

STUDENTS FROM CERRITOS
COLLEGE & NASA MICRO-G NEXT
CHALLENGE TEAM "FALCONS"

INCORPORATING NASA AND STEM INTO K-12 CLASSROOMS

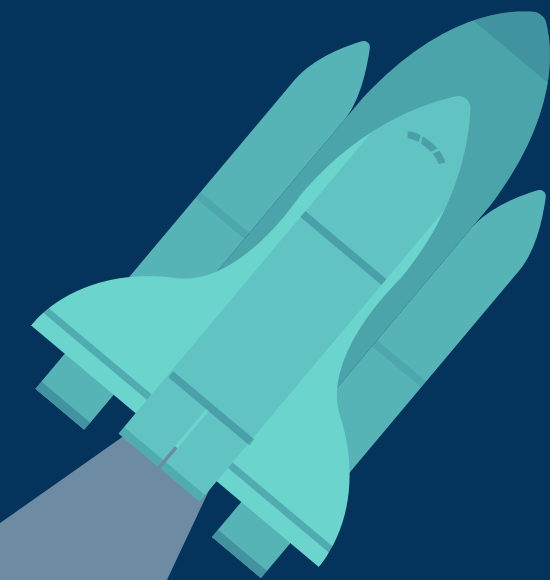


Table of Contents



- About Us
- Our tool, C.L.E.V.E.R.
- Professional Development and Pre-Teacher Opportunities
- STEM Engagement for Teachers and Students
- -Q&A



Cerritos College

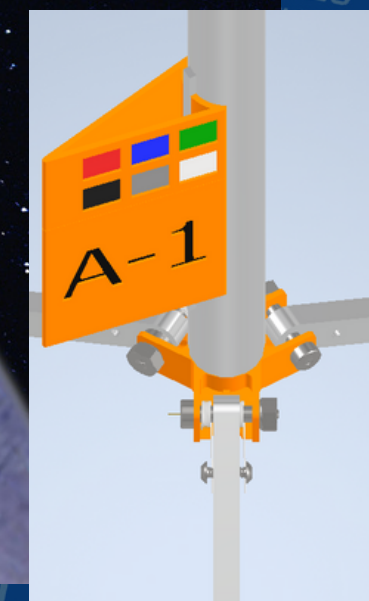
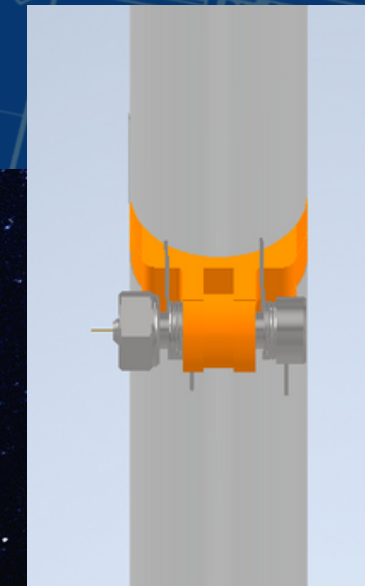


Congratulations
2022
#MicrogNExT
Teams!



C.L.E.V.E.R.

Cerritos Lunar Expandable Viewing Equipment for Rocks



Professional Development and (Pre-)Teacher Opportunities



OVERVIEW

- Digital Badging
- STEM Teacher and Research Program (STAR)
- Airborne Astronomy Ambassador Program
- Space Exploration Education Conference (SEEC)
- Endeavor STEM Teaching Certificate Project
- Albert Einstein Distinguished Educator Fellowship (AEF) Program





What is Digital Badging?

A digital certification that
verifies your completion
of an online training or
course





NASA Educator and Student Digital Badging

- Earth and Space Sciences
- Engineering & Technology
- Life Sciences
- Mathematics
- Physical Science
- STEM INstructional Practices
- Next Gen
- Strategic Themes

Earth & Space - Ames Aeronautics Exploration Encounter Using NASA Smart Skies in your Grades 3-6 math classes. Let's go!	Earth & Space - Blue Marble Matches: Earth Processes The Blue Marble Matches activity introduces students to geologic processes on Earth and models. Let's go!	Earth & Space - Curved Space-Time in the Classroom! Overview Back in 2004, NASA's Marshall Space Flight Center and Stanford University developed a Let's go!
Earth & Space - Data Analysis and Interpretation for Educators (Part 3 of 3) OverviewThese badges will help develop data-literate learners who Let's go!	Earth & Space - Data Visualization for Educators (Part 2 of 3) OverviewThe Data Visualization for Educators and Data Analysis is the Let's go!	Earth & Space - Earth's Orbit and Distance From the Sun In this badge, designed to help Middle School teachers make the connection between Data Let's go!
Earth & Space - Earth's Water Resources Learn about hydrology, Earth's water cycle, and scientific and cultural resources for studying Let's go!	Earth & Space - Exploring Space Destinations With Commercial Partners Learn about NASA's Commercial Crew Program (CCP), its partners, Let's go!	Earth & Space - GLOBE: Elementary Water Studies-Storybooks and STEM Scientists use water quality studies and data to record some alarming Let's go!

Mine All

STEM Instructional Practices - Using Badges with Students
Using electronic micro-credentials -- more commonly called "badges" -- to deliver information has been
[Review](#)

<https://www.txstate-epdc.net/digital-badging/>

K-12 educators, Pre-Service educators, University faculty, informal educators



Earth & Space - Curved Space-Time in the Classroom!

Overview

Back in 2004, NASA's Marshall Space Flight Center and Stanford University developed a sophisticated experiment, Gravity Probe B (GP-B), to test Einstein's general theory of relativity. Einstein's theory predicts that space and time are distorted by the presence of massive objects.

During its orbit, NASA's Gravity Probe B (GP-B) mission has confirmed two key predictions derived from Albert Einstein's general theory of relativity, which the spacecraft was designed to test. The experiment used four ultra-precise gyroscopes to measure the hypothesized geodetic effect, the warping of space and time around a gravitational body, and frame-dragging, the amount a spinning object pulls space and time with it as it rotates. GP-B determined both effects with unprecedented precision by pointing at a single star, IM Pegasi, while in a polar orbit around Earth.

