


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



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

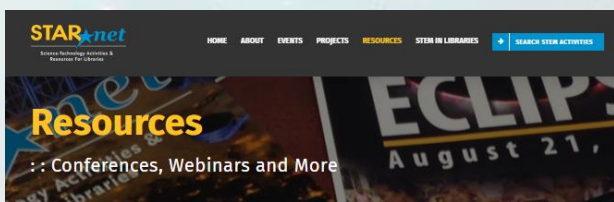


Audio problems? Click and highlight the  button at the top of your screen. You can also click “Meeting” > “Audio Setup Wizard”. You will not need microphone capabilities.

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

Join the STAR Library Network!



Curated Resources For Professional Development

Building the capacity of public libraries and library staff to deliver engaging, inspirational, and educational STEM programs has the potential to transform the STEM education landscape across the country. What started in libraries some years ago as independent experiments in STEM programming has become a national STEM movement.

Across the country, libraries are redefining their roles. They're becoming primary centers of informal learning, especially STEM learning. And this critical transition is being carried out by many dedicated librarians. To help them, the STAR Library Education Network (STAR_net) is providing resources to support their efforts to develop new skills and provide quality STEM programming.

Collaboration is the key to transforming libraries into STEM learning centers



Conferences



Webinars



Newsletters



Online Forums



STAR_Net Blog



2017 Solar Eclipse



Exhibition Posters



Books, Videos & More!



Guides, Facts & Tips

Recent Blogs

> Watercraft Design

> The Dirt on Soil

> Do You Have Your Solar Eclipse
"Glasses" On yet - Now Try Them Out!

Upcoming Events

Discover NASA Exhibition
(AZ)
May 2 - July 28

Summer Learning - Build a
Better World
May 10 - August 20

Discover Tech Exhibition
(CO)
May 31 - August 20

[View All Events](#)

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

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

STEM ACTIVITY Clearinghouse

For example:
[DIY Sun Cookies](#)

STEM Activity Clearinghouse

Search

STARnet Science-Technology Activities & Resources For Libraries

CS Cornerstones of Science awakening curiosity, enriching lives

Collections 2017 Total Solar Eclipse

ATTRIBUTES

2017 TOTAL SOLAR ECLIPSE

There are 7 items.

Showing 1 - 7 of 7 items

Content Area

- ☐ Earth Science (0)
- ☐ Astronomy and Space (0)
- ☐ Chemistry (0)
- ☐ Physics (0)
- ☐ Engineering (0)
- ☐ Mathematics (0)
- ☐ Technology and Computing (0)
- ☐ Health Science (0)

Age Group

- ☐ Family (0)
- ☐ Infant (0-2) (0)
- ☐ Pre-K (0)
- ☐ Early Elementary (0)
- ☐ Upper Elementary (0)
- ☐ Tweens (9-12) (0)
- ☐ Teens (0)
- ☐ Adults (0)

Time to Complete Activity

- ☐ Under 10 minutes (0)
- ☐ 10-20 minutes (0)
- ☐ 20-40 minutes (0)
- ☐ 40 minutes to 1 hour (0)
- ☐ 1-2 hours (0)
- ☐ 2-4 hours (0)
- ☐ Long Duration (days to months) (0)

How Big, How Far, How Hot, How Old?

This is an activity about scale. Participants will arrange imagery of Earth and many other space objects in order of their size from smallest to largest, their distance from Earth's surface, their temperature from coolest to hottest, and/or their age from youngest to oldest.

[Open Activity](#) [Report broken link](#)

Content Area

- Earth Science
- Astronomy and Space

Age Group

- Family
- Upper Elementary
- Tweens (9-12)

Time to Complete Activity

10-20 minutes

Difficulty Level (by content)

Medium

[View Details](#)

How Can the Little Moon Hide the Giant Sun?

This is an activity exploring the concept that distance affects how we perceive an object's size, specifically pertaining to the size of the Sun and the Moon as seen from Earth.

[Open Activity](#) [Report broken link](#)

Content Area

- Earth Science
- Astronomy and Space

Age Group

- Early Elementary
- Upper Elementary

Time to Complete Activity

40 minutes to 1 hour

Difficulty Level (by content)

Easy



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!**

New Clearinghouse Feature



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

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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.



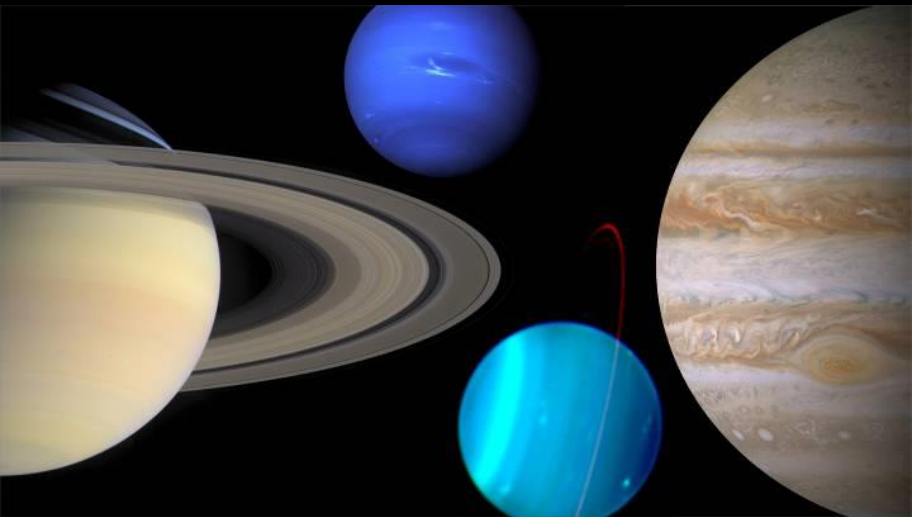
3. Stars and star systems orbit the centers of galaxies



