



Planning at Federal Agencies (NASA perspective)

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The point of this talk



- Provide a high-level overview of NASA activities/role in 2017
- Current plans for 2023/2024
- **Set the stage for input from the community (we need your help)**

Insights & Lessons Learned



- **Leverage brand/resources** - Leverage NASA. Value of NASA's presence and influence
- **Coordination** - Early coordination within NASA and beyond was key: all hands-on deck
- **Sustainability** - Unanticipated extended engagement – the public wanted more
- **Simplicity** - Keep explanations and demonstrations simple!
- **Website** - A well-organized website can lead to well-organized public events
- **Unified messaging** - One message!! All sites pointed to each other in an organized way

The Decision



- NASA made the decision in September 2016 that the entire agency support the 2017 total solar eclipse.
- SMD began coordination activities across all centers in October 2016 to avoid duplication and ensure awareness of other activities.

What We Did



- Website
- Collaborative partnerships within NASA's Science Mission Directorate (SMD) and with external organizations (AAS, NSF, Commerce, Interior, FEMA, DOT, USPS, Exploratorium, ...)
- Official NASA Viewing Sites (stopping points for broadcast)
- NASA supported events
- General depot for what was happening across the country and beyond

5 Focus Areas for 2017 Eclipse



1. **Safety** – NASA’s #1 core value and the #1 priority during any event
(Strong Coordination with AAS/NSF)
1. **Science** – Awareness of missions, science and return on investment
1. **Education** – Fundamental learning opportunity of nature’s processes
1. **Public Engagement** – Unique opportunity for all U.S. to participate
1. **Citizen Science** – Several apps for citizens to gather data on nature’s processes

Safety



How to View the 2017 Solar Eclipse Safely

A solar eclipse occurs when the moon blocks any part of the sun. On Monday, August 21, 2017 a solar eclipse will be visible (weather permitting) across all of North America. The whole continent will experience a partial eclipse lasting 2 to 3 hours. Halfway through the event, anyone within a 60 to 70 mile-wide path from Oregon to South Carolina will experience a total eclipse. During those brief moments when the moon completely blocks the sun's bright face for up to 2 minutes 40 seconds, day will turn into night, making visible the otherwise hidden solar corona (the sun's outer atmosphere). Bright stars and planets will become visible as well. This is truly one of nature's most awesome sights.



A total solar eclipse is about as bright as the full moon — and just as safe to look at. But the sun at any other time is dangerously bright, and you can only view it safely through special purpose safe solar filters.

Looking directly at the sun is unsafe except during the brief total phase of a solar eclipse ("totality"), when the moon entirely blocks the sun's bright face, which will happen only within the narrow path of totality.

The only safe way to look directly at the un eclipsed or partially eclipsed sun is through special-purpose solar filters, such as "eclipse glasses" (example shown at left) or handheld solar viewers. Homemade filters or ordinary sunglasses, even very dark ones, are not safe for looking at the sun. To date three manufacturers have certified that their eclipse glasses and hand-held solar viewers meet the ISO 12312-2 international standard for such products: Barrow Symplicity, American Paper Optics, and Thousand Oaks Optical.

- Always inspect your solar filter before use. If scratched or damaged, discard it. Read and follow any instructions printed on or packaged with the filter. Always supervise children using solar filters.
- Stand still and cover your eyes with your eclipse glasses or solar viewer before looking up at the bright sun. After glancing at the sun, turn away and remove your filter — do not remove it while looking at the sun.
- Do not look at the un eclipsed or partially eclipsed sun through an unfiltered camera, telescope, binoculars, or other optical device. Similarly, do not look at the sun through a camera, a telescope, binoculars, or any other optical device while using your eclipse glasses or hand-held solar viewer — the concentrated solar rays will damage the filter and enter your eye(s), causing serious injury. Seek expert advice from an astronomer before using a solar filter with a camera, a telescope, binoculars, or any other optical device.
- If you are within the path of totality, remove your solar filter only when the moon completely covers the sun's bright face and it suddenly gets quite dark. Experience totality, then, as soon as the bright sun begins to reappear, replace your solar viewer to glance at the remaining partial phases.

An alternative method for safe viewing of the partially eclipsed sun is a pinhole projection. For example, cross the outstretched, slightly open fingers of one hand over the outstretched, slightly open fingers of the other. With your back to the sun, look at your hands' shadow on the ground. The little spaces between your fingers will project a grid of small images on the ground, showing the sun as a crescent during the partial phases of the eclipse.

