

SETalk

In this case, we know LoC=1.5, and the numbers are:

$$\arcsin(0.5 \cdot 1.5) = 48.59 \text{ (approximate)}$$

$$X = \cos(48.59)$$

Therefore $X=0.661$ (approximate), so if the path was exactly 100 km wide, you would need to be:

$$0.661 * (100 / 2) = 33.05 \text{ km from centreline}$$

For convenience, here's a table of approximate X's vs LoC's. Remember that the X's are measured perpendicular to centreline:

LoC X

2.0 0 (this is centreline)

1.8 0.43

1.6 0.60

1.4 0.71

1.2 0.80

1.0 0.87 (half of centreline duration)

0.8 0.92

0.6 0.95

0.4 0.98

0.2 0.995

0.0 1 (this is the path limit)

This simple method is not affected by the non-circularity of the Moon's shadow as it falls upon the Earth. Ultimately, after you do the more difficult calculation for chords through ellipses, you get the same answer as the circle. It is also not perceptibly affected by your altitude unless you're an astronaut.

Where this method does need modification, however, is when the eclipse is less than ~3 degrees high in the sky - because the "upper" and "lower" sides of the shadow then experience significantly different amounts of atmospheric refraction. This deforms the shape of the shadow ellipse on the ground; and it's a tough one because your actual location relative to the shadow itself becomes important. So does the air temperature & pressure on the day.

A more predictable modification to your times arises from the Moon not having a perfectly circular profile. Lunar valleys let the sunlight sneak through...and this becomes especially relevant near the path limits. Fred Espenak's eclipse bulletins explain this issue very thoroughly; and they also include graphical time corrections to the "perfectly circular Moon" case.

These graphs, for example, tell me that the longest durations at the Australian end of 2002 Dec 4 TSE are not on centreline. So if you do want to see precisely 3/4 of centreline duration, then you will need Fred's "lunar limb profile at 09:11 UT" page. Then you and your fellow Cultists can figure out the exact location of the Outback pebble you will worship that day...;-)

Alternatively you can join me in watching condescendingly as the GPS-toting Yuppies pile themselves onto the exact centreline; while we prepare ourselves - in more tranquil surroundings - to get maximum duration....

From: Fraser Farrell

That was lucky for me....I get the same answers with my method ;-) cheers,

From: klipsi@bluewin.ch

yes, I think it would be Bailey's beads all around, or chromosphere, with a corona hint, and it would last just a second or two. Klipsi

SETalk

From: Marc Weihrauch

Hello That's a question for Glenn Schneider as well - he observed and recorded such a 0-seconds-totality, if I'm not mistaken in 1986. Unfortunately, I don't have the link at hand. Best regards Marc

From: Glenn Schneider @ Home

A picture (or more correctly a montage of pictures) is worth a thousand words (or more):

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_86/E1986_MOSAIC.html

From: Jay.M.Pasachoff@williams.edu

Yes, there could be Baily's beads all around, prominences, pinkish chromosphere, and inner corona visible.

Note: "Baily" has no letter "e" in it. Jay Pasachoff

From: Bob Morris

I invite members of the group to apply for membership in the exclusive "zero seconds totality" club. :-)

I know that Glenn and I are members (I was on the Athens-Sounion road in May '66; pix in Aug '66 S&T) but how many others? Hey, 100 km-wide paths of totality are too easy. :-) Bob Morris

From: Fraser Farrell

Bob, Wouldn't that description apply to the >95 percent of the world's population who have never seen a TSE?

Perhaps call yourselves the "Instantaneous Totality Club" instead, so that you can sneer at us peasants who merely attend umbras with mappable widths?

I should be able to grovel to you - in person - for membership of this exclusive club in Exmouth, Western Australia, on 2023 April 20... ;-) cheers, Fraser Farrell

From: Pierre Arpin

I'm wondering if it would be possible to see the moon shadow leaving the Earth surface for an observer located exactly at Wilcox's point.

I imagine that I would see a narrow shadow column (looking like a tornado at that spot) rushing to me and lift in the air.

What would be the distance west of the Wilcox point where no Baily beads would be visible with a complete chromospheric ring? I believe that a true totality must be beads free.

From: Geoff

Hey, I just wanted to say a big thankyou to everyone who replied to this question. You have all helped tremendously!! So thanks to all. --Geoff.

SETalk

2nd contact sounds?

From: Marc Weihrauch To: SOLARECLIPSES@aula.com Date: Tue, 30 Jul 2002 14:01:12

Dear shadow chasers, I'm searching for a record of 2nd contact sounds. Those voices very well emphasize what totality REALLY looks like. I'm sure some of you have such sounds on their website, but I didn't find any. (Hey Klipsi, didn't you have one?) Thanks for any help Marc

From: KCStarguy@aol.com

I have sounds from 1998, 1999 and 2001 from my video.

From: Pierre Arpin

I put one of the feb. 16th 1980 in India on my web page. Just go to the following URL to hear it :

www.iq89.com/eng/astro/index.html and check on the 1980 row.

I have several others I recorded on different eclipses sites, but I've been unable to convert them in audio format suitable for the web.

Any idead how to do the job ?

From: Evan Zucker

I have a wonderful audio cassette of the sounds at the 11 July 1991 total solar eclipse in Baja, from a few minutes before second contact until a few minutes after third contact. However, like Pierre, I have not been able to digitize it because I wasn't sure what equipment I needed and what procedure to employ.

Does anybody know of a web site that might have that information? -- EVAN

From: GMadden

I, too, have lots of audio on tape. Could use the same info. madden/rochester

From: Dale Ireland

Hi Your camcorder has audio-out plug. You just plug that into the Line-in on your sound card, select the proper input by opening Volume Control that is at the bottom of every windows task bar (almost). Windows comes with "Sound Recorder" find it, open it and start recording, save as a wav file. This is the simplest way and every version of windows has a recorder. Dale

From: to922@bellsouth.net

Hi Everyone, To get your eclipse audio tapes to a digital version you need a sound card in your computer and a software program to do the conversion from the analog signal to a WAV file or a compressed MP3 file. A basic model sound card is just fine. It's actually quite simple. Get the card properly installed in you computer. Hook the outputs of your tape player into the sound card. Start the RECORD process in the software product and start your tape player. The software will convert the signal to a digital file in real time. WAV files are very large files. MP3 files compress the digital data with very little quality loss for the point of this discussion. The software program I have used is Cool Edit. It is available by download. <http://www.syntrillium.com/>

I have done this a lot transferring LP album tracks from my LP collection to make CD's. I also recorded the voice for Eclipse Timer and digitized it. The voice is a WAV file in the program, but a MP3 file on my website so that it

SETalk

downloads faster.