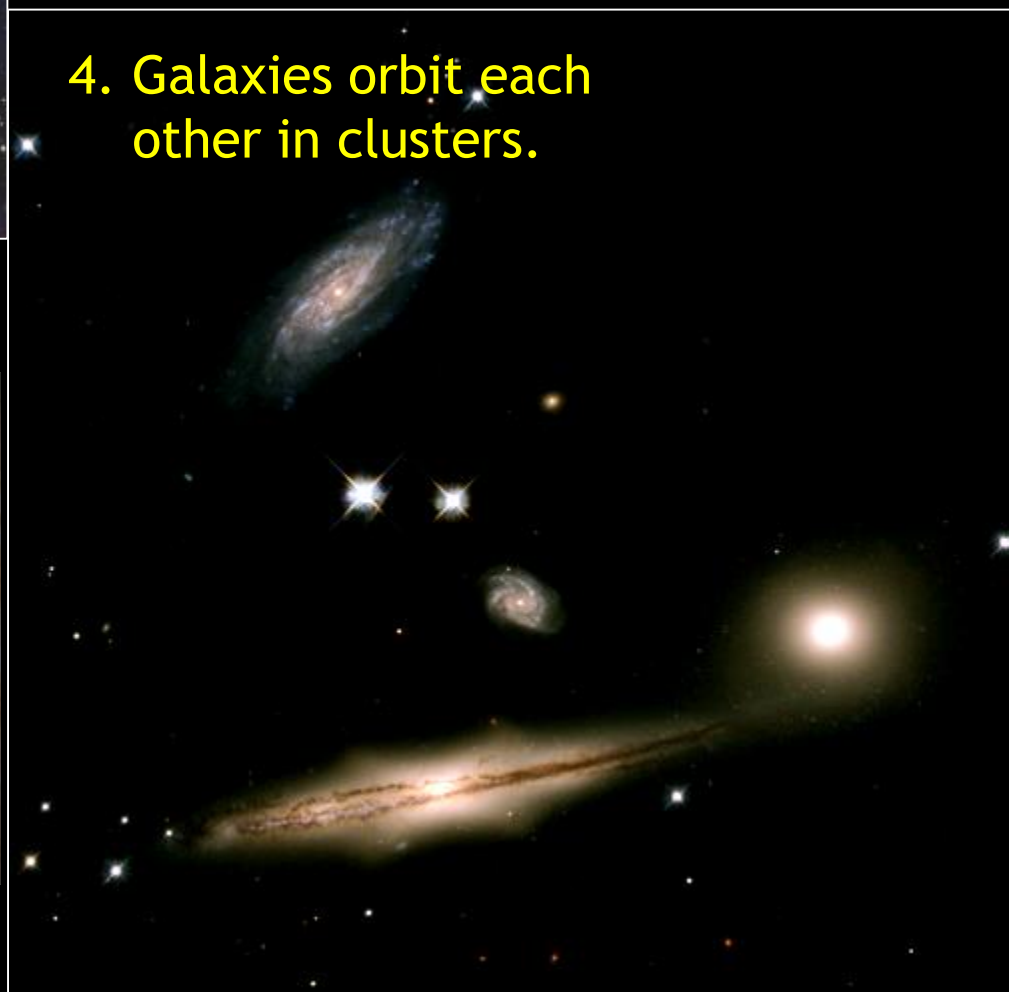
1. Moons orbit planets

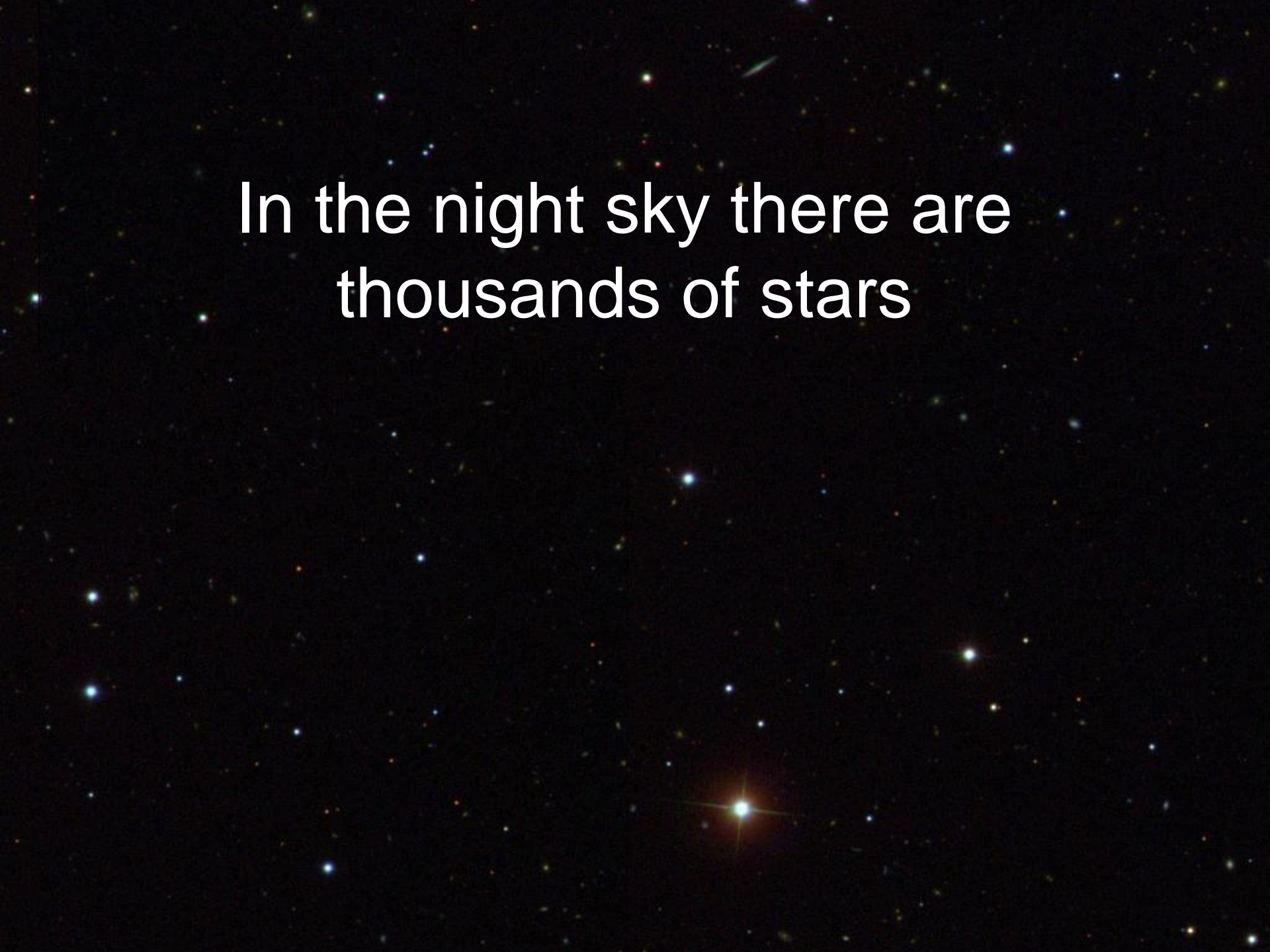


2. Planets orbit stars

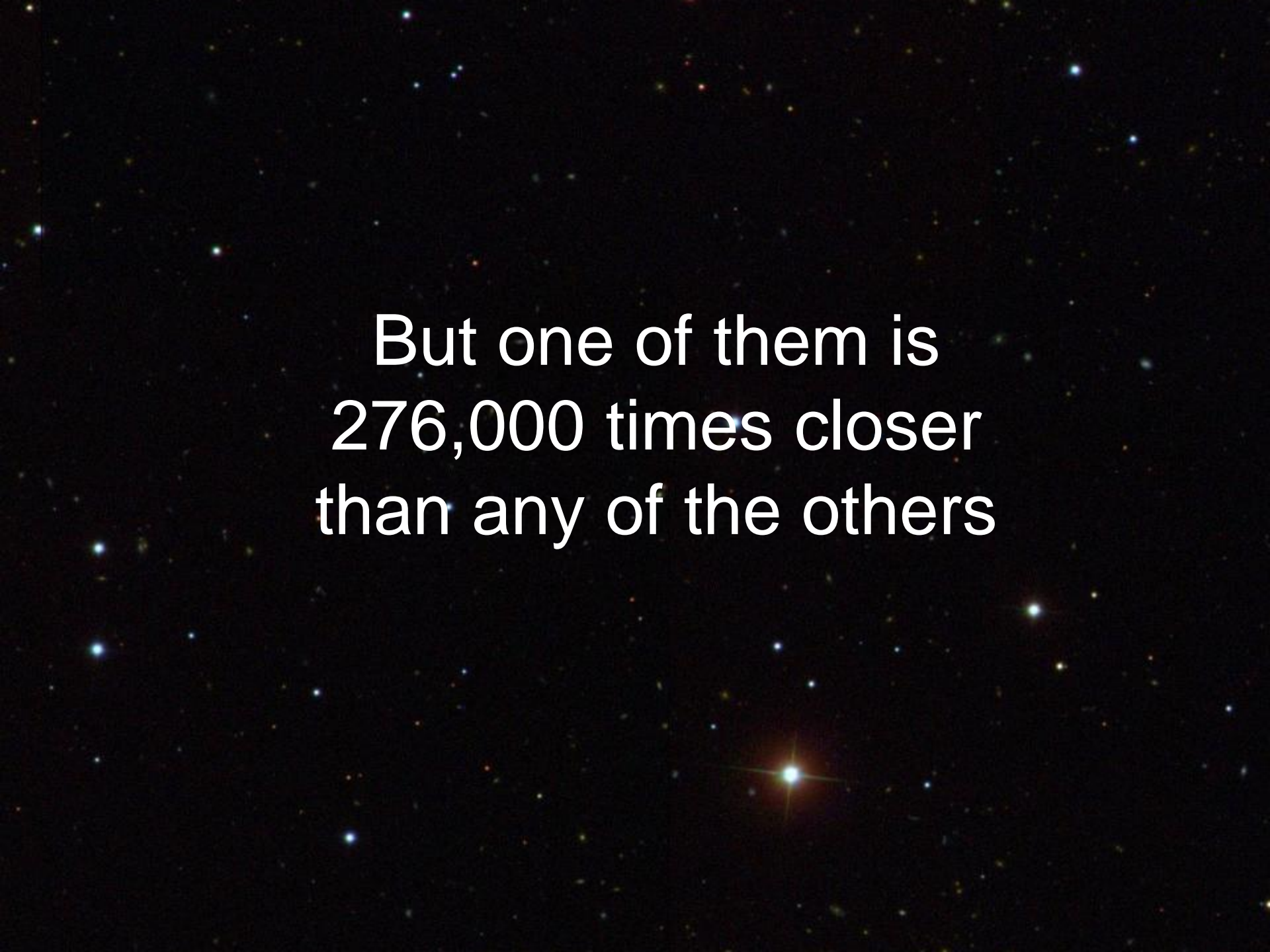


4. Galaxies orbit each other in clusters.




A deep space photograph showing a vast field of stars against a black background. The stars vary in brightness and color, with some appearing as sharp points of light and others as soft, glowing clouds. The text "In the night sky there are thousands of stars" is overlaid in the upper center in a white, sans-serif font.

