

## NASA/HEAT Rice U Status Report – November 2021

Patricia H. Reiff, Rice University

### • *Education: Space Weather talk to college students – Nov 1, 2021*

On November 1, Reiff presented a talk on Space Weather to Gary Morris's freshman class at St. Edward's University, Austin, TX (virtual via Zoom).

The talk included learning objectives on the sun and the magnetosphere, plus the effects of solar and galactic cosmic rays on humans.

1. What is the energy source of the Sun and how does it vary?
2. What is a solar flare
3. What is a CME
4. What is the Magnetosphere
5. How a magnetic field shield energetic particles
6. How the solar wind decreases the flux of galactic cosmic rays

#### **Participants:**

Students: 35 (20% economically disadvantaged, 25% Hispanic, 50% women)  
teachers: 2

### • *Eclipse Workshop at “CAST Conference” (in person) November 11*

Reiff, assisted by three of the teachers in her Master of Science Teaching program, gave a hands-on workshop on eclipses and safe solar observing at the CAST conference, Fort Worth, TX, November 11, 2021. After the talk Reiff and the teachers demonstrated safe solar observing techniques. Each teacher in the workshop got a pack of 25 solar eclipse glasses (paid for by our cooperating company MTPE, Inc.). In addition, another 300 teachers stopped by our booth (paid for by our cooperating company MTPE, Inc.) and picked up heliospheric materials, viewed the 3D magnetosphere model, and got a pair of eclipse glasses plus a flyer for more eclipse information.

#### Learning Objectives:

1. Solar eclipses happen when the moon moves between the Earth and Sun
2. An annular eclipse happens when the moon is at apogee and is not



*MST teachers helping with the workshop: Pam Jones, Patricia Reiff, Kirah Martinez, Samantha Stanley*

- large enough in angular size to cover the entire Sun
3. It is not safe to observe the Sun with naked eyes except during totality.
  4. In an annular eclipse it is not safe to observe the sun with naked eyes at any time.

**Participants:**

Science Educators: 30 (scanned) in full workshop  
(Few if any economically or physically disadvantaged)  
~ 20 women, 6 Hispanic, 4 black

In booth: additional 333 teachers, 60% women, ~30% hispanic, ~15% black.

**Materials distributed:**

Helio flyers and stickers from Carolyn Ng -roughly 500 pc  
Solar eclipse glasses (1038 pc)



*(Left) Dr. Reiff demonstrating filtered binoculars and Sunspotter for solar observing.*



*Right: detail of sunspotter with sunspots visible*

*Teachers visiting our booth at CAST, getting eclipse glasses and viewing the 3D magnetosphere model.*



- ***Annular Eclipse and Artemis Animations Additional Distribution***

The annular and Artemis animations, created by famed artist Don Davis using realistic models and lunar textures, are posted to the websites in small “preview” size, which is accessible from our eclipse animation web page or directly from YouTube. These are now available free to planetarians and the public in resolutions up to 4K.

We sent out notices to our eclipse planetarians list and have provided digital copies to 51 planetariums and other educators so far.

**Planetarians can sign up to get any of our animations for free here:**

<https://forms.gle/sS8q31qFSDRnhnbX7>

**Annular eclipse animation** info and links:

[https://space.rice.edu/eclipse/eclipse\\_animations.html](https://space.rice.edu/eclipse/eclipse_animations.html) **Note** the descriptions and links to the individual pieces are given in last month’s report.

**Recipients of the animations November 2021:**

8 planetariums downloaded the animations in November:

Four from the US: zip codes 18530, 29204, 55113, 29732

Four from International planetariums in: UK, Switzerland, Canada, Slovenai