Sun-Earth Day Highlights (06-04-08)
Eclipse 2008: China
Interview with Fred Espenak

[Troy Cline]
"But at the moment of totality, all became silent and dumb. Neither a cry nor a rustling, nor even a whisper (was heard), but everywhere there was anxiety and consternation. To everyone the two minutes of the eclipse were like two hours. I do not exaggerate or imagine any of these details. Several people whom I questioned after the eclipse regarding the duration of totality replied that it had lasted for two hours." This quote refers to a total solar eclipse in Sudan that took place on July 18, 1860.

> *From: M Bey, Comptes Rendus.*
> *Quoted in Historical Eclipses and Earth's Rotation, by F Richard Stephenson, Cambridge University Press, 1997, page 385.*
> *(refer to http://www.mreclipse.com/Special/quotes4.html)*

My name is Troy Cline and welcome to another Sun-Earth Day Highlights podcast. On Friday, August 01, 2008, a total eclipse of the Sun will be visible from within a narrow corridor that will traverse half the Earth. The path of the Moon's umbral shadow will actually begin in Canada and extend across northern Greenland, the Arctic, central Russia, Mongolia, and China.

With an eclipse on the way, the Sun-Earth Day team has been busy gathering quite bit of information that you'll be able to find on the Sun-Earth Day website after June 16th, 2008. Also, several of the upcoming podcasts will focus on eclipse related topics and will include interviews, interesting facts, how to find information on eclipses past, present and future.

So let's get started with none other than the man who had come to be known by many as Mr. Eclipse, Fred Espenak. I asked Fred to tell us a little bit more about himself.

[Fred Espenak]
Well I'm an astrophysicist here at Goddard Space Flight Center. I've been here for about 29 years. Right now most of my work is concerned with the prediction of solar and lunar eclipses and publishing this material for the international astronomical union and for the general public on the web site that I monitor.

[Troy Cline]
For this podcast I asked Fred to give us some basic information about eclipses starting with the question, "What is an Eclipse?"

[Fred Espenak]

An eclipse is an astronomical event where one object blocks another object. In the case of the Sun, an eclipse of the Sun is when the Moon passes between the Earth and Sun and covers some part of the Sun's surface.

[Troy Cline]
Often people don't realize that there are different types of eclipses. I asked Fred to give us a brief description of each.

[Fred Espenak]
For solar eclipses there are three basic kinds that take place. The first is a partial eclipse where the Moon blocks some fraction of the Sun's disc but not all of it and you see a bite taken out of the Sun during the eclipse. Those are fairly common eclipses. The second type is a total eclipse; in which case the Moon covers the Sun's entire disc. You don't see the bright surface of the Sun, it's hidden from view - but you do get a chance to see the Sun's very faint outer corona which usually isn't visible to the eye. The third type of eclipse is called an annular eclipse, and annular comes from the greek work annulus or ring. What happens there is the Moon is at its furthest point in its orbit and it actually looks smaller then the sun does in the sky. So during the eclipse when the Moon passes in front of the Sun it can't cover the outer cirrcumfrance of the Sun and it leaves a bright ring during the middle phase. So that is what the annular eclipse is referring to.

[Troy Cline]
We're often asked the question, "What can solar eclipses tell us about the Sun?"

[Fred Espenak]
The most important type of eclipses from a scientific point of view are total eclipses because during that period of time when the Sun's disc is completely covered by the Moon it gives scientists an unprecedented opportunity to study and make measurements of the Sun's outer corona which is normally hidden from the bright glare of everyday life. By studying the corona we can learn more about the physics taking place above the Sun's surface; and in relation to that what is going on in the interior of the Sun as well.

[Troy Cline]
I asked Fred to tell us more about the location of the eclipse that will be witnessed on August 1st, 2008.

[Fred Espenak]
The next total eclipse takes place this summer on August 1st 2008. This eclipse path begins in northern Canada. It crosses near the North Pole across northern Greenland, down into central Asia into Russia and it ends at sunset in northern China. My plans will be taking me to northern China for this eclipse.

[Troy Cline]

Fred has spent years gathering a tremendous amount of information about eclipses, transits and moon phases that can be found on the NASA Eclipse Website at http://eclipse.gsfc.nasa.gov . I asked Fred to give us some more information about that website and specific sections we should explore.

[Fred Espenak]
You can find out more about solar eclipses and lunar eclipses by visiting the NASA eclipse web site that I monitor at Goddard which is http://eclipse.gsfc.nasa.gov/. If you go into that web page you'll find links to solar eclipses, lunar eclipses, to transits; which occur when a planet moves across the Sun's disc. And information about phases of the moon and things like that. When you hit some of those major pages it will take you to catalogs of eclipses that have taken place in the past or in the future and it will get really specific on particular eclipses during the current period of time, for instance, this summer for the August 1st eclipse. There are pages and pages of information, and maps and tables giving all kinds of details about that particular eclipse.

[Troy Cline]
I would like to give a special thanks to Fred Espenak for taking time from his busy schedule to share this information with us.

In upcoming podcasts we'll talk with Fred about his own eclipse experiences, take in a few photography tips and hear about how he actually got started as an astronomer. Lou Mayo will fill us in on the latest Sun-Earth Day supported eclipse activity for Amateur Astronomers. We'll also hear from the chief editor of Sun-Earth Day's Technology Through Time series about the latest eclipse addition.

I hope you enjoyed this edition of Sun-Earth Day Highlights. We are very interested in hearing your questions and comments. If you have something to say, just 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 our past SED themes be sure to visit our website at sunearthday.nasa.gov.