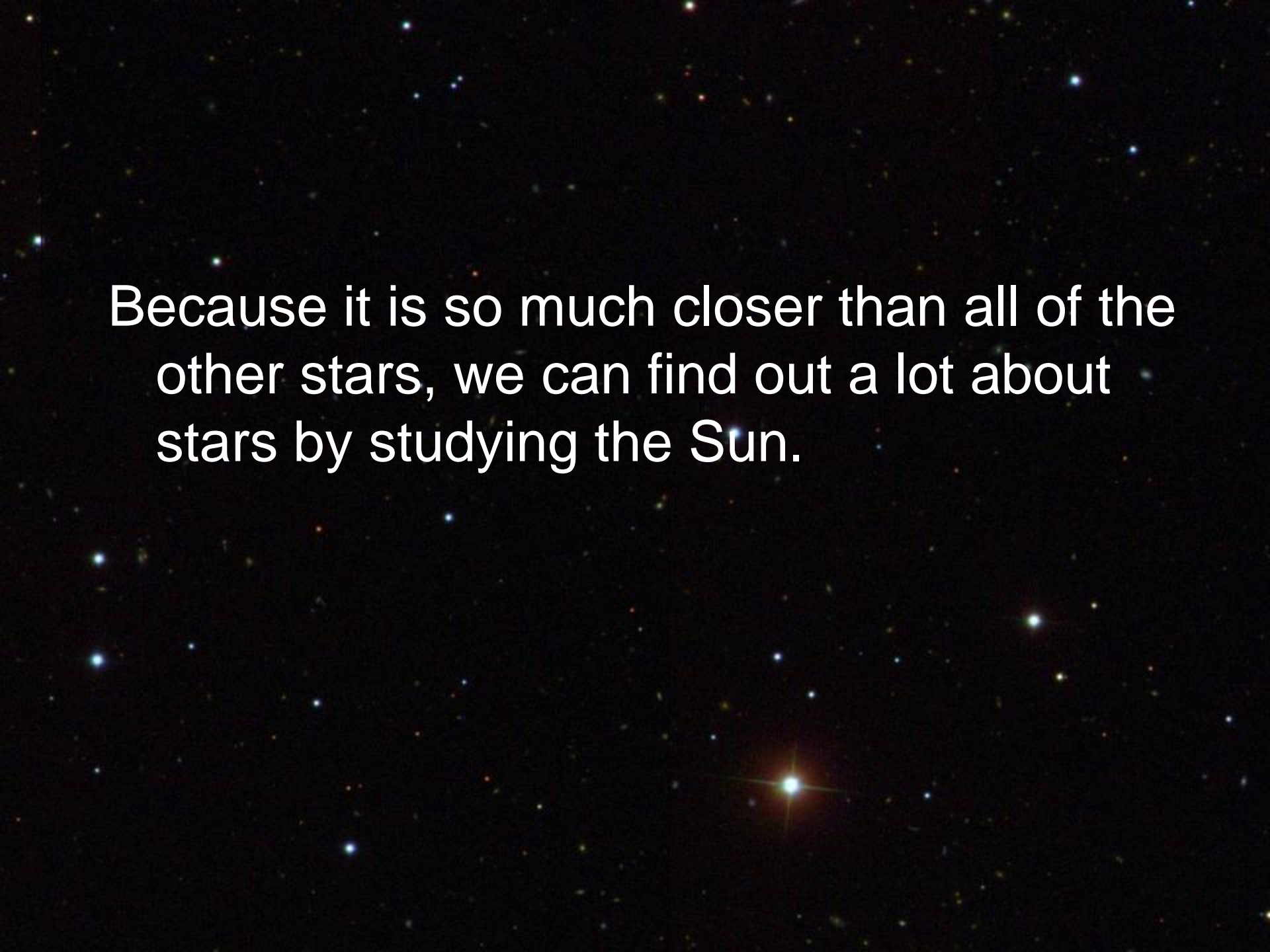
In the night sky there are
thousands of stars



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



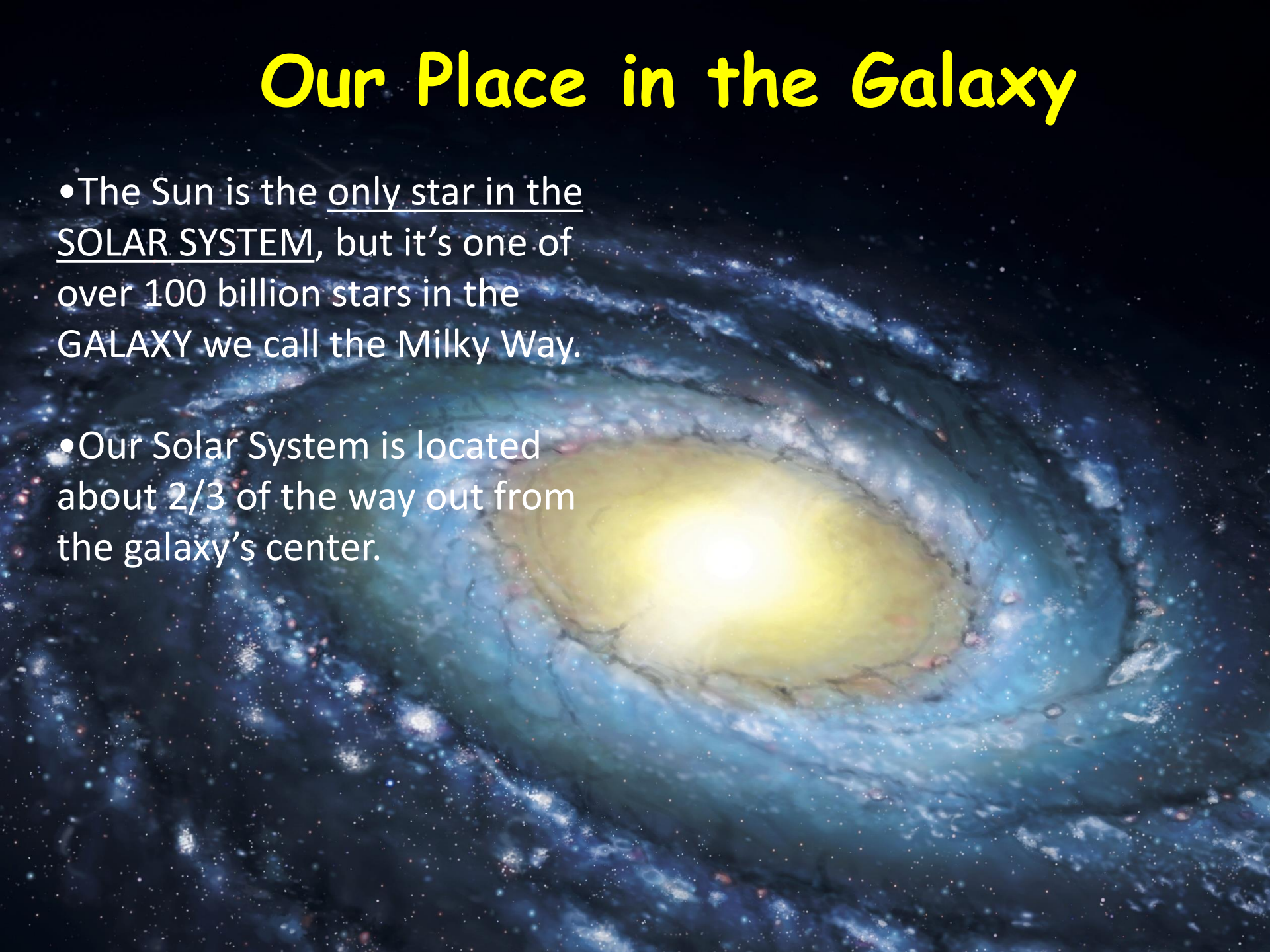
Our Star
The Sun



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 $\frac{2}{3}$ of the way out from the galaxy's center.



