NASA@ My Library

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

NCIL National Center for Interactive Learning

Libraries Helping Girls STEAM Ahead with NASA

Brooks Mitchell (SSI), Emma Marcucci (STSCI), Holly Ryer (STSCI), Thalia Rivera (NASA-JPL)

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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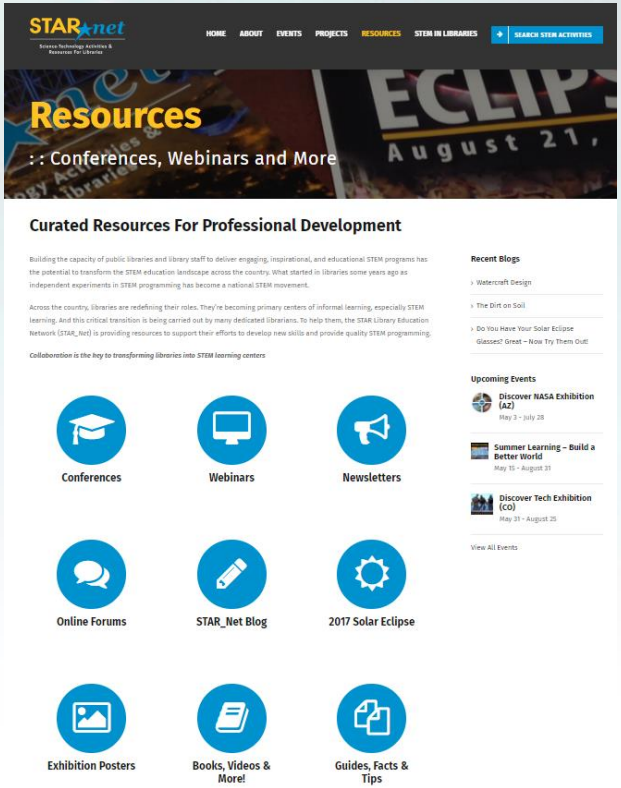
Join the STAR Library Network!



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

NASA ALA American Library Association Cornerstones of Science PACIFIC SCIENCE CENTER EDC Learning transforms lives. COSDA

Upcoming Webinars

A Universe of NASA Resources

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

August Webinars

- International Observe the Moon Night
- Lights on Afterschool
- More to Come!

Headed to ALA? Come See Us!

- **NASA Booth #1839 – Hyperwall talks, swag, and more!**
- **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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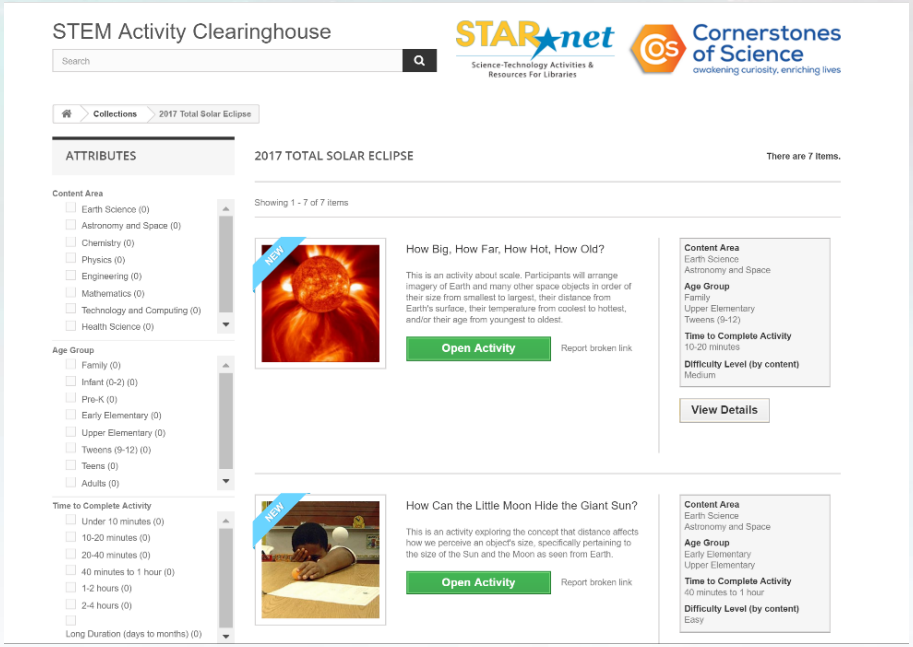
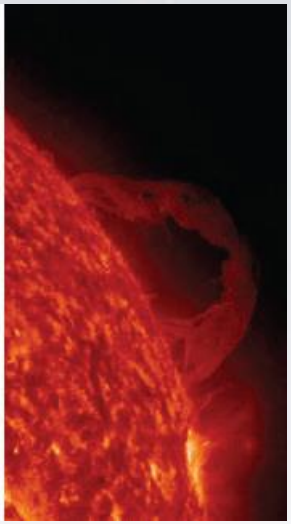
STEM ACTIVITY Clearinghouse



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!**

NASA ALA American Library Association Cornerstones of Science PACIFIC SCIENCE CENTER EDC Learning transforms lives. COSLA Chief Officers of State Library Agencies

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New Clearinghouse Feature

Tweet | Share | Google+ | Pinterest

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.

