

# PREPARE for the ECLIPSES!

With host, Phil Plait  
"The Bad Astronomer"

Do  
**NASA**  
Science

**LIVE!**

September 19th  
4pm PT/7pm ET

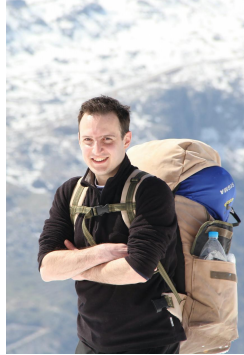


# Welcome!

Meet the behind-the-scenes team from SciStarter



**Emma Giles**



**Roland Moundalak**



**Trevor Bartone**

# Poll



**How do you plan to experience the upcoming eclipses?**

View the annular eclipse path on October 14th, 2023

View the total eclipse path on April 8th, 2024

Watch one or both from home (online or TV, etc)

None of the above

# Poll



**Are you...**

A space fan

A student

A parent

A teacher, educator, troop leader, etc.

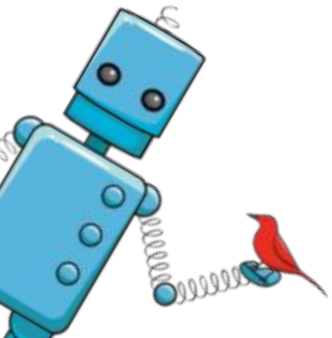
A librarian

A scientist

A curious or bored person on the internet

# Join the SciStarter Community

- Find recommended projects that match your location and interests
- Easily send messages or questions to project scientists
- Bookmark and join many projects with "one-click"
- Track your contributions to projects
- Help scientists find you when and where they need you the most!



[SciStarter.org/login](https://SciStarter.org/login)

## Chat

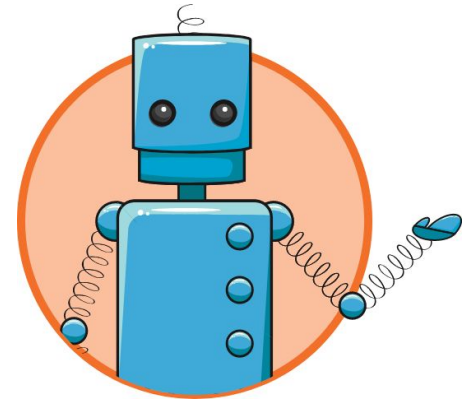
- Use the “Chat” option to share messages with Everyone, Panelists/Hosts, or specific people.
- Direct message IT Support if you need technical help

## Q&A

- Use the “Q&A” option to post questions you’d like the presenters to answer related to:
  - The Heliophysics Big Year
  - Eclipses
  - NASA Citizen Science Projects
  - SciStarter

**Welcome!**

Please introduce yourself in the chat (name & location).



**Zoom features are located at the bottom of your Zoom window.**

# PREPARE for the ECLIPSES!

Do  
**NASA**  
Science  
**LIVE!**

With host, Phil Plait  
"The Bad Astronomer"

September 19th  
4pm PT/7pm ET





**Welcome to Do NASA Science LIVE!**



**Eclipses: What, when, where...and why they matter to science and humankind**



**The Heliophysics Big Year**



**Preparing for and participating in eclipse research**



**Introduction to FIVE NASA research projects that need your help**



**Q&A and additional resources**





# Did you experience the eclipse in 2017?

Where were you?

What was it like?

Who were you with?

*Tell us in chat!*



2023 Maximum Partial Obscuration (%)

2024 Maximum Partial Obscuration (%)



# The 2023 & 2024 Solar Eclipses through the eyes of NASA

Lunar topography data from NASA's Lunar Reconnaissance Orbiter and the Japan Aerospace Exploration Agency's SELENE lunar orbiter were used to precisely calculate the location of the Moon's shadow for the 2023 and 2024 solar eclipses. The planetary positions are from NASA's Jet Propulsion Laboratory Development Ephemeris #21. Earth imagery from NASA's Blue Marble: Next Generation series were used to create the terrain and Earth at night imagery from NASA's Black Marble were used under the eclipse paths.