An artistic rendering of the Parker Solar Probe spacecraft in orbit around the Sun. The probe is shown from a side-on perspective, with its large black heat shield facing the Sun. The Sun is a massive, glowing orange sphere with visible solar flares and a prominent coronal mass ejection on the left. The probe's various instruments, including a long boom with a camera at the end, are visible. The background is a deep red, suggesting the intense heat and radiation of the solar environment.

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 °F

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





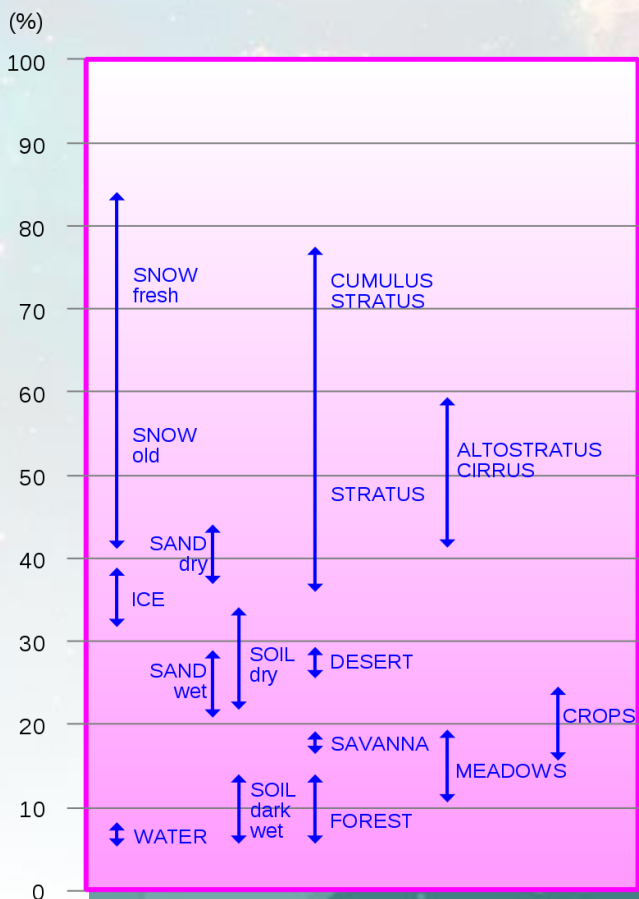
The Launch Vehicle – A Delta IV Heavy Rocket

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

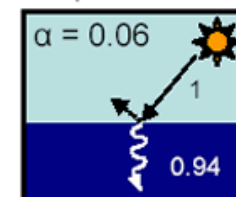
Solar Probe: a Video Tour

Solar Energy and Albedo

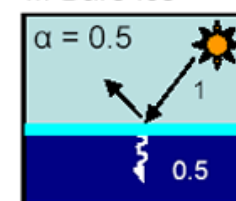




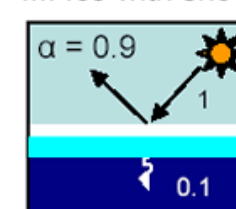
I. Open ocean



II. Bare ice



III. Ice with snow



Solar Energy



Solar Energy

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

[Open Activity](#)



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Content Area

Astronomy and Space
Physics
Engineering

Age Group

Upper Elementary
Twins (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.

Sample Parker Program

Suntastic Science:

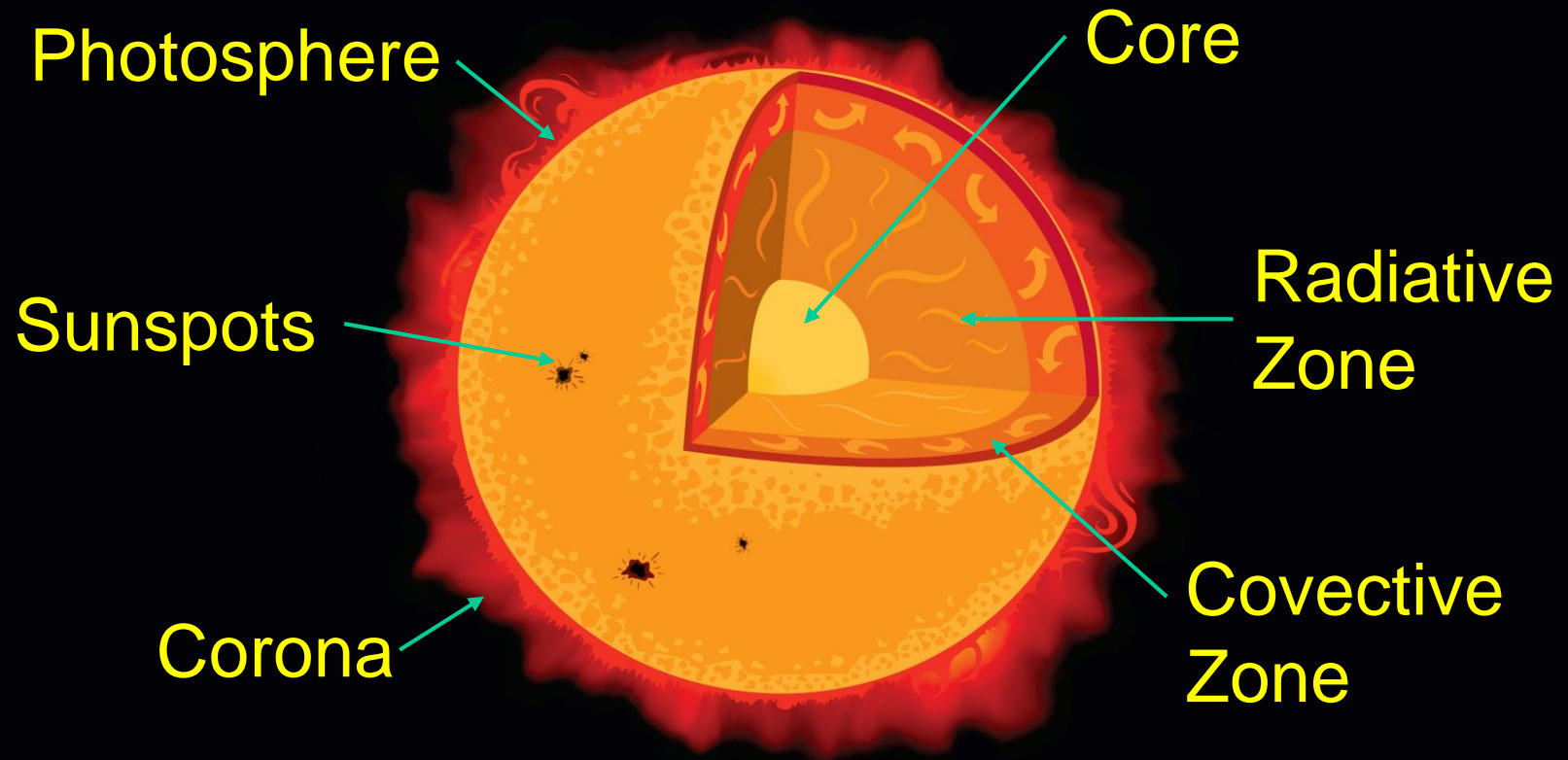
Awnali Mills; Public Services Specialist
Libbie Mill Area Library; Henrico, VA

