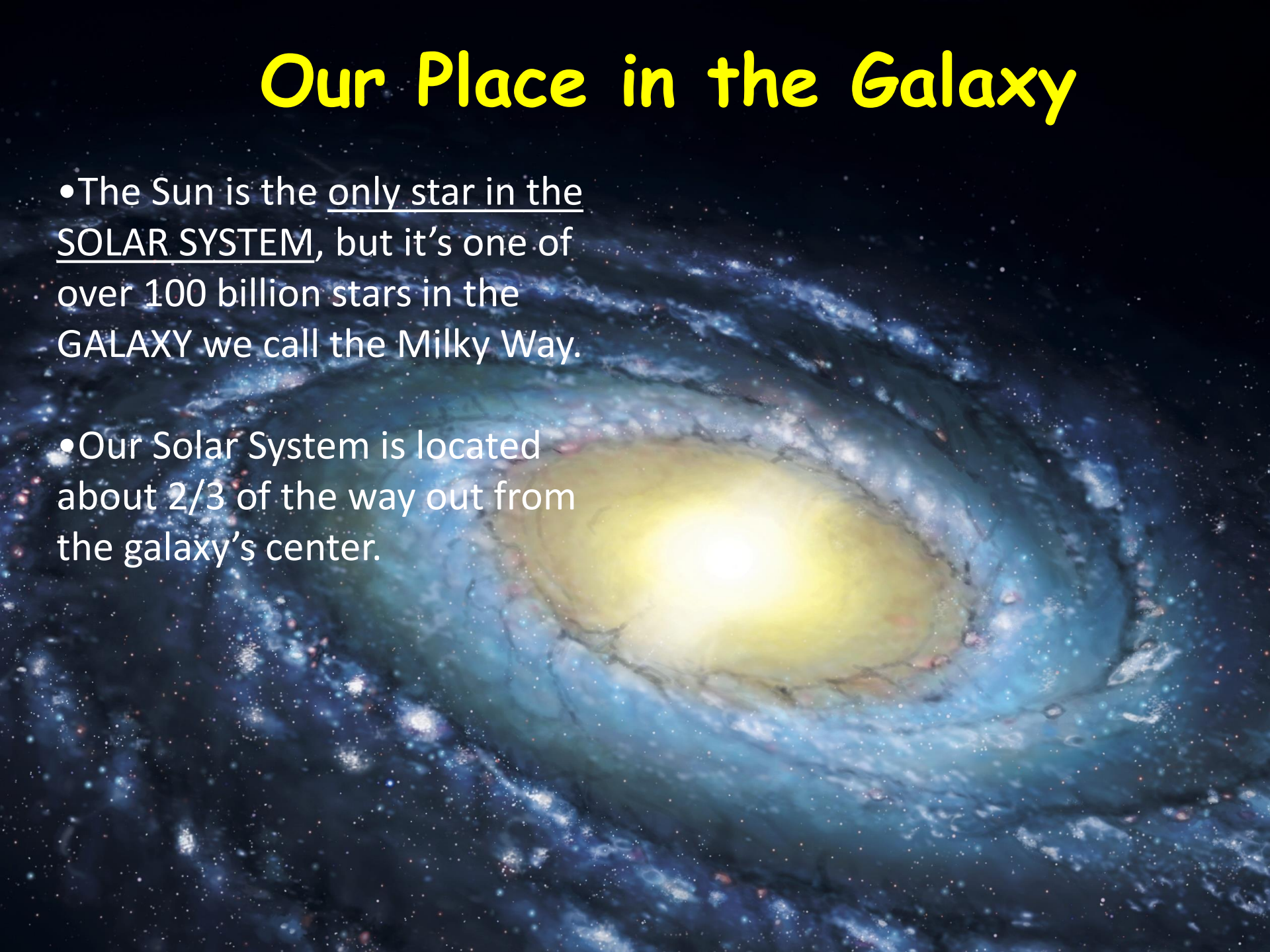

In the night sky there are
thousands of stars

But one of them is
276,000 times closer
than any of the others


Our Star
The Sun

Because it is so much closer than all of the other stars, we can find out a lot about stars by studying the Sun.

Our Place in the Galaxy



- The Sun is the only star in the SOLAR SYSTEM, but it's one of over 100 billion stars in the GALAXY we call the Milky Way.