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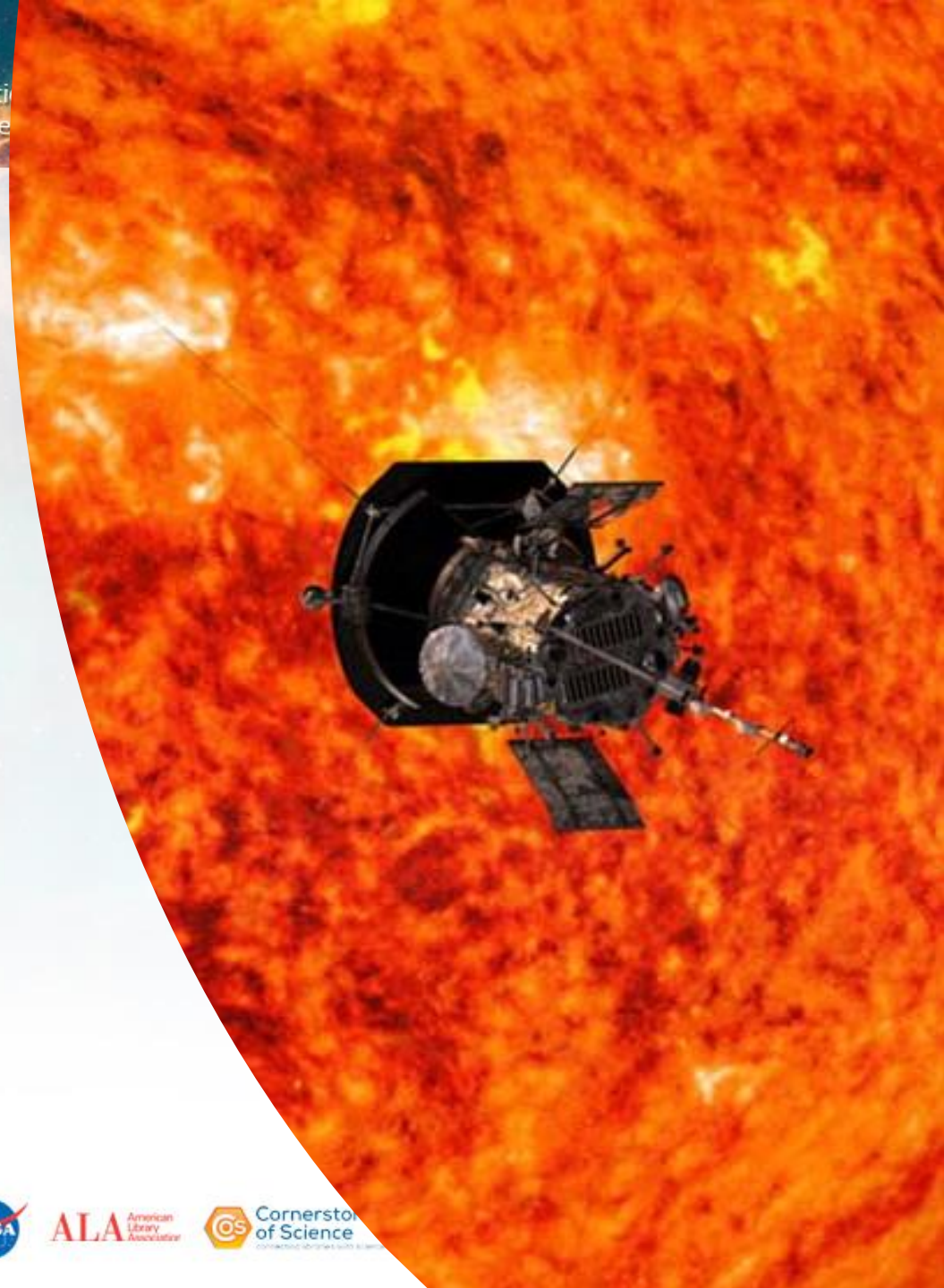
Connects NASA, Public Librarie

Parker Solar Probe Launch

- Launch Window: 7/31 – 8/19
- Webinar Recording: https://youtu.be/sDxLulYT2-s
- Event Page: http://www.starnetlibraries.org/parker-solar-probe/
- Clearinghouse Sun Activities: http://clearinghouse.starnetlibraries.org/124-sun



NASA ALA American Library Association Cornerstones of Science

Today's Speakers

Emma Marcucci

Education and Outreach Scientist at Space Telescope Science Institute

Thalia Rivera

Public Engagement Specialist for NASA's Exoplanet Exploration Program

Holly Ryer

Senior Education Specialist at Space Telescope Science Institute

Today's Speakers

Dr. Emma Marcucci is an Education and Outreach Scientist at the Space Telescope Science Institute. She received her Ph.D. in planetary geology from the University of Colorado at Boulder in 2013. As a Postdoctoral Fellow, she worked with satellite stereo images to make topographic models of locations that lack good elevation information, such as in Alaska and on Mars and Mercury. Dr. Marcucci is now part of the Office of Public Outreach at STScI sharing the science of the Hubble and James Webb Space Telescopes with the general public and supporting informal learning of NASA astrophysics content as a member of the NASA's Universe of Learning.

Emma Marcucci

Education and Outreach Scientist at
Space Telescope Science Institute

Girls STEAM Ahead with NASA

NASA'S UNIVERSE OF LEARNING

STAR Net Webinar
May 30, 2018

Speakers:
Emma Marcucci (STScI)
Thalia Rivera (JPL)
Holly Ryer (STScI)

NASA'S UNIVERSE OF LEARNING

An Astrophysics STEM Informal Learning Program funded by NASA SMD

Learners of all ages and backgrounds are engaged and immersed in exploring the universe for themselves.

