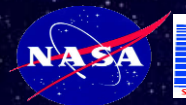




# NASA Educator Resources

Caitlin Nolby and Marissa Saad  
North Dakota Space Grant Consortium



# NASA Education

The screenshot shows the NASA Education website interface. 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. Below the navigation bar is a large banner featuring a stylized pencil with icons for a beaker, a computer, a microscope, and 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

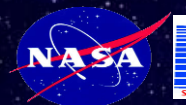
**Current Opportunities for Educators**  
Browse the STEM-related professional development opportunities, webinars, workshops, and ways for you and your students to get involved with NASA.

**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

Search



# NASA for Students

## 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 Exploration



NASA Kids' Club



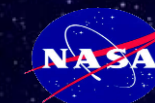
Explore This: Technology




### 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



# Space Math at NASA



National Aeronautics and Space Administration  
Goddard Space Flight Center

GO

Flight Projects | Sciences and Exploration

## Space Math @ NASA

Home    Problem Books    STEM Modules    Inquiry

Math by Grade Level    Math in Science    Math in Engineering    Math in Press Releases    Math by NASA Mission    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

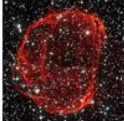
- Eyes on the Solar System - [Click here](#)


### 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 sun's changing activity levels in 2012 and 2013. (PDF)

### Multi-Media Math Modules



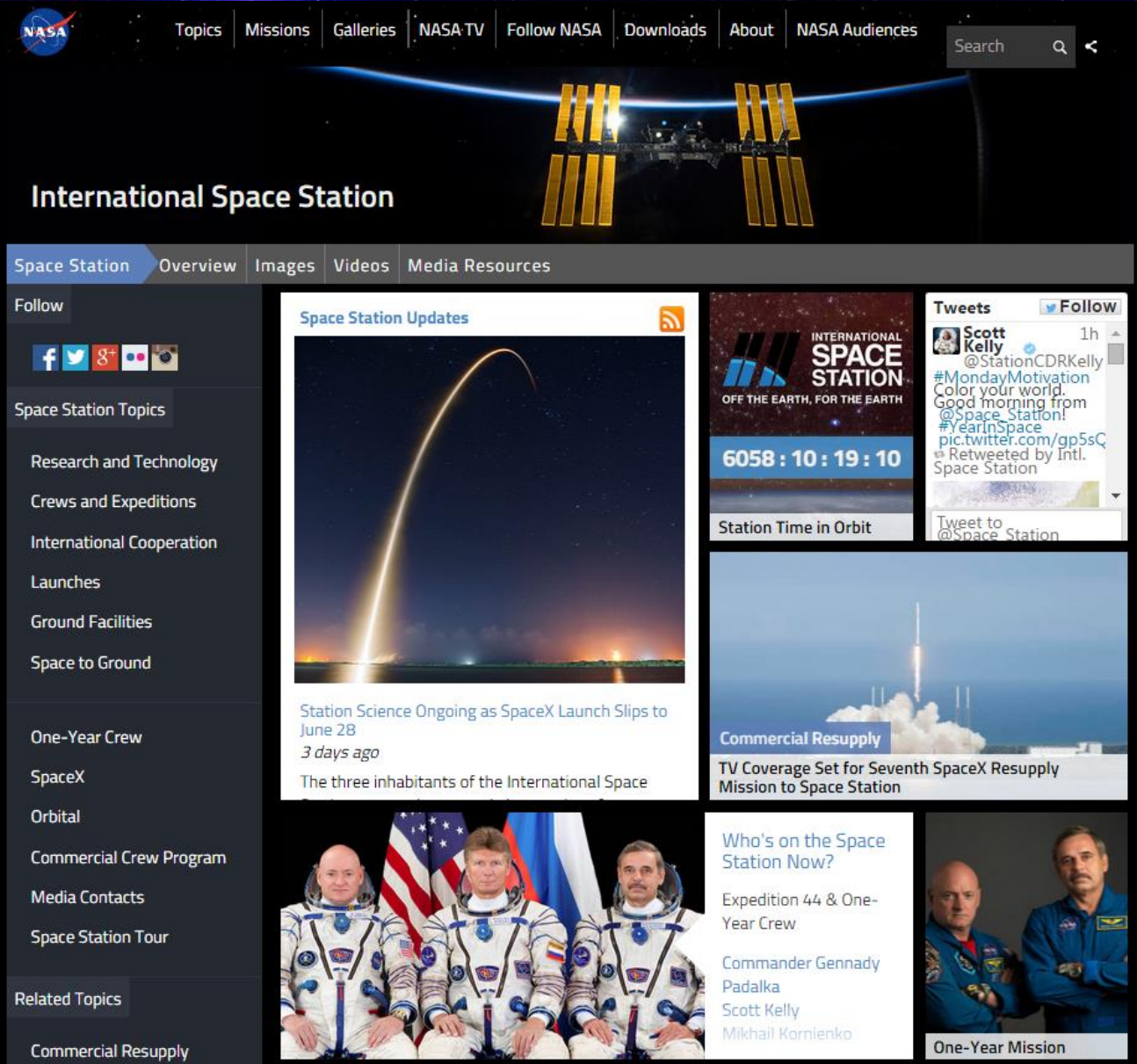
**Grades 6, 7 and 8:** Standards-based, multi-media math resources featuring NASA eClips video segments, readings from NASA press releases, online interactive resources, and of course math problems!  
[\[click here\]](#)

