

Sun-Earth Day Highlights

Eclipse 2008: China

Interview with Lou May: New Activity for Amateur Astronomers

[Troy Cline]

My name is Troy Cline and welcome to another Sun-Earth Day Highlights podcast.

In today's podcast we'll talk with Lou Mayo about a new eclipse based activity that he designed specifically for the Amateur Astronomer section of the Sun-Earth Day website. The title of that activity is the, "NASA Lunar Parallax Challenge". Lou will also give us some rather interesting historical information about eclipses, the significance of eclipse viewing in today's world, how you can find more eclipse information on-line and finally how to start your own After School Astronomy Club.

So let's get started. Here's Lou.

[Lou Mayo]

Well, you know Troy we live in a magnificent era right now where we understand the universe in ways that were impossible only 50 or 100 years ago. For most of human history we have not understood the true nature of eclipses. And so, most eclipses were viewed with fear and foreboding, bad omens. There are many stories of the significance of eclipses. In history the Lydians and Medes, that's a great story from about 430 B.C., these 2 groups had been fighting for 5 years. They'd had constant wars. The advantage shifted back and forth. Nobody seemed to be winning but in the 6th year for their war, an eclipse occurred and they were so afraid that the gods were unhappy with this war that they immediately stopped all fighting and formed a peace treaty.

There's also a wonderful story, although it's not quite clear if this is true or not, but around the year 2000 B.C., I think 2134, there are 2 Chinese astrologers, and back then astrology and astronomy were considered to be the same thing...so these 2 Chinese astrologers, Hsi and Ho, failed to predict the eclipse for the emperor and it was so important that they understood eclipses at that time that these two unfortunate astronomers were beheaded. So, eclipses through time have mostly been frightening events but in modern times we understand them much better.

[Troy Cline]

Later that afternoon I was able to take a walk with Lou just outside of the building where he works at Goddard Space Flight Center. So, I used part of that time to ask a few questions about the Lunar Parallax Challenge that he developed for the Sun-Earth Day website. It was a beautiful day and if you listen closely you should be able to hear the sounds of a variety of birds in the background.

[Lou Mayo]

Well, this is not new but it's a fun activity. You can actually derive the distance to the moon by using very simple concept of parallax during a solar eclipse. So we're going to have people from all over the world send in their pictures of the eclipse, the partial eclipse, or perhaps they're along the path of totality, and by looking at these pictures and understanding how the eclipse will look different from different parts of the earth you can do a pretty good job in calculating the distance to the moon.

[Troy Cline]

The instructions for this entire activity can be downloaded from the Eclipse feature on the Sun-Earth Day website.

During our conversation Lou talked about the After School Astronomy program and how that program has played such an instrumental role in getting all 3 of his daughters ages 10, 13 and 16, interested in astronomy. Well, that, and a few other parenting tricks...

[Lou Mayo]

You can get them to do a lot when the promise is that you can get them out of school. I've taken them on eclipse trips with me, internationally. I take them on trips to observe meteor showers. I get them up at 4 in the morning to watch the Venus transit.

[Troy Cline]

I'm sure they were thrilled about that one....(laughs)

[Lou Mayo]

Yeah, the big question is, "Well, dad will I get out of school for this?"

I ran and still run an Afterschool Astronomy Club at the elementary school that all of my daughters have been to. They've all been through the Astronomy Club. Although, sometimes they roll their eyes and say, "Dad! You're talking about space again!" (laughs) They also really enjoy the astronomy club so I think I feel pretty good that they I've been able to introduce them to the night sky a little bit. Maybe they'll carry that with them through life.

[Troy Cline]

What about the teachers and parents who are listening to our conversation right now. If they are interested in getting their children involved, students involved or community members involved in astronomy, where can they go to find more information about 'how' to do that?

[Lou Mayo]

Well there's a website they can go to called afterschoolastronomy.org and it shows you how to set up your own Afterschool Astronomy Club in your school or

in your community center. It has a list of activities. If you've never done this before it has step by step instructions on how to set this up. It also has local resources. So for example, local Amateur Astronomy Clubs are a wonderful way to get involved in astronomy and you can find one, almost certainly, within driving distance of where you are.

[Troy Cline]

Now on the Sun Earth Day website in the Amateur Astronomer's section in particular, will there be links there to some of these places you're talking about: to where people can find out about more about astronomy clubs?

[Lou Mayo]

Oh you bet. The Sun Earth Day website will be a wonderful 'one-stop' shopping place to go for eclipses, astronomy clubs, all kinds of things.

[Troy Cline]

Throughout history eclipses have played a significant role in scientific discovery. So towards the end of our conversation I asked Lou if he would share a few of his favorite examples with us.

[Lou Mayo]

Well, of course, today we understand eclipses very well, we know what causes them, we can predict them. It turns out that they've been instrumental in helping us understand other areas of astronomy. I'll give you 2 examples. There was an eclipse in 1868 and the French astronomer, Pierre Janssen, was observing a solar prominence. Once the moon has completely blocked out the sun, you could see the subtle solar atmosphere and some of the features of the sun. He found a spectral line that was just a little bit short of the sodium line, a line that presented itself in the yellow part of the spectrum. They didn't know what it was at the time but it turns out that this was the discovery of helium, the second most abundant element in the universe and the only element, not discovered first on earth, but in fact on the sun. Another very famous eclipse occurred in 1919 after Albert Einstein had proposed the theory of general relativity which talks about how gravity can actually bend space. They used an eclipse that was a 'total' solar eclipse to observe the positions of stars very near the limb of the sun. With the Sun completely blocked out you can actually see stars in the day time. So they recorded the position of those stars and then they recorded the positions at night when the edge of the sun was not very near those stars and found that the position of those stars appeared to change. This was verification that Albert Einstein was right...that massive objects like the sun in fact do warp space and so the light paths of these stars had actually curved a little bit going around the edge of the sun.

[Troy Cline]

Lou Mayo is a planetary scientist at the NASA Goddard Space Flight Center working on problems involving the atmospheric modeling of Saturn's largest

moon, Titan. He spends much of his time designing and promoting education outreach programs with the Sun Earth Connection Education Forum. He also runs a national network of after school astronomy clubs.

I would like to thank him for taking time to share this information with us.

As a reminder, a total solar eclipse will occur on August 1, 2008 and 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. The Sun-Earth Day team plans to bring that event to you with a live webcast from China. You can get more information about that webcast on the Sun-Earth Day home page.

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 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.

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