Purpose

In this badge, you will learn how to help your students understand Einstein's Gravity with the Gravity Probe-B mission and develop a plan to teach about curved space-time, gyroscopic motion and frame dragging using presentations and classroom activities.

Standards

This badge provides an extension of the Next Generation Science Standards PS2: Force and Motion for advanced classes.

Intended Audience

High school educators (Grades 9-12)

Time to Complete

Time to complete this badge is ~6 hours.

Badge Overview

This is an overview of the information about this badge.

[Start](#)

Gravity Probe-B Mission: An Overview

In this step, you will learn about NASA's Gravity Probe-B mission goals, objectives, and achievements.

[Start](#)

Gravity Probe-B: Educational Resources

Explore high quality, intellectually stimulating Gravity Probe-B educational resources.

[Start](#)

Applying Gravity Probe-B Concepts in the Classroom

In this activity, badge earners will engage their students using a Gravity Probe-B activity. In this step, you will engage your students using a Gravity Probe-B activity.

[Start](#)

STEM Instructional Practices - Practicing Equity in STEM Education

Learn about the barriers in STEM Education for students from underrepresented groups, and how diversity at NASA with spotlight on contributions of women, notably Katherine Johnson can be used to make STEM more relevant to diverse students. You will utilize principles of Culturally Responsive Teaching and Engagement to lessons from NASA's Modern Figures Toolkit, which was inspired by "human computers" portrayed in the popular movie Hidden Figures.

Audience: **Grade K-12** STEM Educators

Time Required: ~ **4 hours**

Badge Overview

This activity (time required ~ 30 mins) will provide an overview of the badge.

[Start](#)

Identifying and Removing Barriers in STEM Education

In this activity (time required~60 mins) you will review resources that highlight barriers in STEM Education.

[Start](#)

From Hidden to Modern Figures

In this activity (time required~60 mins) you will explore NASA Mathematician Katherine Johnson's story as resource for addressing diversity and equity issues in STEM classrooms.

[Start](#)

Modern Figures Interactive Toolkit

In this activity (time required~60 mins) you will explore Modern Figures Toolkit that leverages historical contributions to inspire diverse learners in STEM.

[Start](#)

Student Badges

Aeronaut-X: X-Planes Student Badge

NASA CCP Next Gen STEM Student Badge

Red Planet | Green Thumb

Exploring and Living on the Moon

Orbital Systems

We Are the Artemis Generation: Phases of the Moon

Moon to Mars Student – We Go as the Artemis Generation

Preparing for Life on the Red Planet



STEM Teacher and Research Program (STAR)

- First time applicants must be pre-service (before first Full-time contract)
- <https://star-web.csm.calpoly.edu/about/>
- <https://star-web.csm.calpoly.edu/apply/>



STAR

<https://vimeo.com/148331501>





Airborne Astronomy Ambassador Program

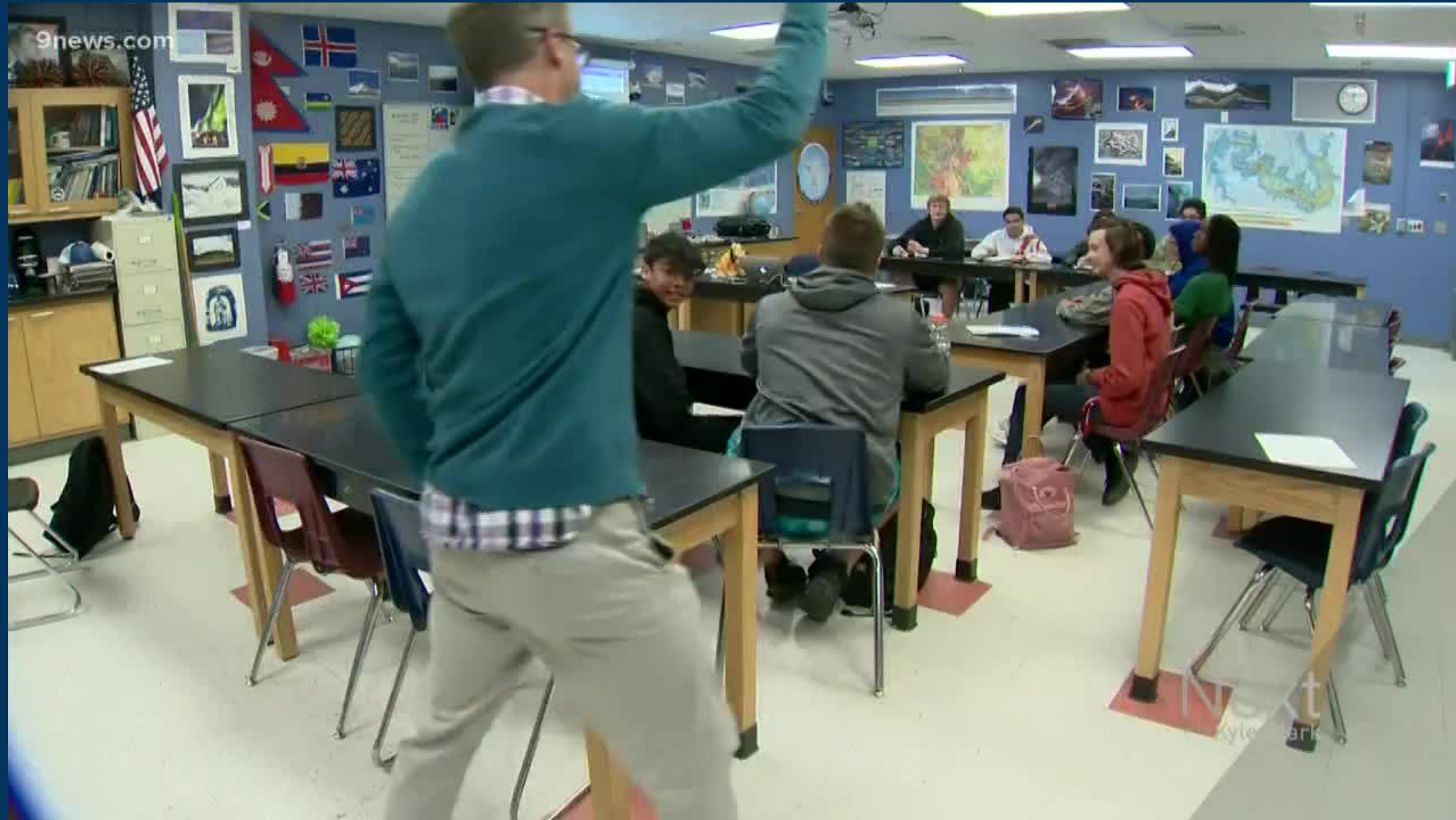
- Teacher training program from including webinars, asynchronous content learning, to a hands on curriculum workshop
- STEM immersion at a NASA astronomical observatory
- Ongoing meeting with experts after programs completed