- 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



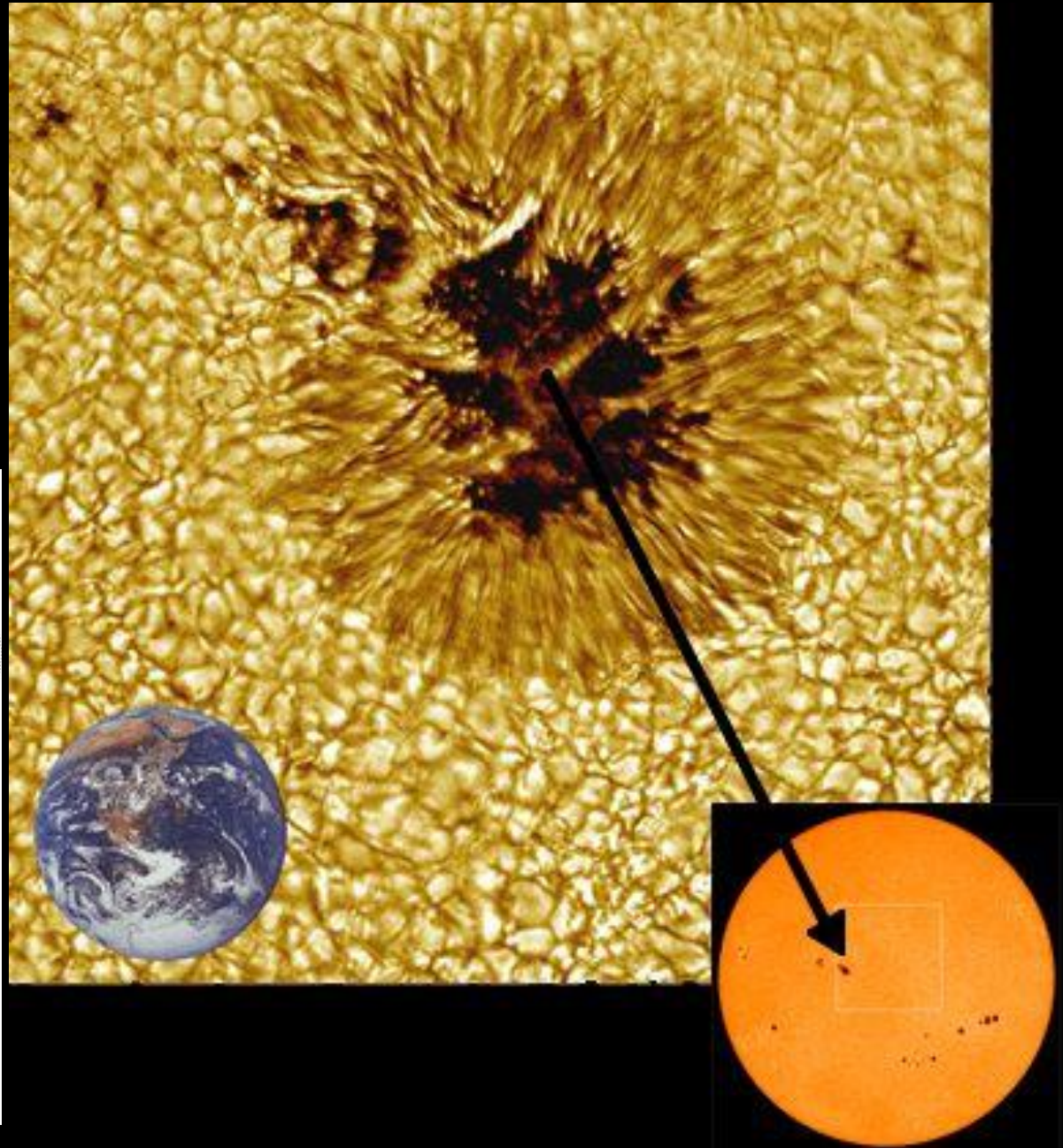
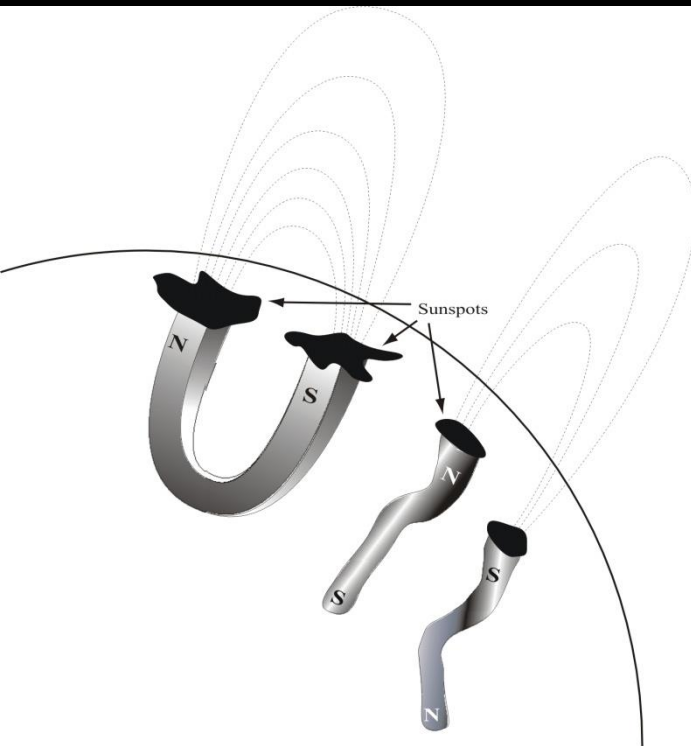
Our Star, the Sun