Girls STEAM Ahead with NASA

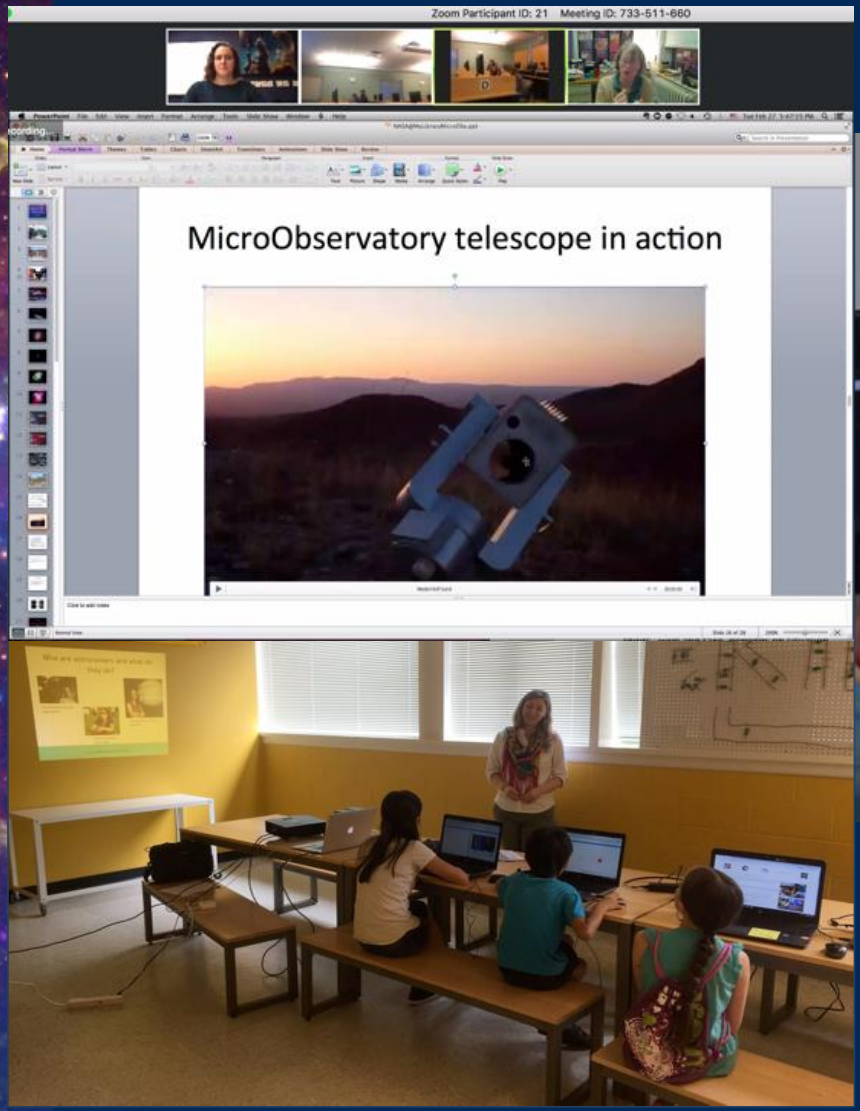
Empower public libraries and community-based organizations to **engage girls** and their families in STEM

Provide accessible **exhibits, community programs, hands-on resources** that feature NASA Astrophysics science and technology

Provide **interactions with Subject Matter Experts (SMEs),** to increase awareness of how we know what we know about our universe and to foster STEM identity.

Resources—SME Involvement

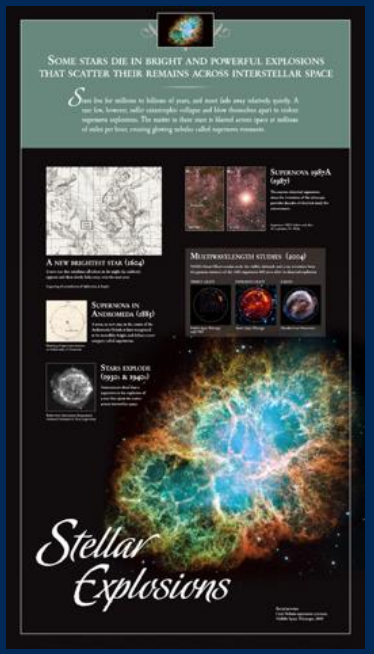
Virtual (Zoom, Skype, Google Hangouts)
In Person (select locations)



Resources—Exhibits/Posters

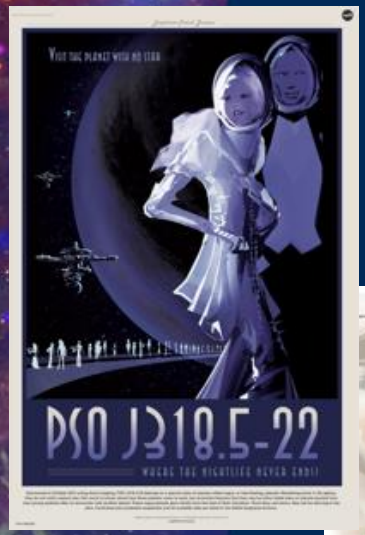
Exhibits

- Here, There, Everywhere
- AstrOlympics (Winter and Summer)
- Light: Beyond the Bulb
- From Earth to the Universe
- Visions of the Universe



Posters

- Women in STEM series
- Women of Color: Pioneers and Innovators
- Exoplanet Travel Posters



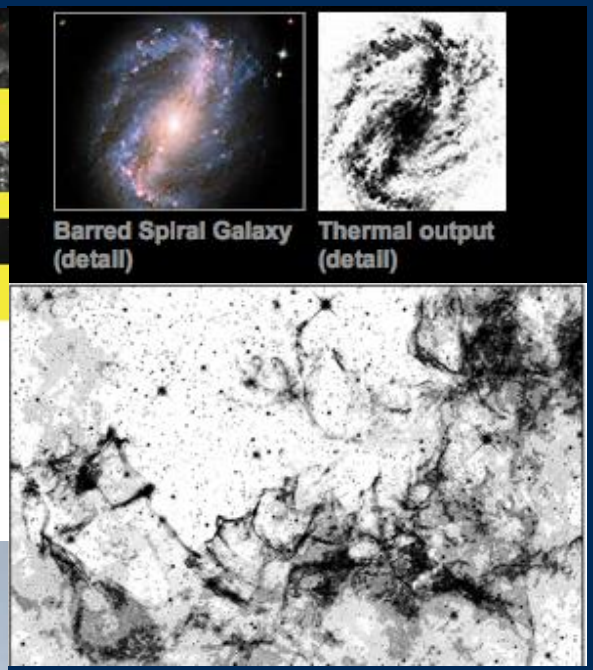
Some translated to Spanish, Portuguese, German