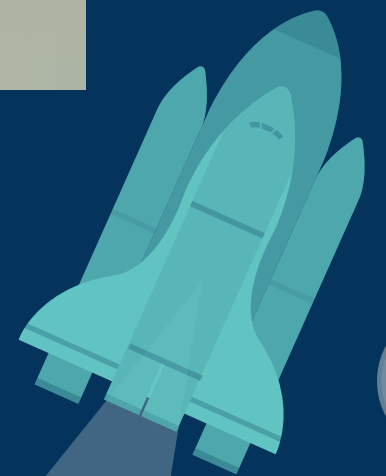
<https://www.seti.org/aaa>



AIRBORNE ASTRONOMY AMBASSADOR PROGRAM



https://www.youtube.com/watch?v=DAOpDObAAGs&ab_channel=Next9NEWS





WHO CAN ATTEND?

- Kindergarten through 12th-grade educators.

WHAT THEY DO?

- Participate in curated sessions from educators and NASA experts and interact with other teachers to learn and grow together.
- Network and make valuable connections with presenters and fellow stellar educators.
- Take back innovative and immersive lessons for all grade levels.
- Embark on tours to explore iconic Space Center Houston exhibits and historic NASA locations.



Education

- STEM LEADERSHIP CERTIFICATE
- MASTER'S DEGREE
- TAKE ONE
- STEM PROFESSIONAL DEVELOPMENT(PD) MINI MODULES
- SCHOLARSHIPS