- Our Solar System is located about 2/3 of the way out from the galaxy's center.


The Parker Solar Probe Mission
NASA's First Mission to Touch the Sun

Some Cool Facts

- Parker Solar Probe will swoop to within 4 million miles of the sun's surface, facing heat and radiation like no spacecraft before it.
- Launch Window: Jul 31 – Aug 19, 2018 (20 days)
- Arrival Date: December 2024
- Spacecraft Speed: 430,000 mph (that’s fast)
- The spacecraft will be protected from the Sun’s heat by a 4.5-inch-thick carbon-composite shield, which will need to withstand temperatures outside the spacecraft that reach nearly 2,500 ºF

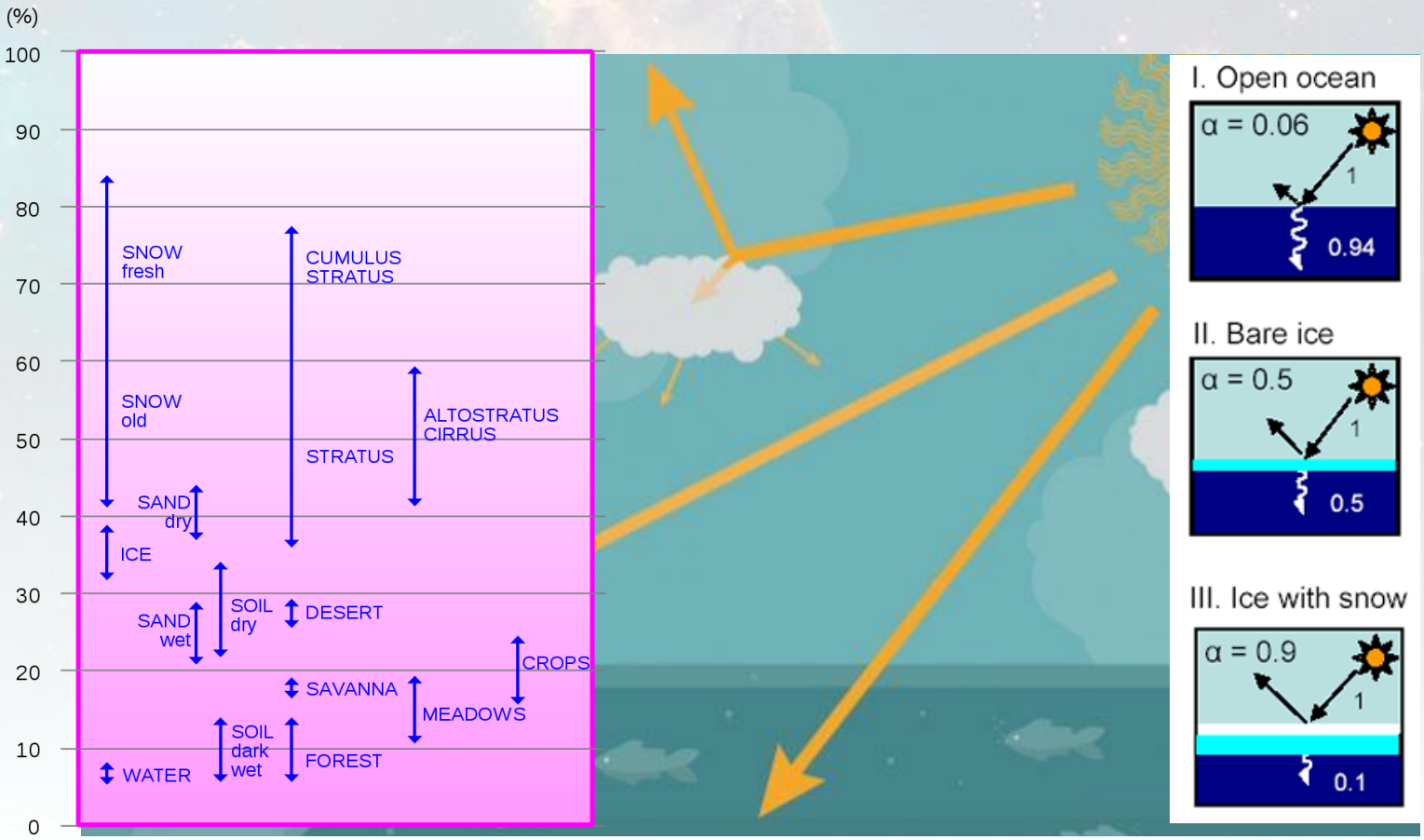
Thermal Protection System Thermal Protection System being installed in the large vacuum chamber at GSFC