Hope this helps get you started. Gordon www.eclipsetimer.com

From: GMadden

But is there not a limit on the size of WAV file permitted? madden/rochester

From: brian seales

Hi All, There is an easy way of recording sound from your video or tape and turning it into an MP3 file, which is a highly compressed digital format for distribution over the internet. There are a number of basic things you need. 1. A sound card with "line in" or "audio in" on the front or back of your PC. There are numerous formats available. 2. Your camcorder must have "line out" or "audio out" although some software will grab the audio directly off a video. 3. Software such as Music Match Jukebox. Download free off the net or get it free on one of those magazine cover discs. 4. A suitable cable to connect your video or cassette player to your PC. In my case stereo phono outputs to a single mini stereo jack plug works fine. I have recorded directly on to my PC hard drive from videos, vinyl records, CD, Casette tapes etc. using this software.

Open Music Match Jukebox, ignore the ads, read the help section on recording to get a feel for it. Choose "line in" as your source, choose "save as MP3", leave everything else such as sampling rates etc. on default settings, click record and play the section of your video or cassette tape which you want to record. Remember where you saved it to on your hard disk and then play it back. Either Music Match will play it or Windows Media player will play it. Once the file is in MP3 format, if it is still too large then you can compress it further with Winzip or similar. This can halve the size of the file without loss of quality. If anyone needs more information please feel free to contact me in person outside the mailing list. Regards, Brian Seales brianseales@eircom.net

From: Evan Zucker

I'm not sure about the other people who responded, but my audio is on an ordinary audio cassette, not a videotape. I have a tape deck on the other side of the room from my computer, and I have a portable tape recorder. The question is how to connect one of those two devices to the computer's sound card. -- EVAN

From: KCStarguy@aol.com

If you import the sound into the computer, one way you can digitize it is by using quicktime . I use it to listen to music and it can be used for editing as well or digitizing sound. I use a program called sound companion to convert sounds as well.

From: Dale Ireland

You get a patch cable to connect the earphone out of the cassette player to the line in of your sound card. It is called audio patch cable and it is six bucks at Radio Shack. You need the kind that has some built in resistance to match the two components. It has a name that starts with "D", duh duh duh something like "discriminating" but that isn't it... I am drawing a blank somebody help Dale

From: Dale Ireland

ATTENUATING AUDIO CABLE... that is it, sorry, \$6 at radio shack, It didn't start with a "D" but I was close :) Dale

From: Fraser Farrell

Pierre, Evan, Dale's suggestion is good, although there are better programs than Sound Recorder for this job. If you can't see a "line in" or "microphone" setting in your Volume Control, select advanced from the menu bar. Of course you can

SETalk

use the same idea to get sound out of a cassette player or vinyl record player or a TV. Your local electronics or music shop will sell the necessary plugs & leads to connect these things to your sound card.

There is a 2 gigabyte size limit on individual files created in Windows 95/98/Me but that shouldn't trouble you for this exercise. In fact most Windows users don't even know about this file size limit - until one day their Outlook mailbox files get that big, and then spontaneously self-destruct. Hint: clean out the Deleted Items regularly....

Recording a WAV file at CD audio quality (stereo 44kHz) requires about 10MB per minute of sound. So converting your entire eclipse audio recording to a stereo WAV requires about 1.3 gigabytes. That's from that first excited cry of "first contact", through to the sounds of awe and amazement of the Big Event about an hour later, right through to the final "it's all over..." about an hour after that.

Of course, only a few of us would download such a massive file. But doing it in mono instead of stereo would halve it. Doing it at 22kHz (typical radio broadcast quality) would halve it again. And converting the thing to an MP3 would cut it down to something even I could download... :)

There's lots of programs to make MP3s from sound files or other audio input. Do a Google search for "MP3 ripping OR encoding" to find one for you. But as my children have discovered, converting a large WAV file to an MP3 may be an overnight job for your computer.

But please make the effort. I couldn't afford to travel to the 1991 eclipse :(cheers, Fraser Farrell

From: Gerard M Foley

Try "attenuating". One end will be red. Gerry K8EF <http://home.columbus.rr.com> <http://www.fortunecity.com/victorian/pollock/263/egypt/egypt.html>

From: Francisco A. Rodríguez Ramírez

Hi, In my personal eclipse web site <http://www.terra.es/personal8/cazaeclipses/index.html>

I have a Real Player sounds from 2001 in National Kafue Park (Zambia). <http://leo.worldonline.es/observat/eclipse/ets2001.rm>

When the third contact finished you can listen the hippos, birds ...

A second contact video in AVI format with sounds
<http://leo.worldonline.es/observat/eclipse/ets2001s.avi>

second contact - totality - third contact in WMV format with sound
<http://leo.worldonline.es/observat/eclipse/ets2001.wmv>

Best Regards Francisco A. Rodríguez www.astroeduca.com
Grupo SAROS www.saros.org

From: Olivier "Klipsi" Staiger

howdy, I also got a few sound bits on <http://eclipse.span.ch/sounds.htm>. they are "background sounds" imbedded with MS Frontpage, so best heard with MS I.E., and you might not get the sound if you use Netscape, sorry. Klipsi