<https://www.us-satellite.net/endeavor/about-certificate.cfm>

ALBERT EINSTEIN DISTINGUISHED EDUCATOR FELLOWSHIP (AEF) PROGRAM



U.S. DEPARTMENT OF
ENERGY

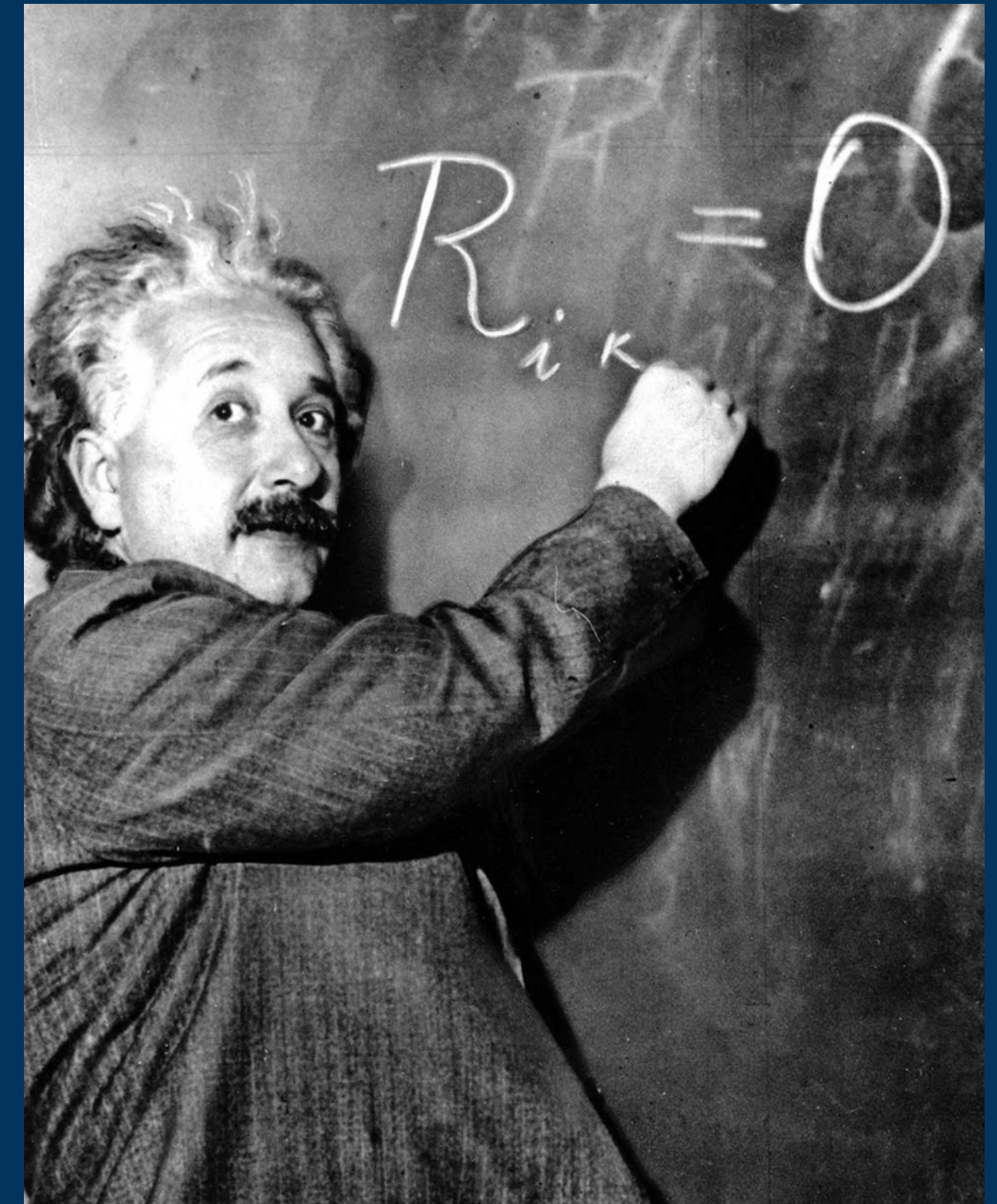
Office of
Science

Opportunity for K-12 educators in STEM to serve in national education arena

- Spend eleven months working in Federal agencies or in U.S. Congressional offices.
- Apply knowledge and classroom experiences to national educational program/ education policy

Benefits of Fellowship:

- Access to national network of education leaders
- Better insight on challenges and opportunities in STEM education
- Renewed passion for teaching

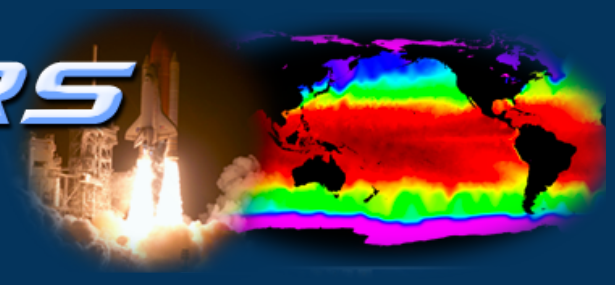


<https://science.osti.gov/wdts/einstein>





SATELLITE EDUCATORS ASSOCIATION



“

The world's finest educators supporting science, technology, engineering, and math (STEM) learning for pre-kindergarten to post-graduate students using real-world applications from satellites and satellite data.

”

- Supports learning in STEM from pre-kindergarten to post graduate
- Uses real-life data from satellites
- Lesson plan library!



<https://sated.org/library/about.htm>



SEA Library



More Lessons from the Sky

The Satellite Educators Association Lesson Plan Library

The **SEA Lesson Plan Library** offers STEM lesson plans and supplemental materials for grades K-12 enhancing understanding of space-based technologies especially satellites and satellite-based remote sensing. Each lesson module appeared in **More Lessons from the Sky**, a regular feature of the monthly [SEA Newsletter](#) online... [MORE >](#)

Search for Lessons Addressing Next Generation Science Standards

Select a Grade Level, Subject Area, Practice, and/or Crosscutting Concept, then click SEARCH...

Grade Level

ALL GRADE LEVEL ▼

Subject Area

ALL SUBJECT AREAS ▼

Science & Engineering Practice

ALL SCIENCE & ENGINEERING PRACTICE ▼

Crosscutting Concepts

ALL CROSSCUTTING CONCEPTS ▼

SEARCH

Analyzing the Antarctic Ozone Hole

Use satellite imagery to explore the Antarctic ozone hole. Is it increasing or decreasing? What causes this effect? Can we do anything about it? Download and display satellite imagery of stratospheric ozone. Measure the area of the thinning ozone using computer image processing tools. Graph the changes over a period of years. Extend your analysis to investigate ozone in other geographic areas and the relationship between ozone and other environmental factors.

Includes revised standards and two data sets for comparison: 1979-1992 showing increasing area of ozone "hole" and 2004-2017 showing a decrease.

Relevant Disciplines:	All
Grade Level:	5-12
Adaptable to Other Grades:	No
Time Required (class periods):	1-3
Prerequisites:	None
Additional Resources Available:	Yes

Next Generation Science Standards addressed in this lesson:

[5-ESS2-1](#) [MS-ESS3-3](#) [HS-ESS3-5](#)

Download Entire Lesson PDF

Download Student Pages Only DOCX

Lesson Resources for Analyzing the Antarctic Ozone Hole	
File Type/Link	Description
Images (png)-zip	OMI_Pics.zip - Collection of 8 OMI images, 2004-2011 for lesson tutorial, 640x480 and 16-19KB each; zipped 136KB total
Images (png)-zip	OMI_2012.zip - Additional OMI images, 2012-2013 for lesson tutorial if desired, 6430x480 and 19KB each; zipped 36KB total