**2023 Annular Solar Eclipse** Saturday, October 14, 2023  
**2024 Total Solar Eclipse** Monday, April 8, 2024

Credit: Michala Garrison and the Scientific Visualization Studio (SVS), in collaboration with the NASA Heliophysics Activation Team (NASA HEAT), part of NASA's Science Activation portfolio. Eclipse calculations by Erno Wighn, NASA Goddard Space Flight Center

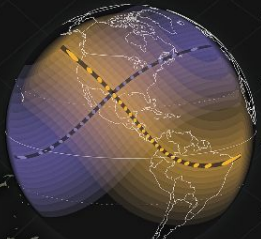
### 2023 Path of Annularity October 14, 2023

Along a path about 125 miles wide, the Sun will appear as a "ring of fire" in the sky. Annularity lasts up to 6 minutes depending on the viewer's location within this path.

### 2024 Path of Totality April 8, 2024

Along a path about 115 miles wide, the Moon will completely block the Sun in the sky. Totality lasts up to about 4 minutes and 28 seconds depending on the viewer's location within this path.

Outside of these paths, viewers within the 48 contiguous U.S. states and many other areas will see a partial solar eclipse (in the shaded areas below).



Find More: [solar.eclipse.nasa.gov/eclipses](https://solar.eclipse.nasa.gov/eclipses)