#### Problem Archives

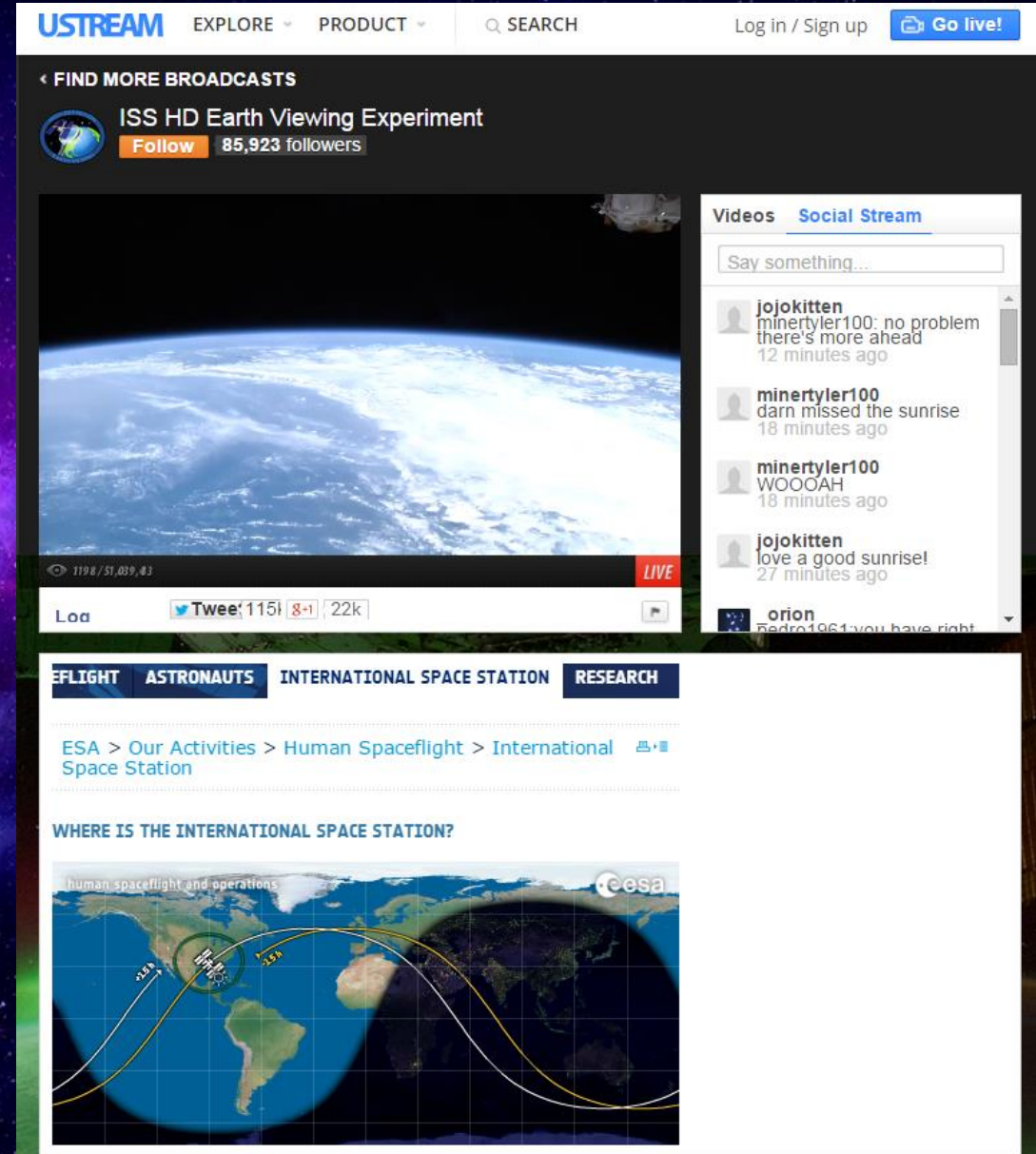
- I - Problems 1 to 38
- II - Problems 39 to 64
- III - Problems 65 to 101
- IV - Problems 102 to 148
- V - Problems 149 to 233
- VI - Problems 234 to 342
- VII - Problems 343 to 428
- VIII - Problems 429 to 478
- IX - Problems 479 to Current