<https://sated.org/library/search.htm>

Satellites & Education Conference XXXV

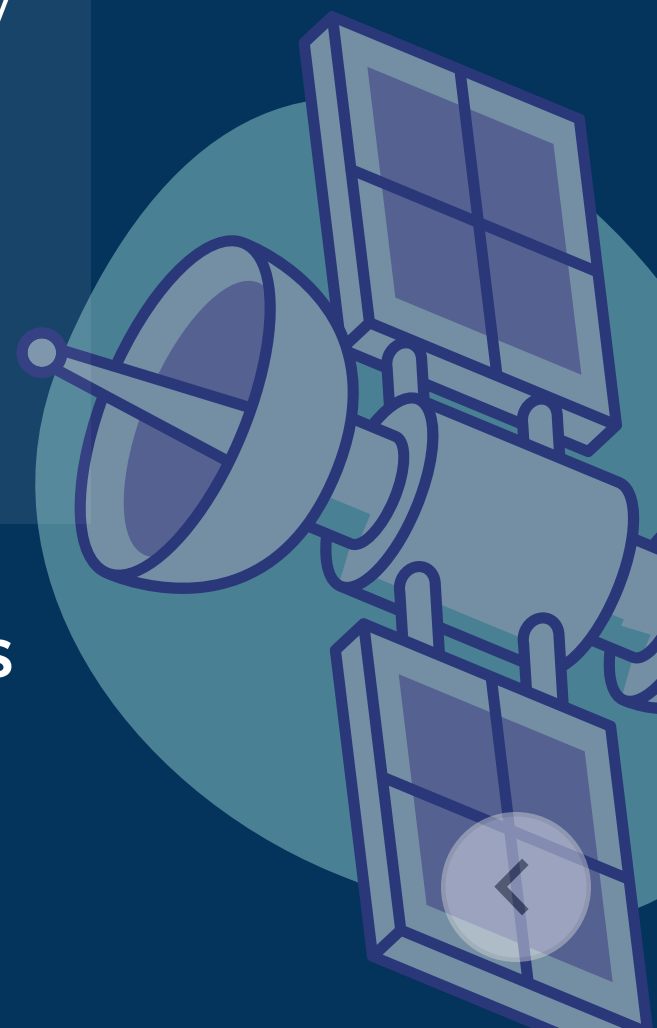


July 29-30, 2022

- Meet with representatives from NOAA, NASA, aerospace industry
- Connect with Teachers from all levels and backgrounds
- Attending teachers will receive professional development credit

California State University, Los Angeles

<https://sated.org/newsletters/Newsletter-202203.htm#SEA>



NASA Express!

NASA EXPRESS Newsletter Sign-up

Are you looking for the latest NASA resources for educators, students and families? Keep up with the latest NASA STEM happenings by subscribing to the NASA EXPRESS newsletter.

Each weekly email features at-home activities to inspire learning and exploration. Find crafting ideas, science experiments with household items and videos to watch as a family. Updates on workshops, internships, contests and student challenges are also included.

[Sign Up](#)



<https://www.nasa.gov/stem/express>



STEM

STEM Engagement for Teachers and Students



NASA STEM Engagement

<https://www.nasa.gov/stem>

**NASA
STEM**
for students
**GRADES
K-4**

Space to Play



**NASA
STEM**
for students
**GRADES
5-8**

Out-of-this World Stuff



**NASA
STEM**
for students
**GRADES
9-12**

Experience NASA



ENTER



NASA STEM Engagement

<https://www.nasa.gov/stem>

Explore NASA STEM

Follow Us    

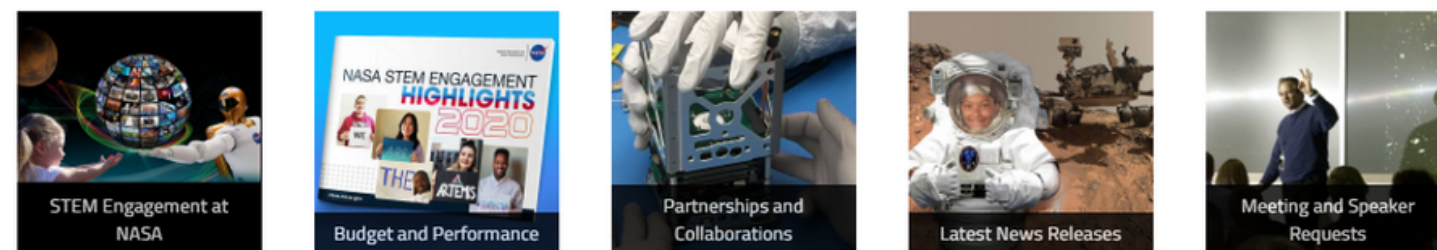
For Students



For Educators



About NASA STEM Engagement



Explore STEM Resources for K-12 Educators

Follow Us    

Classroom Combos — Resource Collections To Teach STEM Topics



Don't Miss These Opportunities for Educators!



It's Elementary: Resources for K-4 Educators



STEM in the Middle: Resources for 5-8 Educators



<https://www.nasa.gov/stem>

NASA STEM Engagement

INSPIRE · ENGAGE · EDUCATE · EMPLOY
The Next Generation of Explorers

NASA STEM Engagement

Browse Topics For: **Students** **Educators**

Search Resources and Opportunities Selected by NASA STEM Experts

Opportunities	Grade Level	Types	Subjects
Contests and Challenges	K-4	Lesson Plans/Activities	Careers
Internships and Fellowships	5-8	Educator Guides	Earth Science
Citizen Science	9-12	Play and Learn	Engineering Design
Online	Higher Education	Videos	History
In Person	Informal Education	Interactive Multimedia	Life Science
International Participation		Posters	Mathematics
Lectures and Webcasts		Mobile Apps	Physical Science
Exhibits and Museums		Image Galleries	Space Science
		Websites	Spanish
			Technology

[View All Educator Resources](#)

Filter By:

▼ Audience

- ☒ Educators
- ☐ Students

▼ Grade Level

- ☐ K-4
- ☒ 5-8
- ☐ 9-12
- ☐ Higher Education
- ☐ Informal Education

▼ Opportunities

- ☐ Citizen Science
- ☒ Contests and Challenges
- ☐ Educator Professional Development
- ☒ Events
 - ☐ Exhibits and Museums
 - ☐ Funding Opportunities
 - ☐ International Participation
 - ☐ Internships and Fellowships
 - ☐ Lectures and Webcasts
 - ☐ More

► Subjects

► Types



Genes in Space Challenge

Audience: Educators, Students
Grade Levels: 5-8, 9-12
Subjects: Living and Working in Space, Present and Future, Space Biology

From bacterial cell growth to the human immune system, everything works a little differently in space. Working individually or in teams, students are asked to design a DNA experiment that addresses challenges in space travel and deep space exploration. One winning experiment will be launched to the International Space Station, where it will be carried out by astronauts. Participation is free and does not require specialized equipment.

Entries are due **April 11**. [Click here](#) to learn more.

<https://www.nasa.gov/stem-ed-resources/genes-in-space-challenge.html>



ARTEMIS I

Fly your name
around the
Moon!