HP-2022-11-909-GSFC



# HELIOPHYSICS **BIG YEAR**



<http://go.nasa.gov/HelioBigYear/>

# HELIOPHYSICS BIG YEAR MILESTONES



**ANNULAR  
SOLAR ECLIPSE**

OCT. 14, 2023



**TOTAL  
SOLAR ECLIPSE**

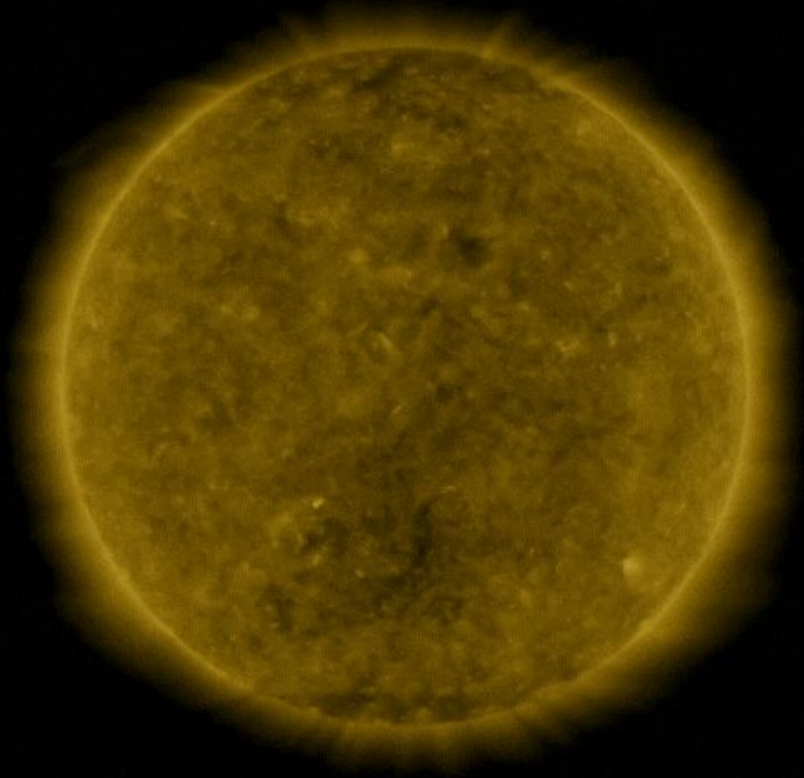
APR. 8, 2024



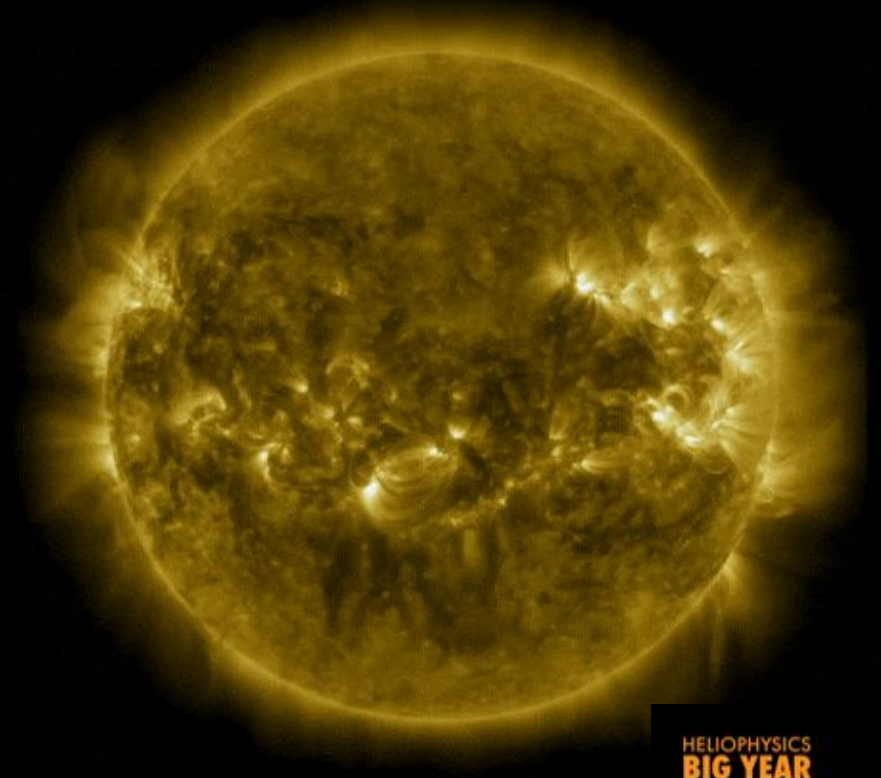
**CLOSEST  
APPROACH TO SUN**

DEC. 24, 2024

# SOLAR MINIMUM



# SOLAR MAXIMUM



# UPCOMING SOLAR ECLIPSES

15

## Annular Solar Eclipse



## Total Solar Eclipse

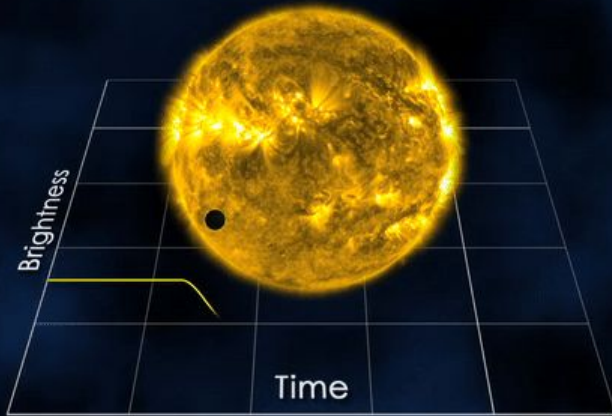


<https://solarsystem.nasa.gov/eclipses/>

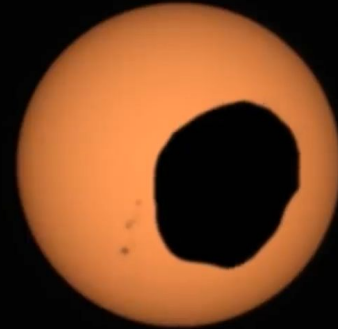
HELIOPHYSICS  
**BIG YEAR**

# INTERDISCIPLINARY SOLAR ECLIPSE SCIENCE

## Exoplanet Transit



## Solar eclipse viewed on Mars by NASA's Perseverance Rover





More than TWO MILLION volunteers in  
167+ countries join NASA research  
projects and collaborate with scientists to  
help make discoveries!