A solar eclipse is one of nature's grandest spectacles. By following these simple rules, you can safely enjoy the view and be rewarded with memories to last a lifetime.

For more information visit www.aas.org and <http://eclipse2017.nasa.gov>

This document does not constitute medical advice. Readers with questions should contact a qualified eye-care professional.



National Aeronautics and Space Administration



Safety Tips for the 2017 Solar Eclipse

- Extreme heat safety**
<http://bit.ly/26LXx8e>
- Camping health and safety**
<http://bit.ly/2qg3DN>
- Car safety** (Fact Sheet for State and Local Departments of Transportation)
<http://bit.ly/2eZ29P>
- Food and drink safety**
<http://bit.ly/1gh228u>
- Protection against distracted driving**
<http://bit.ly/2e6R6p0>
- Preparing for hazards**
<http://bit.ly/1KGLC2u>
- Safeguard against biological hazards**
<http://bit.ly/2qg2YQ>
- Crowd safety**
<http://bit.ly/2eZK0Za>
- Stay safe in the sun**
<http://bit.ly/1th228f>
- Tips for hikers**
<http://bit.ly/2qg48f>

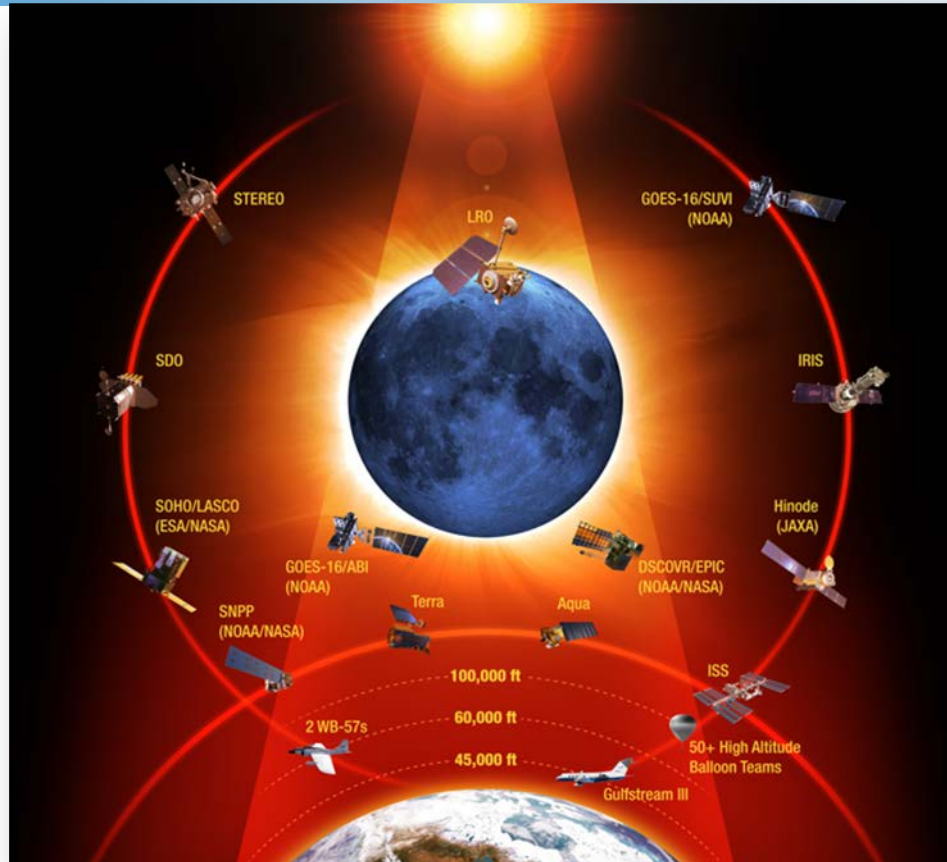


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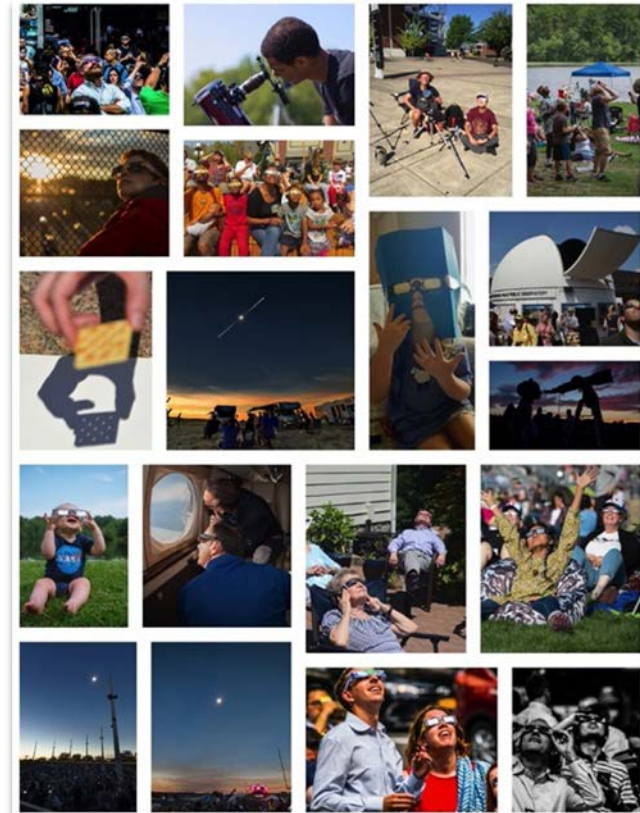
EXPERIENCE
THE 2017 ECLIPSE
ACROSS AMERICA
Through the Eyes of NASA
<http://eclipse2017.nasa.gov>
www.nasa.gov



Science



Public Engagement



Citizen Science



EXPERIENCE THE 2017 ECLIPSE ACROSS AMERICA
THROUGH THE EYES OF NASA
<http://eclipse2017.nasa.gov> AUGUST 21, 2017

CITIZEN SCIENCE



Get Involved with Real Research!

The 2017 solar eclipse presents many opportunities for students, amateur astronomers and lifelong learners to get involved with science research. In addition to science projects focusing on the 2017 eclipse, members of the public can assist NASA in learning about the Sun, Earth, Moon and even eclipses in exoplanetary systems. There are programs at every level from the most basic observations to publishable research opportunities in partnership with NASA and university scientists. Join us and experience the excitement of learning and making real discoveries!