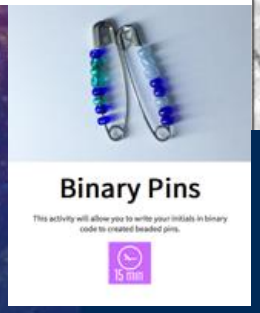
Supplemental information available

Resources—STEM Activities

Paper/Pen activities

- Recoloring the Universe
- Scale Models (TRAPPIST-1 and Solar System)
- Binary activities
- Tactile Universe





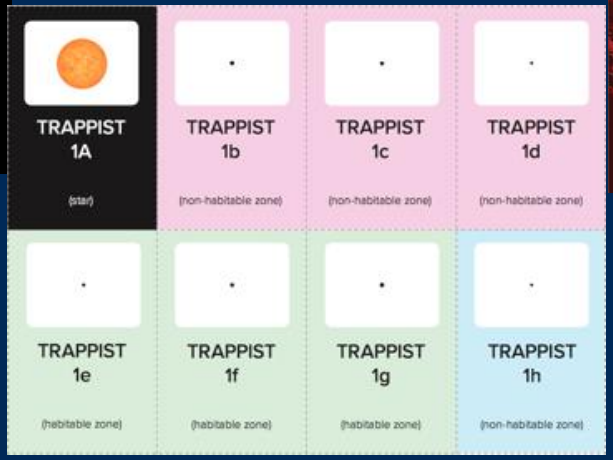
Computer-based activities

- Recoloring the Universe
- Observing with NASA
  - MicroObservatory
  - DIY Planet Search
- Universe in 3D
- Eyes on Exoplanets
- Exoplanet Travel Bureau

Demonstration of Selected Resources

Observing with NASA
(microobservatory.org)

Exoplanet Travel Bureau
(https://exoplanets.nasa.gov/alien-worlds/exoplanet-travel-bureau/)



Binary activities
http://chandra.si.edu/binary/

Scale Models
https://media.universe-of-learning.org/documents/UoL_TRAPPIST_Scale_Model-2018-02.pdf

Eyes on Exoplanets
(https://eyes.jpl.nasa.gov/eyes-on-exoplanets.html)

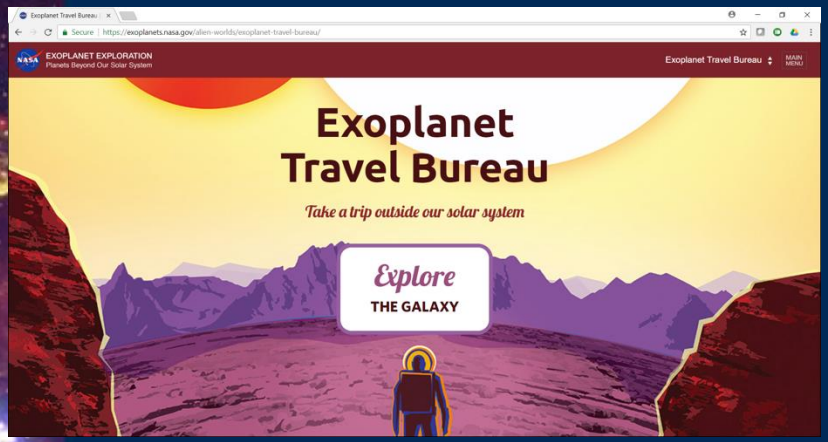
Today's Speakers

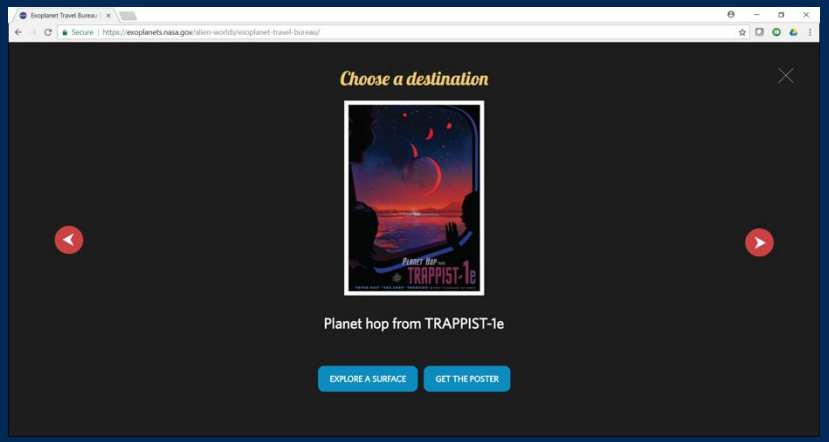
Thalia Rivera is a Public Engagement Specialist for NASA's Exoplanet Exploration program. She works on public engagement by coordinating and managing outreach events such as "A Ticket to Explore JPL," American Astronomical Society conferences, and other general public events and scientific conferences. She develops and assists in creating informative materials for distribution to the public and science community. These events and materials help make the science of exoplanet exploration relatable, accessible, and exciting to those who may be unfamiliar with current NASA Exoplanet missions and research. Ms. Rivera has a bachelor's degree in Speech Communications from the University of La Verne