[science.nasa.gov/citizenscience](https://science.nasa.gov/citizenscience)

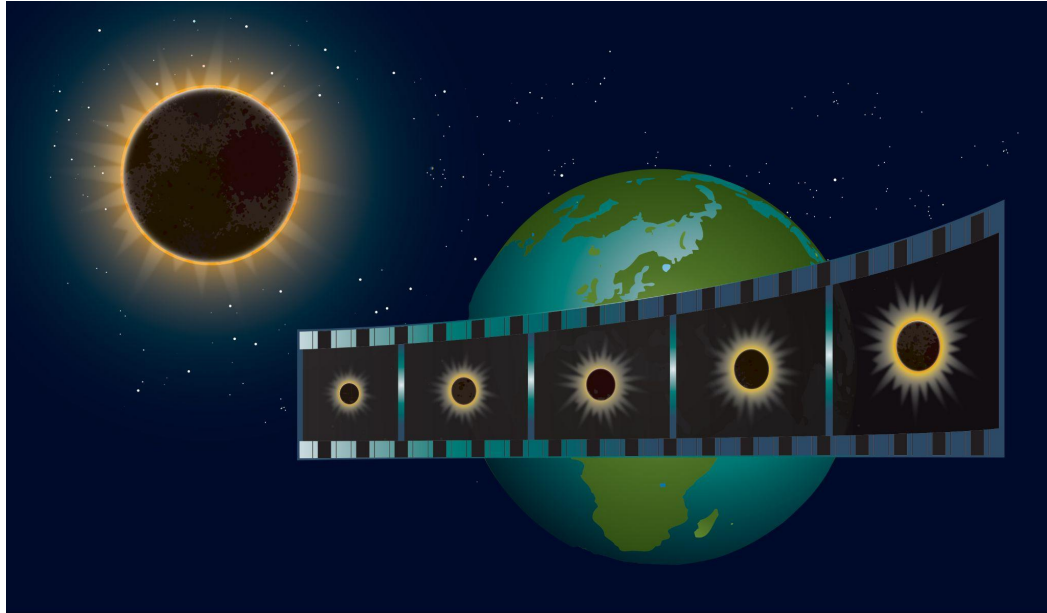


SunSketcher™

Gordon Emslie



*A beautiful example of Baily's Beads, eclipse of 2 July 2019 as seen at La Silla (Credit P. Horalék/ESO).*



Laura Peticolas

**JOIN US! Sign up at our website.**



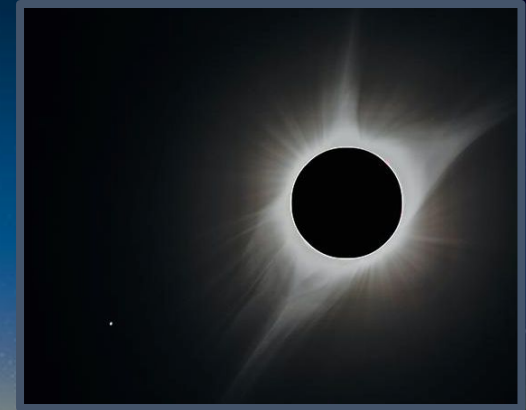
[eclipsemegamovie.org](http://eclipsemegamovie.org)

Volunteer to help the Eclipse Megamovie 2024 (EM2024) study changes in the Sun's atmosphere, the corona.

1. Eclipse Photography
2. Machine Learning (AI) and Python coding
3. Donate to support other's involvement

Our project is giving away one hundred 3-D printed equatorial mounts to volunteer photographers.