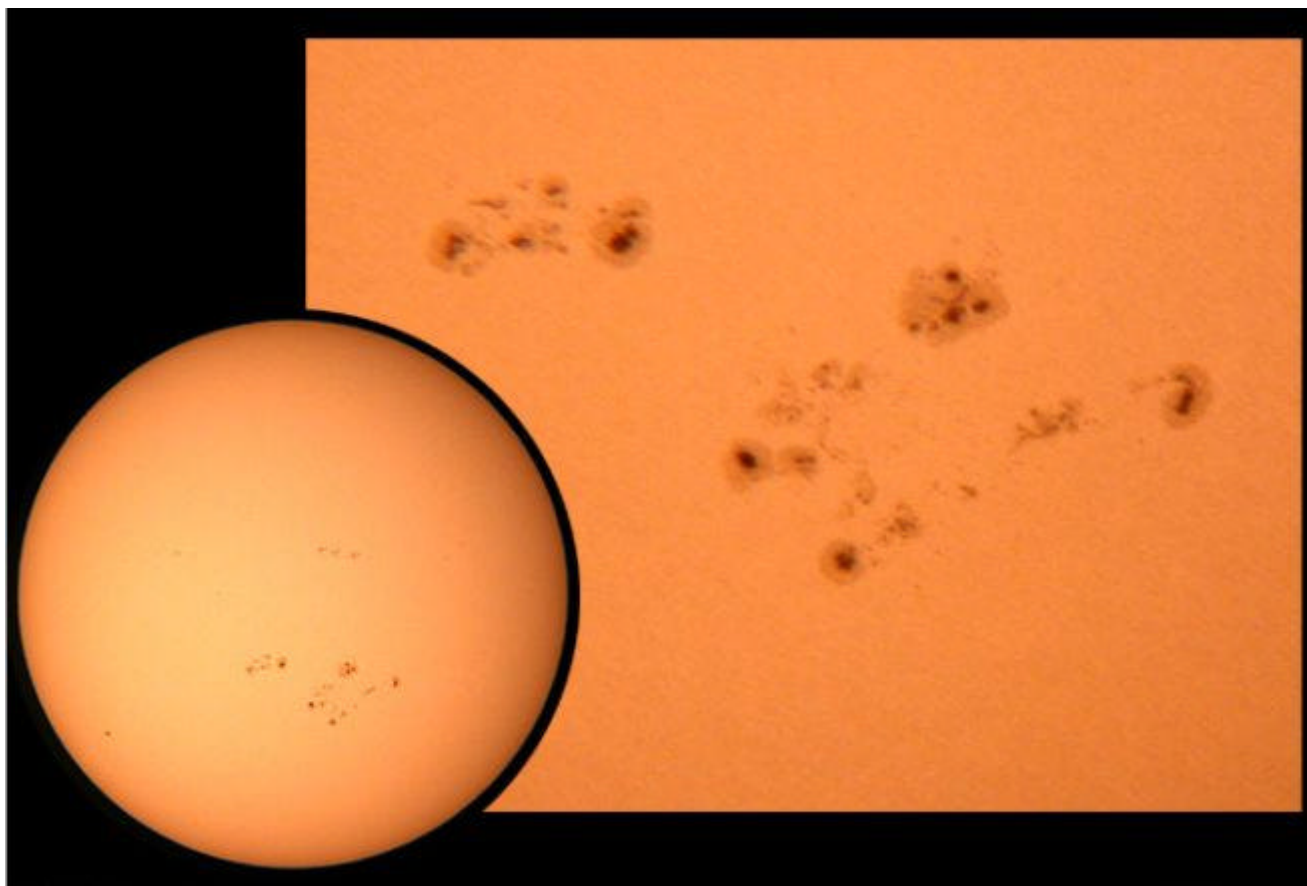
SETalk

Astronomy picture of the day

From: Jean-Paul GODARD To: solarECLIPSES@AULA.COM Date: Thu, 01 Aug 2002 18:27:46

<http://antwrp.gsfc.nasa.gov/apod/astropix.html>

It's not an eclipse but it's from an eclipse chaser.... Have a look! Cordialement, jean-paul.godard@noos.fr



Delta T

From : Jean Meeus <JMeeus@compuserve.com> Date : Wed, 3 Jul 2002 11:46:30 -0400

On 2002 June 1, the difference between the uniform Dynamical Time and Universal Time was Delta T = 64.42 seconds.
Jean Meeus

From : Jean Meeus <JMeeus@compuserve.com> Date : Thu, 1 Aug 2002 22:43:30 -0400

On 2002 July 1 the value of Delta T (the difference between the uniform Dynamical Time and the Universal Time) was 64.41 seconds.

This is a *decrease* of 0.01 second since June 1. However, each year the increase of Delta T reaches a minimum around June-July, as can be seen from the following values of Delta T (in seconds):

2000 2001 2002

SETalk

Jan 1	63.83	64.09	64.30
Feb 1	63.85	64.11	64.32
Mar 1	63.88	64.13	64.34
Apr 1	63.91	64.16	64.37
May 1	63.94	64.18	64.69
Jun 1	63.97	64.21	64.42
Jul 1	63.98	64.21	64.41
Aug 1	63.98	64.21	
Sep 1	63.99	64.21	
Oct 1	64.01	64.22	
Nov 1	64.04	64.25	
Dec 1	64.07	64.28	

Jean Meeus

From : Jean Meeus <JMeeus@compuserve.com>

Sorry for a typing error in my list giving the values of Delta T from 2000 to 2002.

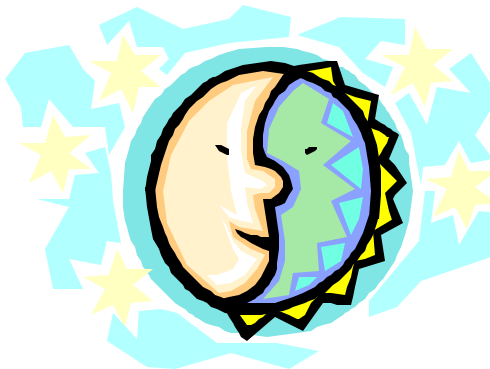
For 2002 May 1, one should read, of course, 64.39 seconds instead of 64.69. Jean Meeus

August 2002

From: Rybrks1@cs.com To: SOLARECLIPSES@AULA.COM Date: Thu, 01 Aug 2002 03:45:46

New Moon this month is August 8, 2002 at 19:16 UT

This new moon passes quite high above the Sun (gamma 4.4) since Earth is now two months past ascending node alignment with the Sun (June 9, 2002). The Moon's shadow is 69 miles in diameter as it passes the Earth's Vertical Centerline 1.5 Earth diameters above the Earth's limb at 37.5 miles per minute in 1.8 minutes time. The shadow cone extends 7,500 miles (about 2 Earth radii) beyond the Earth's Vertical Centerline or Fundamental Plane.



Future

The saros for this new moon will not bring an eclipse to Earth until 129 high misses have passed (each miss a saros increment 18 yrs 11 days apart), another 1700 years from now, arriving June 14, 3715 in the north as a partial eclipse. Arrival is almost three saros orbits away from nowâ€¦from this August to that June. Being so far in the future means a high Saros number, Saros 213. During those orbits within Saros 213 the new moon moves away from its present association with perigee to association with apogee then back to association with perigee so when it arrives as central eclipses they will be total. The Saros has mostly totals, two hybrids, a handful of annulars then finishes with two consecutive non-central annulars in the south.

Two consecutive non-central solar eclipses are somewhat rare but not terribly rare. They occur near Earth perihelion when the gamma change from eclipse to eclipse is very small. These non-central annulars have predicted gamma values of -0.9987 (off the Earth's limb with gamma less than 1.0) and -1.0112. Saros 213 leaves Earth in year 4959 as south partials. Raymond Brooks

SETalk

Willcox point

From: Pierre Arpin To: SOLARECLIPSES@AULA.COM Date: Thu, 25 Jul 2002 22:59:30

I'm wondering if an observer standing at the Wilcox point would be able to see the Moon shadow leaving the ground and lift in the sky.

Due to the narrowness of that shadow I believe that the coming shadow will look like a diffuse tornado.

What will be the distance west of Wilcox point where a true totality will be seen ? By true totality I mean a beadless chromospheric arc.

From: Jay.M.Pasachoff@williams.edu

I am not yet ready to accept the term "Willcox point," since it is a generally looked-forward-to point for 2005 and Ken didn't have anything special to do with determining it, as far as I know. He was a very nice fellow but that doesn't mean that he gets something permanently named after him.

Do note that "Willcox," in any case, has two l's. I hope it isn't as often misspelled as Baily is. Jay Pasachoff

From: Jean Meeus

I too am not happy with the proposed term "Willcox Point".