The Launch Vehicle – A Delta IV Heavy Rocket

Location: Launch Complex-37 at NASA's Kennedy Space Center, Florida

Solar Probe: a Video Tour

Solar Energy and Albedo


(%)
100
90
80
70
60
50
40
30
20
10
0
SNOW fresh
SNOW old
SAND dry
ICE
SAND wet
SOIL dry
WATER
SOIL dark wet
CUMULUS STRATUS
STRATUS
ALTOSTRATUS CIRRUS
DESERT
SAVANNA
FOREST
CROPS
MEADOWS
I. Open ocean
α = 0.06
1
0.94
II. Bare ice
α = 0.5
1
0.5
III. Ice with snow
α = 0.9
1
0.1

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Solar Energy

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Solar Energy

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Difficulty Level (by content)
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Mess Level
Low

STEM Tools
Optional

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Categorized Incorrectly? Let us know!

RELATED PROGRAMMING RESOURCES

Add a Tech Twist	Try using an infrared thermometer or even an infrared camera to visualize the different temperatures.

Sample Parker Program

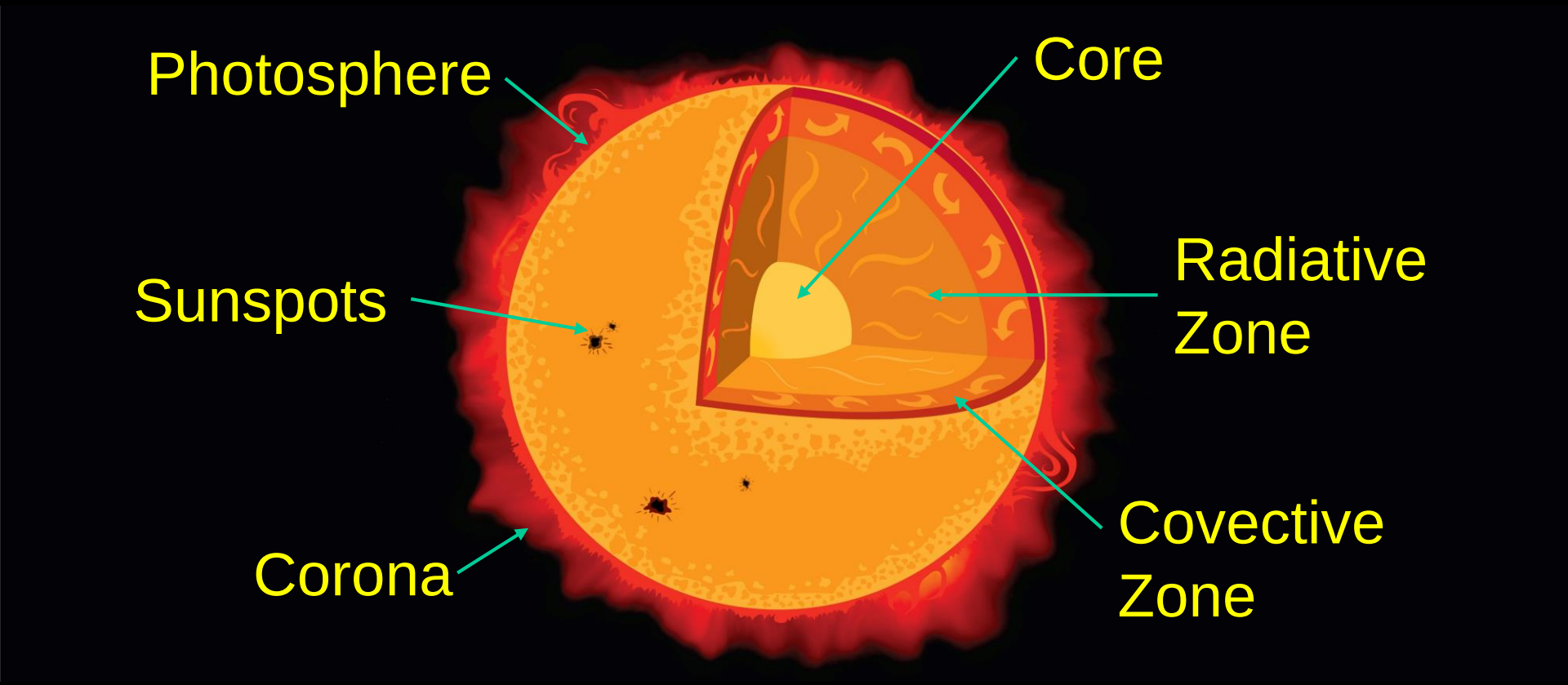
Suntastic Science:

Awnali Mills; Public Services Specialist
Libbie Mill Area Library; Henrico, VA

1) Feature this video about the Parker Solar Probe, which is being launched this year to fly through the sun's atmosphere. https://www.nasa.gov/content/goddard/parker-solar-probe (note that the shield on the probe is white)
2) Place different colors of construction paper outside in the sunshine for at least ½ hour, then have kids guess which ones will be hottest/coolest, or if there will be no difference at all (be sure to include black and white). Use the infrared thermometer from the NASA kit to take the temperatures and compare.
3) Discuss what a thermal shield is, and why the Solar Probe needs one in order to operate. Build thermal shields out of different materials (copy paper, cardboard, aluminum foil, plastic bottles, etc) for half of each construction paper you put into the sun earlier, then wait for a while and take the temperature of the shielded paper vs. the unshielded paper to see which shields are best.
4) While you're waiting for the papers to normalize:
    1) Use sunoculars to CAREFULLY look at the sun
    2) Let kids play with the Solar Vision app on the NASA tablet.
5) You can also have kids make bracelets from the UV Beads and talk about heat vs. ultraviolet radiation.
6) Show children how to detect ultraviolet light with tonic water

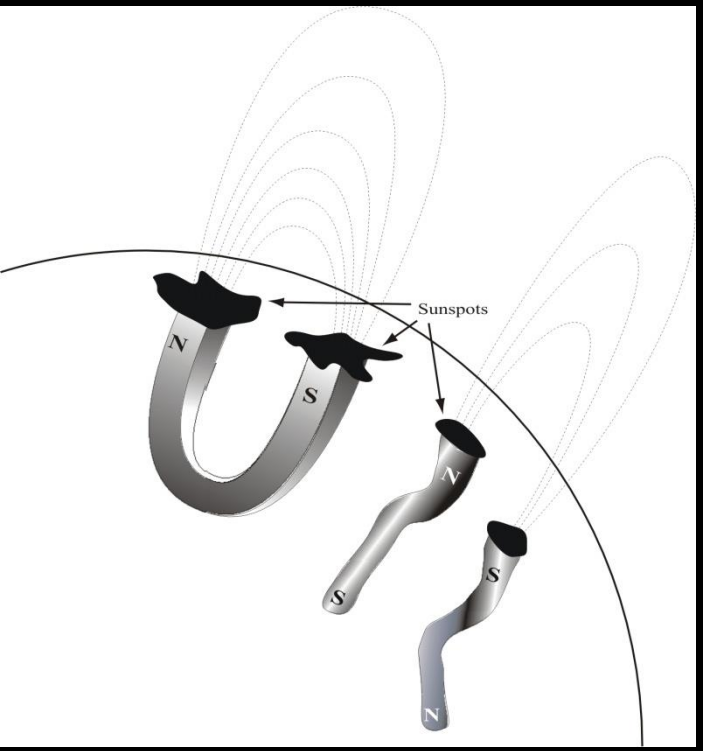
Our Star, the Sun

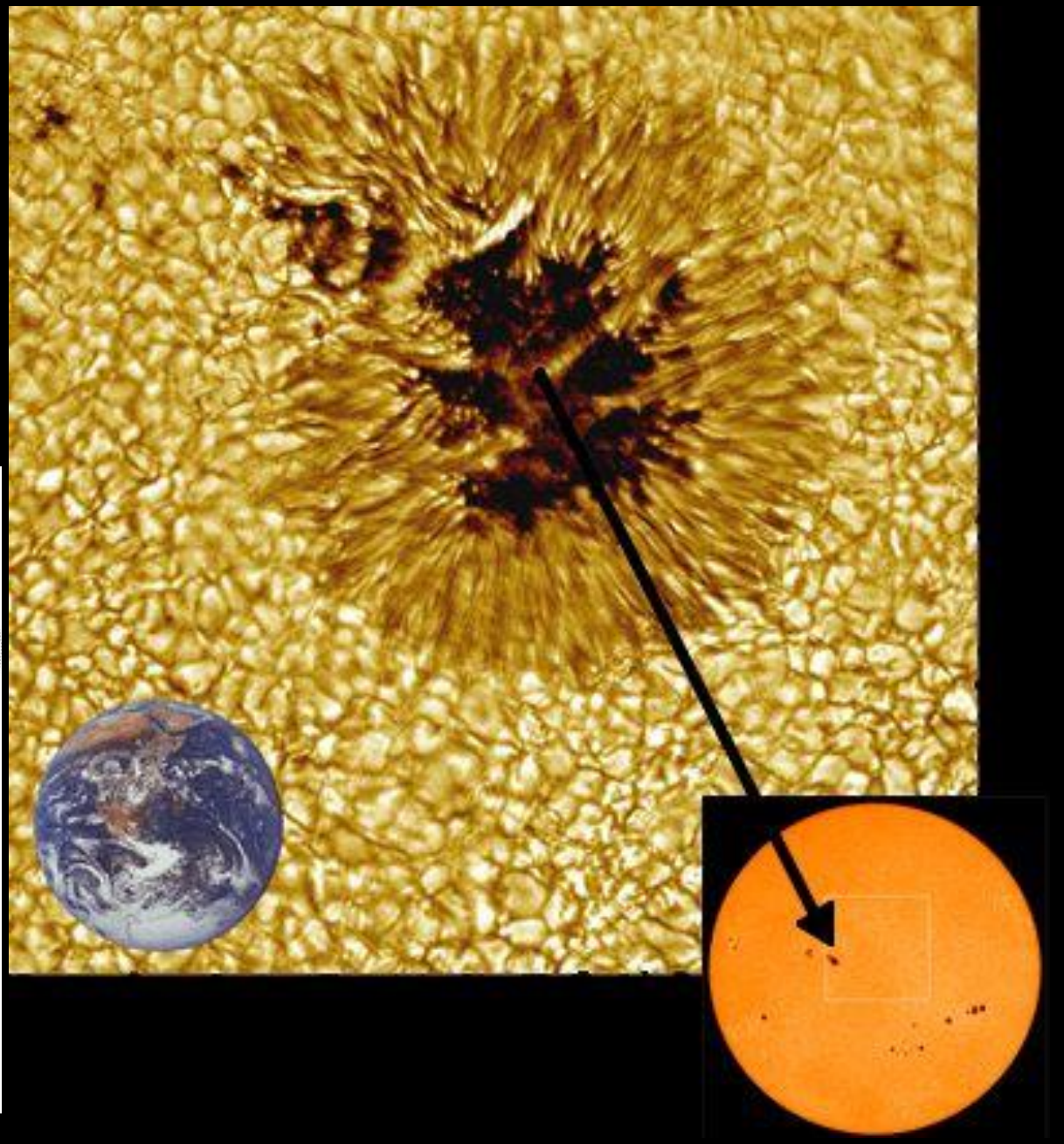
Regions of Our Sun



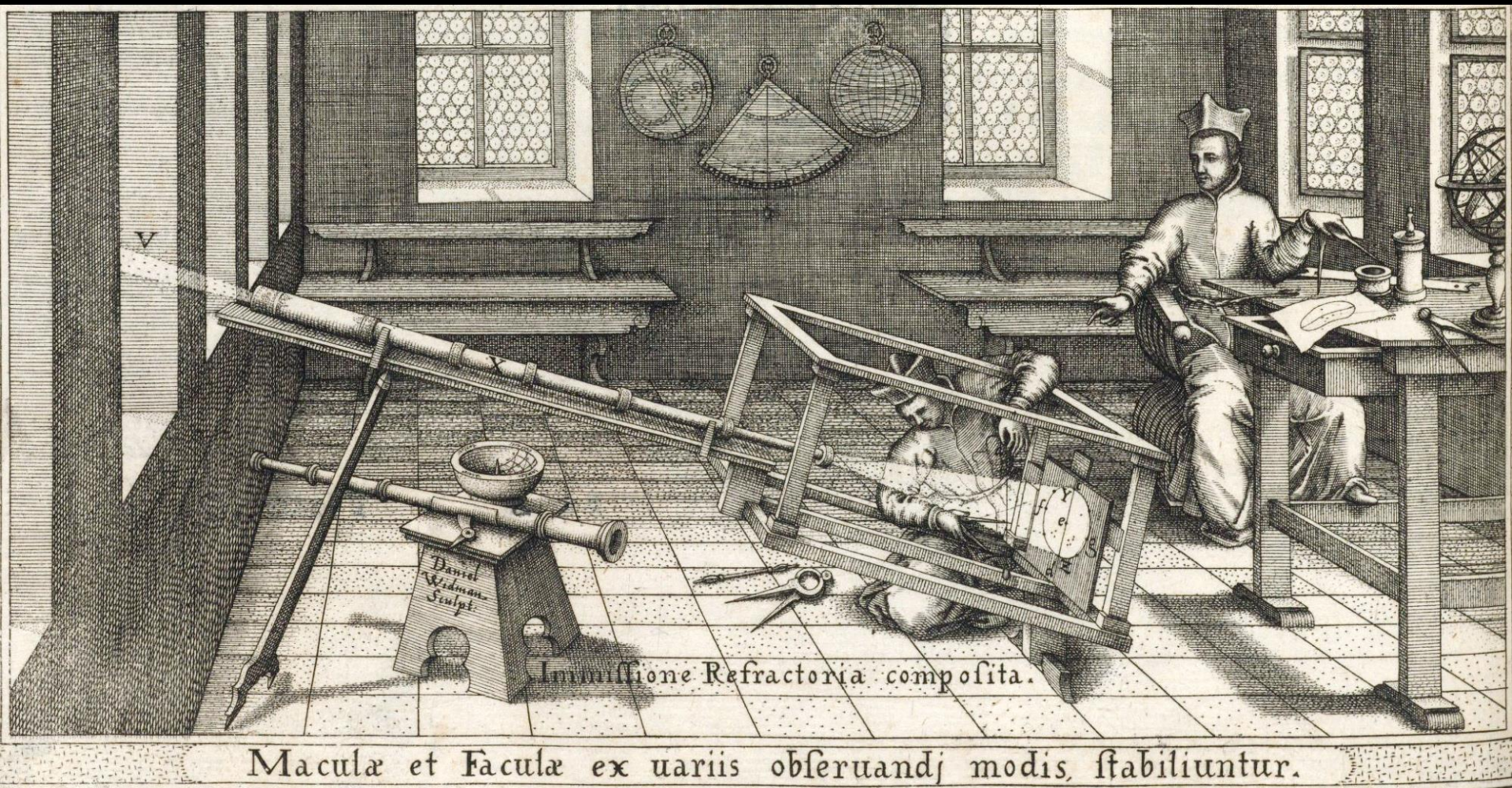
Seeing Spots

Sunspots: cool, dark, & magnetic

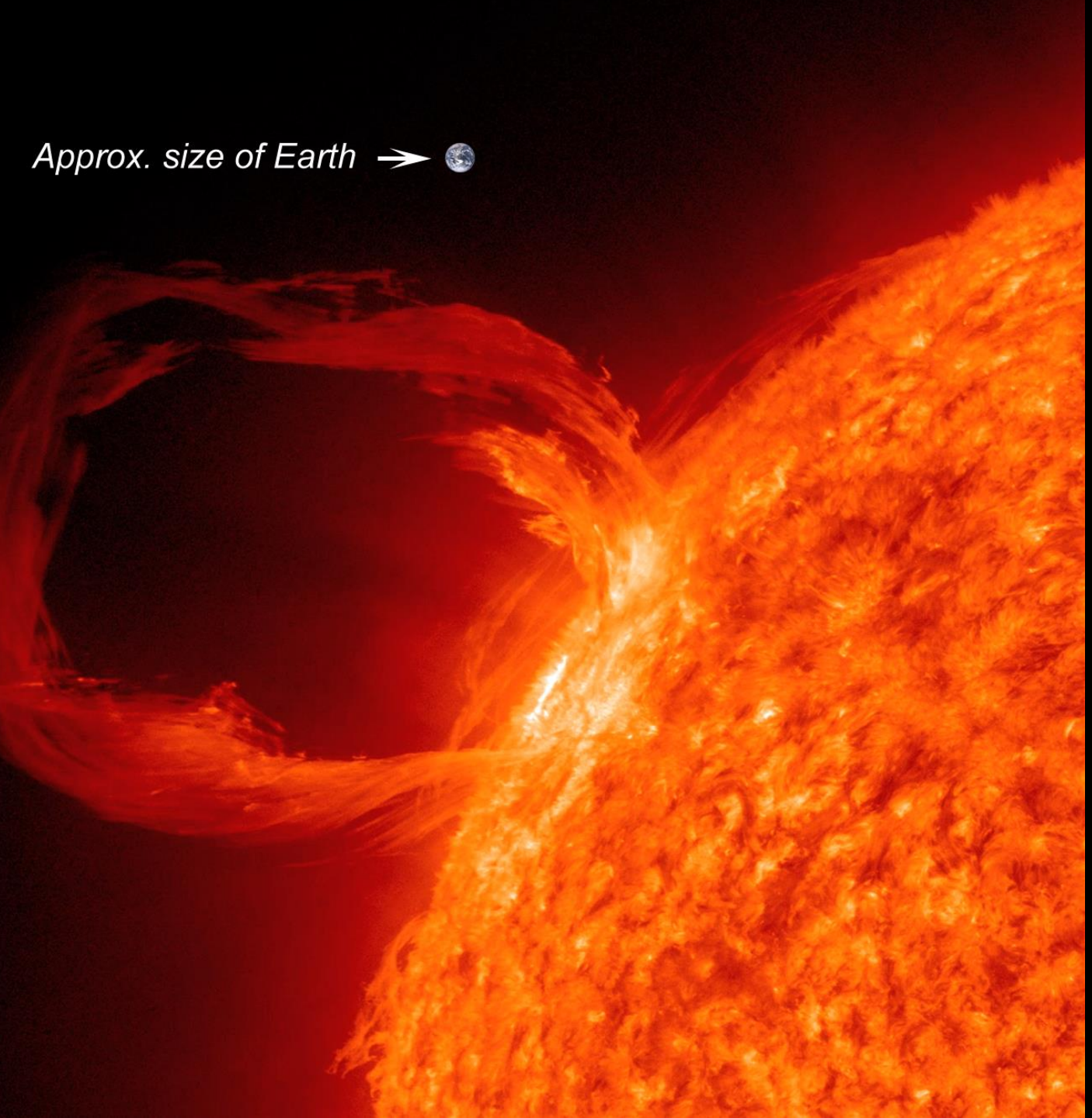




Christoph Scheiner and a fellow Jesuit scientist trace sunspots in Italy in about 1625