ECLIPSE  
MEGAMOVIE



*Eclipse Megamovie 2017  
Solar Corona HDR Photograph.  
Photo Credit: Volunteer astrorx*



Berkeley

SONOMA STATE  
UNIVERSITY





**ECLIPSE**  
SOUNDSCAPES.ORG

MaryKay Severino



Partner

Eclipse Soundscapes is supported by NASA award No. 80NSSC21M0008

# How does life on Earth, specifically wildlife, respond to solar eclipses?

Collect observations and sound data from the October 14, 2023 annular eclipse and the April 8, 2024 total solar eclipse to help us start to figure it out!



## OBSERVER



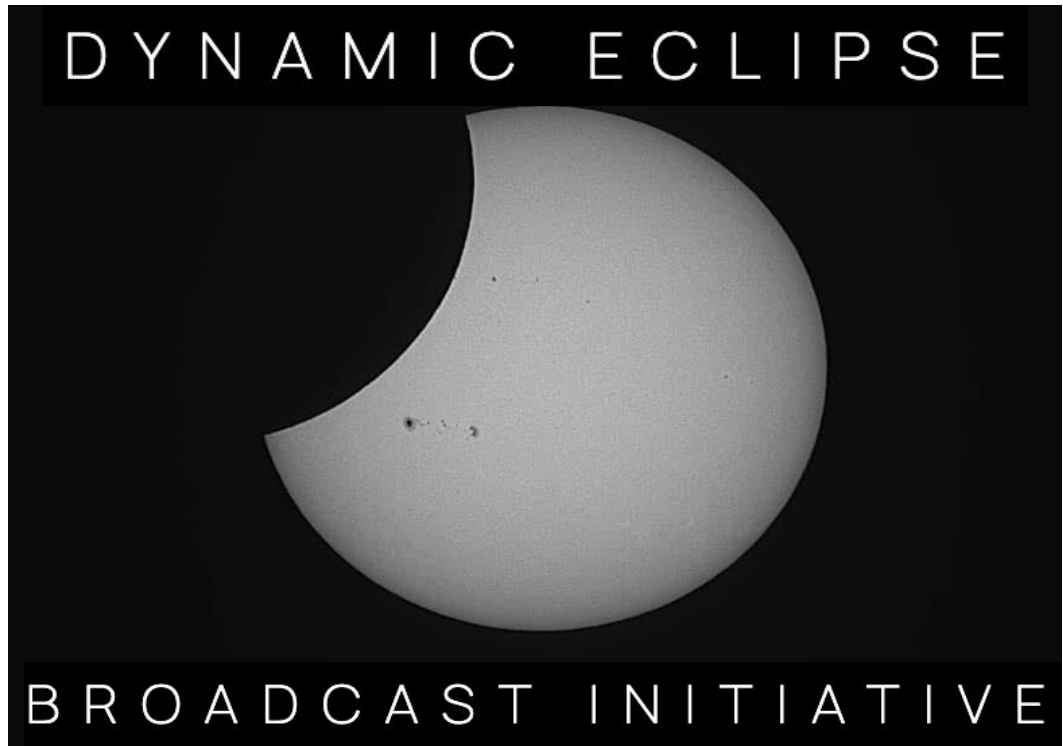
- Eclipse Day Activity
- Free, No Equipment
- On or Off Eclipse Path