Add your name here to have it included
on a flash drive that will fly aboard Artemis I

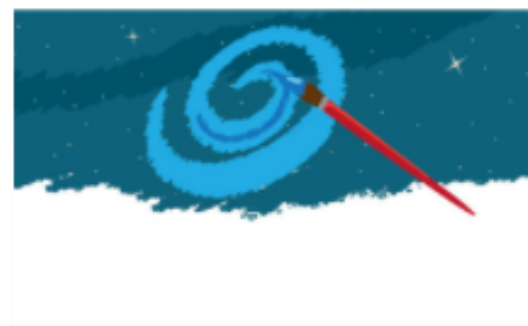
GET BOARDING PASS

Exhibits and Speakers

[Request a NASA Exhibit](#) | [Request a NASA Speaker](#)

[https://www.nasa.gov/about/
exhibits/index.html](https://www.nasa.gov/about/exhibits/index.html)

<https://stem.nasa.gov/artemis/#teach>



NASA Space Place Art Challenge

Product Type: Play and Learn

Audience: Students

Grade Levels: K-4, 5-8

Subjects: Art

Each month Space Place has an art mission. Draw, color or paint the subject of the month. Send a picture of your art, and maybe you will see it on Space Place next month.

<https://spaceplace.nasa.gov/art-challenge/en/>
OPEN NOW!



Artemis Camp Experience

Product Type: Educator Guides, Lesson Plans/Activities

Audience: Educators

Grade Levels: Informal Education

Publication Year: 2022

Product Number: NP-2022-02-3038-HQ

Subjects: Engineering Design, Mathematics, Physical Science, Technology

This set of hands-on activities tells the story of NASA's Artemis Program that will land the first woman and first person of color on the Moon. Intended for use in K12 informal education settings such as after school programs, summer camps, STEM nights, and weekend workshops, this education resource is sure to bring the excitement of returning to the Moon to the Artemis Generation of Explorers.

[Artemis Camp Experience](#) [Full PDF]

Artemis Camp Experience Lesson Modules

- [Design a Crew Module](#)
- [Design Stabilizing Fins](#)
- [Assess the Structural Integrity of a Space Module](#)
- [Build a Heat Shield](#)

[https://www.nasa.gov/stem-ed-
resources/artemis-camp-experience.html](https://www.nasa.gov/stem-ed-resources/artemis-camp-experience.html)

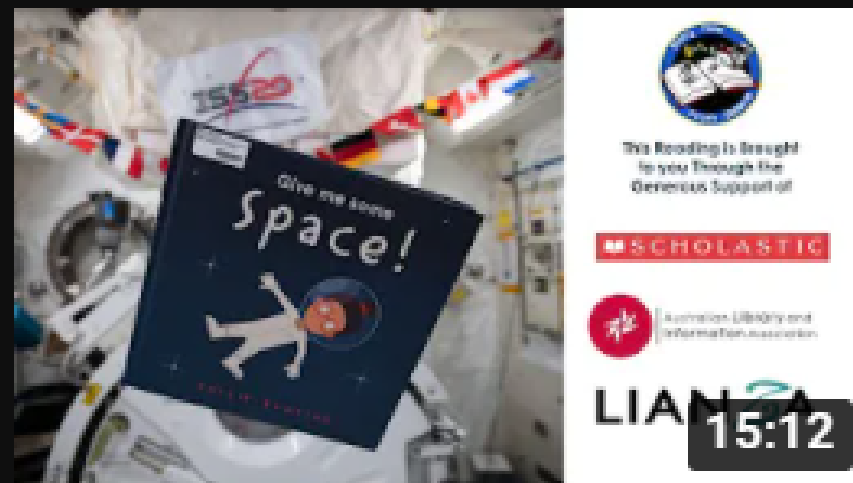


Story Time from Space



Science Time From Space: Sun, Earth, and Space

11K views • 7 months ago



Story Time From Space Presents -- Give me Some...

87K views • 7 months ago



Snoopy, First Beagle on the Moon! (Peanuts)

7.5K views • 10 months ago



Shoot for the Moon, Snoopy!

