

# Dinner

A composite image of space. The background is a dark field of stars. In the lower-left foreground, the blue and white horizon of Earth is visible. In the upper-right, the reddish-orange surface of Mars is shown. In the lower-right, a satellite with solar panels is depicted.

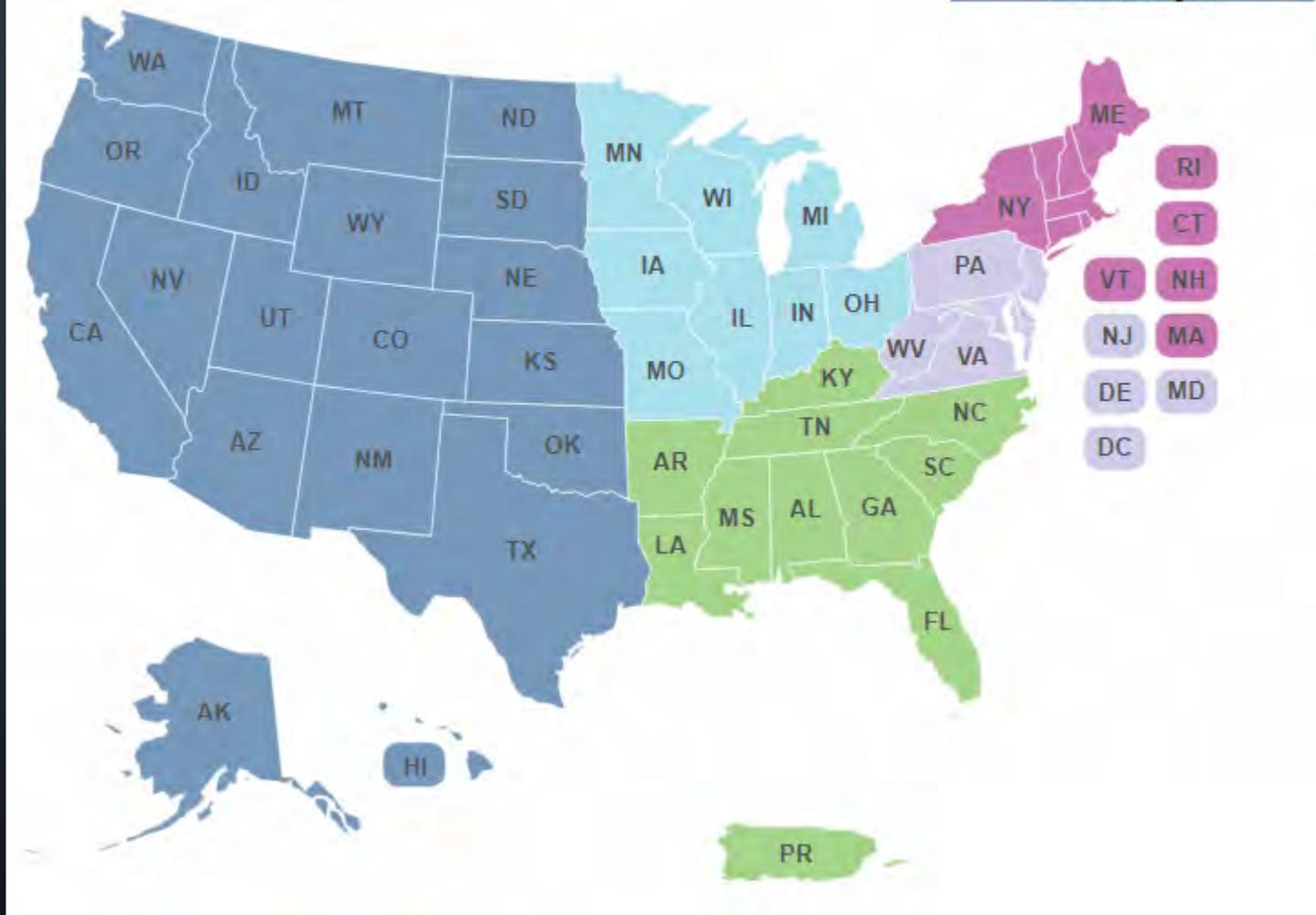
What did the astronaut put in her sandwich?

# About NDSGC

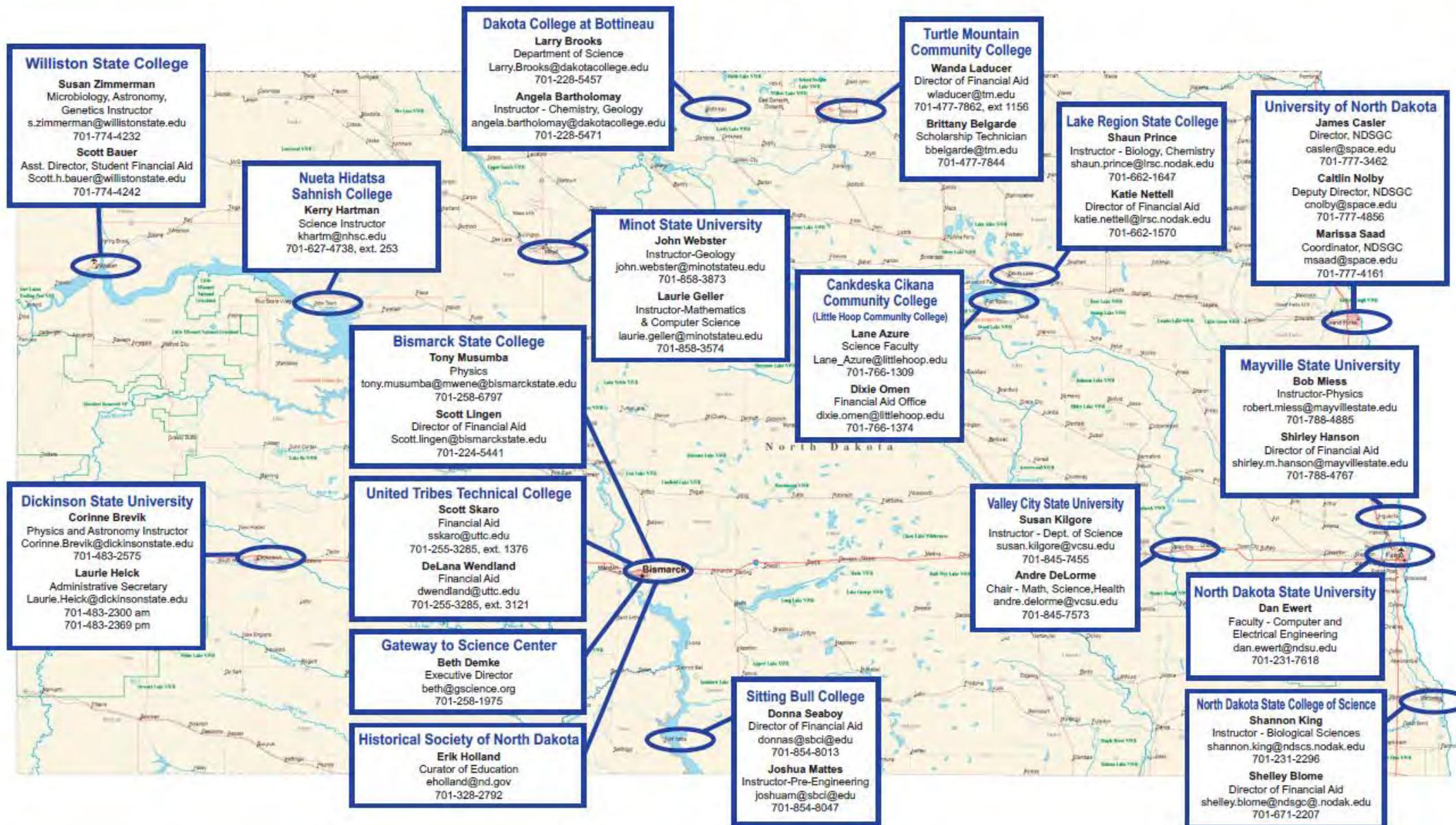


**Space Grant Regions**

- Great Midwestern Region
- Mid-Atlantic Region
- Northeast Region
- Southeastern Region
- Western Region



# NASA North Dakota Space Grant Affiliates









SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH through

# EXPERIENTIAL LEARNING

## K-12 Ballooning

### Near-Space Balloon Competition

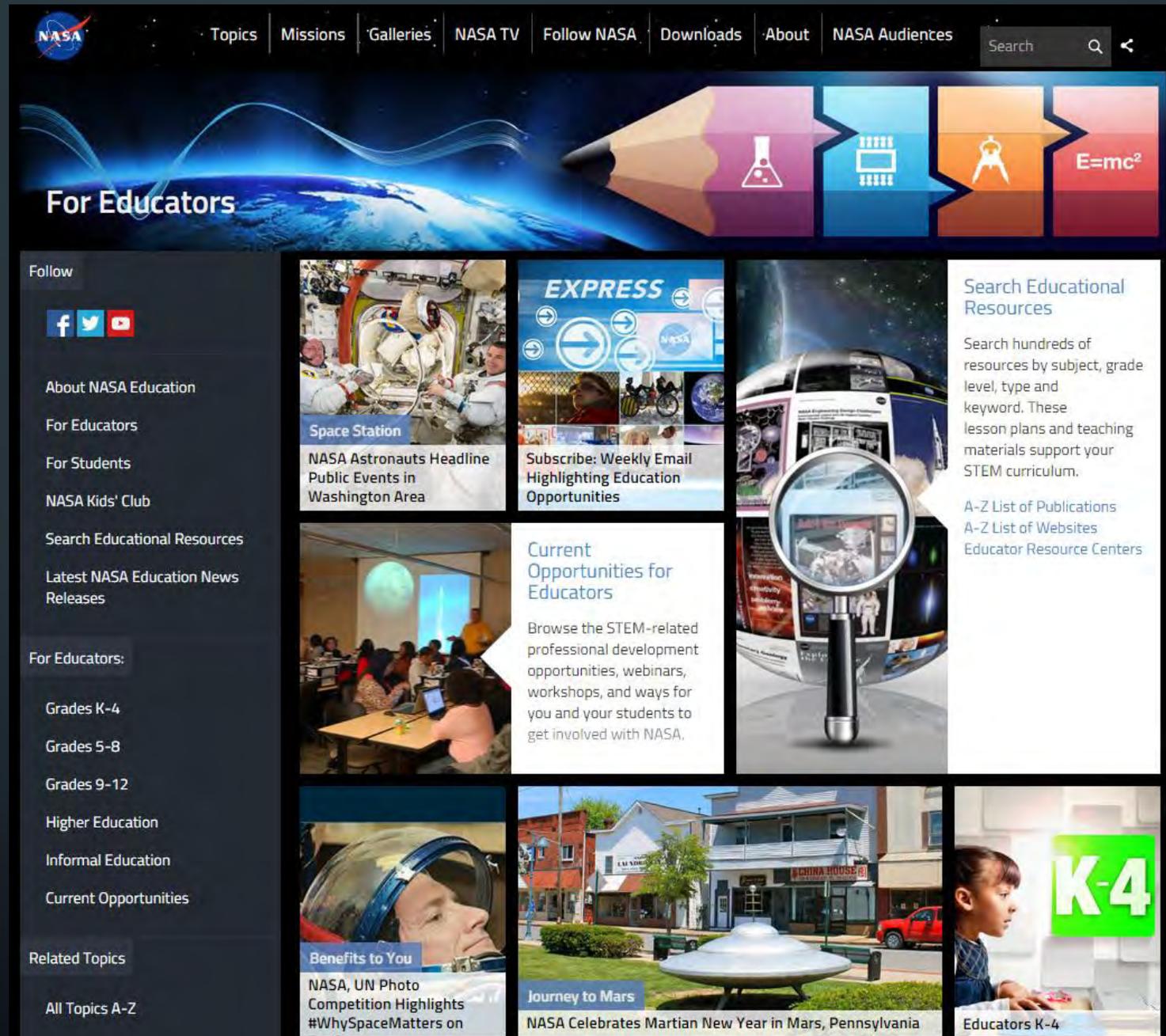
The NSBC is an engaging launch competition for middle and high school students in North Dakota. The NSBC is supported by the NASA North Dakota Space Grant Consortium (NDSGC), a state-wide educational program that involves North Dakota faculty, students, and K-12 students in multi-institution, collaborative, NASA-relevant research

## College Ballooning

### AESIR

The Atmospheric and Educational Student Initiated Research (AESIR) is the science, launch, and recovery team from the Space Studies Department at the University of North Dakota. The AESIR team oversees all K-12 and college-level ballooning missions.

# NASA EDUCATION



The image shows a screenshot of the NASA Education website. At the top, there is a navigation bar with the NASA logo and links for Topics, Missions, Galleries, NASA TV, Follow NASA, Downloads, About, and NASA Audiences. A search bar is located on the right side of the navigation bar. Below the navigation bar is a large banner featuring a stylized pencil with icons for science (flask), technology (circuit board), and mathematics (compass), along with the equation  $E=mc^2$ . The text "For Educators" is prominently displayed on the left side of the banner.

**Follow**

- Facebook, Twitter, YouTube icons
- About NASA Education
- For Educators
- For Students
- NASA Kids' Club
- Search Educational Resources
- Latest NASA Education News Releases

**For Educators:**

- Grades K-4
- Grades 5-8
- Grades 9-12
- Higher Education
- Informal Education
- Current Opportunities

**Related Topics**

- All Topics A-Z

**Space Station**  
NASA Astronauts Headline Public Events in Washington Area

**EXPRESS**  
Subscribe: Weekly Email Highlighting Education Opportunities

**Current Opportunities for Educators**  
Browse the STEM-related professional development opportunities, webinars, workshops, and ways for you and your students to get involved with NASA.