As if Willcox had really discovered something special! Those points on a central line where an eclipse changes from annular to total, or vice versa, have been known since many centuries. Jean Meeus

From: Cliff Turk

I agree with Jay and Jean that I am not too happy with the term "Willcox Point." On the other hand, perhaps it should have an official name. "Changeover Point" seems a bit mundane to me. Any bright suggestions? Cliff Turk

From: Olivier "Klipsi" Staiger

okay, I accept the criticism. My main goal was to find a short name to avoid

having to say "that-point-out-there-where-annularity-turns-to-totality-during-a-hybrid-eclipse-ya-know-watta-mean?" , and for personal reasons I thought of Willcox. Sure I know Ken did not "invent" that special spot, but I thought he would be glad to know something in an eclipse would be named after him.

Another name ? I thought of "ground zero" but after 9-11 it just doesn't fit anymore... ;-(so let's do brainstorming and let's find a good name to officially accept.

...

the hybrid point ?

the hybrid ground zero ?

the non-eclipse point ?

the blind-spot ?

the black hole point ?

the zero second corona point ?

or how about : the Bailey's heaven point ?

and as this discussion showed, there are most of times 2 such points, (with rare exceptions) so there would be "the first -

SETalk

--- point " and "the second --- point ". Klipsi

From: Madden

All, I was going to avoid getting into this one but it has been on my mind.

The question I have is why *not* name these transitions "Willcox Points"? Everyone says they are not happy about this idea, but few reasons are given and those given are not particularly compelling.

"Changeover Point" is silly and thank God Klipsi decided wisely against "ground zero".

Look, I never knew Ken Willcox, but by every account he was a good guy and a good astronomer and has been published and since these hybrid transitions are, in any event, fairly arcane it seems good enough for me to memorialize Willcox with this nomenclature. The International Astronomical Union may not like it, but they didn't approve the naming of the crater Tyco either. madden/rochester

From: Vic & Jen Winter - ICSTARS Inc.

I can't let this topic go without commenting either.

I willfully recognize that the IAU should form a clinical definition for this moment. I also submit that those individuals and amateurs who wish to refer to this singular moment in space and time as the Willcox point should be able to do so.

I, myself am one who will chose to use the term Willcox Point. The name, to those who knew Ken, brings more meaning to the title than a certificate for the discoverer. The name embodies fitting ideas about a fragile place in space and time, whose very existence is uncertain and unpredictable. Almost as-if circumstances would have it not occur, but for a narrow glimpse of its true beauty that succeeded nevertheless.

This term suits the application quite nicely for amateurs and enthusiasts who chase not merely for scientific definition, but for the treasure of personally experiencing totality.

I believe we should have BOTH a technical term and a name such as the Willcox point adopted by amateurs such as ourselves. Clear Skies, Jen Winter

From: Jean Meeus

Is it really necessary to give a name to those two special eclipse points? How often are they mentioned in the astronomical literature?

Certainly "non-eclipse points" is not a good name, as it would suggest that at those points no eclipse takes place, while in fact the eclipse there is just total!

< The question I have is why *not* name these transitions "Willcox Points"? Everyone says they are not happy about this idea, but few reasons are given and those given are not particularly compelling.

Well, this is a rather odd statement. It is putting things upside down. It is the proposer of a name who should give the reason for his choice.

Surely Willcox was a good guy, but, once again, what has he to do with those special eclipse points? These could better be called Espenak points, because Fred calculated them. Or why not Oppolzer points?

Here is a better suggestion, I think. We could call those points the @ points, because the symbol @ stands for "at", and "annular-total" is abbreviated to "a-t"! What do you think?

SETalk

Or maybe "transition points" is even better, because at those points we have a transition from annular to total, or vice versa. Yes, after all, to me this looks to be a better name. Jean Meeus

From: Katherine Low

How about the 'conic points', since the top of cone of the umbra of the moon is touching the earth's surface. So we will have a first conic contact and a second conic contact or shorter: a first conic point and a second conic point.

From : Julien Onderbeke

Concerning the Willcox-points, I think Jean has a very good idea with "@"-points. Maybe they could be indicated as the points H1 and H2 on solar eclipse maps, just like the points (and instants) P1 and P4.

From: Donald Watrous

"Conic" and "transition" were both words in my list of possibilities. Why not combine the two and call them "conic transition" points? You could distinguish them as first and second by the direction of the earth's surface's movement within the shadow (ie, "total conic transition" and "annular conic transition") which would ease describing the case where only one happened. Don

From: Jean-Paul GODARD

> God Klipsi decided wisely against "ground zero".

I propose "needle point" Cordialement, jean-paul.godard@noos.fr

From: B0802Alex@aol.com

I believe, we have discussed so many times until now about the Willcox-Point, so that this name's already the winner. Regards, Alexander Birkner www.kernschatten.info

From: GMadden

Please see interparagraph . . .

Jean Meeus wrote: Is it really necessary to give a name to those two special eclipse points?

No it is not necessary. On the other hand since they constitute a unique natural phenomenon that is related to very real, albeit rare, events I see no reason not to name them particularly since they have no name.

> How often are they mentioned in the astronomical literature?

Rarely, if ever. Which is part of my point.

> Well, this is a rather odd statement. It is putting things upside down. It is the proposer of a name who should give the reason for his choice.

And he did (Klipsi). I was merely approaching the question from a different angle: devil's advocate [I don't know the Dutch translation for that].

> Surely Willcox was a good guy, but, once again, what has he to do with those special eclipse points? These could better be called Espenak points, because Fred calculated them.

I strongly believe that namings should be postmortem. Fortunately for all of us, Fred remains among the living. Person-

SETalk

ally I hope that remains the case for many years to come.

> Or why not Oppolzer points?

I don't know who Oppolzer was.

> Here is a better suggestion, I think. We could call those points the @ points, because the symbol @ stands for "at", and "annular-total" is abbreviated to "a-t"! What do you think?

No comment. madden/rochester

From: Rybrks1@cs.com

The Willcox point certainly has everyone's interest.

Some have said it does not occur often enough to justify naming it. Well, it occurs about 12 times per century using Fred Espenak's data over 5400 years. Or about 10 times per century according to a Popular Astronomy article in Feb 1976. So about every eight to ten years frequencyâ€ pretty often. Probably is worth naming, like U1 or P1 so it fits on a map easily.

Defining the point will also be an issue, easily done mathematically using a mean smooth limb but where people see a circle of beads will not be just one point on Earth. Clearly there will be a central point where/when totality starts/ends. Another point where annularity (unbroken circle of photosphere) begins/ends. Between these will be a transition length on Earth where varying numbers of beads are seen and in the middle of the length would be this yet-named mathematical point/time of exactly magnitude 1.000. The path, a locus of central path points, has a length that is dependent on the actual lunar limb profile for a particular event. Deep valleys, tall mountains will make for a longer transition path; shallow valleys a shorter path.

Hybrids that transition near sunrise or sunset are long transition paths due to the steep angle but over a short time (10 seconds or so). Hybrids that transition near greatest eclipse are also long distance but because it takes a long time (measures in minutes of time) due to the flat angle of Earth surface.