To learn more about citizen science projects at NASA, go to: science.nasa.gov/citizenscientists

Explore These Opportunities:

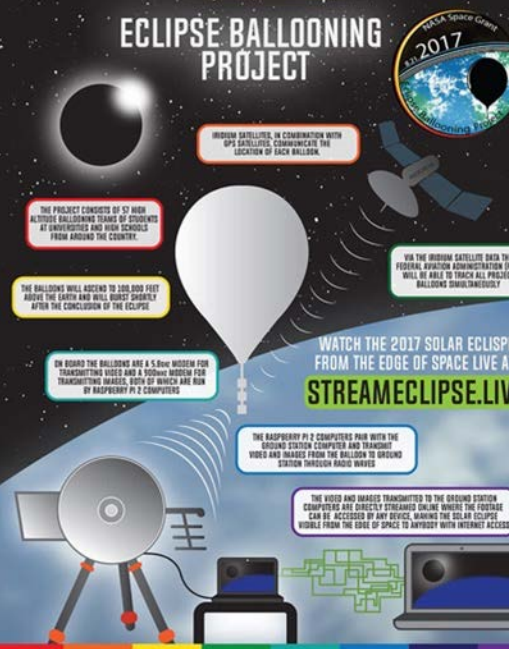
Citizen CATE (National Solar Observatory)
The Citizen Continental-America Telescopic Eclipse (CATE) Experiment will use more than 60 identical telescopes equipped with digital cameras positioned from Oregon to South Carolina to image the solar corona. The project will then splice these images together to show the corona during a 90-minute period, revealing for the first time the plasma dynamics of the inner solar corona.
eclipse2017.nso.edu/citizen-cate

GLOBE Observer (NASA, NOAA, NSF & U.S. Department of State) – What happens in the atmosphere and on Earth's surface when the Sun's light is blocked, even temporarily? By collecting data during the eclipse, you can help us explore how the eclipse changes atmospheric conditions. You will also be contributing to a database used by students and scientists to study the effects of the eclipse on the atmosphere. Even if you are not on the path of totality, you can provide useful comparison data. General citizen scientists can observe clouds and air temperature with GLOBE Observer, while those interested in pursuing additional online training (especially formal and informal educators) are encouraged to check out other data collection and research ideas from the full GLOBE Program.
www.globe.gov/web/eclipse/overview

National Aeronautics and Space Administration
www.nasa.gov



ECLIPSE BALLOONING PROJECT



WATCH THE 2017 SOLAR ECLIPSE FROM THE EDGE OF SPACE LIVE AT **STREAMECLIPSE.LIVE**

UNIFORM SATELLITES, IN CONJUNCTION WITH GPS SATELLITES, COMMUNICATE THE LOCATION OF EACH BALLOON.