6.7K views • 10 months ago

34 Videos of astronauts reading picture books in space
that can be simultaneously read in the classroom.

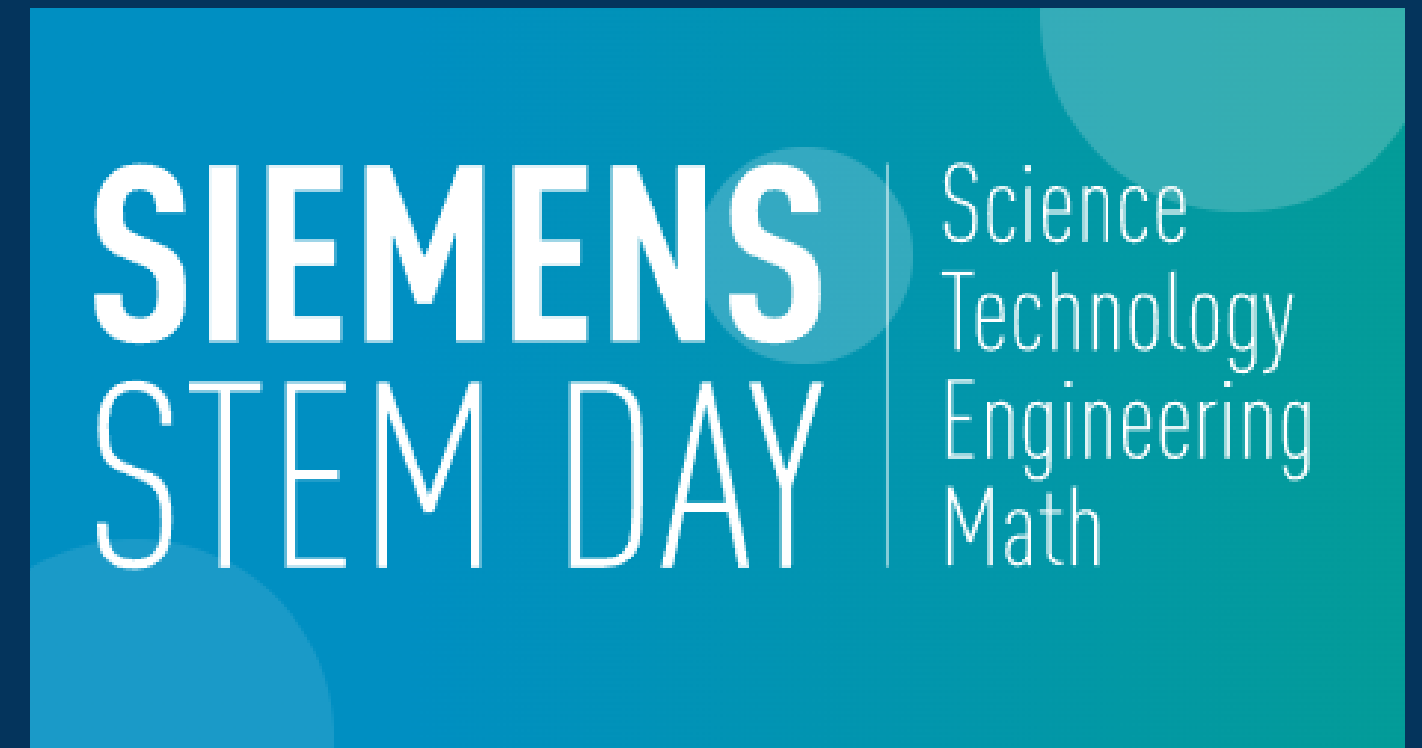
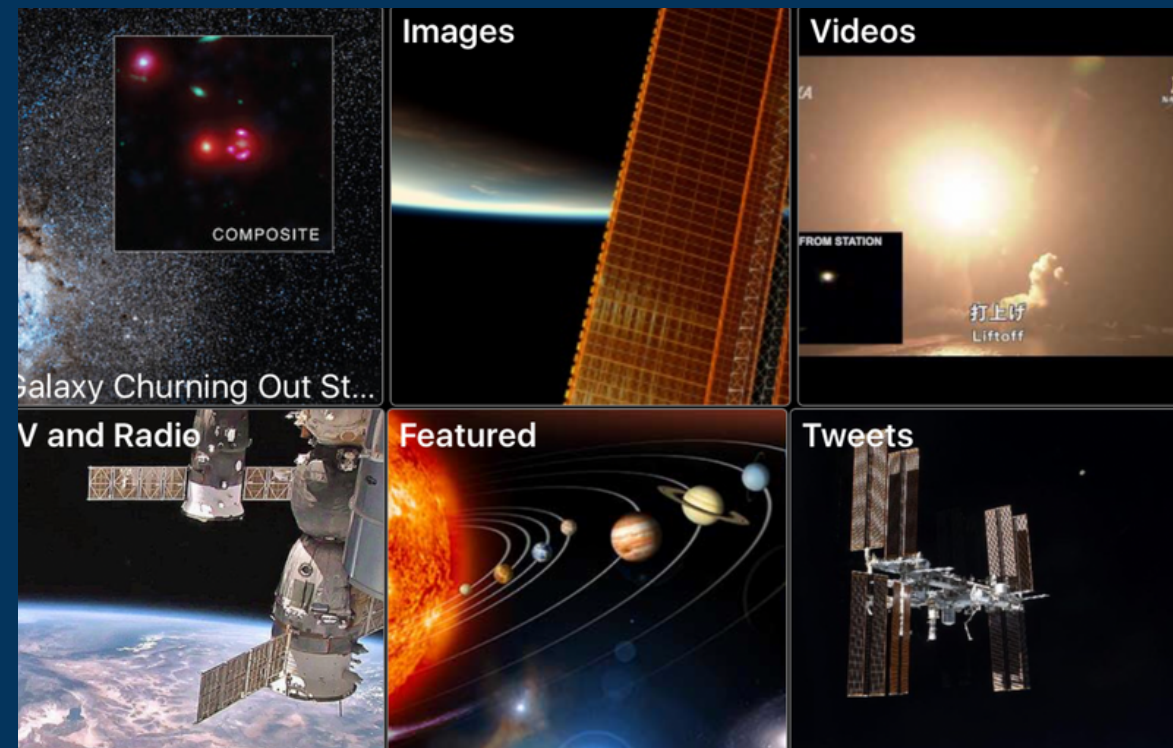
<https://www.youtube.com/c/StoryTimeFromSpace/videos>



More STEM Activities for the Classroom



NASA APP



<https://www.siemensstemday.com/>



Citizen Science

OceanEyes

Status: Active - recruiting volunteers

Geographic Scope: Main Hawaiian Islands



Cooperative research provides new data...

Status: Active - recruiting volunteers

Geographic Scope: Puget Sound, WA



Archaeology Citizen Science at Fort...

Status: Active - recruiting volunteers

Geographic Scope: southwest Washington, Portland Oregon metropolitan area



Landslide Reporter

Status: Active - recruiting volunteers

Geographic Scope: Global



Steller Watch

Status: Active - recruiting volunteers

Geographic Scope: Aleutian Islands, Alaska



Democratization of Measurement and Modeling...

Status: Active - not recruiting volunteers

Geographic Scope: Pittsburgh, Pennsylvania



The Hawaii Island Volcanic Smog...

Status: Active - not recruiting volunteers

Geographic Scope: Hawaii



Hui o ka Wai Ola...

Status: Active - recruiting volunteers

Geographic Scope: Maui, Hawaiian islands



SMART (Stormwater Management Research Team):...

Status: Active - recruiting volunteers

Geographic Scope: Maine, New York, North Carolina, Florida, Alabama,...



Project Harvest

Status: Active - recruiting volunteers

Geographic Scope:



Building Resiliency in California's Central...

Status: Active - not recruiting volunteers

Geographic Scope: Regional (California's Central Valley)



Shared Air/Shared Action (Sa2): Community...