## DATA COLLECTOR

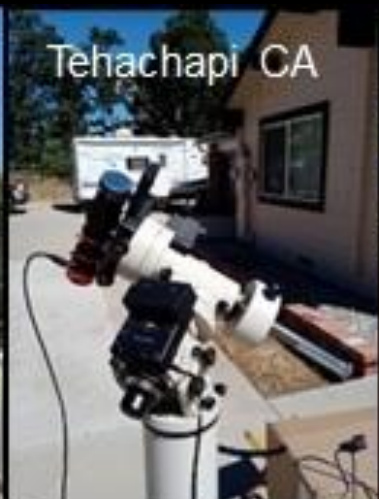


- Eclipse Week Activity
- Equipment Required
- 70%+ Eclipse Path



Cori Brevik







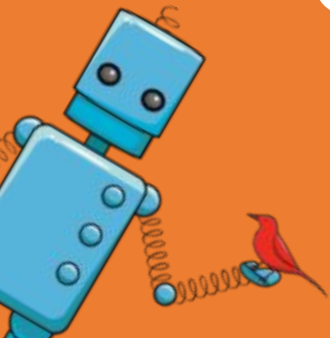
Amir Caspi



Find these and other  
NASA projects on  
[SciStarter.org/NASA-LIVE](https://www.scistarter.org/NASA-LIVE)

---

Questions?



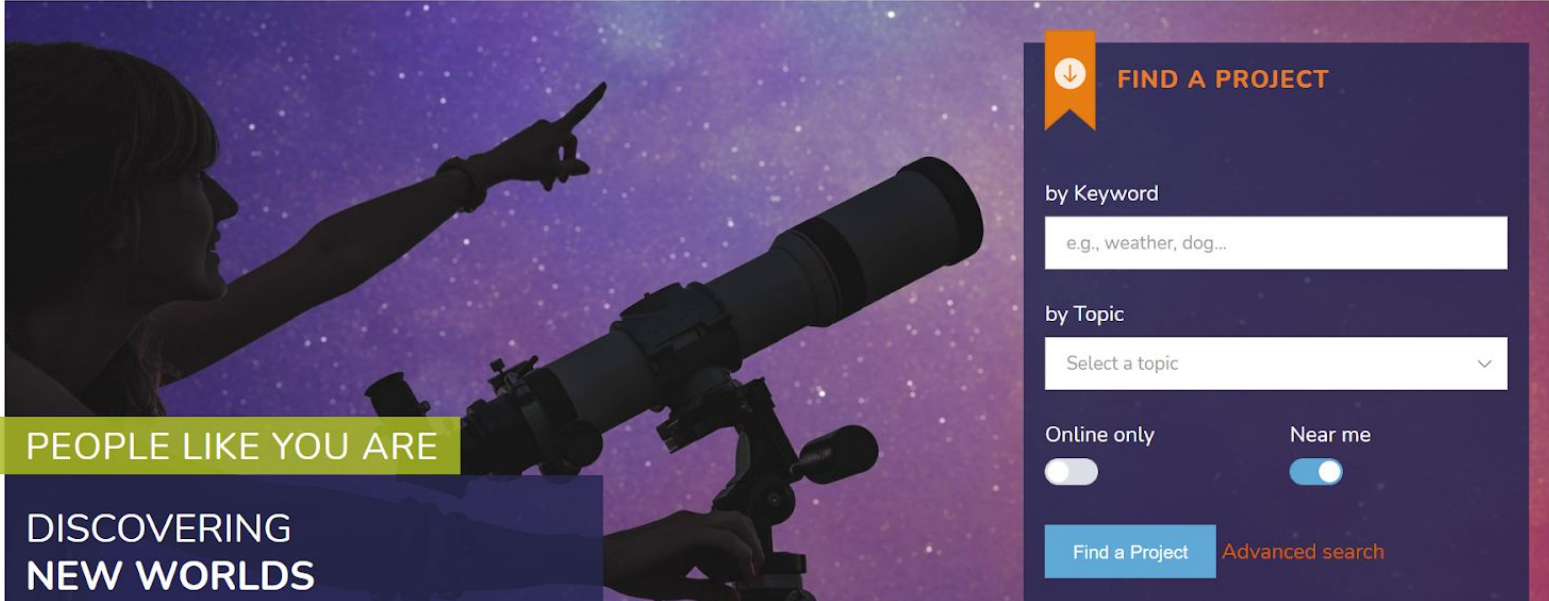


Do  
**NASA**  
Science

**LIVE!**



Partner



**Visit  
SciStarter.org**

SciStarter is a globally acclaimed, online citizen science hub where **thousands of projects** from all over the world have been organized and made searchable!