**Search Educational Resources**  
Search hundreds of resources by subject, grade level, type and keyword. These lesson plans and teaching materials support your STEM curriculum.  
A-Z List of Publications  
A-Z List of Websites  
Educator Resource Centers

**Benefits to You**  
NASA, UN Photo Competition Highlights #WhySpaceMatters on

**Journey to Mars**  
NASA Celebrates Martian New Year in Mars, Pennsylvania

**K-4**  
Educators K-4

[Topics](#)[Missions](#)[Galleries](#)[NASA TV](#)[Follow NASA](#)[Downloads](#)[About](#)[NASA Audiences](#)

# For Students



# NASA for Students

## Follow

[About NASA Education](#)[For Educators](#)[For Students](#)[NASA Kids' Club](#)[Search Educational Resources](#)[Latest NASA Education News Releases](#)

## For Students: Grades K-4

[Grades 5-8](#)[Grades 9-12](#)[Higher Education](#)

## Related Topics

[All Topics A-Z](#)

Explore This: Planetary Explorer



NASA Kids' Club



Explore This: Technology



### Now in Space! Expedition 44

Expedition 44 is part of a special mission. Scott Kelly and Mikhail Kornienko are staying on the space station for one year!

Planet of the Month: Jupiter -- King of the Planets

The screenshot shows the NASA Kids' Club website. At the top, there's a NASA logo and the text 'NASA KIDS' CLUB' with a 'Text Only Site' link. Below this is a navigation bar with five numbered buttons (1-5) and a 'kids' club' label. The main content area features three panels: a world map with a red line, a satellite in space with the text 'link confirmed', and a colorful nebula. Below these are sections for 'Ready For A Challenge?' with an 'Exploration Design Challenge' (EDC) and a 'Join Now!' button, and 'Mars FunZone' with a 'Start Exploring' button. On the right, there's a cartoon character and the text 'For kids of all ages!'.

# Space Math at NASA

The screenshot shows the Space Math @ NASA website. At the top, there is a NASA logo and the text "National Aeronautics and Space Administration Goddard Space Flight Center". A search bar with a "GO" button is on the right. Below this is the "Space Math @ NASA" title in a stylized font. A navigation menu includes "Home", "Problem Books", "STEM Modules", and "Inquiry". A secondary menu lists "Math by Grade Level", "Math in Science", "Math in Engineering", "Math in Press Releases", "Math by NASA Mission", and "Articles".

**Space Math @ NASA**

SpaceMath@NASA introduces students to the use of mathematics in today's scientific discoveries. Through press releases and other articles, we explore how many kinds of mathematics skills come together in exploring the universe.

**Partnering NASA Missions**

**Astrophysics:**

- Chandra - [Click here](#)
- Kepler - [Click here](#)
- James Webb ST - [Click here](#)

**Earth Science:**

- SAGE-III - Under development

**Heliophysics:**

- Hinode - [Click here](#)
- IMAGE - [Click here](#)
- MMS - [Click here](#)
- RBSP - [Click here](#)
- THEMIS - [Click here](#)

**Planetary:**

- Cassini - [Click here](#)
- Dawn - [Mission Math](#)
- EPOXI - [Click here](#)
- InSight - [Click here](#)
- Juno - [Click here](#)

**Partnering NASA Programs**

- Eyes on the Solar System - [Click here](#)

**SpaceMath@NASA News Updates**

**March:** NASA Press Release about SpaceMath@NASA- [\[Read Press Release\]](#)  
**July:** New math guide to Mars Exploration and the Curiosity Rover - [\[Click Here\]](#)  
**August:** Expanded and updated math guide on Black Holes posted- [\[Click Here\]](#)  
**November:** SpaceMath@NASA served 6,000,000th math problem at the website!  
**December:** New multi-media Grade 6 Math Modules added- [\[Click Here\]](#)  
**February:** New multi-media Grade 8 Math Modules added- [\[Click Here\]](#)  
**April:** The 7 millionth Space Math problem is downloaded

**Math in the News**

A behind-the-scenes look at the math in NASA press releases

**Problem 517: A Distant Supernova Remnant Discovered**  
Students explore the size and speed of a distant supernova remnant nebula and compare it to the speed of the International Space Station. (PDF)

**Problem 516: Hinode Observes Solar Eclipse from Space**  
Students use the geometry of a solar eclipse to estimate the distance to the sun using simple proportional reasoning. (PDF)

**Problem 515: Telling Time on Mars**  
Students learn about the difference in time between a martian day and an Earth day, and use this to explore how work schedules change for scientists working with the Curiosity rover on Mars. (PDF)

**Problem 514: Solar Flares and the Stormy Sun**  
Students use simple averaging to explore the sunspot cycle and our suns changing activity levels in 2012 and 2013. (PDF)

[\(More problems from 2012-2013\)](#)

**Multi-Media Math Modules**

**Grades 6, 7 and 8:** Standards-based, multi-media math resources featuring NASA eClips video segments, readings from NASA press releases, online interactive resources, and of course math problems! [\[click here\]](#)

**Problem Archives**

- I - Problems 1 to 38
- II - Problems 39 to 64
- III - Problems 65 to 101
- IV - Problems 102 to 148
- V - Problems 149 to 233
- VI - Problems 234 to 342
- VII - Problems 343 to 428
- VIII - Problems 429 to 478
- IX - Problems 479 to Current

# International Space Station - Live!

**NASA** Topics Missions Galleries NASA TV Follow NASA Downloads About NASA Audiences Search

## International Space Station

Space Station Overview Images Videos Media Resources

Follow

- Space Station Topics
  - Research and Technology
  - Crews and Expeditions
  - International Cooperation
  - Launches
  - Ground Facilities
  - Space to Ground
- One-Year Crew
- SpaceX
- Orbital
- Commercial Crew Program
- Media Contacts
- Space Station Tour

Related Topics

- Commercial Resupply

### Space Station Updates



Station Science Ongoing as SpaceX Launch Slips to June 28  
3 days ago

The three inhabitants of the International Space

### INTERNATIONAL SPACE STATION

OFF THE EARTH, FOR THE EARTH

6058 : 10 : 19 : 10

Station Time in Orbit

### Tweets

Follow

Scott Kelly @StationCDRKelly 1h  
#MondayMotivation Color your world. Good morning from @Space\_Station! #YearInSpace pic.twitter.com/gp5sC  
Retweeted by Intl. Space Station

Tweet to @Space\_Station

### Commercial Resupply

TV Coverage Set for Seventh SpaceX Resupply Mission to Space Station

### Who's on the Space Station Now?

Expedition 44 & One-Year Crew

Commander Gennady Padalka  
Scott Kelly  
Mikhail Kornienko

### One-Year Mission



**USTREAM** EXPLORE PRODUCT SEARCH Log in / Sign up Go live!

### ISS HD Earth Viewing Experiment

Follow 85,923 followers



1198 / 51,039,431 LIVE

Load Tweet 1151 8+1 22k

#### Videos Social Stream

Say something...

- jojkitten minertyler100: no problem there's more ahead 12 minutes ago
- minertyler100 darn missed the sunrise 18 minutes ago
- minertyler100 WOOOAH 18 minutes ago
- jojkitten love a good sunrise! 27 minutes ago
- orion Pedro1961: you have right

**FLIGHT** **ASTRONAUTS** **INTERNATIONAL SPACE STATION** **RESEARCH**

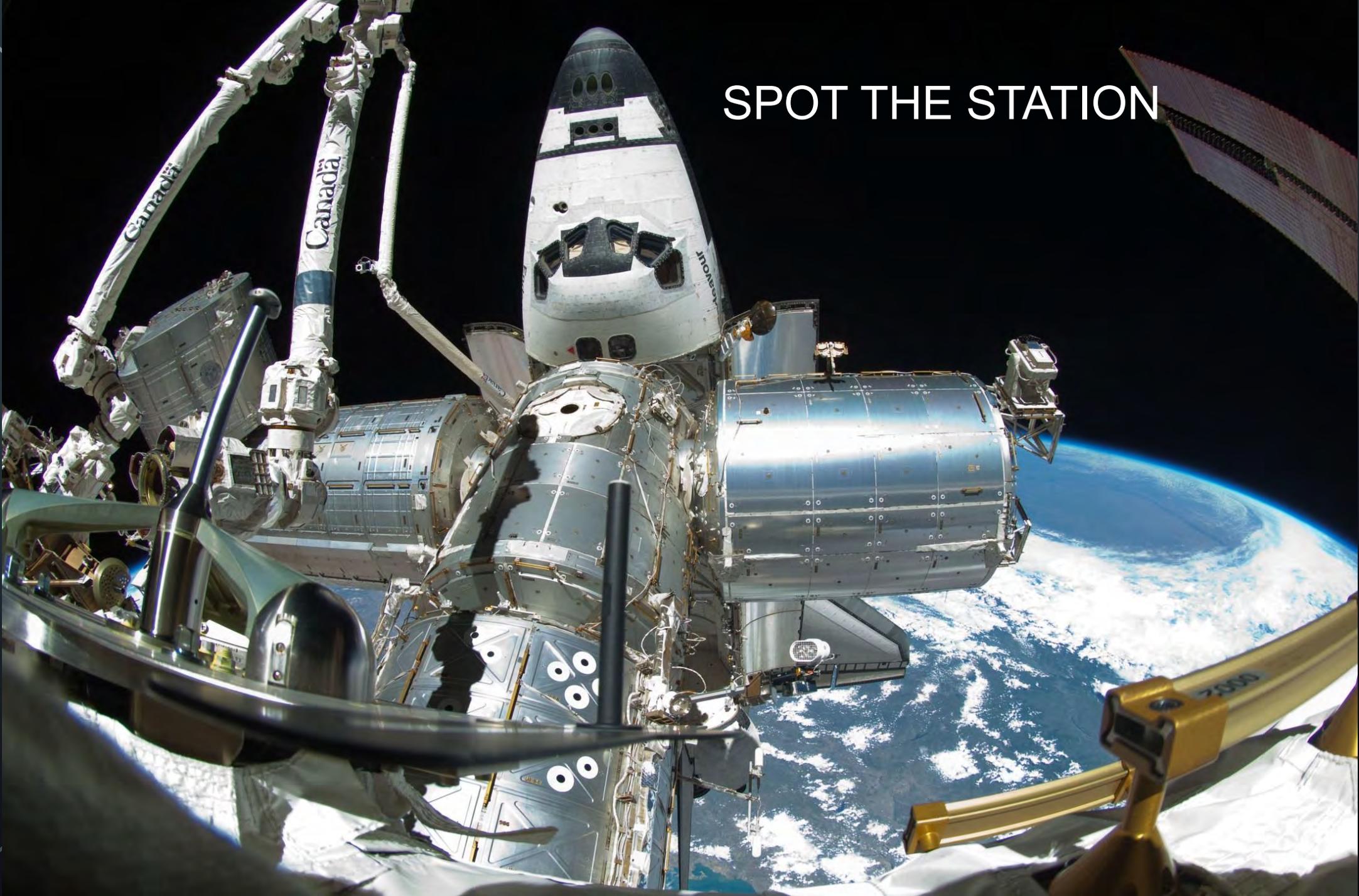
ESA > Our Activities > Human Spaceflight > International Space Station

### WHERE IS THE INTERNATIONAL SPACE STATION?



human spaceflight and operations cesa

# SPOT THE STATION



Every NASA mission has its own kid-friendly page

Here is Mars Curiosity Rover →



# NASA – Lunar Reconnaissance Orbiter

NASA National Aeronautics and Space Administration  
Goddard Space Flight Center

Flight Projects | Sciences and Exploration

LUNAR RECONNAISSANCE ORBITER

Home The LRO Mission Images and Multimedia Science and Data Education and Outreach

LRO KIDS!

Get animations, streaming video, cartoon characters, audio narration, interactive games!

NASA | Wall-E Learns About Proportions

Moon Concentration  
How Good is Your Memory?

Moon Quiz  
Is it a big hunk of cheese? Take quiz and find out!

Moon Cookies  
Make these tasty cookies (no baking required)

Unscramble  
Take the Challenge!  
Unscramble Moon-related graphics

Wordsearch  
Help Us Find Our Lost Lunar Words

Moon Calculator  
How much would you weigh you lived on the Moon?

Crossword Puzzles  
Answer clues and solve the puzzle

Ask Dr. Marc  
Dr. Marc answers questions asked by visitors about the Moon and other topics.

Lunar Cryptograms  
Decode these important messages

LRO CRAFTS

Welcome to the  
Space Operations Learning Center (SOLC) [Back to Home](#)

SPACE OPERATIONS LEARNING CENTER

BEGINNER

← Kids Zone 2 Earth Science Kids Zone 3 Space Station Kids Zone 4 The Moon Kids Zone 5 The Sun Kids Zone 6 Comets Meteors and Asteroids →

ADVANCED

Launch & Deployment Space Communication Flight Dynamics Information Processing Mission Operations Spacecraft Disposal

Did You Know?  
Light from the Sun reaches Earth in around 8 minutes.

Take Our Short Survey

Log In

Goddard Space Flight Center  
Computing Environments and Collaborative Technologies Branch / Code 585

- About Us  
- Text-Only Version  
- NASA Privacy Policy and Important Notices

SCaN

# SciGirls Activities



[About](#)
[My Page](#)
[Activities](#)
[Video](#)
[en español](#)
[Groups](#)
[Learn](#)
[Program Resources](#)
[Forum](#)
[Photos](#)

## Activities

SciGirls has made a commitment to providing quality, gender-equitable, inquiry-based STEM activities that are fun for all! Check out the activities under the following topic areas:

- Earth & Space
- Engineering
- Health
- Life & Environmental
- Physics & Chemistry
- Technology

Download the complete guides from Season Three:



SciGirls Participate: Citizen Science Adventures  
Public participation in scientific research, also known as citizen science, engages ordinary people (kids and adults) in the collection of data for use by research scientists. The activities in this book support and prepare your girls for participation in citizen science.