(More problems from 2012-2013)

# International Space Station - Live!



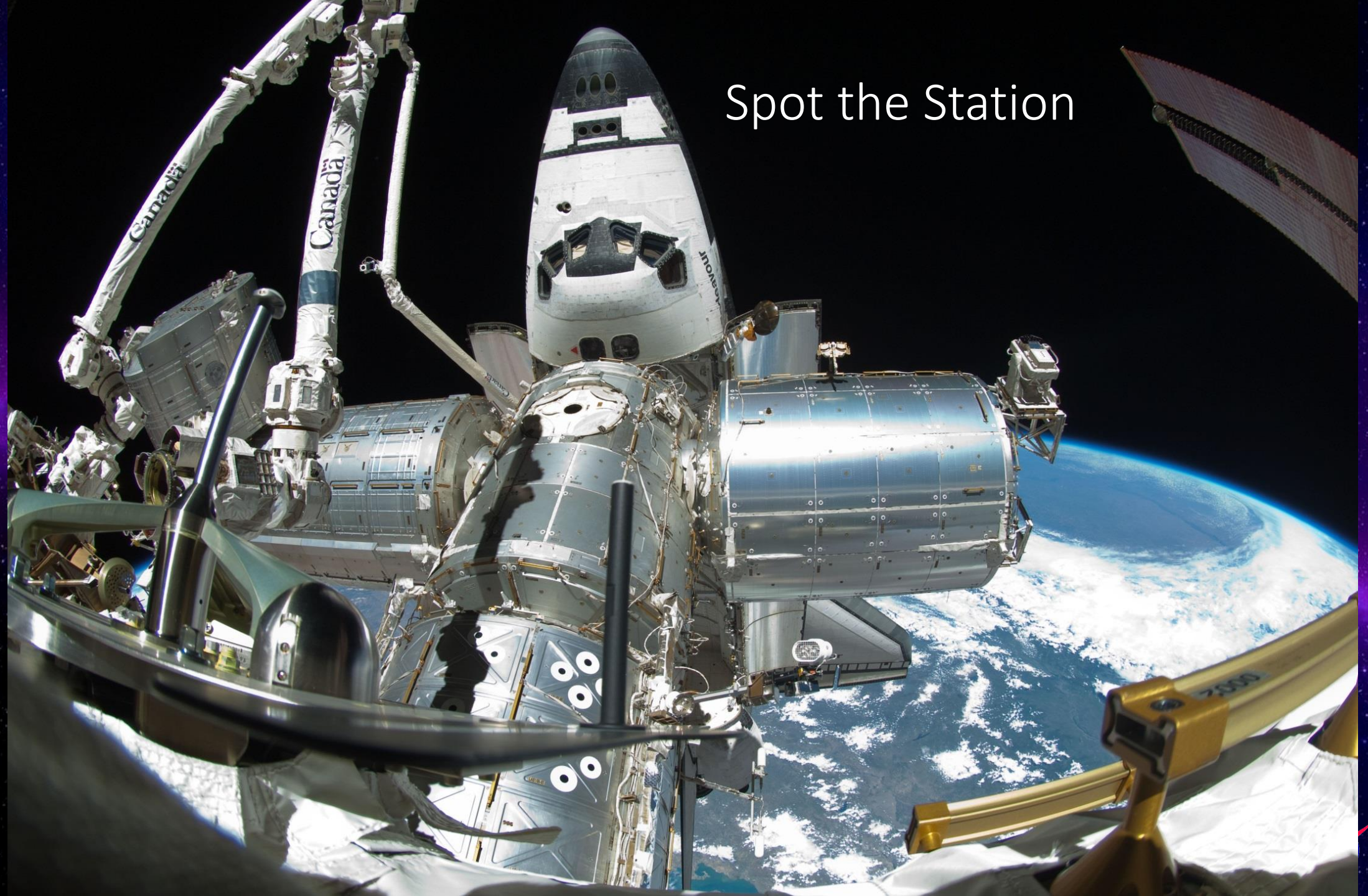
The NASA website features a top navigation bar with links for Topics, Missions, Galleries, NASA TV, Follow NASA, Downloads, About, and NASA Audiences. A search bar is located on the right. The main header displays the International Space Station in orbit. Below this, a secondary navigation bar includes Space Station, Overview, Images, Videos, and Media Resources. A left sidebar lists various topics such as Research and Technology, Crews and Expeditions, and Launches. The main content area is divided into several sections: 'Space Station Updates' with a video of a launch, 'Station Time in Orbit' showing a 6058:10:19:10 timer, a tweet from Scott Kelly, 'Commercial Resupply' with a video of a SpaceX launch, 'Who's on the Space Station Now?' featuring Expedition 44 crew members, and 'One-Year Mission' with a photo of the crew.



