

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

Patricia H. Reiff, Rice University

- ***“Teaching Earth and Space Science” class started Aug 25.***

We are pleased that six teachers signed up to take the Solar System class for credit, and another six signed up for Professional Development hours. <http://mst.rice.edu/ASTR502> . This class would not be possible without this grant paying a small portion of the tuition. (The teachers each pay only \$200 and Rice gives us more than \$6000 each as a cost-share). This class includes the basics of solar system dynamics (including Newton’s Laws and Kepler’s laws), plus a section on each planet plus the Sun and heliosphere and magnetosphere.

Participants (for privacy reasons only initials are given): (all are teachers except one Solar System Ambassador)

Name	Zip Code	Gender	Ethnicity
C. A.	48134	F	Cau
D. E.	77449	F	Cau
P. G.	60616	F	African-American
P. J.	77441	F	Cau
A. K.	77062	F	Cau
S. L.	84790	F	Cau
K. M.	77469	F	Hispanic / African American
W. M.	48638	M	Cau
N. K.	95035	F	Asian
S. S.	77515	F	Hispanic
K. T.	77339	F	Cau
V. W.	77469	F	Cau

- ***Underserved Student Event: Houston Hispanic students***

We are on the organizing committee for the Houston STEM event at the Lone Star Flight Museum, scheduled for October 2. We are planning for 400 hispanic students plus adult chaperones (teachers or parents). The chief organizer is the “Gathering of Eagles”, with help from the Flight Museum, the West Point Foundation, Rice U and the University of Houston. The event will feature a tour of the museum and booths highlighting STEM careers.

The website is set up <https://goestemfest.org> and the registration is open. We are inviting lower-income primarily hispanic student to participate. We are planning on having a booth to demonstrate the 3D magnetosphere model and other physics demos, including a Wimshurst machine (that was very popular in the Reach for the Stars exhibit) and a demonstration of magnetic eddy currents using a large copper plate and a very strong magnet.



### ***Eclipse Animation Update***

The final animations to be created under our initial project is to add annular eclipse animations to our other seven eclipse animations that we created previously for the 2017 event. We identified two animations to be done (in 4K x 4K fulldome fisheye for planetariums, but also available in pre-warped for mirror systems and in flatscreen). We have been working with the animator (Don Davis) and have the basics agreed to. He is already in progress on low-resolution versions of the animations for review.

1. A closeup of the phases of the annular eclipse, much like the “Total Eclipse from the Earth” animation ([https://space.rice.edu/eclipse/eclipse\\_animations.html](https://space.rice.edu/eclipse/eclipse_animations.html)) but larger, but not as large as the “Bailey’s Beads” animation (on the same page). We are doing two version of this – one with a full black background and one with moving clouds.
2. An animation of the geometry of an annular eclipse, showing the umbra not quite touching the earth, leaving only the penumbral shadow. This would be similar to the “Eclipse Geometry” animation for the total eclipse, but would not include the lunar eclipse at the end and would “close in” to the shadow.

We have also identified two more animations to go along for the Artemis launch this fall – one is an animation of a flyby of Artemis over the lunar surface, and one is an animation of the Figure-8 Artemis flyby path.

We have signed a contract with Don to do the animations, to be finished before the grant ends on Sept 30.

### ***Space Weather Forecast Website; new version “Space Weather” software for Mac.***

We have finished rewriting all our image generating scripts for the space weather forecast pages. The forecast page is: <https://mms.rice.edu/forecast.html> and the solar wind input page is here: <https://mms.rice.edu/realtime.html>.

Unfortunately, at times the time codes from NOAA are bogus which makes the plots look very strange. This apparently is caused by one of their ancillary data servers. We have communicated to them the problem but it still occurs occasionally.

We have managed to create a new version the Space Weather software to get it to run in 64 bits on newer Mac's. (It runs on all Windows machines but not Mac Catalina or higher). [https://mms.rice.edu/spaceweather\\_software.html](https://mms.rice.edu/spaceweather_software.html) . We now have a functioning version available for download on request, although it makes the download package larger (by about 500 MB). It is being made available to our teachers to test out before we release it to the public. So far it looks very promising.

### ***Other Activities***

We hosted a “Perseids live” webcast on the evening of Aug 11, both streamed from my farm but also showing feeds from other sites around the world. We also made a presentation on our animation work to the IPS international planetarium society virtual meeting.

Participants:

Perseids: 38 families and adult learners (short term), unknown ethnicity

IPS: 48 colleagues, various ethnicity