For these special eclipses should there be three points defined in the transition?

Morning end 1 - Annular ends 2- T1 (or whatever name) 3 - Totality begins

Afternoon end 1 - Totality ends 2- T2 (or whatever name) 3 - Annular begins

Example, assume we had a lunar limb with valleys on both east and west limbs that reduced totality duration by 3 seconds time on each side. The Nov 3, 2013 hybrid could transition very close to sunrise in 12 seconds from pt. 1 to T1 and then 30 seconds from T1 to pt. 3 over almost 600 miles. The Apr 8 2005 hybrid (not as close to sunrise/set) near Central America could take 4 minutes from pt. 1 to T2 and then less than 4 minutes from T2 to pt. 2 over perhaps 400 miles. All depends on libration.

What name?

Should we assemble a list?... and send your choice directly to Patrick? (to avoid flooding the SEML)

I was thinking null point since it is neither total nor annular. non-eclipse point did not make much sense since it is certainly an eclipse. Seems like the popular ones discussed so far are (alphabetical order):

name label on map

@ pt. @1, @2

conic pt. C1, C2 already exists and there is no point of the cone due to Moon limb roughness

hybrid pt. H1, H2

magnitude 1 pt. M1, M1 both morning and afternoon points labeled as M1 ??

SETalk

needle pt. N1, N2
 null pt. N1, N2
 transition pt. T1, T2 (could also mean Glenn's tiara pt.)
 Willcox pt. W1, W2
 zero point Z1, Z2

Now the big question, seriously, and this is where we need the expertsâ€¢.where due we take the cruise ship in the transition length? We would not want it to be too total looking or too annular looking. I would think to this unnamed point but not on the central line. Rather to the center of the mean limb (center of figure) not the ctr of mean limb (center of mass) â€¢ so that the ring of beads is centered visually and aesthetically. That could be as much as 2 or 3 miles off centraline. Look at Glenn's photos of the Iceland eclipseâ€¢they are beautiful. I am getting very psyched for Apr 8 2005. Ray Brooks

From: 76630,2206

madden: Theodor Ritter von Oppolzer (Ritter means 'knight'; in Britain he would be Sir Theodor...) was an Austrian mathematical astronomer who spent his career charting planets' motion in the sky. In 1887, the year of his death, his book, Canon der Finsternisse (Canon of Eclipses) was published. It was a book describing about 4000 years of central solar eclipses with accompanying maps of the earth to about 30 degrees south.

These eclipses were all calculated by hand. Although we have emapwin and other software that does the same thing, and considerations of delta-T that take into account the slowing of the earth's rotation thereby relocating the eclipses of past and future, this book is a masterpiece and a classic.

The Canon has been reprinted occasionally, but getting even a reprint is a challenge. (I understand that the Vienna observatory has produced some reprints that are still available.) Jean Meeus produced a more accurate Canon in the 1960's (Jean, am I correct here?) that covered fewer eclipses but the paths are much more accurate than Oppolzer's. Also, the Meeus book looks more forward into the future, including the North American eclipse frenzy of the mid 2200's and covers the entire world.

The purpose of the Canon was to act as a historian's reference. At the least, if an archaeologist dug up a writing about a total or deep partial eclipse, he could use the book to get at an accurate time of the event or when the writing occurred.

If we want to memorialize a person by naming the change points, then I suggest that Oppolzer would be an excellent choice. -Robert B Slobins

From: Michael Gill

I like 'transition point'. When used in the context of hybrid/annular-total eclipses, the reader knows intuitively what is being referred to. Guy Ottewell uses 'crossover points' in his book, which I also like.

Using 'Oppolzer' or 'Willcox' would surely require an asterisk or some further explanation.

Of course, people will always use terminology and jargon and as long as both/all parties know what is being communicated who cares what name is used? I'll use 'transition point'. Michael Gill

From: JohnLX200@aol.com

That's quite good, certainly one of the best I've sen so far. It might still be a bit confusing, in that all contact points are intersections with conic sections. You almost need to say "conic POINT point" to clarify it.

So one approach is to find a more specific name for the point. Perhaps umbral extinction point or umbral limit point or even umbral-antumbral point.

Or just umbral apex or apex!

SETalk

So that would yield:

Apex ingress contact (or apex ingress point)

Apex egress contact

or

Apex contact 1

Apex contact 2

or

Umbral limit point ingress

Umbral limit point egress

or

Umbral limit point contact 1

Umbral limit point contact 2

or.... etc.

Thinking back to the Apollo-program days of "trans-lunar injection burns" and so forth, perhaps we could get away with:

Apex injection contact

Apex extraction contact

...

or to clean up the language if anyone objects to double meanings:

Western apex contact

Eastern apex contact

or

1st apex contact

2nd apex contact

Etc.

The direction-based ones would of course need to be properly clarified in odd cases of east-west paths, etc. just as the traditional limits do.

The word selection is not easy. I've thought of many more very clear and graphic phrases describing the two events in terms of the geometry and actions of the cones at time of transitional contact. However, in order to differentiate from the more common blunt bat/ball type cone-tangency contacts, the best phrases have double meanings of a potentially obscene nature not likely to be accepted by the scientific community. I've tried to only give the ones which can most easily pass the "censors." Regards, John Hopper

From: Marc Weihrauch

Hi there, as there still are requests for additional suggestions I'll give you my two cents as well. First I agree that "Willcox points" may not be a good choice. I don't want to detract from the memory of Ken Willcox, but as far as I un-



SETalk

derstand he didn't have anything to do with these two points. Neither did he write an important scientific work about them nor was he the first to describe a 0-seconds-totality nor was it his special passion to chase eclipses at the tip of the umbral cone, am I right?

(However, we've been discussing now for many days what other name we could give the Willcox points... No matter what name we chose, we'll always think "***-point? That's the Willcox point, isn't it?" anytime we hear it.)

Or how about "point of parity"? To an observer there the apparent diameters of sun and moon are exactly equal at the instant of maximum eclipse. This point can be considered to belong both to the umbral and the antumbral cone, so one would experience both a total and an annular phase of 0 seconds duration. Best regards Marc

Minor Planet names to solar eclipse related persons

From: Patrick Poitevin To: SOLARECLIPSES@AULA.COM Date: Wed, 31 Jul 2002 22:04:36

"Dale Ireland" <direland@drdale.com> wrote: >so has Frank Zappa, 3834 ZappaFrank. Interesting little article on the asteroid name game here. http://explorezone.com/archives/99_10/20_asteroids_rock.htm

Before we start having discussions about non solar eclipse Minor Planet names or star naming.

Solar eclipse related Minor Planet names are Mitchell, Young, Menzel, Moore, Mason, McGee, Goffin, Meeus, Pasachoff, Dunham, Hiei, Steel, Bessel, Comello, Feijth, Robinson, di Cicco, Baily, de Jager, Eddington, Secchi, Dyson, Todd Mabel, Herge, Arago, Todd David and Oppolzer.