Download the complete guides from Season Two:

Welcome to SciGirls CONNECT

[Sign Up](#) or [Sign In](#)

SciGirls on Facebook

Like

SciGirls on Twitter

Tweets

Follow

PBS LearningMedia @PBSLrnMedia 8h

What kind of stuff is preserved in a bog?  
@SciGirls activity/video describes functions of unique wetland environment.

### Activity 4 Star Power

**CREATE A STAR SHOW AND LEARN HOW YOU CAN PREVENT LIGHT POLLUTION.**

The stars in the night sky have fascinated humans since we first walked the Earth. But today, electric outdoor lighting threatens our ability to see the stars. Light pollution is a real problem, and not just for astronomers. Animals become disoriented from the excess lights, which can disrupt their mating, migration, and predation behaviors. For example, sea turtle hatchlings follow light from the moon to find their way to the ocean, but coastline lighting can lure them toward roads and predators.

**You'll Need:**

- room that can be darkened
- 1 desk lamp with lamp shade removed

**Part 1 (for each small group):**

- shoe box (the narrower, slinky kind is best) or rectangular tissue box and tessa paperboard (e.g., cereal box)
- 3"x5" index card
- tape (duct or masking)
- scissors
- pushpin
- LED keychain flashlight
- optional: book that contains drawings of constellations, construction paper, glue, markers, crayons, colored pencils

**Part 2 (for each small group):**

- aluminum foil
- paperboard (e.g., cereal box)
- tape (duct or masking)
- scissors

**2 hours**

### Activity 2 Insulation Station

**DETERMINE THE BEST INSULATION TO KEEP ICE CUBES FROM MELTING**

Insulation in the home is used for different purposes in different parts of the country. In warmer climates, insulation keeps the cool air in and the hot air out; in cooler climates it has the opposite effect. The purpose of insulation is to slow down the conduction of heat from one side of a wall to the other.

**You'll Need:**

- large pitcher
- water
- several insulating materials (styrofoam peanuts, bubble wrap, cardboard packing strips or fabric)

**For each small group:**

- 2 ice cubes
- 1 8 1/2 oz. insulated cylinder (50 ml. or larger)
- plastic wrap
- 2 large paper cups
- scissors
- rubber
- tape (masking or clear)
- paper and pencil
- 1 work light with clamp (or desk lamp capable of holding a 120 watt bulb)
- 1 stopwatch or clock

**1 hour**

**SMART START:**

Prepare one paper cup testing station to display by cutting off the top (approximately 3 cm) of a paper cup and filling with one of the test materials. Use the plastic wrap to cover and keep the "insulation panel" inside the top of the second whole cup (testing cup). Once the group has seen this sample, remove the test material and insulation.

**Fill a large pitcher with water and allow it to reach room temperature.**

**Here's how:**

1. **Question.** Divide the girls into small groups, and introduce the idea of insulation. Have them brainstorm different materials that might provide good insulation for different needs (insulating clothing, food storage, etc.). Deliver the SciGirls Challenge: How can you keep ice cubes in a cup from melting?
2. **Design the experiment.** Show your example paper cup testing station and ask your girls to choose one material to test. Explain to the girls

[www.go.to/scigirlsconnect.org/](http://www.go.to/scigirlsconnect.org/)

### Activity 5 Deep Sea Diver

**THINK LIKE AN OCEAN ENGINEER AND DESIGN YOUR OWN MODEL DEEP SEA DIVER.**

Buoyancy is the ability to float. When you put an object in water, it pushes water out of the way to make room for itself. An object floats when it weighs less than the water it displaces; an object sinks when it weighs more than the water it displaces.

**SMART START:**

Here's one way to start this activity. Get your girls thinking about buoyancy. Show them a group of objects and ask them to predict which will sink and which will float. Then, test their ideas using a plastic container filled with water. Do the girls' predictions match the results?

**Here's how:**

1. **Explore buoyancy.** Can you think of things that don't float on the water and don't sink to the bottom (cork, a diver, submarine, balloons, plastic beanie-baby, drinking straw, craft sticks, wooden skewers, plastic eggs, balloon, ping-pong balls, sponge, craft foam)?
2. **Design and build.** Engineers will often build models before they design full scale. The models help them understand the factors that may be key to the success of the design. Deliver the SciGirls Challenge: Build a small diver (no larger than 3 in. by 3 in.) that is neutrally buoyant. In small groups, have girls brainstorm what materials they'd like to use, then design and build their diver.

**You'll Need:**

- Items to adjust buoyancy (assorted metal washers, pennies, paper clips, binder rings, Styrofoam packing peanuts, small balloons)
- Items for the body of the diver (Styrofoam ball, plastic beanie-baby drinking straw, craft sticks, wooden skewers, plastic eggs, balloon, ping-pong balls, sponge, craft foam)
- Items to hold the diver together (rubber bands, duct tape, or hot glue gun)
- optional: objects that sink or float (marbles, metal spoon, Ping Pong balls, sponges, plastic spoon, pieces of fruit)

**For each small group:**

- sturdy clear container at least 6 in. x 6 in. that can hold water
- water
- washers
- scissors
- paper and pencil

**45 min**

**Watch the SciGirls test a neutrally buoyant underwater robot on the SciGirls Invert DVD. (Select Aquatics: Test and Redesign 1.)**

Use caution when working with hot glue.

# Lunar and Planetary Institute



## Teachers and Faculty

LPI K-12 Teacher Workshops, Institutes, and Field Trips

Exploration of the Moon and Asteroids by Secondary Students

LPI Summer Intern Program

Humans in Space Youth Art Competition

Educator Resources

Education Newsletter

LPI Higher-Education Faculty Programs



Find upcoming LPI teacher trainings in Earth and space science topics, and connect to resources from past workshops and field trips.

# Explore!

## NEW AND UPCOMING



### Cosmic Explorations: A Speaker Series

The Universe is Out to Get Us and What We Can (or Can't) Do About It



### Solar System Exploration Pre-Service Teacher Institute

June 23-27, 2014  
Application deadline: June 2



### Mars Through Time Workshop

July 8-11, 2014  
at the University of New Mexico

# NASA Summer of Innovation

## What to Consider When Selecting Content

### Themed Units



### Grades 4-6

#### Life Science

- Body
- Food
- Life Out There?
- Plants
- Survival

#### Physical Science

- Aeronautics
- Force and Motion
- Gravity
- Properties of Matter
- Waves and Optics

### Grades 7-9

#### Earth and Space Science

- Climate and Seasons
- Destination Mars
- Earth Moon Systems

#### Engineering

- Aeronautics
- Challenges
- Design Process

## Themed Camp Guides



### Aeronautics Camp

This camp centers on the mathematical and design principles of flight design.



### Designing for Space Camp

This camp centers on developing an appropriate learning progression that focuses on the concepts necessary to learn about engineering.



### Life Science Camp

This camp centers on the characteristics of living things, astrobiology, exoplanets and adaptations to the space environment.

# NASA Discovery Program

## Discovery Program

- Home
- Program
- Missions
- News
- Education
- Multimedia
- Small Worlds

Upcoming Mission Events

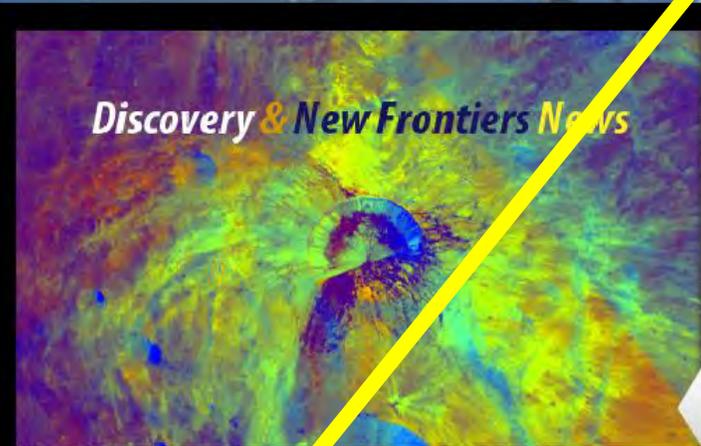
Dawn Orbit Insertion



HOME

Search

GO



- Cosmic Art in Action!**  
New Activity Blends Science and Art, Spurs Creative Thought Processes
- Onward to Ceres**  
Ion Propulsion Powers Dawn Through the Asteroid Belt
- Looking Back at Us**  
MESSENGER Takes Image of the Earth
- MESSENGER to Snap Earth**  
Mercury Orbiter Will Take Images of Earth and Moon
- Read All about It!**  
Latest Discovery and New Frontiers Newsletter Now Online



**Space School Musical**  
The solar system comes alive!



**Exo's Discovery**  
Take the controls and explore with Exo's Discovery

**Image Impact**  
Take the controls and explore with Exo's Discovery

### Space School Musical

Hannah is trying to finish her science project - a model of the solar system. But there's a problem: it's due tomorrow, she's not finished yet, and it's past her bedtime. How will she get it done? With a little help from her friends - the most talented troupe in the Milky Way!

**SONGS**  
WATCH VIDEOS & SING ALONG

**ACTIVITIES**  
CROSS-CURRICULAR & FUN

**GALLERY**  
PHOTOS & VIDEOS

**PRODUCE**  
YOUR OWN MUSICAL



Watch ★ Laugh  
★ Learn ★ Perform ★

Join Hannah on a trip through the solar system in this ultra-cool edu-tainment "hip-opera" that is out of this world! Move and groove along with the planets, moons, meteors, comets, asteroids and even some rockin' scientists as they sing, dance and serve up the freshest facts in the galaxy. *Space is definitely one cool place.*



# North Dakota Space Grant

*...18 affiliate institutions*

*...reaching new heights!*

# North Dakota Space Grant Consortium



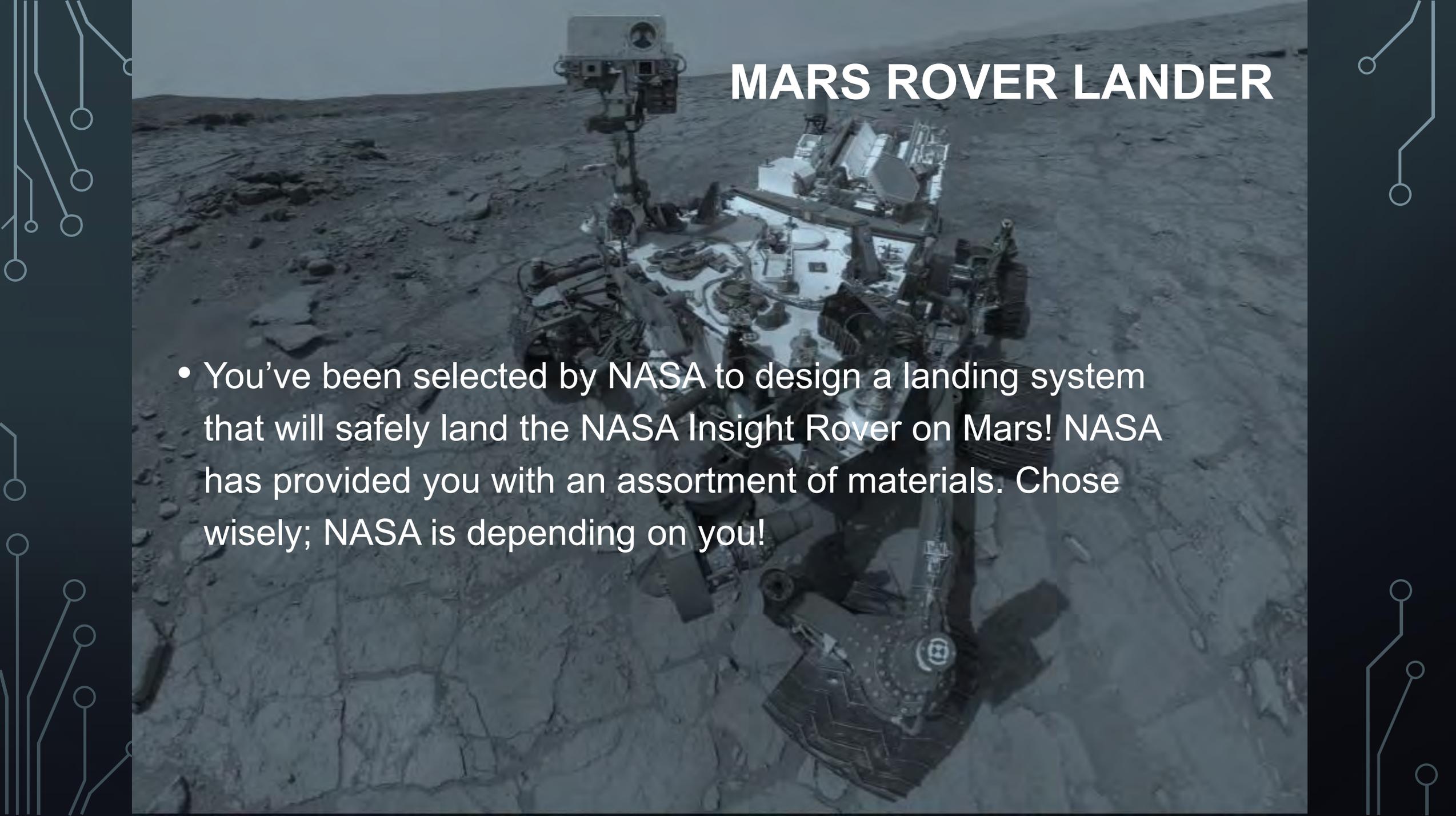
# NDSGC K-12 Educator Email Listserv

- Workshop opportunities
- New STEM education resources for the classroom
- NASA student contests/team competitions
- Professional Development opportunities
- Emails ~once a week



# Mars Rover Lander



A high-angle photograph of a Mars rover on a rocky, cracked surface. The rover is white and black, with various instruments and a camera mast. The background shows a vast, flat, rocky landscape under a hazy sky. The image is overlaid with a dark blue semi-transparent layer containing text and decorative circuit-like patterns on the left and right sides.