The Ustream broadcast page for the 'ISS HD Earth Viewing Experiment' shows a live video of Earth from the ISS. The page includes a 'FIND MORE BROADCASTS' section, a 'Follow' button with 85,923 followers, and a 'Social Stream' of viewer comments. Below the video, there are navigation tabs for 'EFLIGHT', 'ASTRONAUTS', 'INTERNATIONAL SPACE STATION', and 'RESEARCH'. A breadcrumb trail reads 'ESA > Our Activities > Human Spaceflight > International Space Station'. A section titled 'WHERE IS THE INTERNATIONAL SPACE STATION?' features a map showing the station's orbit around Earth, with a 'cesas' logo in the top right corner.



Spot the Station



# Mars Curiosity Rover

The screenshot shows the NASA Jet Propulsion Laboratory website for the Mars Science Laboratory Curiosity Rover. The background features a 3D rendering of the rover on the Martian surface under a starry sky. At the top left is the NASA logo and the text "Jet Propulsion Laboratory California Institute of Technology". A navigation bar includes links for "HOME", "MISSION", "NEWS", "MULTIMEDIA", "PARTICIPATE!", "SEARCH", and "ALL MARS". A secondary navigation bar lists "JPL HOME", "EARTH", "SOLAR SYSTEM", "STARS & GALAXIES", and "SCIENCE & TECHNOLOGY", along with "BRING THE UNIVERSE TO YOU:" and links for "JPL Email News", "RSS", "Mobile", and "Video".

The main content area is titled "FOLLOW YOUR CURIOSITY" and features a central panel with a diagram of Mars and the Sun. The text in this panel reads: "Mars Missions to Pause Commanding in June, Due to Sun", "Read More >>", and "More on Solar Conjunction >>". Below this panel is a row of icons for "What's New?", "Recent Videos", "Fun", "Ask Dr. C", and "Curiosity".

At the bottom, a "FAVORITES" section contains two buttons: "Raw Images" and "SEND A POSTCARD TO CURIOSITY".

Logos for "USA.gov" and "NASA" are visible in the bottom left and right corners, respectively. A "NORTH DAKOTA SPACE GRANT CONSORTIUM" logo is also present in the bottom right corner.