Those do not have a name, though the name ~~name~~ belongs to another person are van den Bergh (not THE vd Bergh, though for Sydney van den Bergh) and Tuttle (not for THE Tuttle though for Horace Tuttle.

Those I have proposed via different contacts many years ago and still trying, though without success, are: Lockyer, Janssen, Airy, Waldmeier, Stephenson, Espenak, Anderson, Chou, Schneider, Fiala, Krupp, Koutchmy, Edward Walter Maunder, Warren de la Rue and Houtgast. Maybe I forgot more, but send me a private mail if we can add names. Thank you.

See as well the solar eclipse calendar for more solar eclipse related Minor Planets. Best regards, Patrick

Naming Specific Events

From: Gordon Telepun To: SOLARECLIPSES@AULA.COM Date: Tue, 30 Jul 2002 12:28:38

Hi Everyone, I have been following the thread concerning specific events during an eclipse. As far as I can recall, no one has yet brought up the very important point that Marc Weihrauch has just mentioned. That generally, in the scientific community, eponyms are used when a person makes a significant discovery, or a significant contribution to the understanding of a specific event or process. It is an appropriate way to give that person credit for their work. If that is not the case, then it is really unconventional (again, in the scientific community) to just randomly assign a name to an event or process. I am a surgeon, and in medicine there are many things that are named after the people who discovered or described specific things or procedures. It is an honor to have an eponym, that will stand the test of time, assigned to you. For example, the Heimlich Maneuver. Eponyms are actually helpful, because they cause an immediate association of the specific event or thing with the historical perspective of the event or thing. The eponym (in science) only has merit if the person being associated with the event, thing or procedure, has made the discovery, the first description, or significant scientific contribution that leads to a better understanding of something. Therefore, in my opinion, if there is not a specific person known to have discovered or described the point of transition in an eclipse, then that point should be named in a descriptive manner, not given a randomly assigned eponym.

American heritage Dictionary (not scientific) ep-o-nym - A real or fictitious person whose name has become synony-

SETalk

mous with an era, event, object, practice, or the like.

Stedman's Medical Dictionary (scientific) The name of a disease, structure, operation, or procedure, supposedly derived from the name of the person who discovered or described it first. Thanks for letting me share my opinion. Gordon

From: Pierre Arpin

I would like to make a modest contribution about naming these transition points of hybrid eclipses.

I think Menzel points should be appropriate. It would honor Donald Menzel a Harvard professor and astronomer. He observed a dozen solar eclipse including march 7h 1970.

He wrote an article in the the august 1970 issue of National Geographic about that eclipse.

More infos about him on this site : <http://cfa-www.harvard.edu/menzel/bio.html>

From: Evan Zucker

As I recall, that article was co-written by Jay Pasachoff, who was also Menzel's co-author on some earlier editions of "A Field Guide to the Stars and Planets," http://www.amazon.com/exec/obidos/ASIN/0395934311/qid=1028068968/sr=2-1/ref=sr_2_1/104-4187527-6278364. -- EVAN

From: Evan Zucker

I assumed Dale was joking and told him privately that I'm not sure everybody on this list is going to get the joke. But maybe I was wrong and he was serious.

Either way, I quite agree people should not be doing business with ISR. -- EVAN

Picture wanted

From: Jean-Paul GODARD To: SOLARECLIPSES@AULA.COM Date: Tue, 30 Jul 2002 20:48:31

15 February 1962 was my first clipse....

I was ten! I remember this day and I am looking for a picture (if exist) of this eclipse! Anyone has an url for that ?

From: Evan Zucker

<http://www2.pms-lj.si/oddelki/entomologija/tomi.html>

It's pretty easy to find using google.com: <http://images.google.com/images?q=1962+eclipse&ie=UTF-8&oe=UTF-8&hl=en&btnG=Google+Search> Evan H. Zucker San Diego, California

Website update

From: Dave Schmahl To: SOLARECLIPSES@AULA.COM Date: Fri, 02 Aug 2002 09:38:47

Hello All, www.schmahlconsulting.com now includes the 1998 Feb 26 TSE. Please have a look. Enjoy! Dave.

SETalk

Gamma limit value

From: Jean Meeus To: Solar Eclipses <solareclipses@aula.com> Date: Tue, 30 Jul 2002 07:14:58

Raymond Brooks wrote: I suppose even if it eventually really has a gamma of 1.0001 that would suffice as a non-central annular."

Actually, the limiting value of Gamma for a central eclipse is a little *less* than 1 due to the Earth's flattening. In eclipse theory, the unit of length is the *equatorial* radius of the Earth. Because the Earth is flattened, an eclipse with a Gamma larger than 0.9972 cannot be central. (In fact, the "constant" 0.9972 may vary between 0.9970 and 0.9974 from one eclipse to another).

Besides, hmm..., the year 7438 is far away in the future. I doubt that any lunar theory can allow to make such accurate predictions for such remote epochs. Jean Meeus

From: Jean Meeus

Concerning the mail from Raymond Brooks : While the mean inclination of the Moon's orbit on the ecliptic is $5^{\circ}09'$, at a solar (or lunar) eclipse that inclination is close to $5^{\circ}17'$. The reason is that the inclination is a maximum at the epochs when the line of nodes of the lunar orbit is directed towards the Sun, and that is the case at eclipses.

However, it is not the variation of the inclination of the lunar orbit on the ecliptic which results in a (slight) variation of the Gamma limit for central eclipses. The reason is the variation of the inclination of that orbit on the Earth's *equator*.

When the ascending node of the lunar orbit coincides with the vernal equinox (as in 1987 and 2006), the inclination of the lunar orbit on the equator is about $23.4 + 5.2 = 28.6$ degrees. But when the *descending* node coincides with the vernal equinox (as in 1997), the inclination is $23.4 - 5.2 = 18.2$ degrees. In the first case, the limit value for Gamma is equal to the radius corresponding to geographical latitude $90 - 28.6 = 61.4$ degrees. In the second case, to latitude $90 - 18.2 = 71.8$ degrees.

The tri-axial shape of the globe is not relevant here. Not only is the difference with a perfect ellipsoid very small, but eclipse calculations are always performed by considering the Earth to be a perfect ellipsoid, not tri-axial (except perhaps in very accurate calculations). I presume that even Fred Espenak uses a perfect ellipsoid in his calculations! Jean Meeus

From: Rybrks1@cs.com

Thank you, Jean, for the clarifications. I never noticed that the orbit inclination is quite near $5^{\circ}17'$ at eclipse time. I plugged numerous eclipses into my personal eclipse program (which is largely based on your "Astronomical Formulae" book) and of course you are right.