# MARS ROVER LANDER

- You've been selected by NASA to design a landing system that will safely land the NASA InSight Rover on Mars! NASA has provided you with an assortment of materials. Chose wisely; NASA is depending on you!

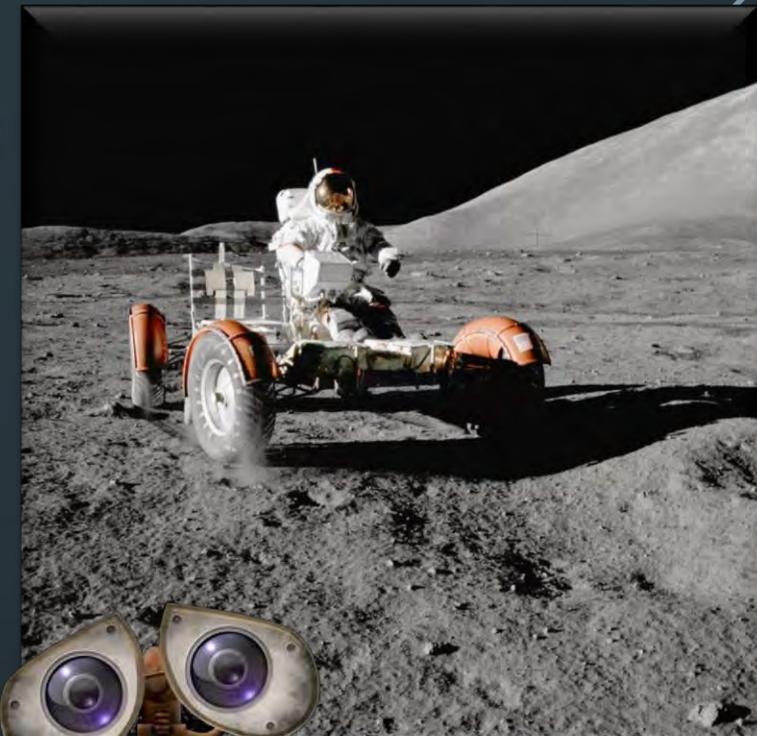
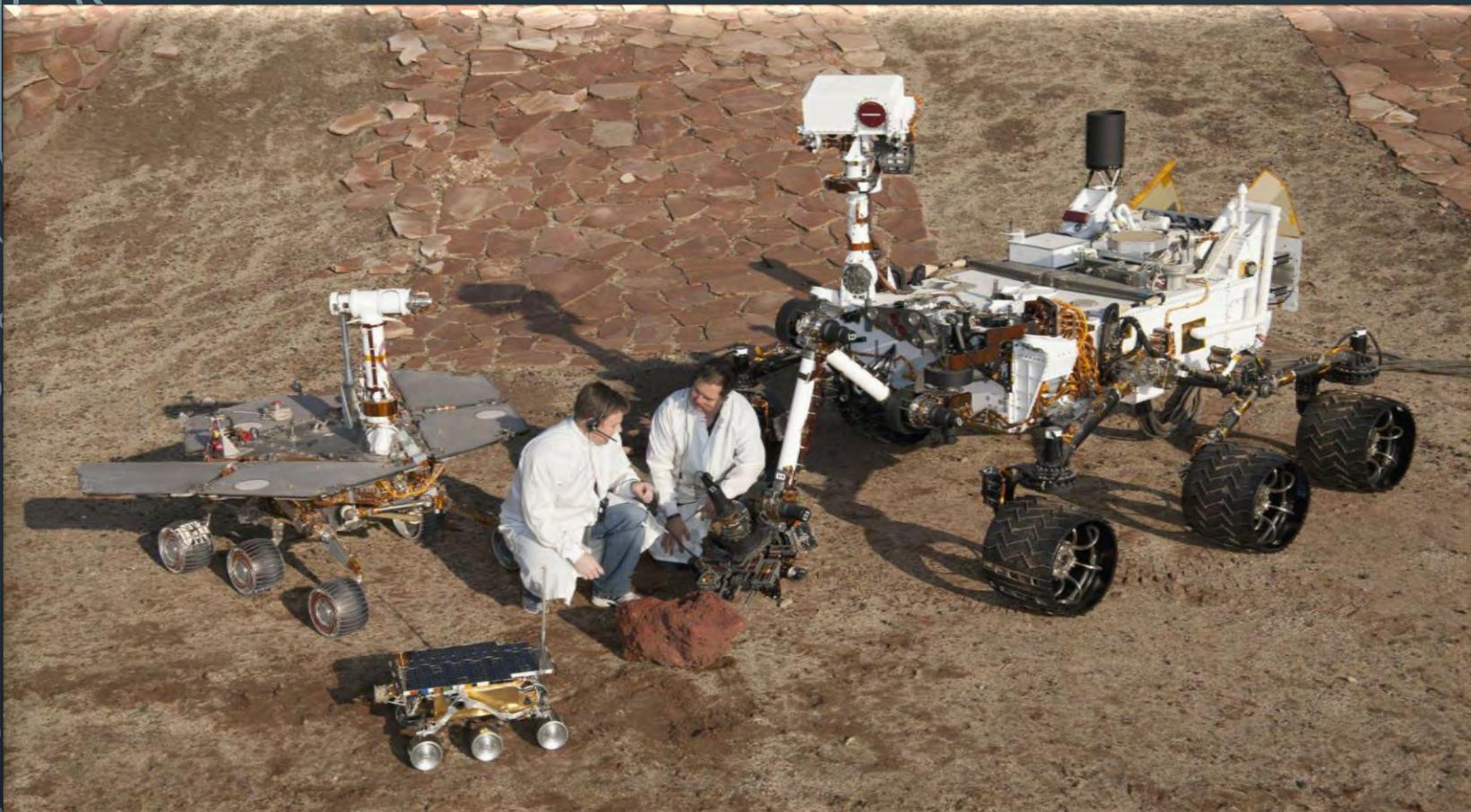
# ORION TEST PARACHUTE FAILS, MOCKUP CRASHES

JULY 2008



**SUCCESS!**  
JANUARY 2014





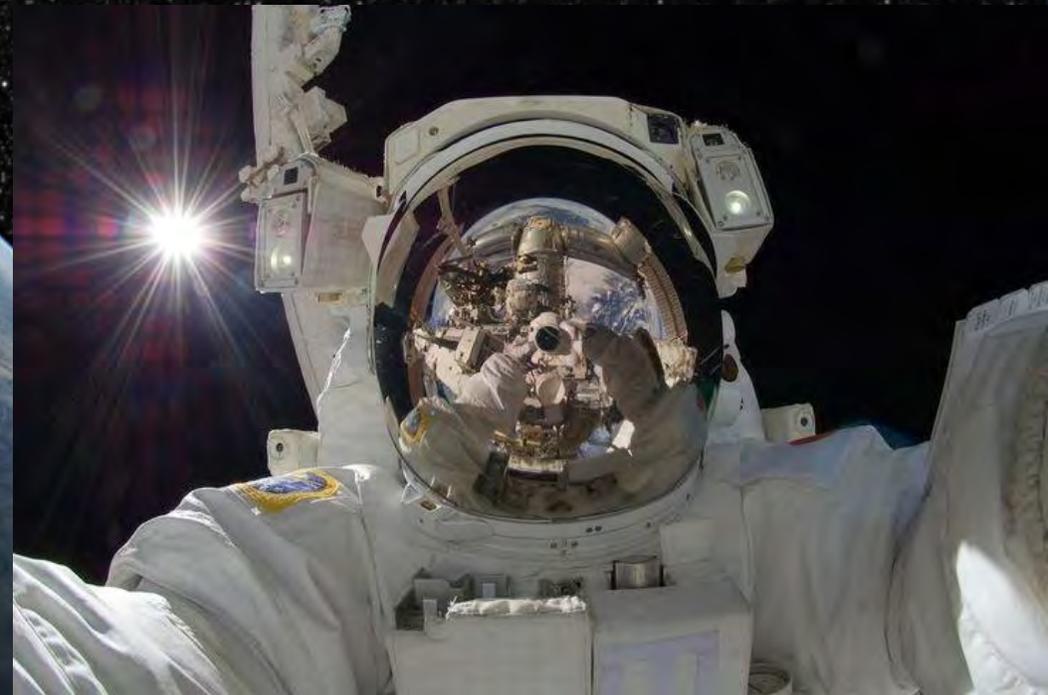
- How can students relate to rovers?
- Mars, Moon, remote RC cars, drones, Roomba, etc.





REFLECTIONS ON  
**INVESTIGATIONS AND TEACHING STRATEGIES**

Good Morning!



# SATURDAY'S AGENDA

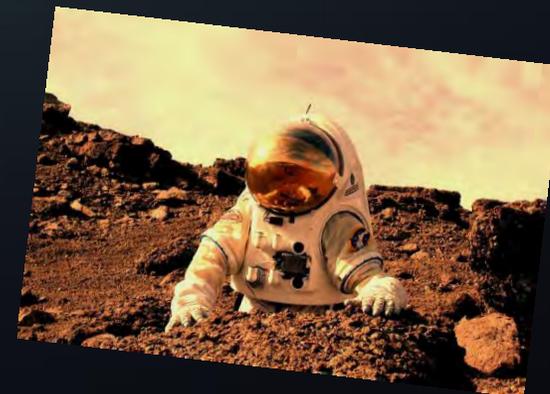
- 8:15 – 8:45 am: **Breakfast**
- 8:45-8:55: Review Workshop Objectives
- 8:55-9:40: Super Sleuths
- 9:40-10:15: Remote Sensing and Meteorites
- 10:15-10:30: **Break**
- 10:30-11:15: Lesson Plan Modification
- 11:15-12:15: **Working Lunch** and NSBC
- 12:15-1:15: Martian Water
- 1:15-1:30: **Break**
- 1:30-2:30: Bristle Bots
- 2:30-3:00: Post-Workshop Survey
- 3:00-3:15 Wrap up: Reflections



# HOW'S EVERYONE DOING?

Are we able to:

- **Engage students in areas of space exploration** and general science, by using effective instructional strategies and educational resources, with inspiring content.
- Promote the effective use of **SciGirls®** investigations and **NASA-developed resources** through integration of space science content with the SciGirls style of inquiry.
- Highlight milestones and challenges in a crewed **Mission to Mars** through hands-on multidisciplinary investigations completed in teams.



# HOW'S EVERYONE DOING?

## Are we able to:

- Develop a comprehensive understanding of the **SciGirls Seven** by the end of the workshop.
- Modify **existing lesson plans** using the SciGirls Seven by the end of the workshop.
- **Confidently teach space science** through an increased knowledge of space-related topics, with an emphasis on a mission to Mars.
- Effectively **conduct investigations** presented during the workshop (and modified lesson plans) in their respective classrooms, utilizing their understanding of the SciGirls Seven and space sciences during the 2018-2019 academic year.



# Super Sleuths



# SPACE ROCKS DEFINED

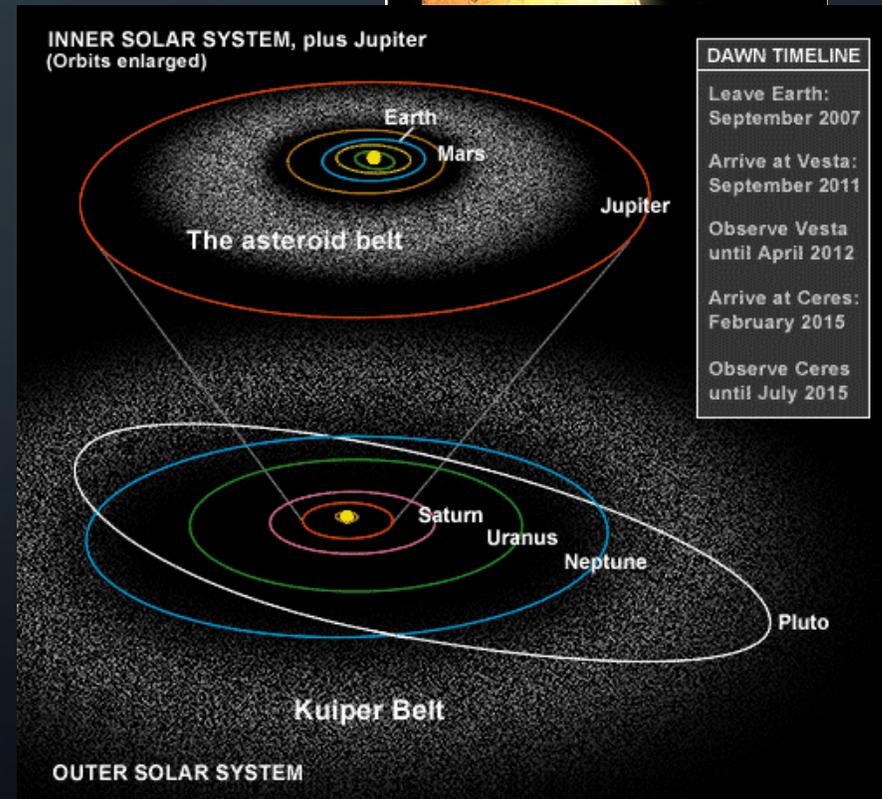
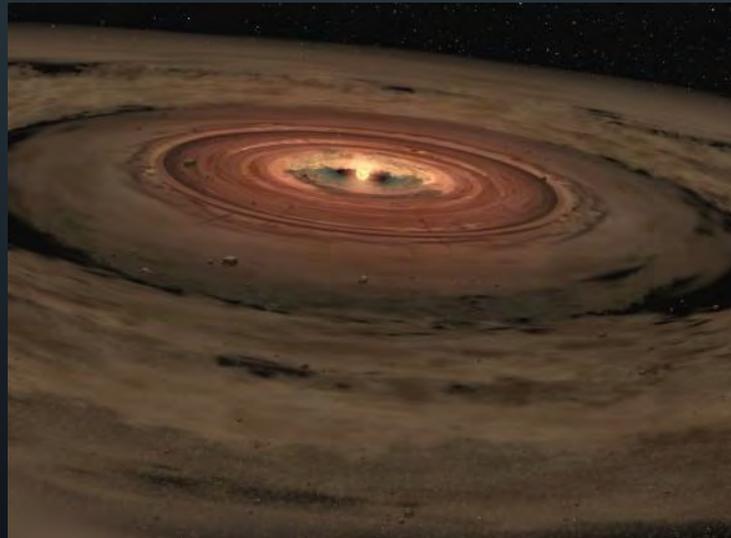
- Meteoroid: Small (less than 10 meters) rock/metallic object **IN SPACE**
- Meteor: The light produced when a meteoroid **ENTERS THE ATMOSPHERE** (sometimes called a “shooting star”)
- Meteorite: A natural rock/metallic object from space that has fallen to **EARTH’S SURFACE**



A **METEORITE** which is a part of the meteoroid that survived atmospheric entry and reached the ground. A **METEOR** formed by a meteoroid entering the atmosphere at high velocity.