# NASA – Lunar Reconnaissance Orbiter

NASA National Aeronautics and Space Administration  
Goddard Space Flight Center

Search

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

Discover our scientific, cultural, and personal understanding of Earth

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

SOUND

### 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

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 @PBSLmMedia 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
- 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 extra 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 (shredded paper, bubble wrap, cardboard packing scraps or fabric)

**For each small group:**

- 2 ice cubes
- 1 91 radiused cylinder (50 mL or larger)
- plastic wrap
- 2 large paper cups
- scissors
- rubber
- tape (masking or clear)
- paper and pencil
- 1 incandescent light bulb, 130 watt
- 1 work light with clamp (or desk lamp capable of holding a 130 watt bulb)
- 1 stopwatch or clock

**1 hour**

---

**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; it sinks when it weighs more than the water it displaces.

**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 beverage drinking straw, craft sticks, wooden skewers, plastic eggs, balloon, pipe caps, sponge, craft foam)
- Items to hold the diver together (rubber bands, duct tape, or a hot glue gun)
- optional: objects that sink or float (marbles, metal paper, 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
- scissors
- paper and pencil

**45 min**



# Lunar and Planetary Institute

LUNAR AND PLANETARY INSTITUTE

About Us Science Meetings Education Resources Analysis Groups The Moon Search

## EDUCATION *and* public outreach

TEACHERS AND FACULTY OTHER SCIENCE EDUCATORS PUBLIC ABOUT US

### 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



Life Science



Physical Science



Earth & Space Science



Engineering

### 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



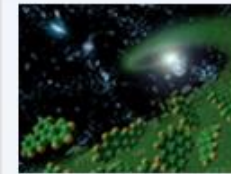
### Aeronautics Camp

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



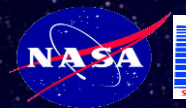
### Designing for Space Camp

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



ART & THE COSMIC CONNECTION



Mission Milestone Interactive



Discovery & New Frontiers Newsletter Archives

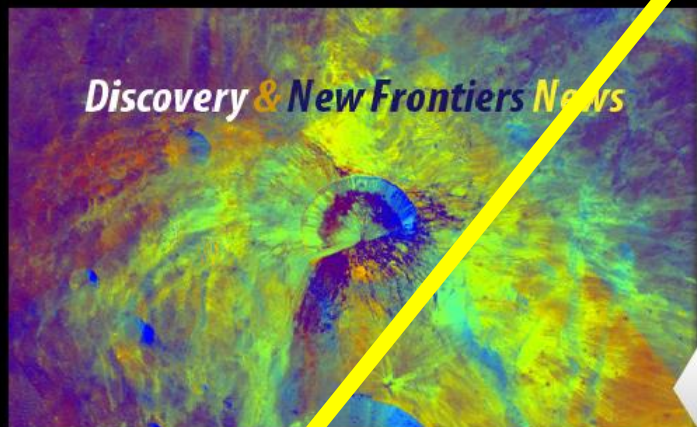


Space Thrills POSTER

HOME

Search

GO



### Discovery & New Frontiers News

- 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

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

### Image Impact

Image Impact  
View the captions.

### 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

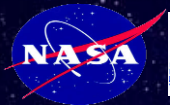
ACTIVITIES  
CROSS-CURRICULAR & FUN

GALLERY  
PHOTOS & VIDEOS

PRODUCE  
YOUR OWN MUSICAL



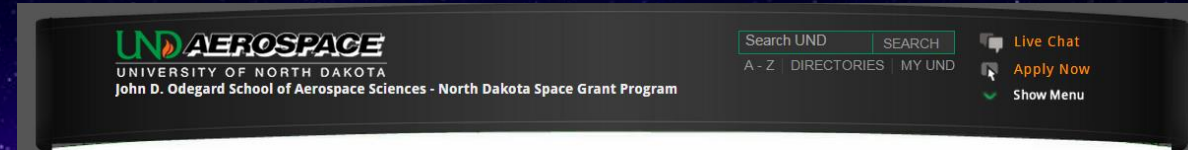
Join Hannah on a trip through the solar system in this ultra-cool edu-tainment "hip-opera" that is out of this world! Move and groove along with the planets, moons, meteors, comets, asteroids and even some rockin' scientists as they sing, dance and serve up the freshest facts in the galaxy. *Space is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



# North Dakota Space Grant



Facebook page for the North Dakota Space Grant Consortium. The page features a cover photo of a satellite launch and a profile picture with the consortium's logo. The navigation bar includes 'Page', 'Messages', 'Notifications', 'Insights', and 'Publishing Tools'. The main content area shows a post from June 18 at 4:11pm in Grand Forks, ND, titled 'Rockets for 200 kids at Grand Forks Public Library! We survived!'. The post includes a collage of photos showing children and adults participating in a rocket launch event. The page also has a 'Promote Your Page' section and an 'ABOUT' section with text describing the consortium as one of 52 consortia of NASA's National Space Grant College and Fellowship Program, established in 1989.

