Sun-Earth Day Highlights:

RHESSI Introduction

[Opening Sound Clip]

[Troy Cline]
Although our technologies have changed over time, our goal **to understand the Sun**…remains the same.

[Sound clip]
My name is Troy Cline and welcome to Sun-Earth Day 2011: Ancient Mysteries-Future Discoveries. This new theme opens the door to a variety of topics ranging from ancient solar sites and discoveries to current and future discoveries. Many of these new discoveries involve NASA missions that, when combined, tell an even greater story of our dynamic solar environment. So…throughout the 2011 we'll feature ancient locations that studied the sun as well as numerous interviews with people who are directly involved with current and future NASA missions. So let's get started!

In today's podcast we will hear from 2 astrophysicists at NASAs Goddard Space Flight Center,Brian Dennis and Gordon Holman. These gentleman works directly with the RHESSI mission that explores the physics of particle acceleration and energy release in solar flares. To start the interview, I asked them to tell us a little bit more about the mission and of coursethat rather interesting acronym.

[Music Transition]

[Gordon Holman]

My name is Gordon Holman; I'm an astrophysicistsat Goddard Space Flight Center, the laboratory for solar physics. I work with the RHESSI project. RHESSI is Reuven Ramaty High Energy Spectroscopic Imager, which observes solar flares on the sun. Solar Flares are the quickest explosions in the solar system; they are much like storms from the sun just as there are storms on the Earth. Earth storms depend on activity in the Earth's atmosphere while solar storms are activity in the Sun's atmosphere but they are controlled by changes in the magnetic field on the sun. We study flares for a couple of reasons: one scientific curiosity, which is how flares work plus the physical mechanisms that occur in flaresare also of interest in many other places in the universe for many other astronomical objects so there is common physical processes in both flares and other objects in the universe. There are also practical ways in studying flares and we have to understand how they work to protect our technology on the Earth, which are satellites, the electrical grid, telecommunications, cable TV, cell-phone communication, GSP and other such technologies that we have become so dependent upon. One of the

mainpurposes of RHESSI is to understand the physics of solar flares, first of all how does a flare occur, we know solar flaresoccur in regions of the sun called active regions where the magnetic field is strong and complex, but we don't know when and how a flare is set off. When a flare is set offgas in the solar atmosphere is at very high temperatures tens of millions of degreesand also very high energy particles which have speeds approaching the speed of light. We want to understand how these flares occur, what triggers the flare and what heats the gas to such high temperatures and how these particles are accelerated to such high energies.

[Brian Dennis]

My name is Brian Dennis; I'm an astrophysicistsat Goddard Space Flight Center, as well. My role is the official NASA mission scientist at Goddard. I am responsible for optimizing the science that RHESSI achieves. One thing that is unique about RHESSI than any other mission for solar flare observations is the ability to make images of the flare in x-ray and gamma rays. These x-rays and gamma rays are produced by the hot plasma that are generated within the flare and also by the particles that accelerate to such high energies of the ions and the electrons. In the past it has been difficult to image in x-rays and gamma rays, simply because x-rays and gamma rays are not reflected by noise or reflected to lenses. You can't make an image in x-rays in the same way you can make an image in a camera for example, as with a lens in a big optical telescope. With RHESSI optical techniques we make images which involves shadow casting, you have constant gridsthat forms shadows of the electrodes, the electrodes form shadows onto the detector and by rotating the whole space craft and by counting every single photon, there are definite photons that come in, we are able on the ground to take that information and reproduce, reconstruct that image of the flare in x-rays and gamma rays of the flares. This has proven to be extremely valuable in understanding the basics of what is happening on the sun.

[Closing]

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I'd like to thank Brian for his time and I look forward to future interviews with the people involved with the RHESSI mission.

As many of you already know, every year we update our Sun-Earth Day resources for educators, museums, community groups and amateur astronomers. We also collect a variety of additional hard copy educational resources that are placed in a beautiful and new Sun-Earth Day folder.If you haven't already, I'd like to remind you to register on the Sun-Earth Day website in order to receive your FREE folder of materials while supplies last.

I'm excited to announce the release of a new mobile version of NASA's Space Weather Viewer! This app is an adaption of the current Space Weather Media Viewer and features near-real-time imagery from a wide variety of NASA missions, as well as video interviews with prominent scientists about the causes of space phenomena and NASA-created visualizations. You can download the app by doing a search in iTunes for the 'NASA Space Weather Media Viewer'. After downloading the app, we would really appreciate seeing your reviews and comments!

I hope you enjoyed this Sun-Earth Day Highlights podcast. We are very interested in hearing your questions and comments. If you have something to say, just join us in Facebook or send an email to sunearthday@gmail.com . If selected we'll share it on one of our upcoming podcasts!

For all other details about the Sun-Earth Day program including information about upcoming events, visit our website at sunearthday.nasa.gov.
While there, don't forget to register in order to receive Sun-Earth Day updates!

You can learn more about NASA by simply visiting www.nasa.gov .