# SPACE ROCKS DEFINED

- Where do they come from?
- Why study space rocks?
- Samples of the early Solar System
- Meteor Showers (Comet Tails)
- Impacts!! – Planetary Protection



# ASTEROIDS

...are nature's way of asking:



“How’s that space  
program coming along?”

# IMPACTS ON EARTH



**Meteor Crater (Arizona) was formed by the impact of an ~50 meter iron asteroid ~50,000 years ago**



# Peekskill Meteorite (12.4 kg) and 1980 Chevrolet Malibu



October 9, 1992 – Peekskill, NY

Michelle Knapp - 18 yr old, HS senior

When police arrived on the scene, they filed a report for criminal mischief by a very strong male.

The smell of gas from the punctured gas tank prompted the fire department to investigate, at which time they found the meteorite.

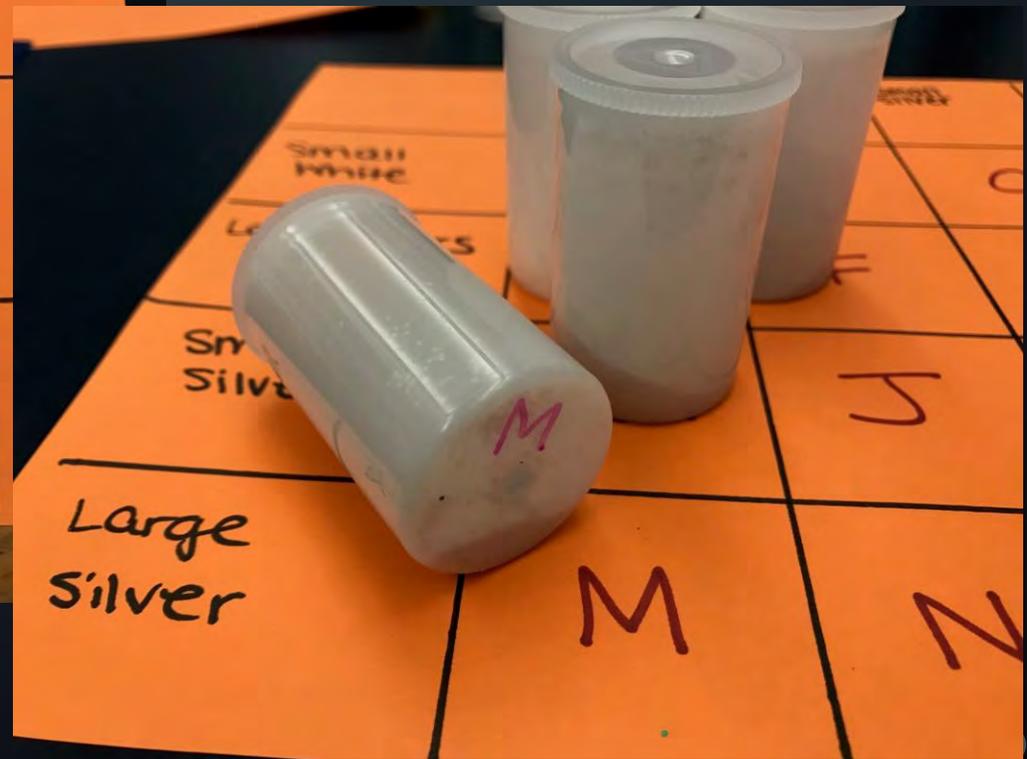
# SUPER SLEUTHS

All meteorites that are found on Earth originally came from a **Parent Body**, or their starting location. The top four parent bodies are:

- 6 Hebe = 35%
- 4 Vesta = 5%
- 3103 Eger = 1%
- Mars



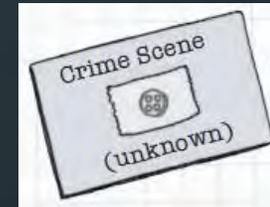
	Small white	large stars white	small silver	Large silver
Small white	A	B	C	D
Large star white			G	H
Small silver		J	K	L
Large silver		N	O	P



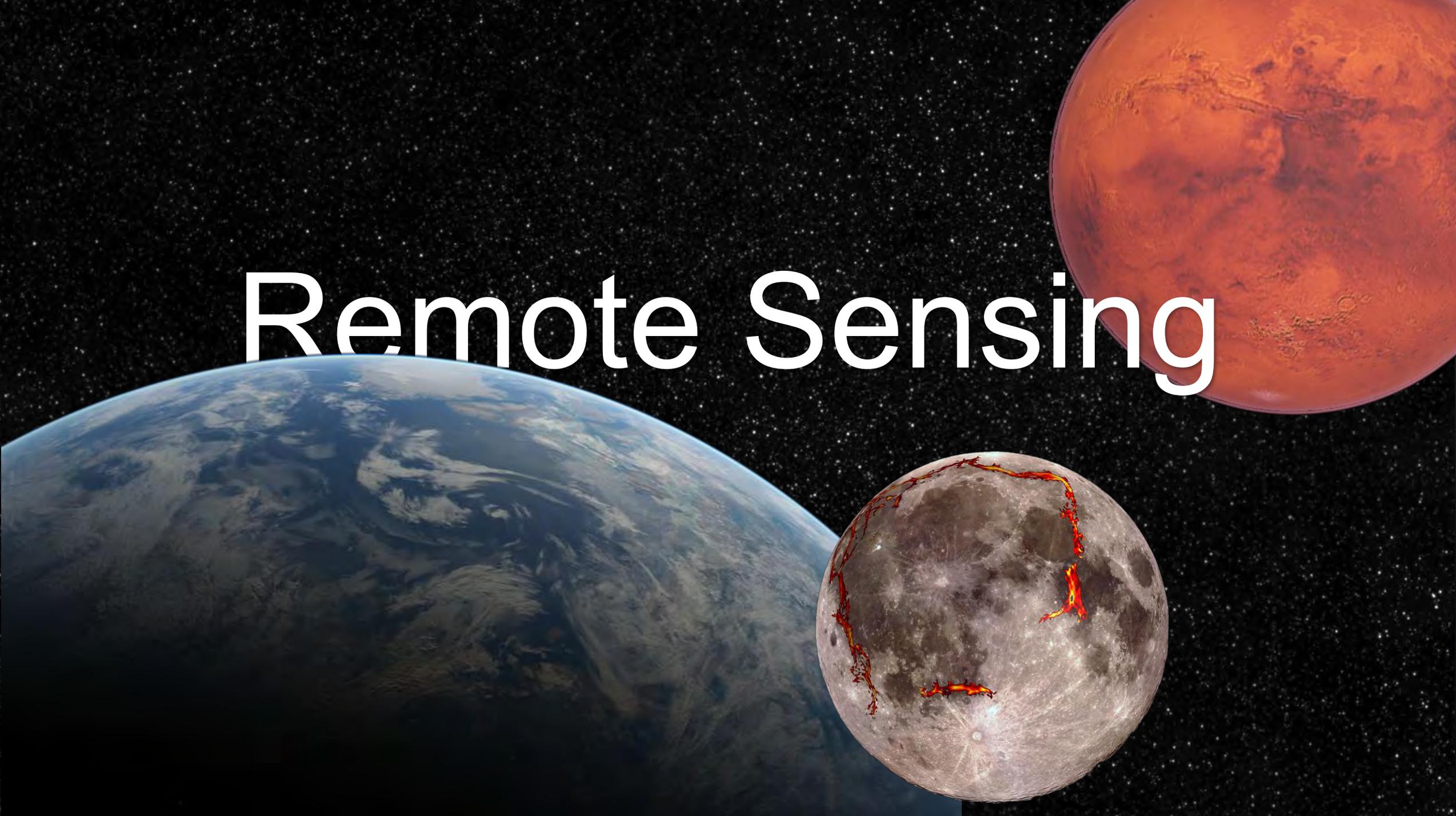
# SUPER SLEUTHS

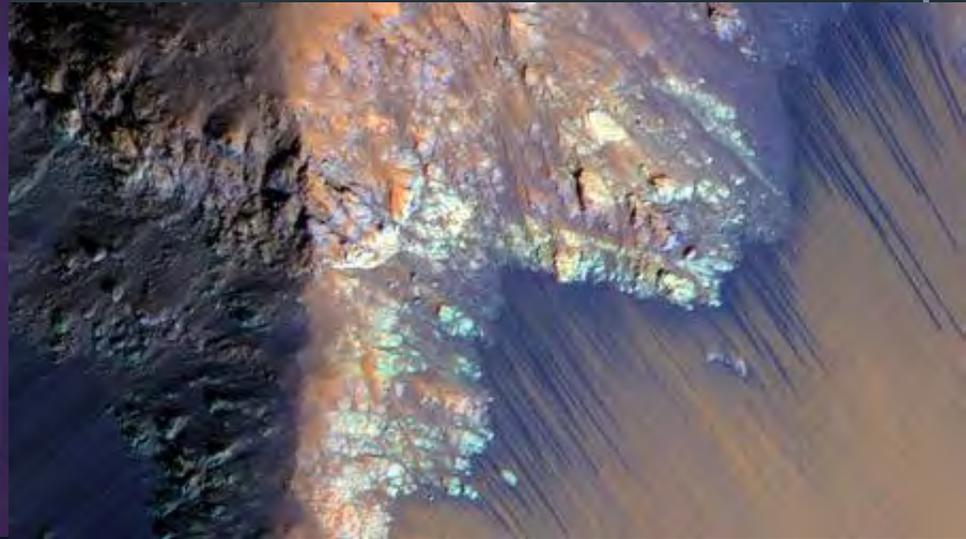
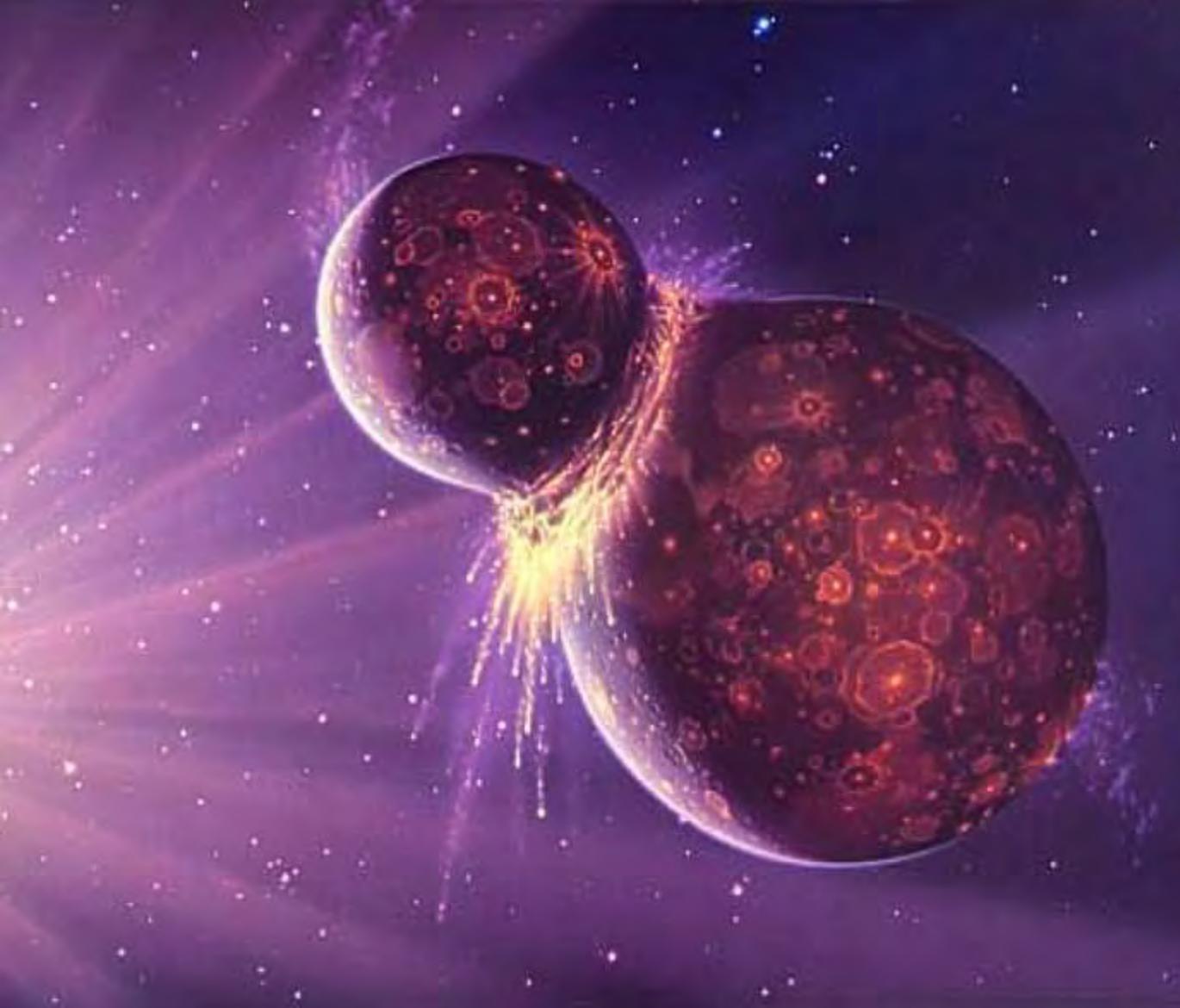
Students will match samples of glitter (asteroids) with its “Parent Body”. They will:

- Identify the problem
  - We found an asteroid (glitter) with an unknown parent body!
- Collect evidence
  - Students will use tape, microscopes, and tweezers
- Prepare slides
  - Students will use the tape to gather glitter evidence
- Observe and collect data
  - Match the characteristics of the sample to the parent body!
- Draw Conclusions
  - Students will explain which glitter is consistent with the unknown glitter



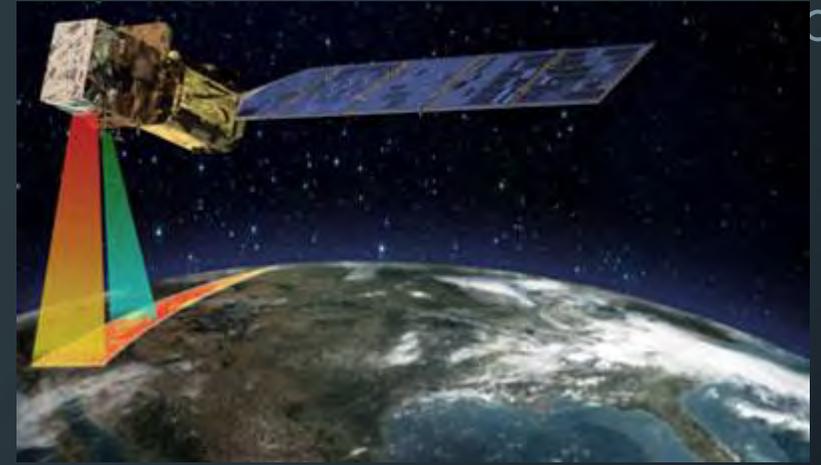
# Remote Sensing





# CLASSIFYING YOUR TERRAIN

- Are there **similar** geological processes?
- You are the planetary scientist! Help your Martian Community learn about their surroundings.
- Create your own classification system using: **Aeolian**, **Volcanic**, **Impact**, **Water**, and **Other**



A space-themed background featuring a view of Earth from space on the left and the planet Mars on the right, set against a starry black sky.

# Lesson Plan Modification

<https://tinyurl.com/yaczu6dq>

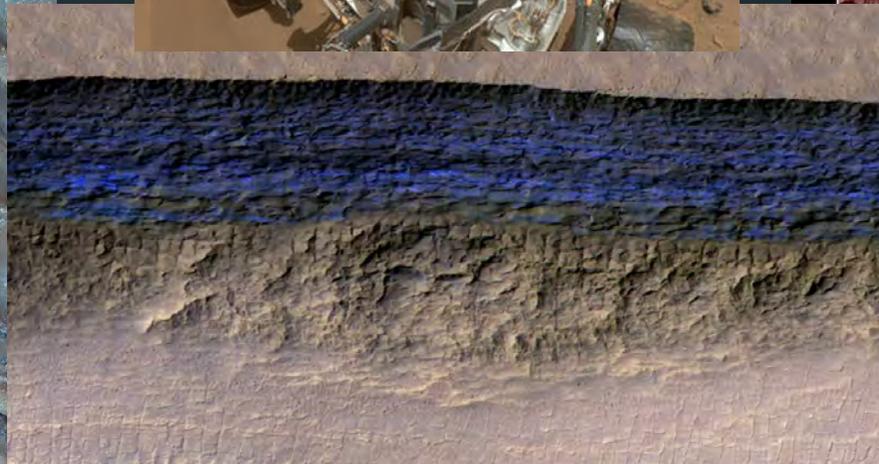
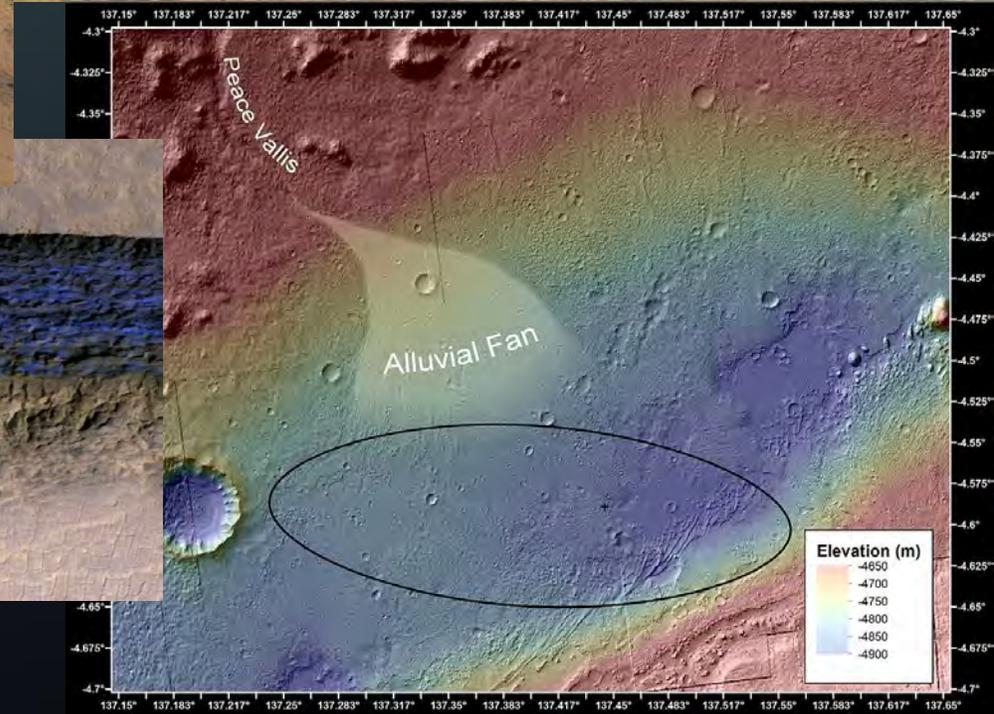
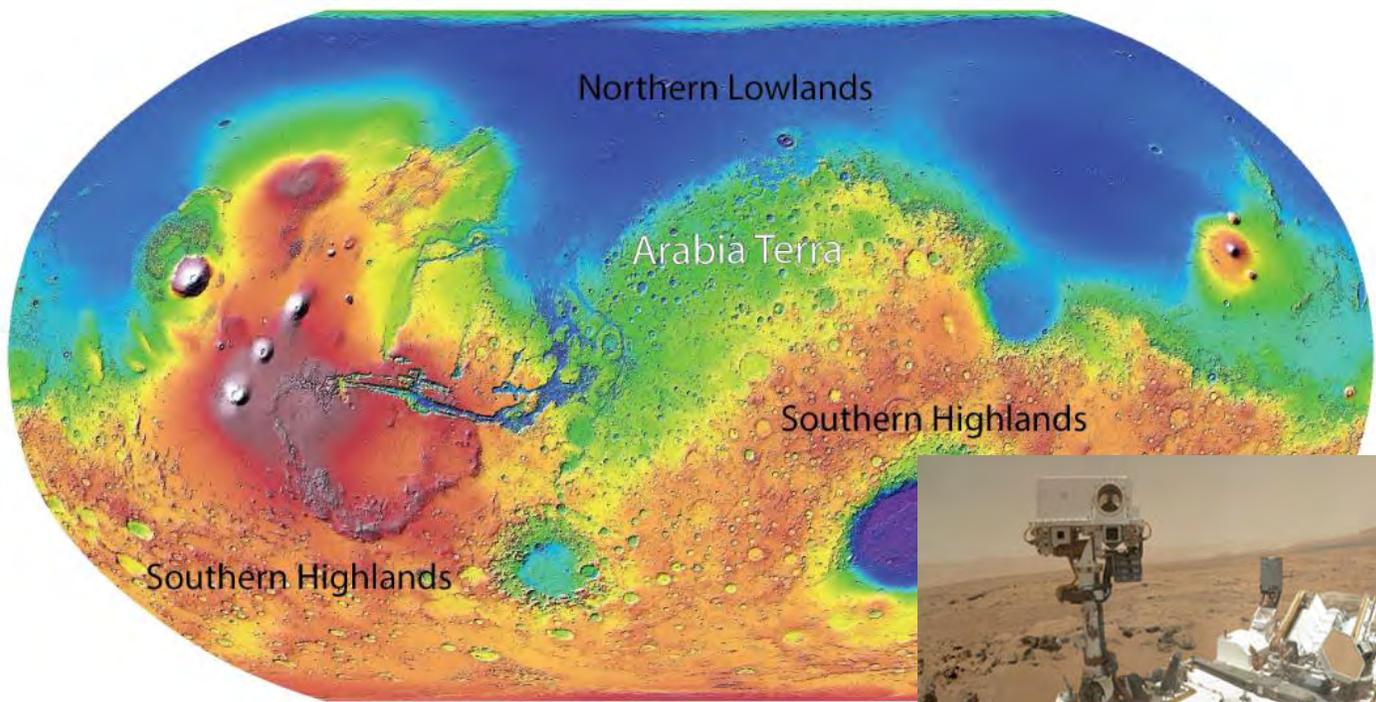
Google

Drive

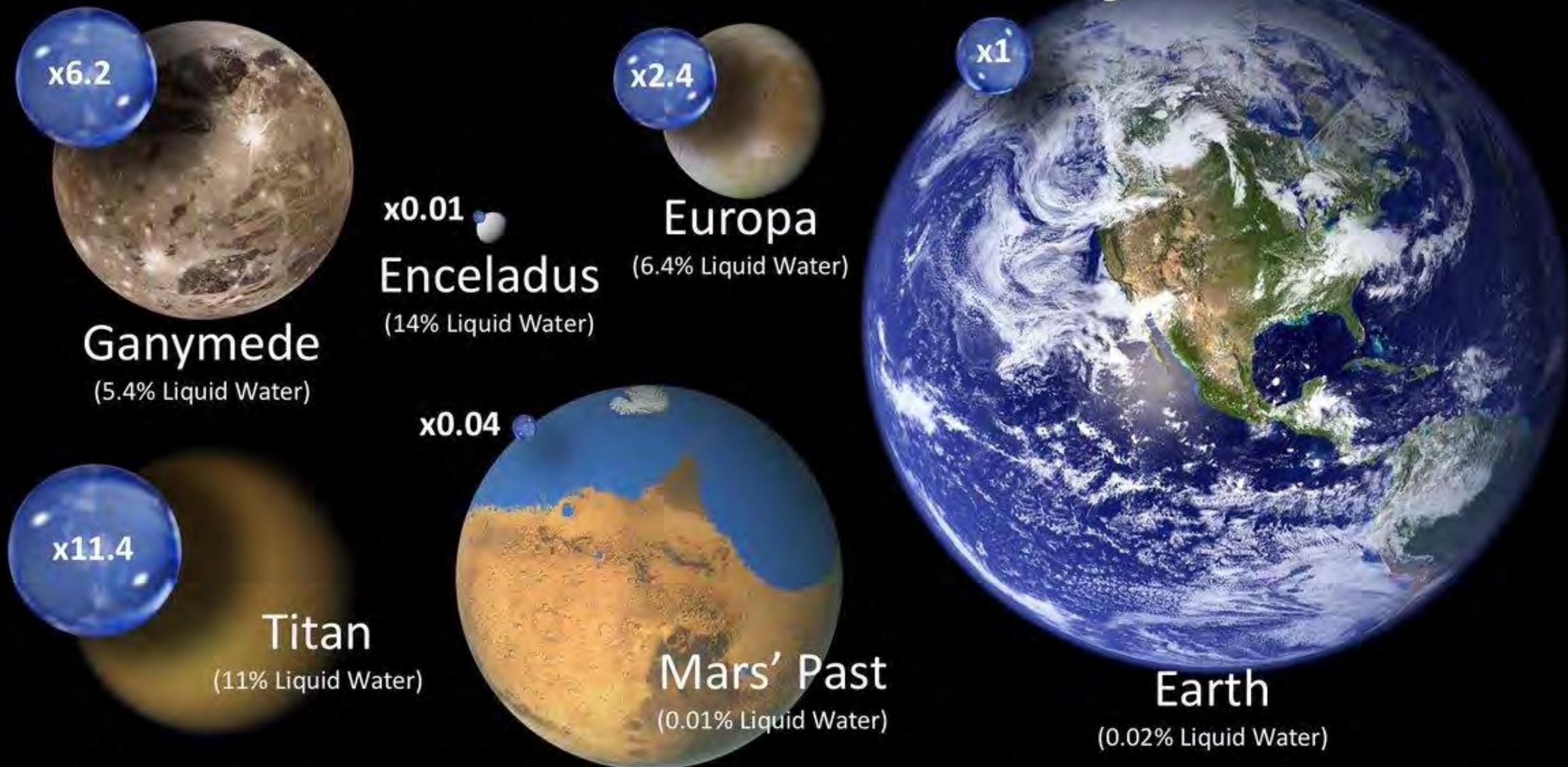
A composite image showing the Earth on the left and Mars on the right, set against a starry black background. The Earth is a blue and white sphere, while Mars is a reddish-orange sphere. The text 'Martian Water' is centered in white, and a blue box with the question 'Is there water on Mars?' is in the bottom right.