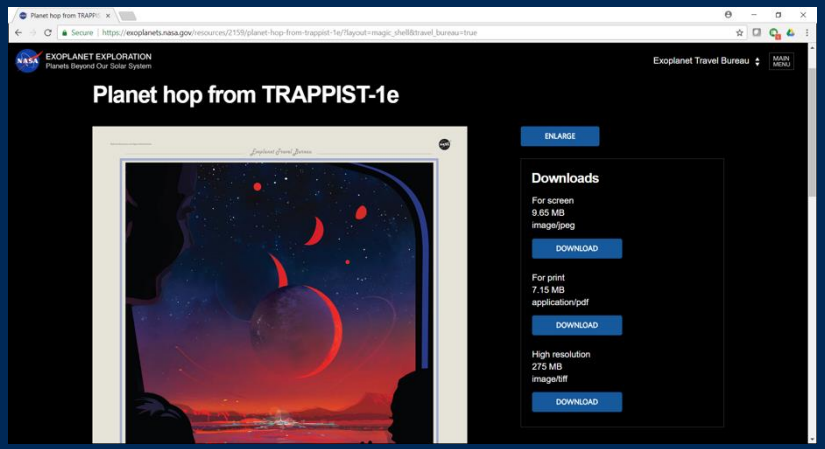
Thalia Rivera

Public Engagement Specialist for NASA's Exoplanet Exploration Program

Exoplanet Travel Bureau

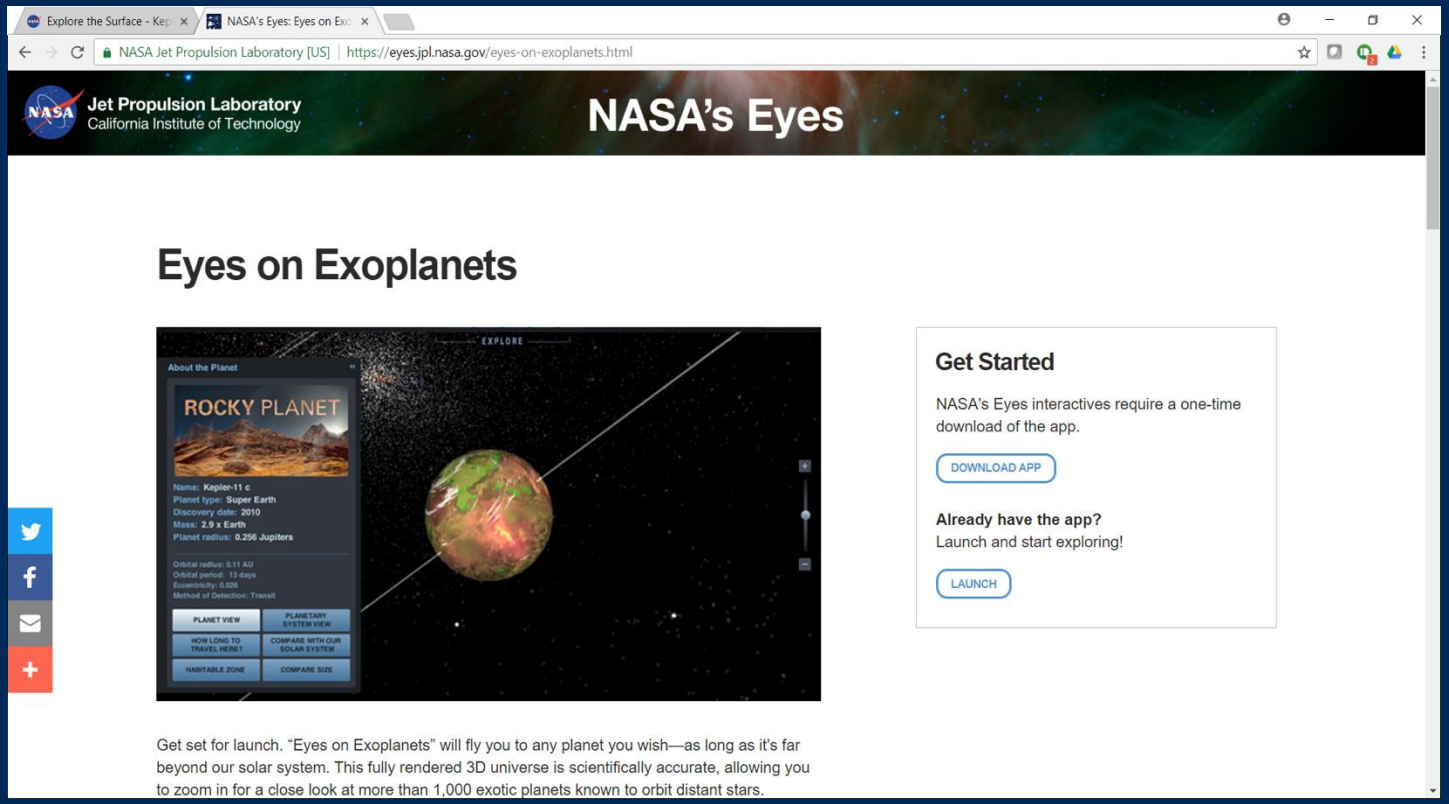






Eyes on Exoplanets

Eyes full version - https://eyes.jpl.nasa.gov/eyes-on-exoplanets.html



Emma Marcucci

Education and Outreach Scientist at
Space Telescope Science Institute

Today's Speakers

Holly Ryer
Senior Education Specialist at Space Telescope Science Institute

Holly Ryer is a Senior Education Specialist at the Space Telescope Science Institute (STScI) in Baltimore, Maryland. As a member of the Science Communications and Engagement team, Holly supports the NASA-funded "Universe of Learning" informal education program. She is responsible for the development and assessment of inquiry-based learning approaches and partnership building for projects such as Girls STEAM Ahead with NASA. She also supports NASA reporting and program evaluation activities and communication activities for the Hubble Space Telescope mission. Holly is a former classroom teacher with eight and a half years' experience teaching in Baltimore-area schools. During that time, she served on various committees, developed district-level curriculum, and participated in the scoring of the Maryland State Performance Assessment Program. Now, Holly takes great pleasure in supporting NASA education and outreach efforts.