The other issue of different Earth latitude for ascending vs descending node was a straight forward one...I should not have missed that. Thanks again. Ray Brooks

From: Rybrks1@cs.com

As Jean points out, the polar radius is about 13 miles shorter than the equatorial radius. This is based on a b/a ratio for the sphere of 0.99664719, which I have been using for years from Jean's Astronomical Calculation book. However, it is certainly possible to have a non-central total or annular eclipse with gamma values higher than 1.00, provided the umbra or antumbra are large enough.

Jean, I assume that the reason the limit of gamma for non-central varies from 0.9970 and 0.9974 is because the Earth is a *tri-axial* oblate spheroid *and* the Moon's orbit inclination varies. Is this correct? That is to say, if it were a simple perfect oblate spheroid the distance from center to Earth limb would be constant for a fixed inclination Moon orbit but because the Moon inclination varies every 173 days, even for a simple oblate spheroid the gamma limit would still vary.

SETalk

Notwithstanding the gamma limit issue, is there now agreement that a saros can theoretically transition from total to annular (and vice versa) without a hybrid? It is certainly possible that the predicted gamma value for the year 7438 eclipse will indeed be central as presently predicted. Raymond Brooks

From: Jean Meeus

I think one should avoid trying to give names of persons to the "transition" or other points of solar eclipses.

If you wish to honor Willcox, try to have his name given to a minor planet, instead.

The names Oppolzer and Menzel already have been given to minor planets: the Nos. 1492 and 1967, respectively.

I am surprised that the name Espenak is still missing from the list of minor planet names. Who can propose this name to the Minor Planet Center? Jean Meeus

From: Jean Meeus

Further to my recent note on the limit of the quantity Gamma for central solar eclipses:

-- the *non*-central annular eclipses of 1950 March 18 and 1957 April 30 had Gamma less than 1, namely -0.9990 and +0.9990, respectively;

-- the next such case will be the non-central total eclipse of 2542 December 8, with Gamma = -0.9977. Jean Meeus

From: Jean Meeus

Yes, of course it is possible to have a total or an annular eclipse when Gamma is a little larger than 1. In that case, it is a NON-central total or annular eclipse.

Examples are the non-central total solar eclipse of 1967 Nov 2, with Gamma = -1.0008, and the two solar eclipses of the year 2043:

2043 April 9, non-central total, Gamma = +1.0030

and

2043 Oct. 3, non-central annular, Gamma = -1.0104.

Although the polar radius of the Earth is 0.996647 times the equatorial radius, the limit of Gamma for a central eclipse is between 0.9970 and 0.9974. The reason is *not* that the Earth is a tri-axial oblate spheroid, but it is because in a limiting case the axis of the lunar shadow cone grazes the Earth near the (northern or southern) polar circle, not at the pole.

In the case of a grazing eclipse occurring near a solstice, the "highest" northern or southern point of the Earth, as seen from the Sun, is not the pole, but a point near the polar circle. In the case of a grazing eclipse occurring near the March or September equinox, the highest northern or southern point *is* the pole, but then the path of the center of the umbra makes an angle of about 23 degrees with the East-West direction, so in that case the graze once again occurs near the polar circle. Jean Meeus

From: Gerard M Foley

>I am surprised that the name Espenak is still missing from the list of minor planet names. Who can propose this name to the Minor Planet Center?

SETalk

I add: If Jan Meeus is not already a minor planet, who can propose that name? Gerry <http://home.columbus.rr.com> <http://www.fortunecity.com/victorian/pollock/263/egypt/egypt.html>

From: Rybrks1@cs.com

I believe Jean does have an asteroid in his name. In 1981 the IAU named Minor Planet 2213 in his honor. Well deserved. Raymond Brooks

From: Evan Zucker

At 03:29 AM 7/31/02, Jean wrote: The names Oppolzer and Menzel already have been given to minor planets: the Nos. 1492 and 1967, respectively.

So have Pasachoff and Meeus: Minor Planet 5100 Pasachoff and Minor Planet 2213 Meeus. -- EVAN

From: Rybrks1@cs.com

The point I am trying to confirm regarding variation of the gamma limit is that if the Moon's orbit were a *constant* 5.15 degrees (or whatever constant value) then the gamma limit value would be fixed and would not vary for a simple oblate spheroid (or a perfect sphere). (This assumes the southern hemisphere has exactly the same b/a ratio as the northern half.)

Isn't the variability of the Moon's orbit inclination the reason for the Gamma limit value varying?

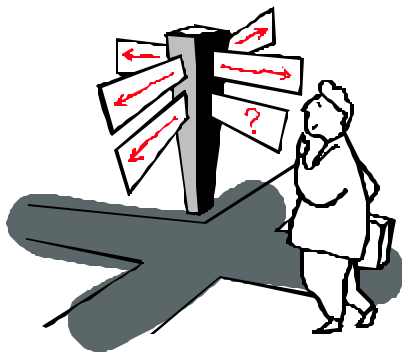
Regarding the tri-axial issue, shouldn't this be considered for just barely central eclipses like Oct 3 1986? Raymond Brooks