# Martian Water

Is there  
water on  
Mars?



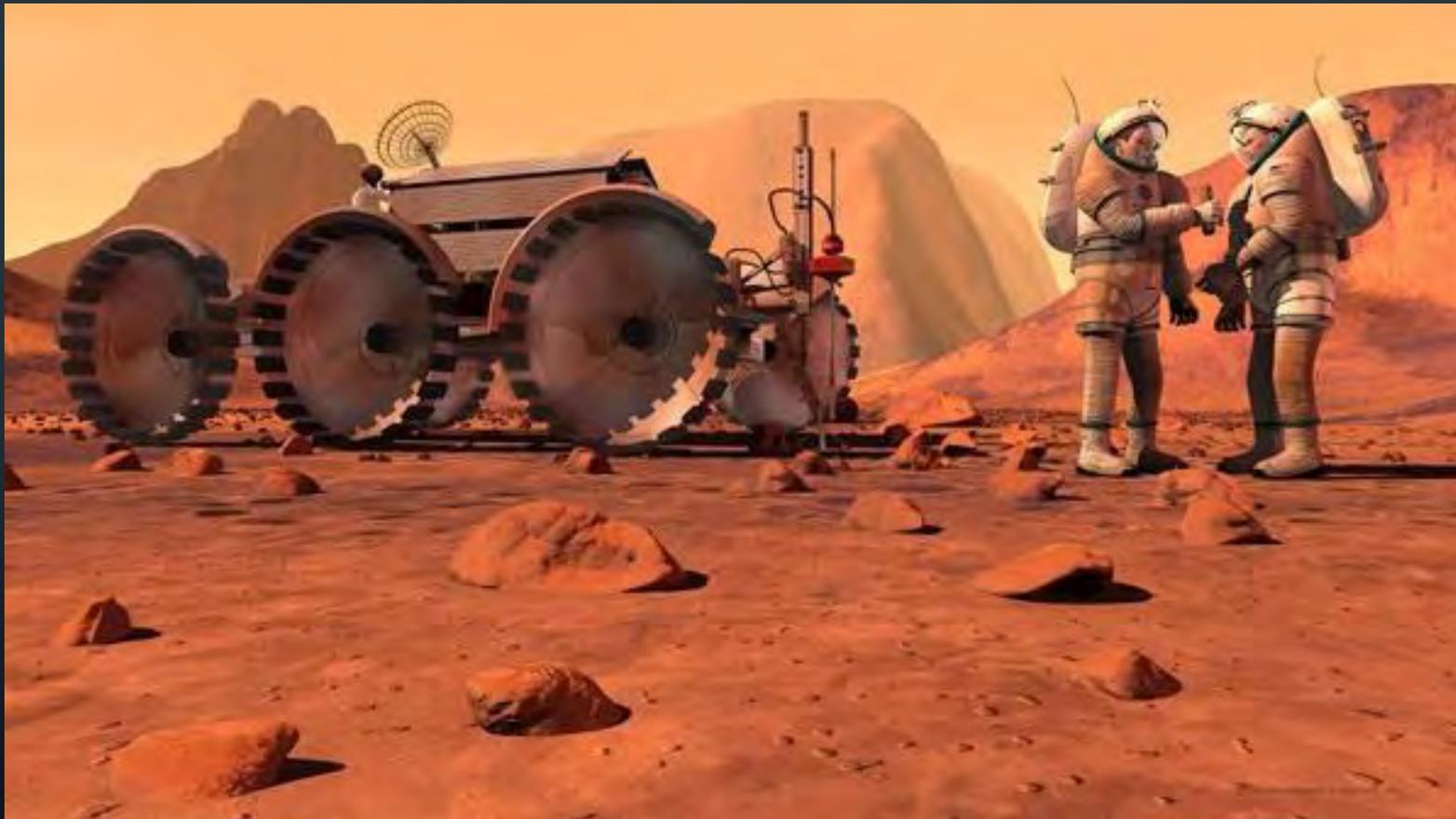
# Oceans in the Solar System



(mass percent of liquid water between parenthesis, excluding water ice)

Credit: PHL @ UPR Arcibo, NASA

WAIT, IS THAT WATER?



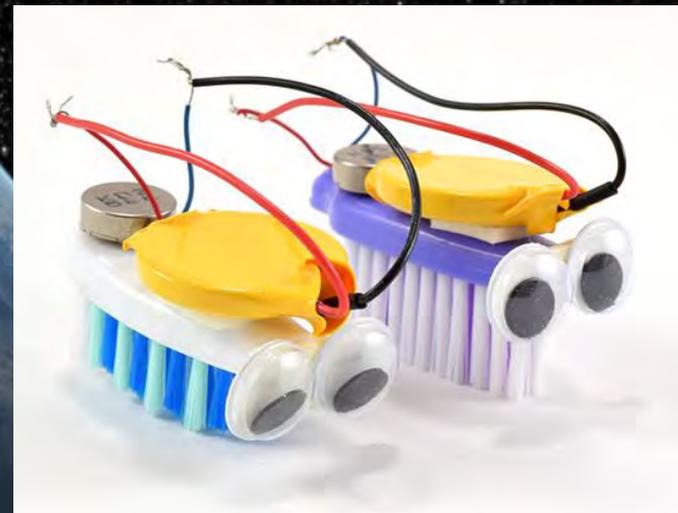
# MARTIAN INVESTIGATIONS!

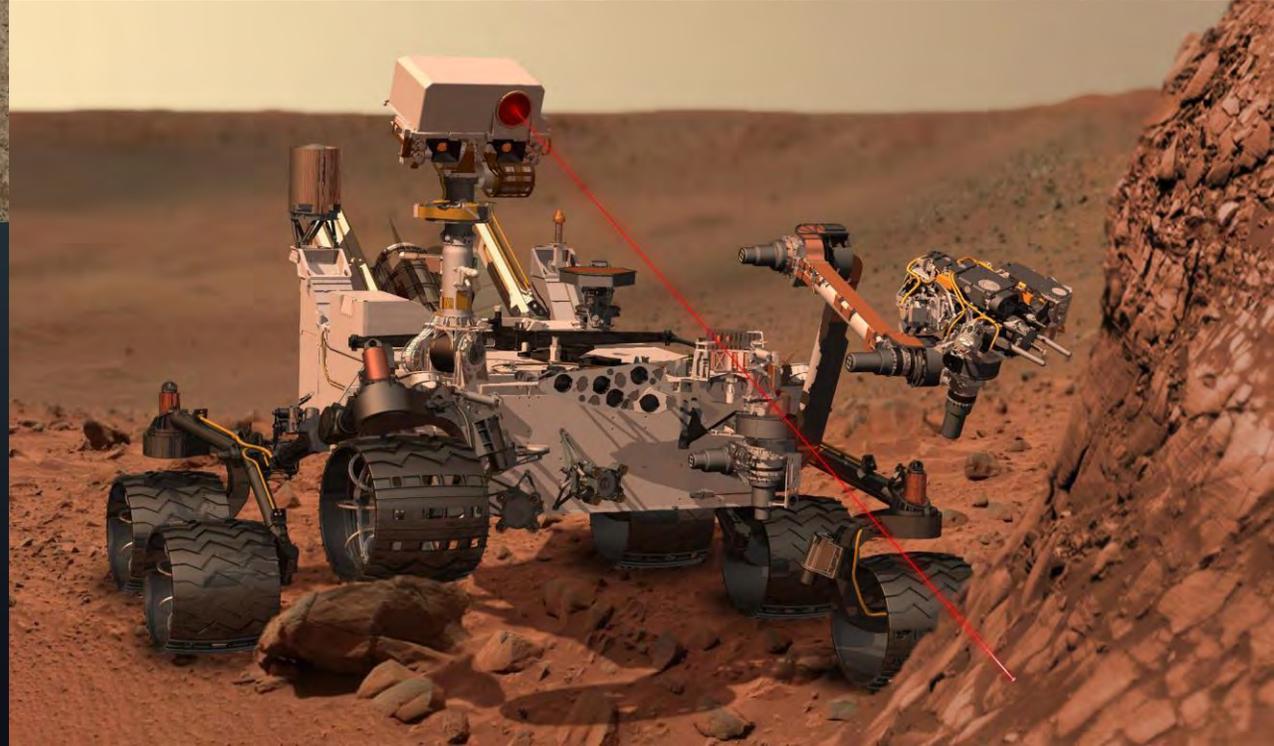
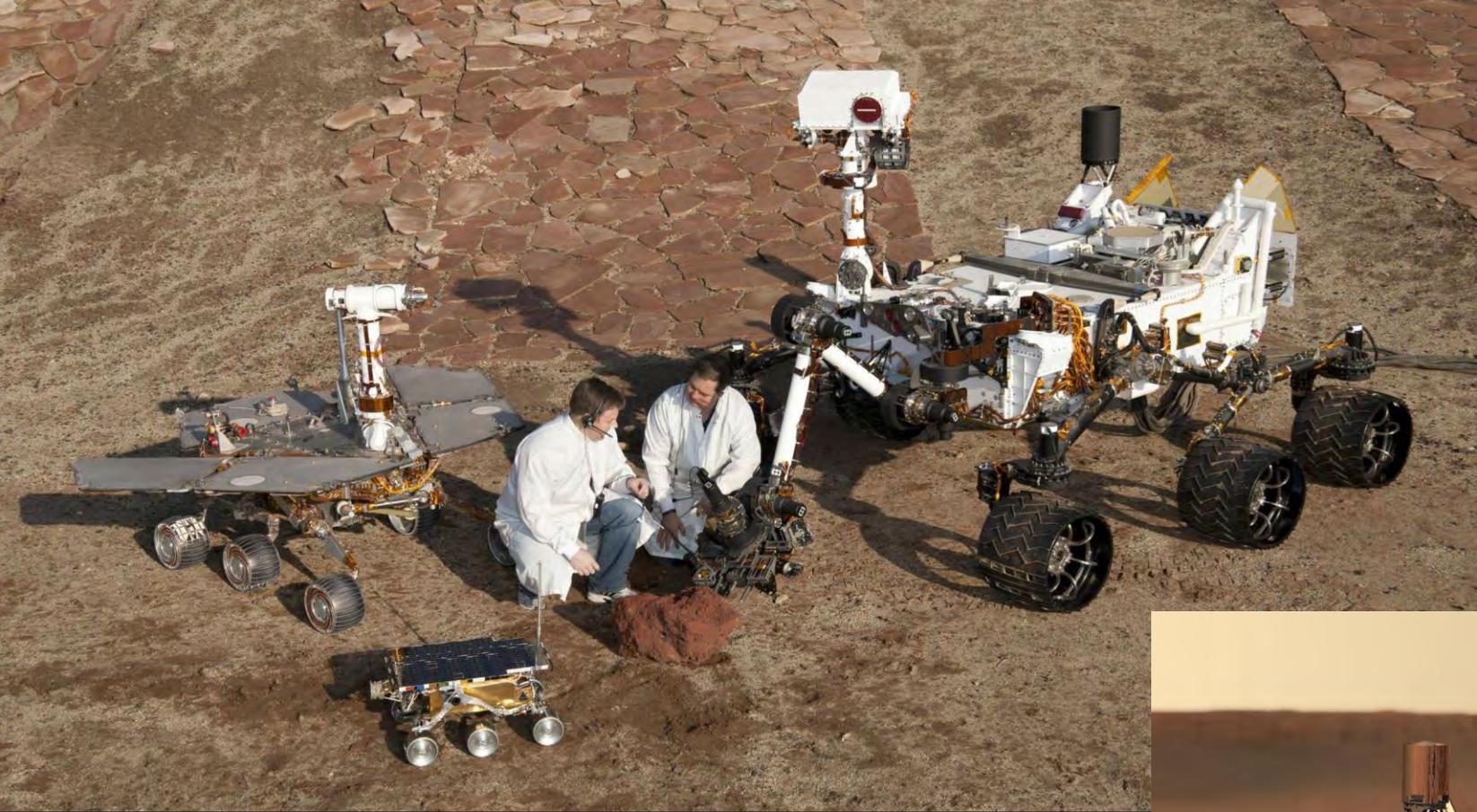