The Good…

- The number of women in science and engineering is growing. Except in computer/mathematical sciences, women have increased their proportion in each broad occupational group since the early 1990s.

- Girls are performing as well as or better than boys as measured by standardized test performance and their high school grade point averages in science and math. They also are earning high school math and science credits at the same rate as boys (U.S. Department of Education, National Center for Education Statistics, 2007) (NSF, Science & Engineering Indicators, 2016).

- Promising – Preliminary findings show that girls' interest in math and science does not drop during middle school as indicated in past research, but remains high. (Generation STEM: A report from the Girl Scout Research Institute, 2012).

The Bad…

- Women with college degrees remain underrepresented in science and engineering occupations. Women make up half of the total U.S. college-educated workforce, but only 29% of the science and engineering workforce.

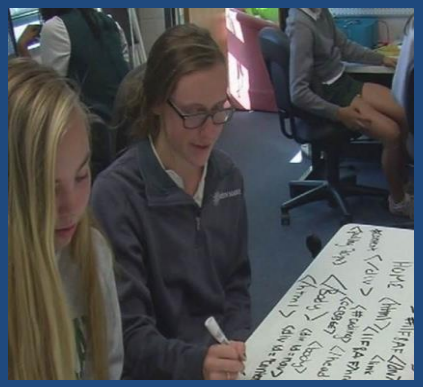
- Women who do earn degrees in these fields leave those professions at much higher rates than men. And the women who graduate with degrees in engineering and computer science are less likely to be employed than men.

The Ugly…

- Three quarters of middle school girls show strong interest in science and math, yet only a tenth will go on to continue their studies in college.
- When making choices about their majors and careers, many young women rule out STEM partly because of interests, feeling ill-prepared for them, or because society identifies these domains as male.

Increasing the Good!

Research suggests that math and science out-of-school activities are positively associated with youths' interest in science and self-concept of abilities in these subject areas.



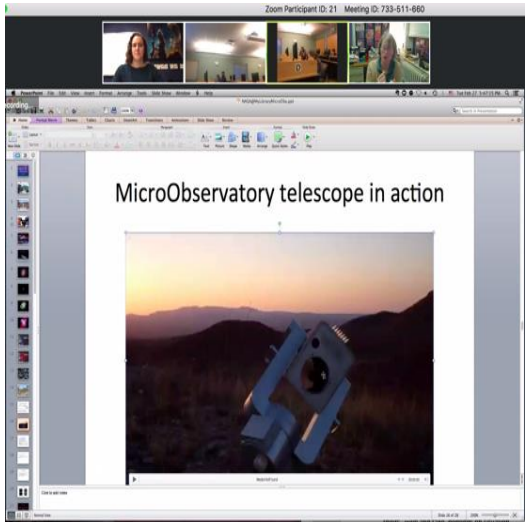
Girls who participate in STEM clubs and activities outside of school are more likely to say they will pursue STEM subjects later in their education.

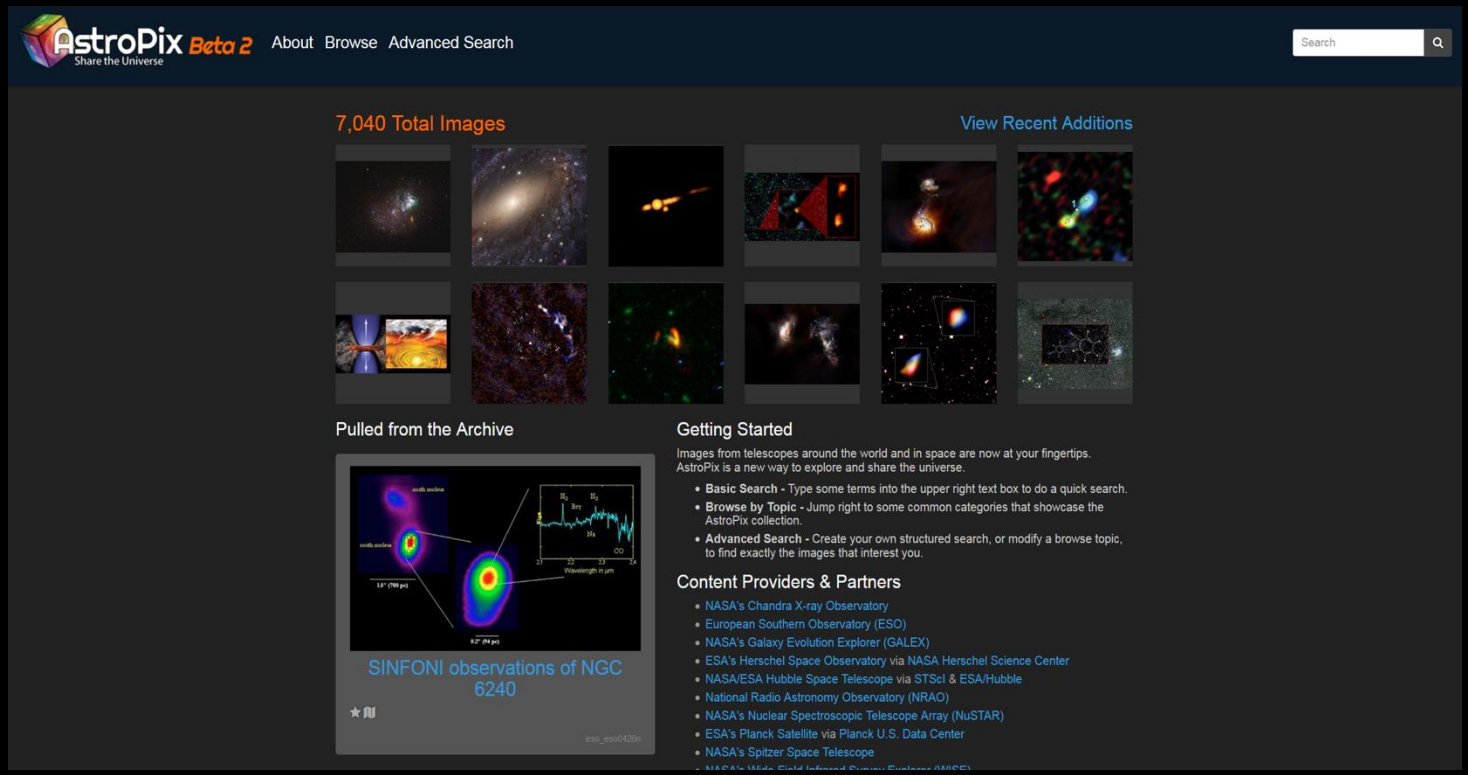
Increasing the Good: Strategies & Best Practices

