

Sun-Earth Day Highlights:

RHESSI – Bob Lin

[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 podcast.

The largest explosions on the sun, called solar flares, can explode with the energy of 100 billion tons of TNT. In today's sun-earth day podcast we talk to Bob Lin who is an astrophysicist at the University of California, Berkeley who says that solar flares send out more than just energy.

[Music Transition]

[Bob Lin]

"I got interested in solar flares because early on we found out that solar flares are the most power particle accelerator in the solar system. Solar flares are the most energetic explosions in the solar system. The explosions people knew about, what surprised us in the early measurements using x-rays and gamma rays we found out that these flares put maybe 20-80% of their energy into high energy particles. So it is a tremendous particle accelerator."

"These explosions have an effect on the Earth. When the sun has a huge explosion there is all kinds of radiation and that radiation will ionize and heat the atmosphere of the Earth and the high energy sometimes get out. All the high energy particles we see from the sun, come from explosions like solar flares and coronal mass ejections. Of course these high energy particles can affect satellites, in fact they destroy satellites and affect communications so we have a practical aspect."

[Troy Cline]

Lin was part of a team that proposed building a satellite called RHESSI to try to understand how these flares work.

[Bob Lin]

"We thought that the best way to look at this, would be to design an instrument that could image and measure the energy of high energy particles, because high energy particles when they hit other atoms and nuclei they produce hard x-rays and gamma rays, the electrons produce hard x-rays and ions produce gamma rays. So that's what RHESSI is, it's basically a telescope for hard x-rays and gamma rays, that is very unusual because when you think of a normal telescope it has a mirror or a lens and it focuses and it makes an image, but at these high energies you could not do that. The x-rays and gamma rays are so energetic that there is no easy way to focus. So we make images by using shadows. You can think of shadowing the x-rays and gamma rays and so 13 years ago, we put together a proposal for this kind of an instrument to be carried on a small space craft, an Explorer. And that would be accepted, so we built this RHESSI space craft and instrument, launched it in 2002. Now it has been giving us good observations and telling us a lot about how the sun releases its energy usually contained in the magnetic fields of the sun, or sunspots in these huge explosions, solar flares. "

[Closing]

[Troy]

Since it launched in 2002 RHESSI has improved our understanding of solar flares, which in turn can help scientists better forecast which solar flares might send their high-energy particles towards Earth.

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

March 19, 2011 was the 11th Sun-Earth Day ...and the events at Goddard had an all-new component: it was a Tweet-up. Now a tweetup is a chance for active Twitter users to come together in person, experience interesting activities, and tweet their comments for all their followers to see. One hundred guests, chosen randomly from some 400 applicants, were invited to participate.

Now the NASA Edge team was also there ...doing something new– this **event** is where they chose to do their first ever live webcast. In front of an audience that they called the "twiterazzi," they interviewed Goddard experts on such topics as space weather, various Heliophysics missions, and they even had a rather funny quiz for Goddard's solar scientist Holly Gilbert in which she was asked to name all the parts of the sun. The webcast also included pre-recorded footage from Sunspot, New Mexico, home to the National Solar Observatory and a prehistoric solar observatory site in nearby Sierra Blanca.

You can now download an edited video podcast version of that show by visiting the Sun-Earth Day home page or by doing a quick search in iTunes for NASA EDGE. From there you'll see the show called NE Live@Sun Earth Day 2011. While there you'll also see the new promo for the 2012 Transit of Venus show that will be filmed live from Hawaii!

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.