BREAK UNTIL 1:30 PM



# Bristle Bots



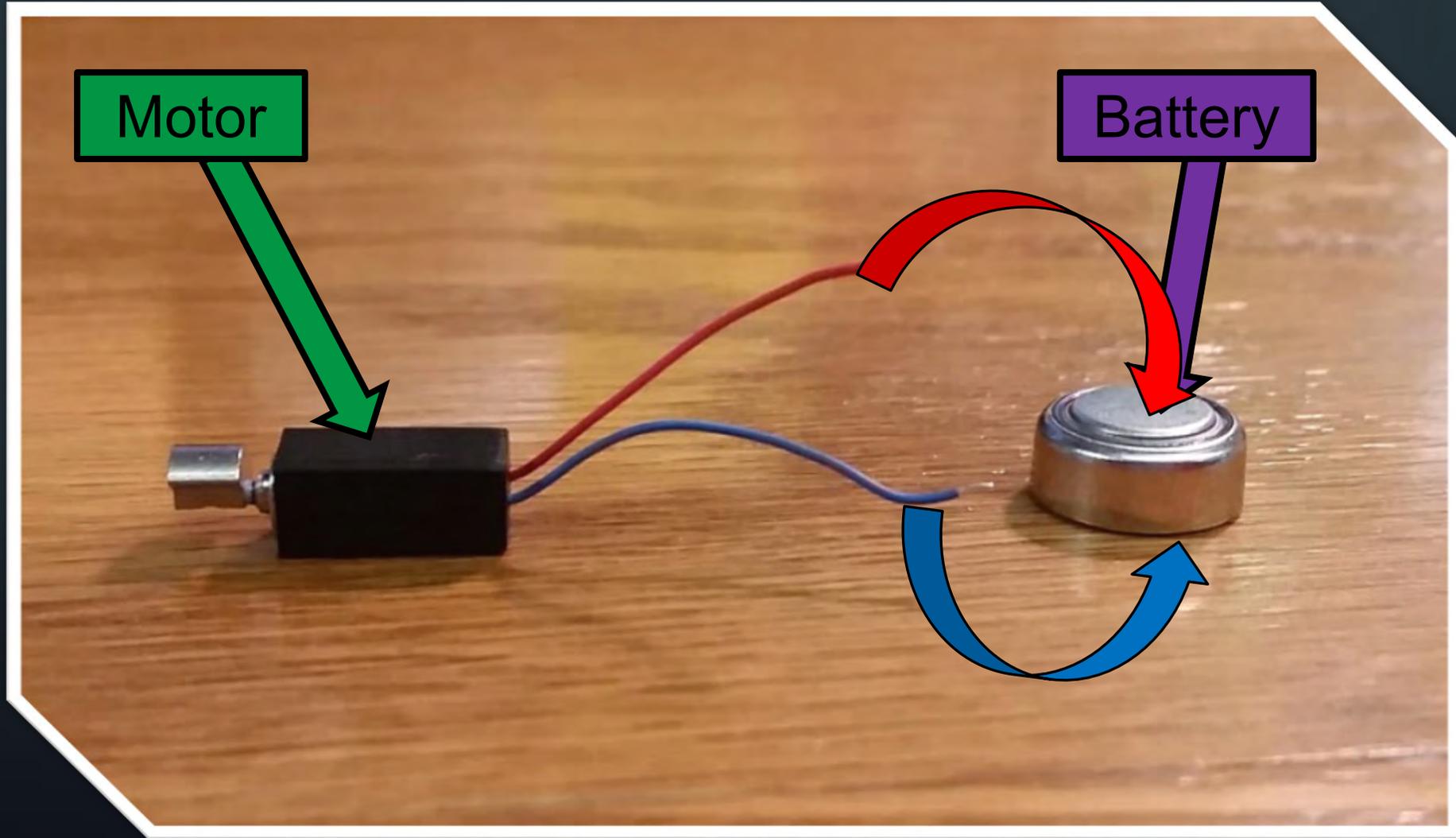


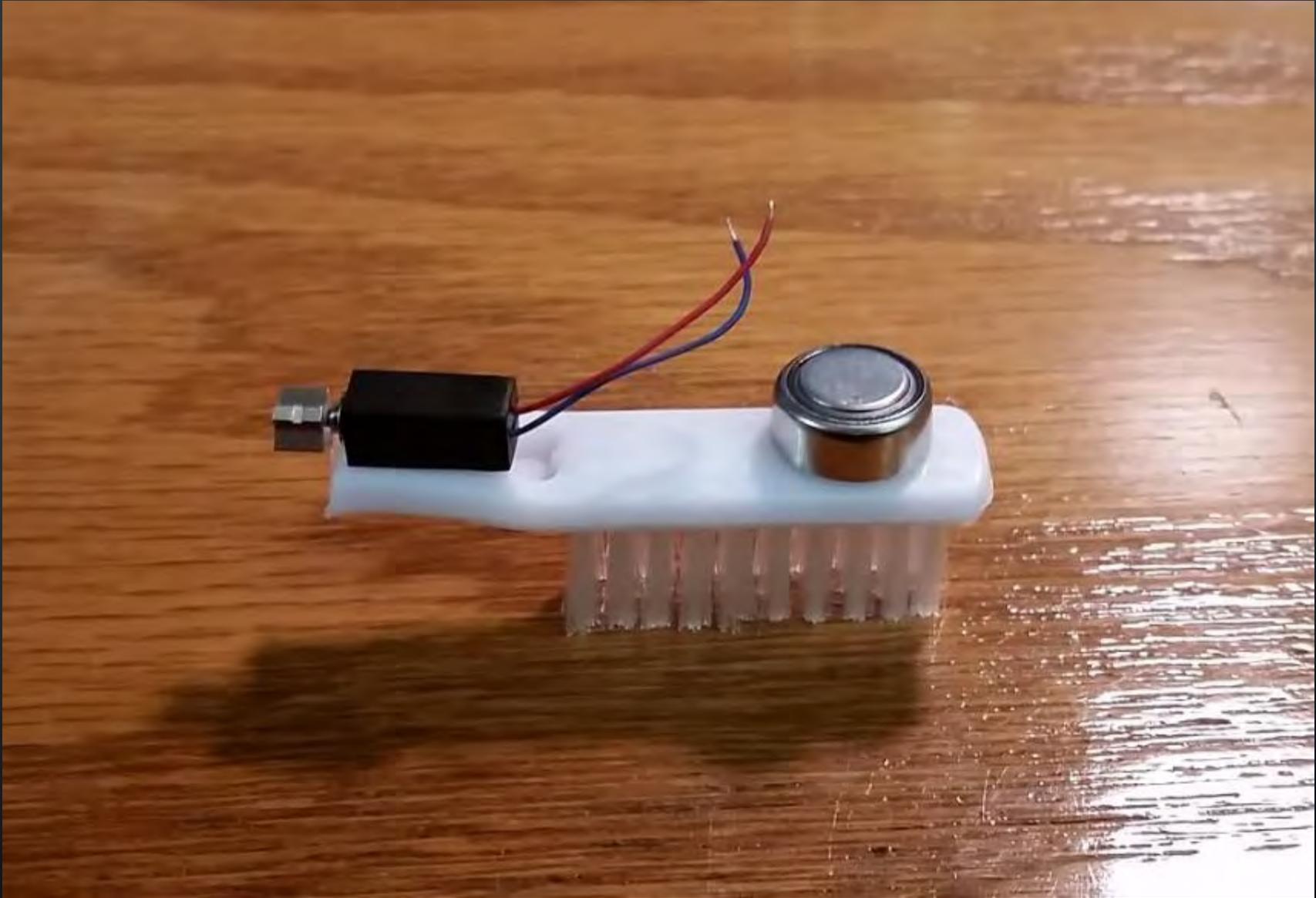
- What are rovers? How could students relate to these?
- Mars, Moon, remote RC cars, drones, Roomba, etc.
- <https://www.youtube.com/watch?v=Q6QksihDpg8>

# BRISTLES: UP OR DOWN?



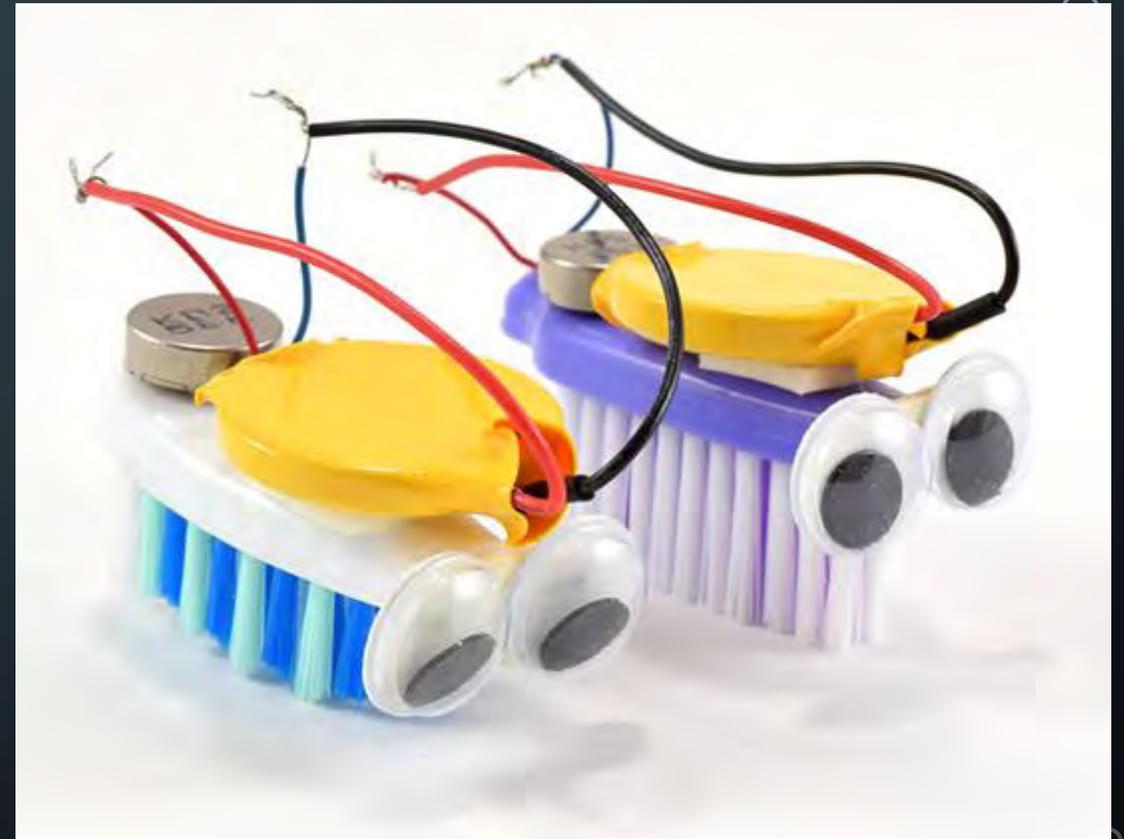
# HOW DO YOU POWER YOUR ROVER?



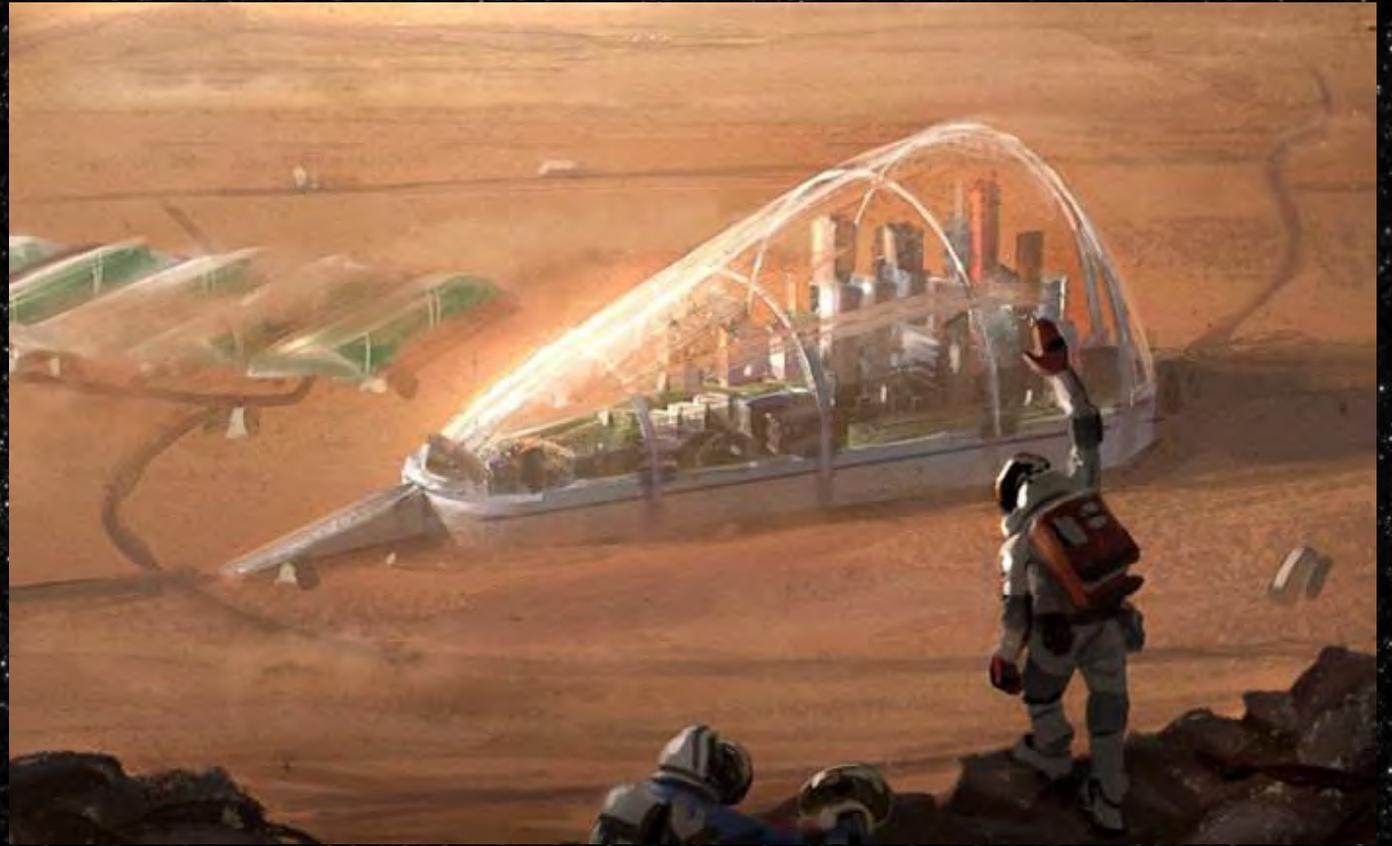


# WE EXPLORED... NOW LETS EXPLAIN!

- How does this relate to your electromagnetism unit?
- What else could you integrate with this lesson?
- Any modifications?
- What are some of the more challenging aspects (for elementary school students)?
- Which designs were most successful?
- How might this relate to young students' lives?
- Why solar panels? Can students relate to these?
- What can we improve for next time?
- Any additional materials?



Congratulations!  
You've safely traveled to Mars!



# Post-Survey

<https://tinyurl.com/yc5ux2n>



How can we  
improve?

# THANK YOU!

- We had a wonderful time!
- Stay in touch! We'll announce ND opportunities for educators throughout the year.
- Reimbursement forms:
  - W9
  - Travel reimbursement
  - Hotel receipt