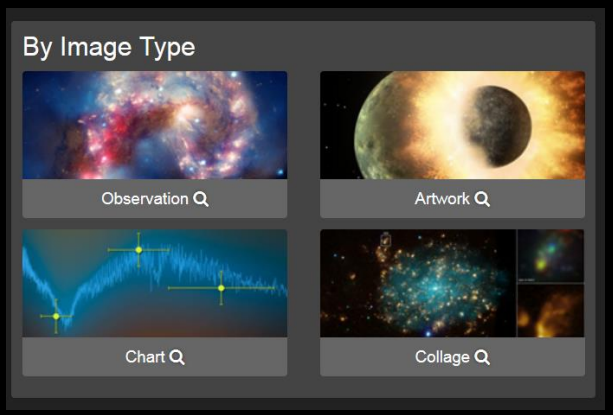
- **Low Pressure:** Emphasize learning something new and having fun. Support youth in trying, exploring, and making mistakes without judgement.
- **Student-centered:** Ask youth to make predictions, decide for themselves what the activity is about and what they would like to learn, and use activities that are open-ended in nature.
- **Emphasize process (not just product):** Encourage youth to make reasoned conjectures about problems, to explore varied approaches to tasks, and to explain and justify their work.
- **Collaborative teamwork:** Have students complete tasks in groups/teams if possible. Start with "ice breaker" activities to encourage teamwork for students who may not know one another.
- **Gender-balanced:** Create a gender-neutral, non-competitive environment. Use language and visuals inclusive of both males and females.
- **Family/parent encouragement - it makes a difference:** Include family members in STEM events. Provide resources for families to engage in STEM activities at home with their children.

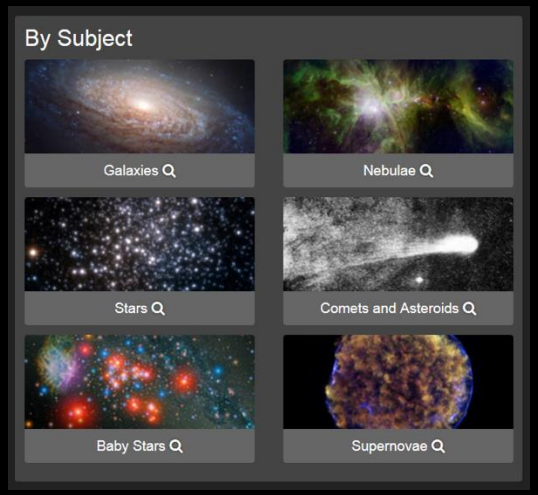
Putting it into Action: Observing with NASA

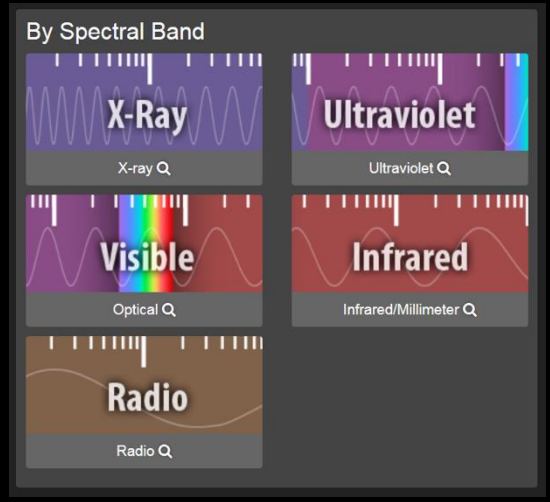
- ✓ Create your own image as a model ahead of time.
- ✓ Have students work in teams to replicate it as you walk them through the activity.
- ✓ Have teams select their own images to process from the image archive.
- ✓ Have teams explore other ways to colorize their images in addition to RGB.
- ✓ Students can print their images for a display area and/or a gallery walk during which teams explain how they created their images.
- ✓ Students can locate their image in AstroPix to see images of their object from other telescopes and make comparisons.
- ✓ Students can continue the fun by requesting other images to process and print at home or at library.