# Foundations of Citizen Science

[SciStarter.org/training](https://SciStarter.org/training)



Learn the basics while participating in two projects. Earn a personalized badge that shows off your new knowledge!



### **Ask the Community**

At the bottom of every SciStarter project page, you can leave a review or ask a question about the project.



### **Ask the Project Leaders**

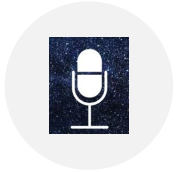
Send a message to a project's leaders with the "Message Project" button on each SciStarter project page.



### **Ask SciStarter**

Email

[Info@SciStarter.org](mailto:Info@SciStarter.org)  
and we'll do our best to help you out!



### **Listen to the Podcast!**

[SciStarter.org/podcast](https://www.scistarter.org/podcast)  
Available also on Spotify, Google, Apple, Podbean, and Stitcher



### **Take a Training**

At [SciStarter.org/training](https://www.scistarter.org/training), you'll find free, self-guided modules like our Foundations of Citizen Science course.



### **Find Your Next Project!**

Ready for more?  
Head back to [SciStarter.org/finder](https://www.scistarter.org/finder) and pick out your next project to contribute to!

# scistarter

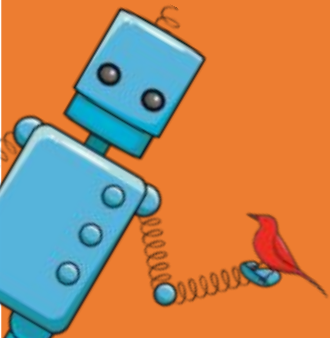
Science we can do together.

## Resources & More

If you registered for this event, we will email you these links.



In partnership with:



CITIZEN SCIENCE  
ASSOCIATION  
CitizenScience.org | @CitSciAssoc



**scistarter**  
Science we can do together.

To learn more and to find additional resources about participatory sciences, go to [SciStarter.org](https://SciStarter.org) and [CitizenScience.org](https://CitizenScience.org)



NASA Science

Watch and Learn

Explore Science

Science Data

Get Involved

Explore the

# NASA Science NOW

Virtual Exhibit

click  
NASA  
Science NOW

HELP  
DESK

Contact  
Us



# Special thanks to our speakers!



**Marc Kuchner**  
NASA



**Gordon Emslie**  
SunSketcher



**Laura Peticolas**  
Eclipse  
Megamovie



**MaryKay  
Severino**  
Eclipse  
Soundscapes



**Amir Caspi**  
Citizen CATE  
2024



**Cori Brevik**  
DEB Initiative

# Special thanks to our host!



**Phil Plait**

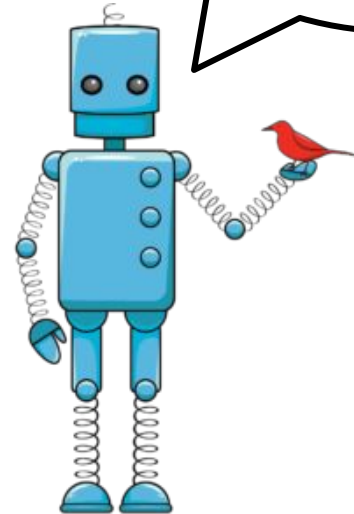
@TheBadAstronomer

Find the five featured projects  
and other NASA projects on  
[SciStarter.org/NASA-LIVE](https://www.scistarter.org/NASA-LIVE)

# Thanks for watching!

---

Reach SciStarter at [Info@SciStarter.org](mailto:Info@SciStarter.org)



Tell us how we  
did by taking  
our survey!