Regions of Our Sun

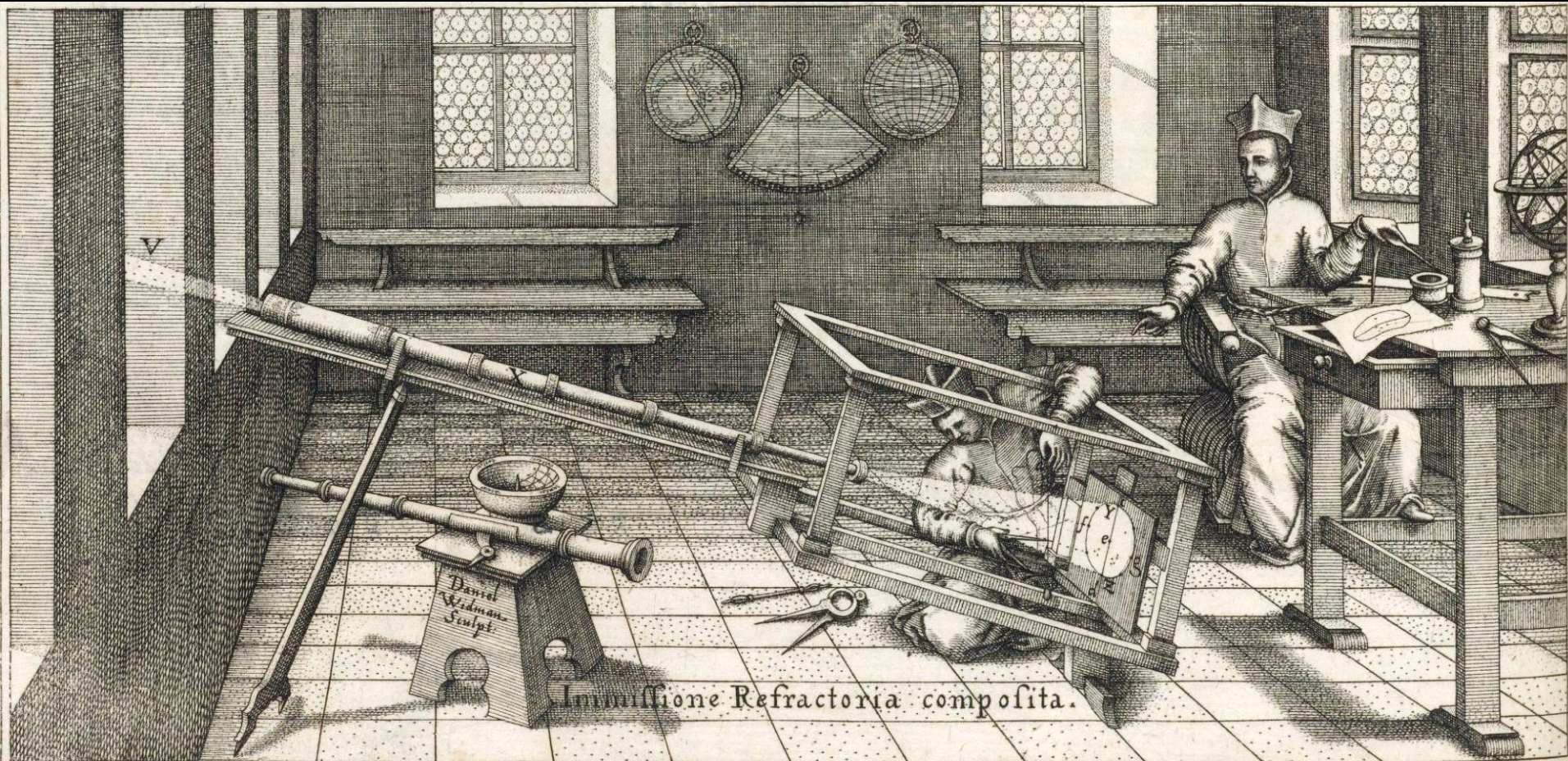


Seeing Spots

Sunspots: cool,
dark, & magnetic




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



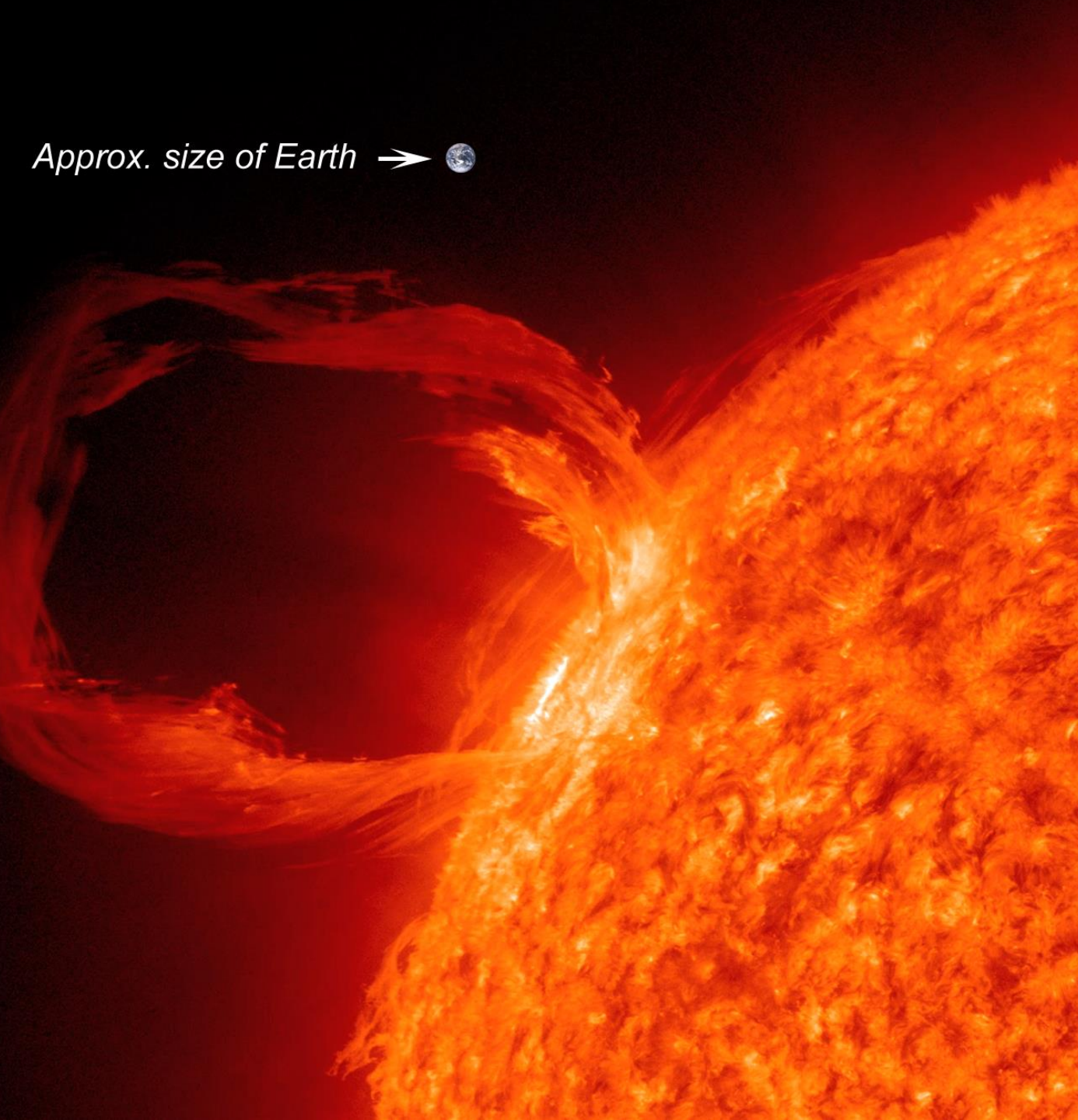
Maculae et Faculae ex uariis obseruandj modis, stabiliuntur.