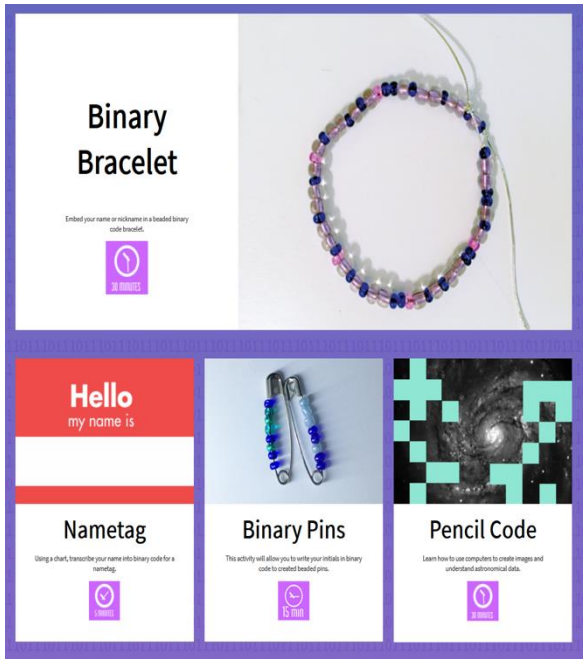




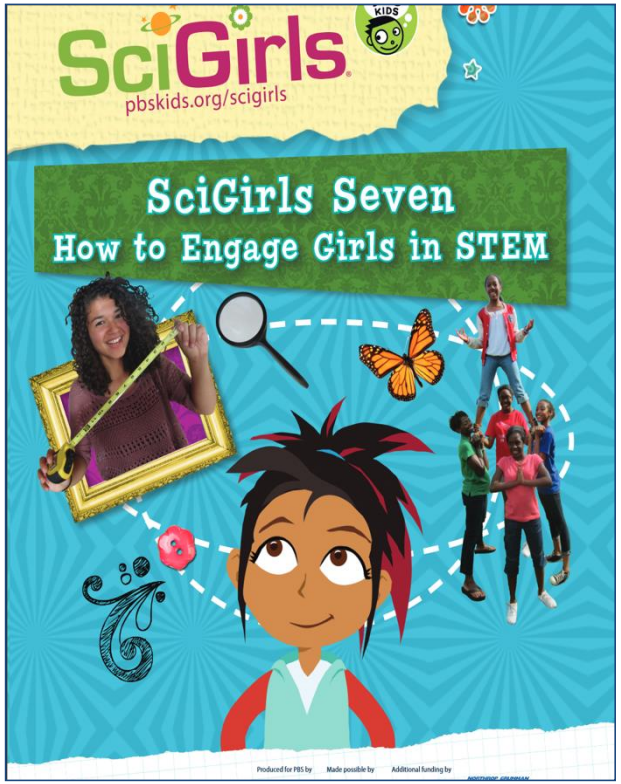
https://astropix.ipac.caltech.edu/

Putting it into Action: Binary (How to Talk to a Spacecraft)

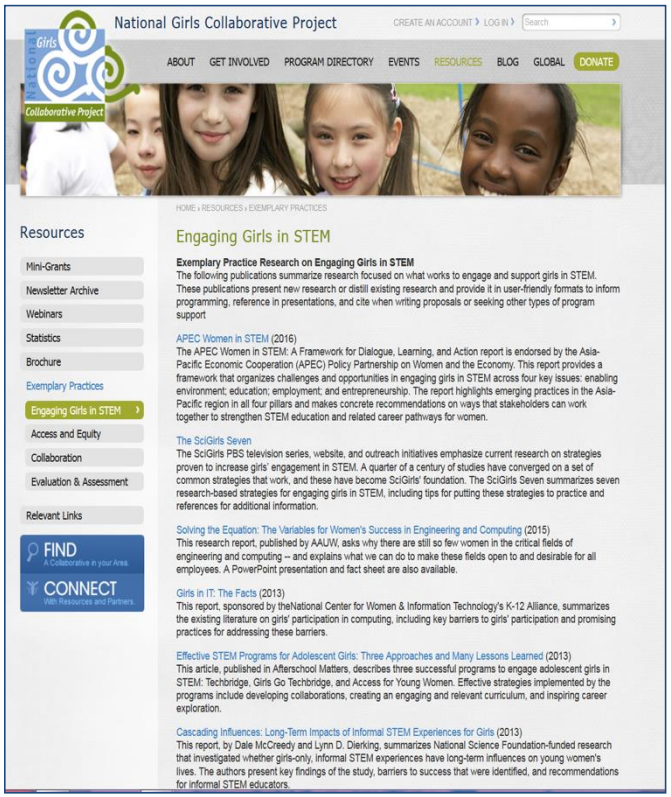
- ✓ Activities can be used by themselves or in conjunction with Recoloring the Universe.
- ✓ One option is to create activity stations/work areas for each binary activity.
- ✓ Have students work in teams to select a project of their choice, or rotate through the stations to try each one.
- ✓ As a follow-on, have students create words or messages and translate them into binary using the code chart.
- ✓ Teams can exchange messages and "decode" them.
- ✓ Students can continue the fun by using Recoloring the Universe at home or at the library.



Strategies & Best Practices: Resources



http://www.scigirlsconnect.org/scigirls/



https://ngcproject.org/engaging-girls-in-stem

Find more information!

http://universe-of-learning.org/girls_steam_ahead

Interest Survey (June 20th): https://www.universe-of-learning.org/girls-steam-ahead-survey

Evaluation

1. Please notify the GSAWN team (girlsSTEAMahead@universe-of-learning.org) **3 weeks prior to your event** and include:

   - Name of event and "evaluation" in your subject line
   - Contact name
   - Contact address
   - Estimated number of attendees

2. Use the evaluation forms mailed to you from Goodman Research Group.

3. Return evaluation forms in self-addressed envelope after your event.

Questions?

http://universe-of-learning.org/girls_steam_ahead

girlsSTEAMahead@universe-of-learning.org

This work supported by NASA under award number NNX16AC65A to the Space Telescope Science Institute, working in partnership with Caltech/IPAC, Jet Propulsion Laboratory, Smithsonian Astrophysical Observatory, and Sonoma State University.

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JPL
Jet Propulsion Laboratory
California Institute of Technology

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SONOMA STATE UNIVERSITY

Thank You!

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