UND AEROSPACE  
UNIVERSITY OF NORTH DAKOTA  
John D. Odegard School of Aerospace Sciences - North Dakota Space Grant Program

Search UND SEARCH  
A - Z DIRECTORIES MY UND

Live Chat  
Apply Now  
Show Menu

Home

ND Space Grant Program

- UND Aerospace Home
- Home
- About
- Scholarships
- Fellowships

Welcome to the North Dakota NASA Space Grant Website  
Congratulations MPCG Science Geeks!



MayPort CG team members pictured are: Lance Johnson, Andrew Fugleberg, Marcus Dale, Gracy Leland, Sterling Minkler, and Joshua Weaver.

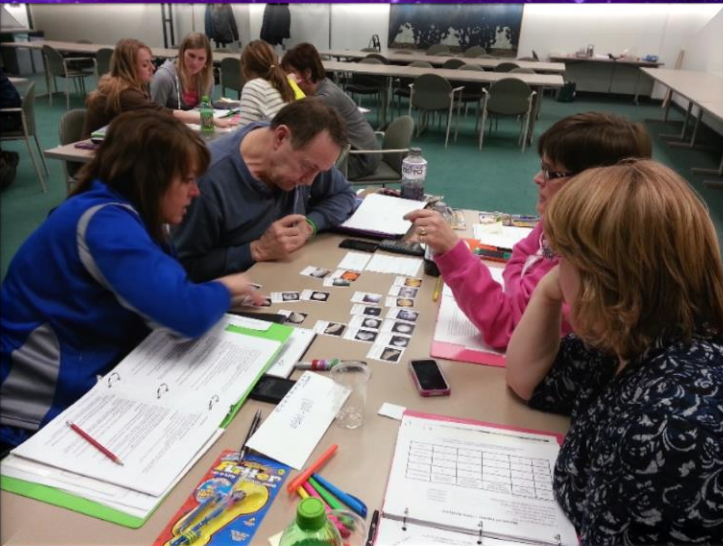


Twitter profile for NASA ND Space Grant (@NDSGC). The profile picture is the North Dakota Space Grant Consortium logo. The bio reads: 'Part of NASA Space Grant program promoting STEM education and research throughout North Dakota through K-12 and college programs and public outreach efforts.' The location is 'North Dakota' and the website is 'ndspacegrant.und.edu'. The profile shows 64 tweets, 3 photos/videos, 366 following, 123 followers, and 6 favorites. A tweet from June 6 says: '2mrw we're launching sensors 2 the #thermosphere! JK-it's a balloon not a spaceship! #spacejoke #cyaninthe stratosphere'. Below the tweet is a photo of a large white balloon with a string of sensors attached, floating in the sky.