Status: Active - recruiting volunteers

Geographic Scope: Chicago, Illinois



JPL Education

<https://www.jpl.nasa.gov/edu/>

Education

| Intern

Learn

Teach

News

Events

Share



NASA/JPL Educator Resource Center

<https://www.jpl.nasa.gov/edu/educator-resource-center/>

Teaching Space With NASA

Join NASA experts and education specialists for live education webinars. Ask questions, get teaching resources and share the excitement of space exploration with students.

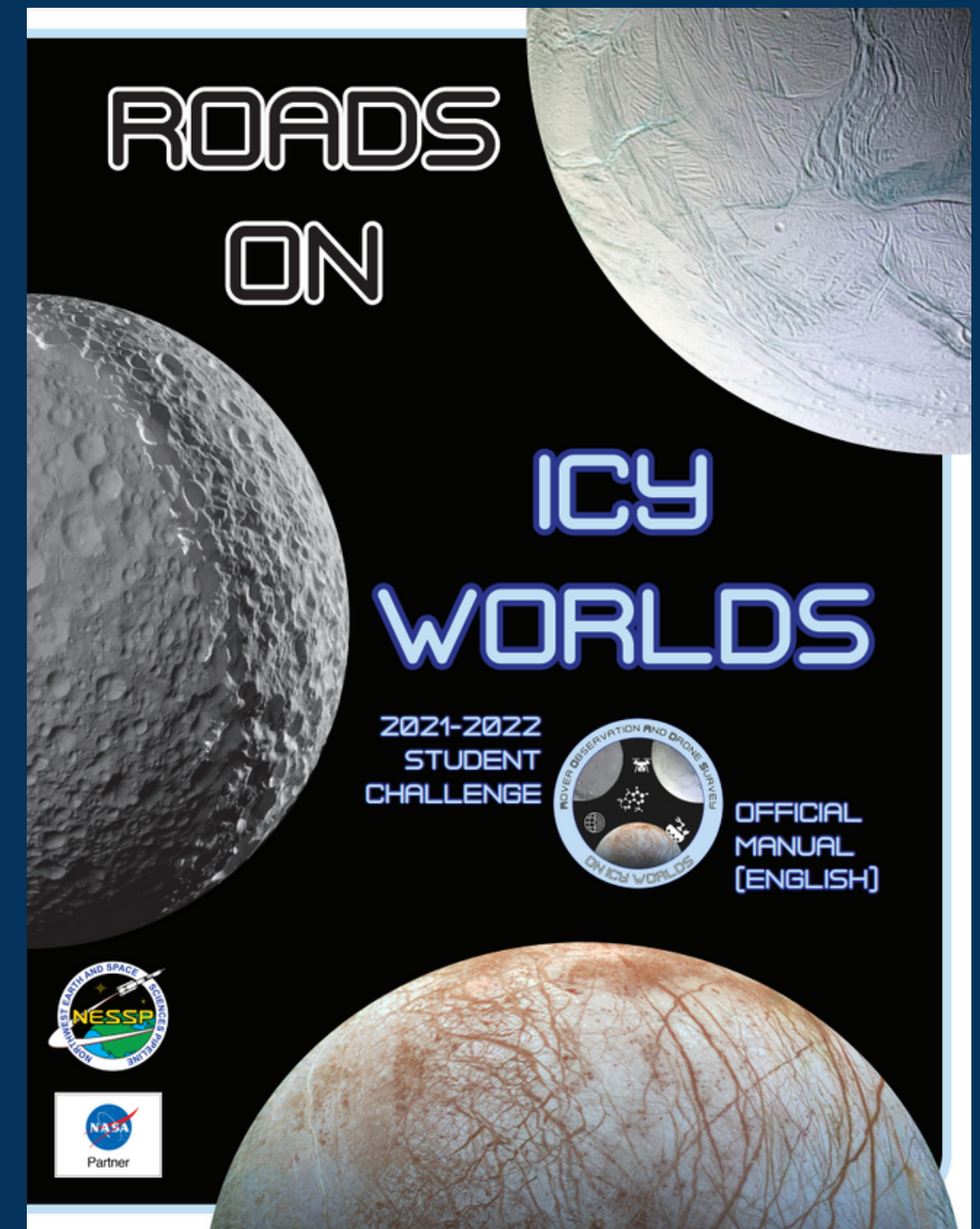
<https://www.jpl.nasa.gov/edu/teaching-space/>

<https://www.jpl.nasa.gov/signup/>



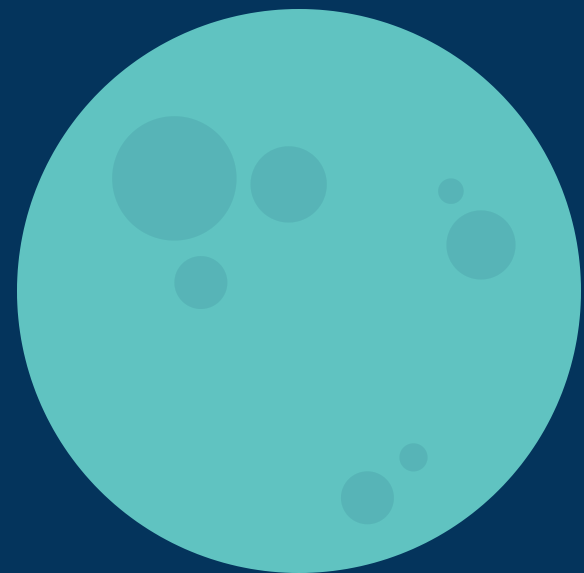
ROADS on Icy Worlds

The ROADS program (Rover Observation And Drone Survey) is a framework that lets students explore STEM concepts through hands-on activities. ROADS takes inspiration from real NASA projects and guides students on a space-related mission. For teams grades 3-12.



<http://www.nwessp.org/icyworlds/>





Q&A

We will now be answering any questions or comments that you may have!



GET SOCIAL WITH US



TWITTER

@cerritostospace



INSTAGRAM

@cerritostospace



YOUTUBE

https://www.youtube.com/channel/UCvYq43C71dJsrwvZ-dr_Jbg