THE PROJECT CONSISTS OF 57 HIGH ALTITUDE BALLOONING TEAMS OF STUDENTS AT UNIVERSITIES AND HIGH SCHOOLS FROM AROUND THE COUNTRY.

THE BALLOONS WILL ASCEND TO 100,000 FEET ABOVE THE GROUND AND WILL BURST SHORTLY AFTER THE CONCLUSION OF THE ECLIPSE.

ON BOARD THE BALLOONS ARE A 5.5 INCH MIRROR FOR TRANSMITTING IMAGES AND A TINY MIRROR FOR TRANSMITTING WAVELENGTHS, BOTH OF WHICH ARE RUN BY RASPBERRY PI 2 COMPUTERS.

THE RASPBERRY PI 2 COMPUTERS RUN WITH THE GROUND STATION COMPUTER AND TRANSMIT VIDEO AND IMAGES FROM THE BALLOON TO GROUND STATION THROUGH RADIO WAVE.

THE VIDEO AND IMAGES TRANSMITTED TO THE GROUND STATION COMPUTERS ARE DIRECTLY STREAMED ONLINE WHERE THE FOOTAGE CAN BE ACCESSED BY ANY DEVICE, ANYWHERE THE SOLAR ECLIPSE IS VISIBLE FROM THE EDGE OF SPACE TO ANYBODY WITH INTERNET ACCESS.

VIA THE MIRRORING SATELLITE DATA THE FEDERAL AVIATION ADMINISTRATION (FAA) WILL BE ABLE TO TRACK ALL PROJECT BALLOONS SIMULTANEOUSLY.

BE SURE TO WATCH THE ECLIPSE LIVE FROM THE EDGE OF SPACE AT **STREAMECLIPSE.LIVE**
SPECIAL THANKS TO THE NASA SCIENCE MISSION DIRECTORATE, NASA SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM, AND THE TEAMS PARTICIPATING IN THE PROJECT.

Initial Plans for 2023/2024



- NASA Eclipse Advisory Council (Alex Young) [internal/external]
[relationship with AAS ETF community is critical]
- NASA Interagency Coordination (NASA official(s)) [external/government]
- NASA Education Action Group (Shannon Reed) [internal]
- Eclipse Community – listserv/meeting (Reed/Young) [external]
<https://forms.gle/NaoZKssPzFrJMh1a6>
- Leveraging Other Resources and Partnership (a start)
 - Space Act Agreement with Michael Zeiler and Fred Espenak
 - Space Act Agreement with AAS/NSF – co branded resources

We need your help <https://forms.gle/NaoZKssPzFrJMh1a6>

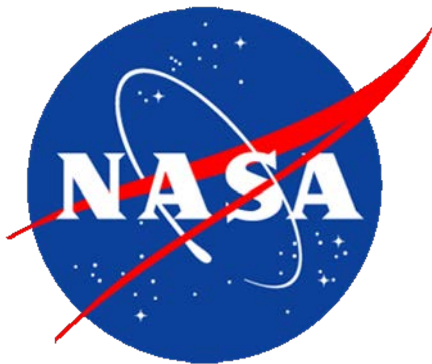


- What interaction did you (do you) have with state and federal agencies for eclipse planning?
- What worked or didn't work with your state/federal interaction for your 2017 eclipse efforts?
- What interaction would you have liked?
- What suggestions do you have for state/federal agencies?
- What needs do you have from state/federal agencies?
- What do you think would be most useful on a NASA eclipse website?

Panelists



- Brook Kaufman (Visit Casper)
- Patrick Son (National Operations Center of Excellence)
- Cat Catlett (Texas Eclipse Task Force)
- Rik Yeames (New Hampshire Eclipse Task Force)



Thank you!

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