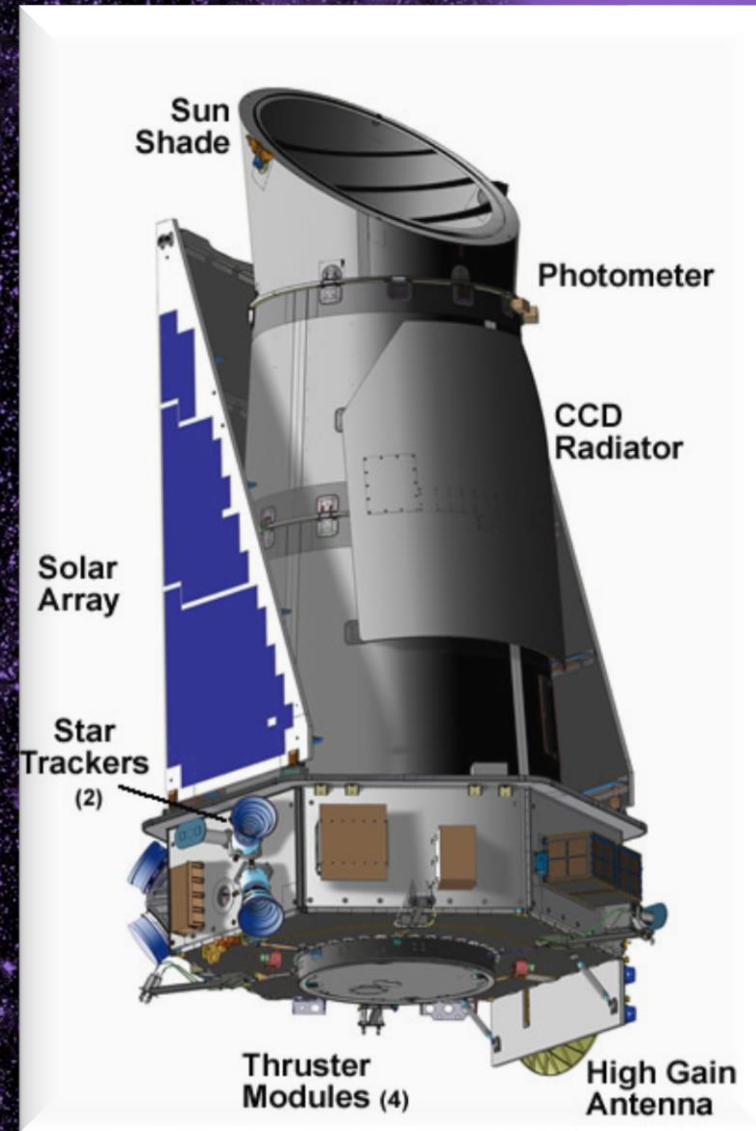
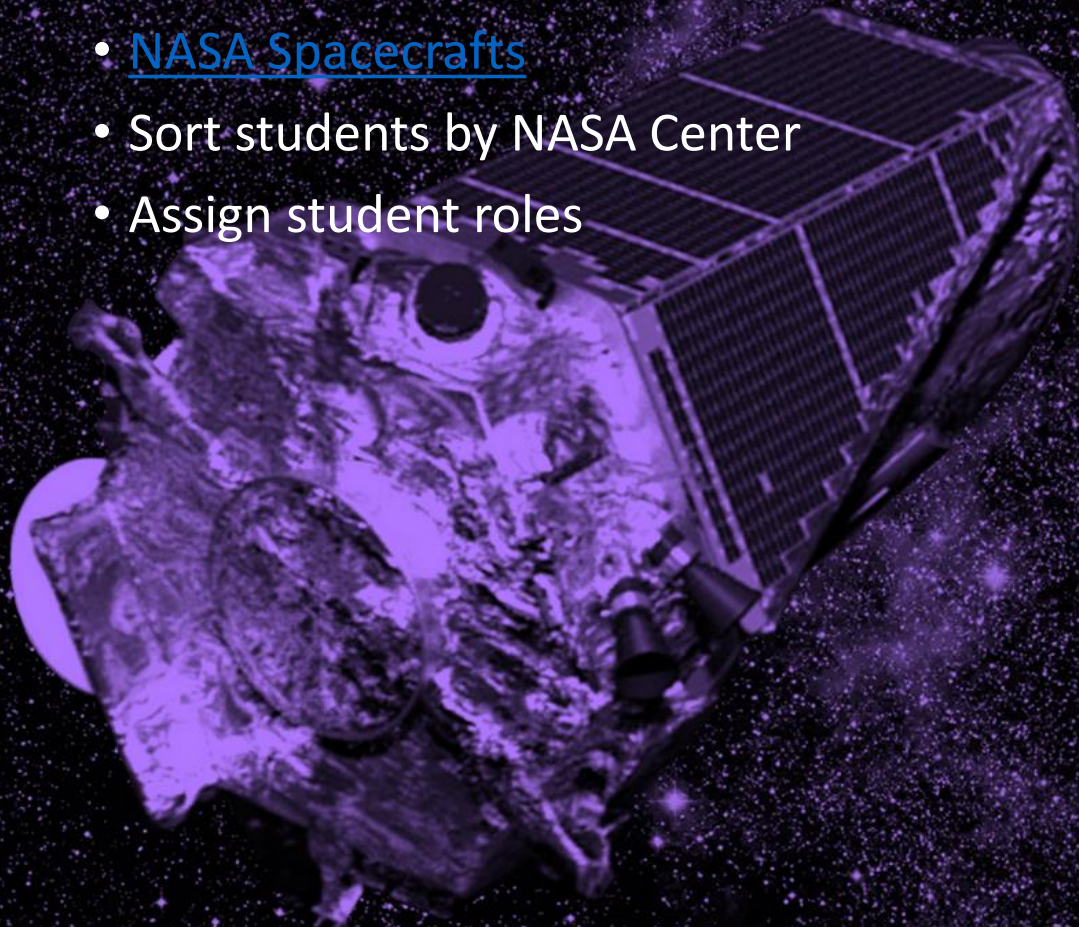
# NDSGC K-12 Educator Email Listserv