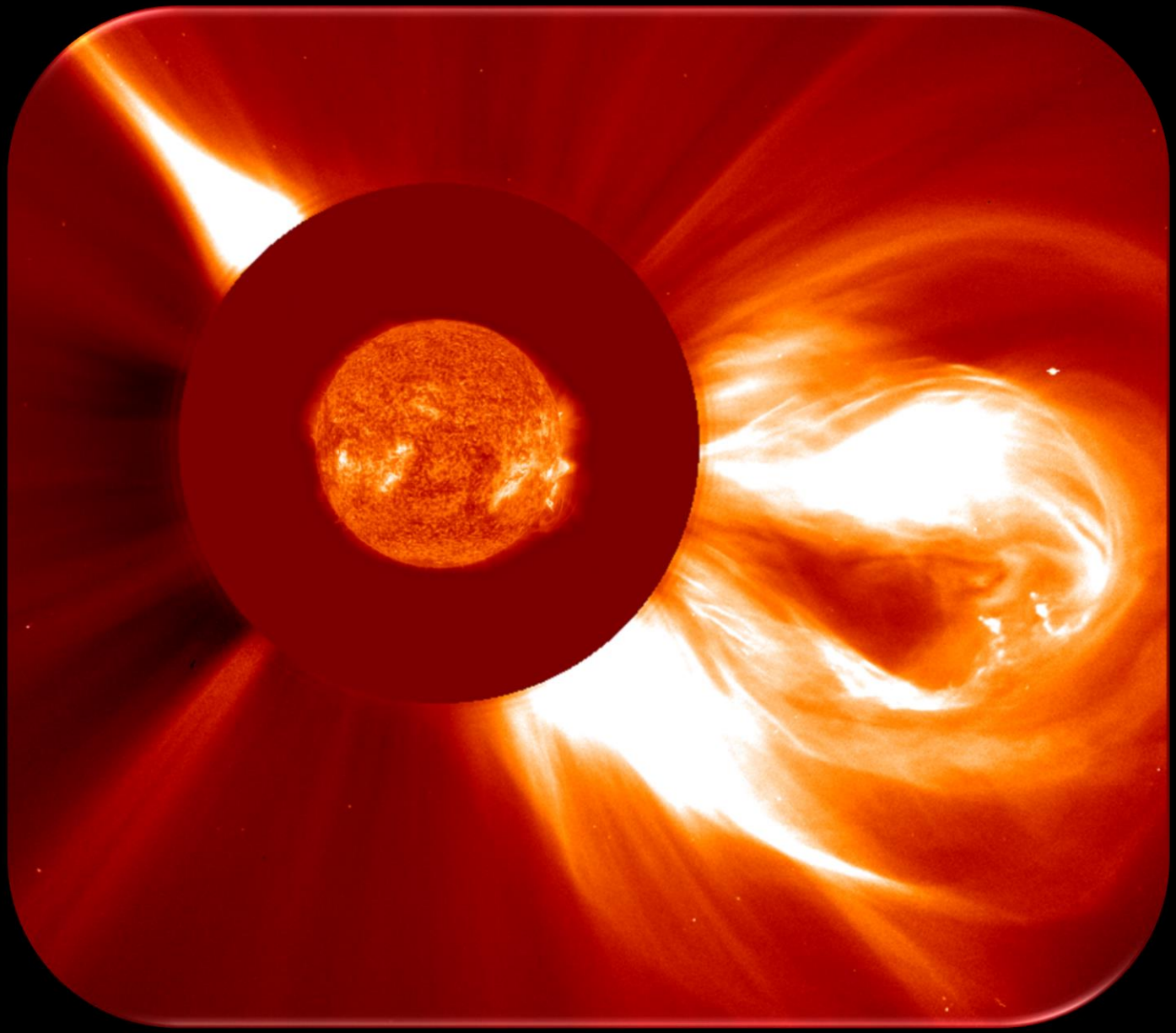
Magnetic Loops



Prominences

Earth-Sun distance
not to scale

Stormy Weather on the Sun



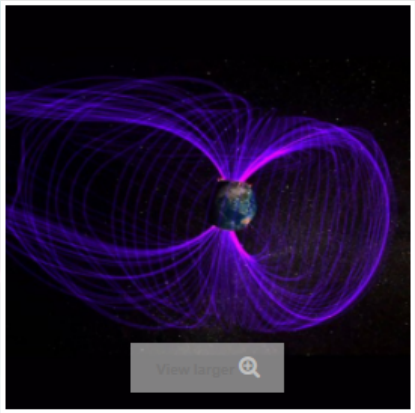
Huge blasts from the corona, known as coronal mass ejections (CMEs), are the most violent space weather event.

Space Weather: Sun-Earth Connections


Thank You!
Inspire – Explore – Discover
www.starnetlibraries.org

Neato Magneto

Activity Link



Neato-Magneto Planets

Participants study magnetic fields at four separate stations: examining magnetic fields generated by everyday items, mapping out a magnetic field using a compass, creating models of Earth's and Jupiter's magnetic fields, and observing aurora produced by magnetic fields on both planets.

Open Activity

How-to Video

Hints for use in your library: Have the children use caution when experimenting with magnets! They should not be brought near computers, computer monitors, audio tapes, or other magnetic devices.

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Write a review

Send to a friend

Print

Content Area
Earth Science

Age Group
Family
Upper Elementary
Tweens (9-12)

Time to Complete Activity
10-20 minutes
40 minutes to 1 hour

Time needed to prep Activity
10-20 minutes

Cost associated with Activity Materials
$1-$5

Difficulty Level (by content)
Medium

Mess Level
Medium

Report a broken link

Categorized Incorrectly? Let us know!

Parker = Solar Eclipse 2.0

Repurpose Those Old Eclipse Programming Ideas!

- **Solar Eclipse Glasses**
- **Sunoculars**
- **Solar Vision App**
- **Scale Model of Sun and Earth (How-To Video)**
- **Indirect Solar Viewing**

Thank You! Questions?