Sample Assignment 3: Citizen Science Project

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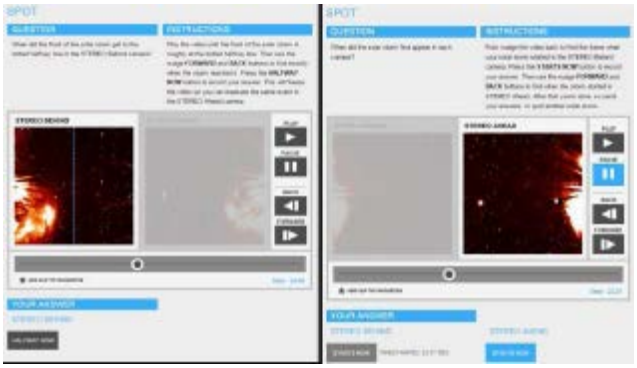
800 words

I chose to do my citizen science project on the Solar Stormwatch Project. Solar storms occur when large solar explosions, called coronal mass ejections (CMEs), are expelled from the Sun and travel across the solar system. These explosions can travel in many directions, and have the possibility of colliding with other solar system bodies including Earth. Scientists are still uncertain as to how these solar storms are formed and how they evolve. Since coronal mass ejections that are on course to collide with the Earth have the potential of being very harmful to astronauts and to satellites, in-depth research is underway. Scientists have manufactured two spacecraft that are being used to take pictures and videos of solar storms, which then immediately send the information back to Earth to be analyzed. The spacecraft are called STEREO Ahead and STEREO Behind. These spacecraft are positioned at different spots around the Sun in order to cover a wider angle, and to give scientists the "fisheye-lens view" of space between the Sun and the Earth.

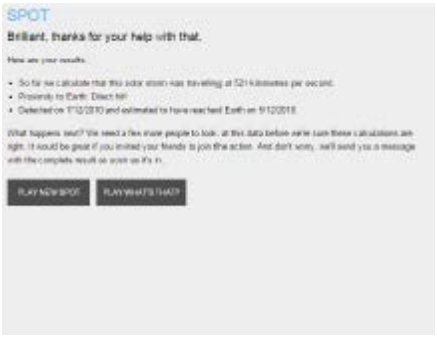
The Solar Stormwatch Project needs participants to help analyze these videos, in hopes that individuals will catch glimpses of information within the videos that another person may have missed. The project provides participants with some training exercises in preparation for the project itself. After training has been completed, there are different challenges that participants can do to help classify solar storms.

The "Spot" challenge asks participants to watch two video clips simultaneously, one from the STEREO Ahead spacecraft camera and one from the STEREO Behind spacecraft camera, to spot solar storms. Participants must select whether they see a storm in the STEREO Behind, STEREO Ahead, both cameras, or if they see nothing (shown in the picture below).

Participants are then asked to look at both videos again, but individually, and indicate when the front of the solar storm reaches the dotted halfway line on the screen (as shown below in the picture on the left). Finally, participants are asked to watch both videos again, individually, and indicate when the solar storm started in both the STEREO Behind and STEREO Ahead cameras (as shown below in the picture on right).



Once this is completed participants are shown a screen containing some fun facts about that particular solar storm, and thanked for their help. The information is then reanalyzed by experts to ensure that it is correct.



Another activity is the "What's That?" challenge, which was my favorite challenge. This challenge doesn't focus on spotting solar storms, instead it is intended to try and spot other activity occurring in space. Since the two spacecraft have such a wide angle of view, they are able to capture videos of other phenomenon such as comets or particle strikes, which may be helpful in solar storm research.

Participants are asked to play the video, pausing, rewinding and fast-forwarding where needed, to try and spot comets, particle strikes, optical effects, or something else. When they view something they hit the "record" button for the appropriate category. It is possible to view more than one of these in a given video, so

participants are able to hit the record button numerous times during the video. In the screen shot below, the straight line on the right side of the screen would be classified as an "optical effect".

I was motivated to do this particular project because these coronal mass ejections are so dangerous not only to satellites, but to astronomers and to our Earth! By looking at videos, and trying to analyze solar storms, we can actually aide in the research for solar storms, and potentially save lives. If the causes of solar storms are discovered, scientists will be able to better prepare and warn astronomers about incoming solar radiation.

I was somewhat surprised by how much activity actually goes on around the sun, making it more difficult than I thought it would be to point out a solar storm. I thought that it would be blatantly obvious when there were coronal mass ejections, but sometimes it was hard to tell the difference between those and the normal fiery flares of the sun. As a result, when I first started to watch the videos captured by the spacecraft, I was very nervous that I would analyze data incorrectly. Thankfully, after I discovered that scientists will reanalyze your findings I relaxed and really enjoyed the project!