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



# Strange New Planet

- Work in NASA teams to collect data to plan missions and explore new worlds!
- [How Kepler Works](#)
- [NASA Spacecrafts](#)
- Sort students by NASA Center
- Assign student roles



# Your Role on the NASA Team

Astronomer



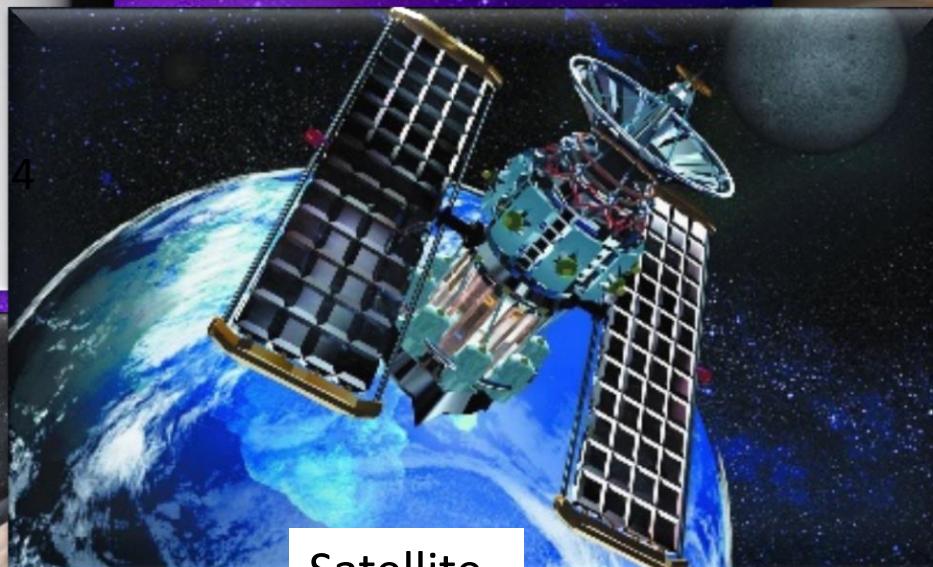
1

Orbiter



2

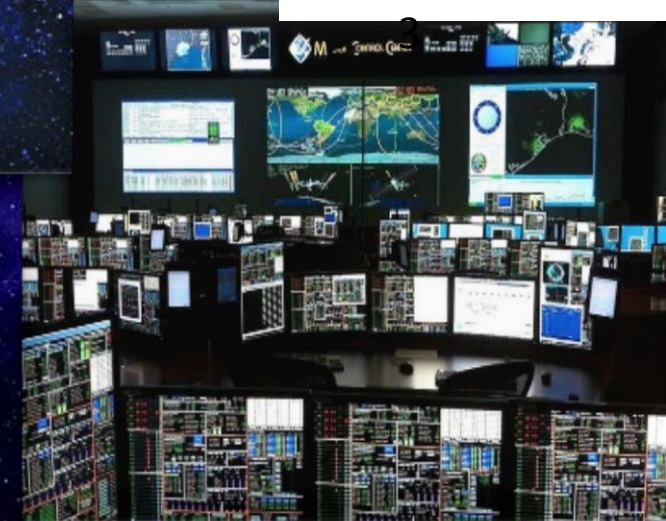
Flyby Spacecraft



Satellite

4

Mission Control



5