Magnetic Loops

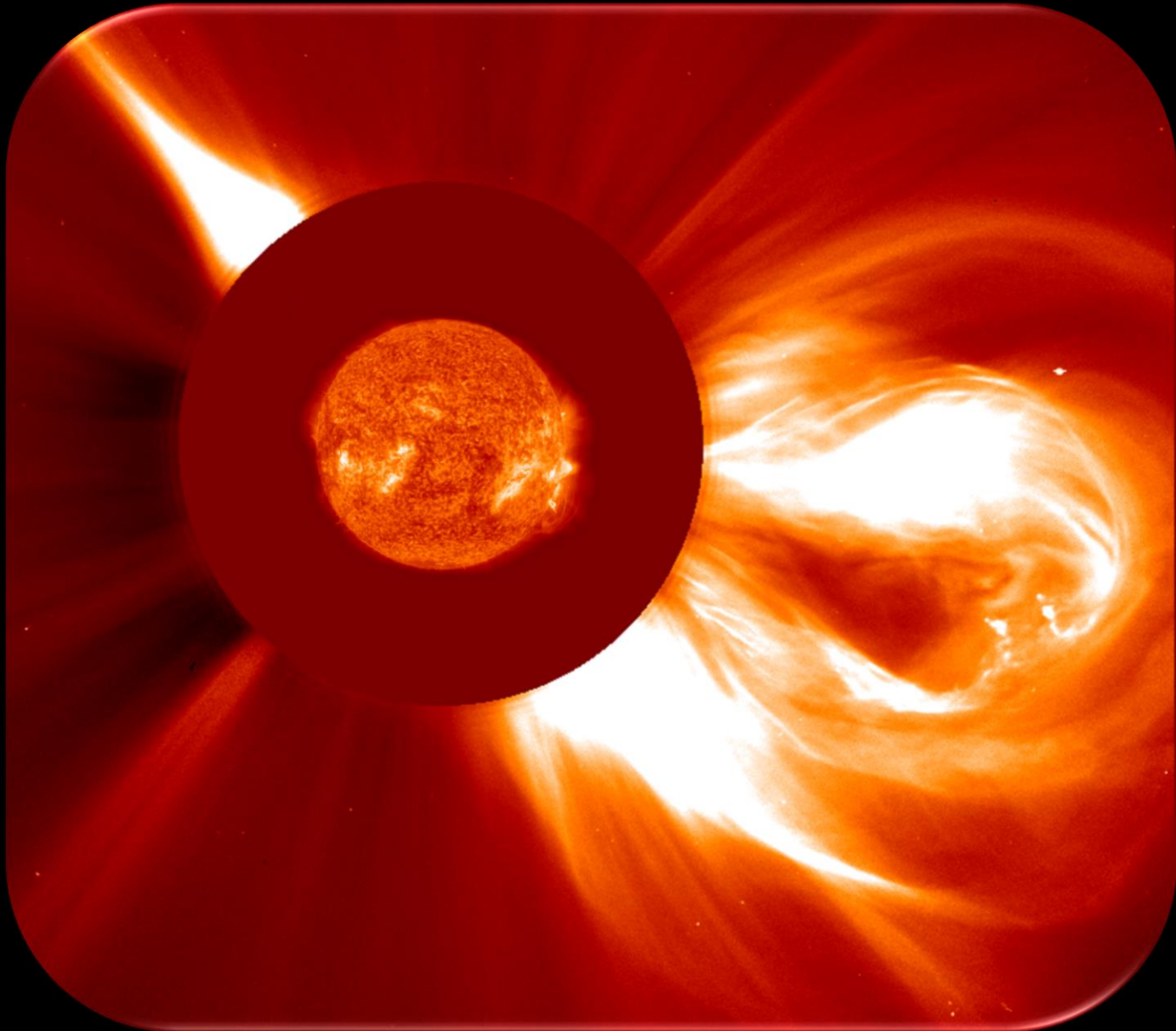
Approx. size of Earth → 

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











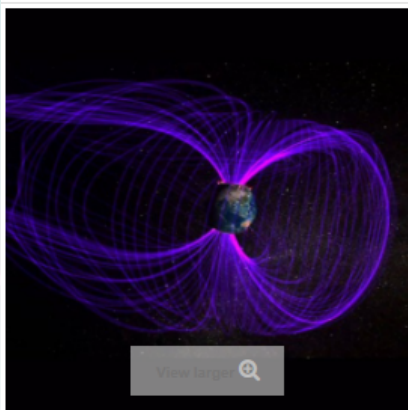
Thank You!

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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Pinterest



Write a review

☐ Send to a friend

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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?