From: Dale Ireland

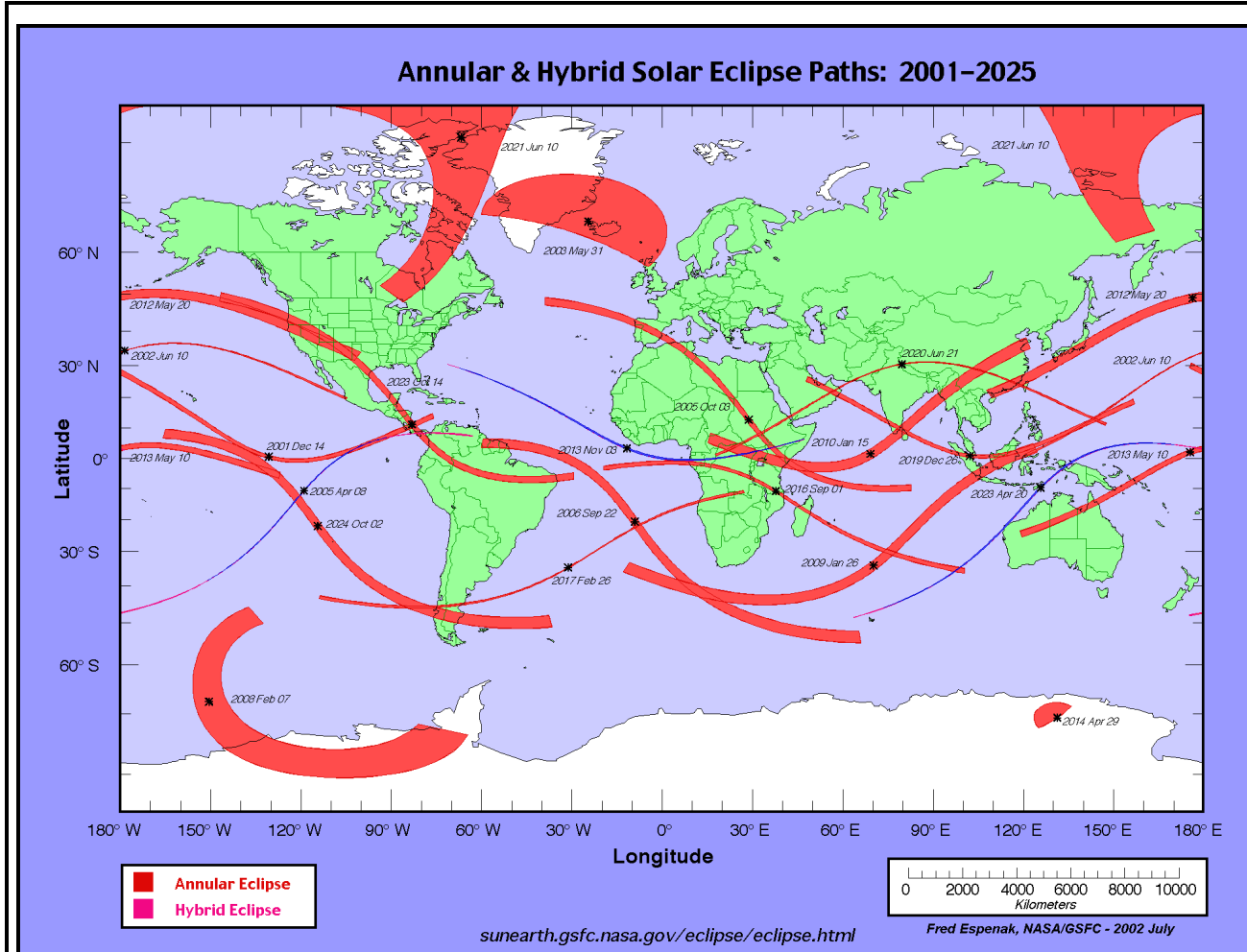
so has Frank Zappa, 3834 ZappaFrank. Interesting little article on the asteroid name game here. http://explorezone.com/archives/99_10/20_asteroids_rock.htm I am not aware of a committee naming eclipse transition points. Perhaps the International Star Registry could get into that arena. Dale

From: KCStarguy@aol.com

Dale Thanks for the asteroid naming info but let's not involve International Star Registry. The International Star Registry is a real sham of business (and I use that term loosely when talking about ISR). My blood boils when I hear the commercials on radio and how they bilk people for money. They give people a certificate with star info and say they will register the name in the copyright office. Now that is bad astronomy. Now Dr. Levy is doing it as a way to raise funds for charity, supposedly.



SETalk

**World Atlas of Solar Eclipse Paths**

From: FRED ESPENAK To: SOLARECLIPSES@AULA.COM eclipse@hydra.carleton.ca Date: Tue, 23 Jul 2002

My summer intern Holly Schurter has been working hard on adding new maps to the web page "World Atlas of Solar Eclipse Paths":

<http://sunearth.gsfc.nasa.gov/eclipse/SEAtlas/SEAtlas.html>

We have just added ten new maps covering the 19th and 22nd centuries. The atlas now covers the years 1801 through 2200 with twenty maps.

Thanks to helpful suggestions from Rick Fienberg, Glen Schneider and Eli Maor, we have modified how hybrid eclipses are displayed. The total eclipse portions of these paths are now plotted in blue while the annular sections of the paths remain magenta. Some people found it difficult to distinguish between the hybrid (magenta) and annular (red) eclipse paths. But I didn't want to go with a radically different color for the hybrid eclipses since they are, after all, annular eclipses along at least a portion of their paths.

All of the maps in the atlas have now been modified to show hybrid eclipses in the two color scheme. As an example, please look at the path of the hybrid eclipse of 2005 Apr 08 in either of the following two maps:

SETalk

<http://sunearth.gsfc.nasa.gov/eclipse/SEatlas/SEatlas3/SEatlas2001.GIF>

<http://sunearth.gsfc.nasa.gov/eclipse/SEatlas/SEatlas3/SE2001-25A-2.GIF>

Notice that the point where the hybrid eclipse changes from total back to annular is located about 1000 km west of Panama.

Please contact me with any comments or corrections. Regards, Fred Espenak

From: Jean Meeus

I notice something odd about the "hybrid" (annular-total) solar eclipse of 2013 November 3.

Fred's map shows the track of this eclipse to begin as annular (which is correct), then change to total, then returns to annular near the end of the track.

Actually, this eclipse remains total up to the end of the track. It is one rare case when the hybrid eclipse is annular-total, instead of the usual hybrid type annular-total-annular. This is because during the event the Moon's distance to the Earth is decreasing. Consequently: an error in Fred's maps ?? Jean Meeus

From: FRED ESPENAK

Jean is absolutely correct! In my haste to add an overlap track for hybrid eclipses in order to show the extent of the total portion of the path, I neglected to test the extreme ends of the path as to whether they were annular or total.

The problem with the 2013 eclipse path has now been corrected in the following eclipse maps:

<http://sunearth.gsfc.nasa.gov/eclipse/SEatlas/SEatlas3/SE2001-25A-1.GIF>

<http://sunearth.gsfc.nasa.gov/eclipse/SEatlas/SEatlas3/SE2001-25A-2.GIF>

<http://sunearth.gsfc.nasa.gov/eclipse/SEatlas/SEatlas3/SEatlas2001.GIF>

Jean's observation brings up an interesting point. Hybrid eclipses usually begin as annular, then change to total and finally revert back to annular before the path ends. The 2013 eclipse is a notable exception since it begins as annular but quickly changes to total for the remainder of the path.

How often does a hybrid eclipse occur in which the path either begins or ends with a total rather than annular eclipse (as in the 2013 eclipse)?

I have posted a web page listing all 550 hybrid eclipses over the 5000 year period from -1999 to 3000:

<http://sunearth.gsfc.nasa.gov/eclipse/SEcat/SEhybrid.html>

I invite Jean (or anyone else on the SEML) to generate a subset list of hybrid eclipses in which the path begins or ends as a total eclipse. Or has Jean already provided such a list in his two Mathematical Astronomy Morsels books? - Fred Espenak

From: FRED ESPENAK

The catalog of hybrid solar eclipses is now posted at: <http://sunearth.gsfc.nasa.gov/eclipse/SEcat/SEhybrid.html>

In preparing this catalog, I also generated a shorter catalog of hybrid eclipses which have a duration of totality of 01m30s or more. Out of the 550 hybrid eclipses occurring during the 5000 year period -1999 to 3000, there are only 26 of these

SETalk

very long hybrid eclipses. Three of them tie for the longest duration of 01m45s (to nearest second) in the years -0437, 1199 and 1423. In comparison, the hybrid eclipse of 2013 has a maximum duration of 01m40s which makes it the longest hybrid eclipse during the 1500+ year period 1424 to 3000!

I had not noticed how exceptional the 2013 hybrid eclipse was until Jean Meeus pointed out that it does not revert back to annular at its path end as most hybrid eclipses do.

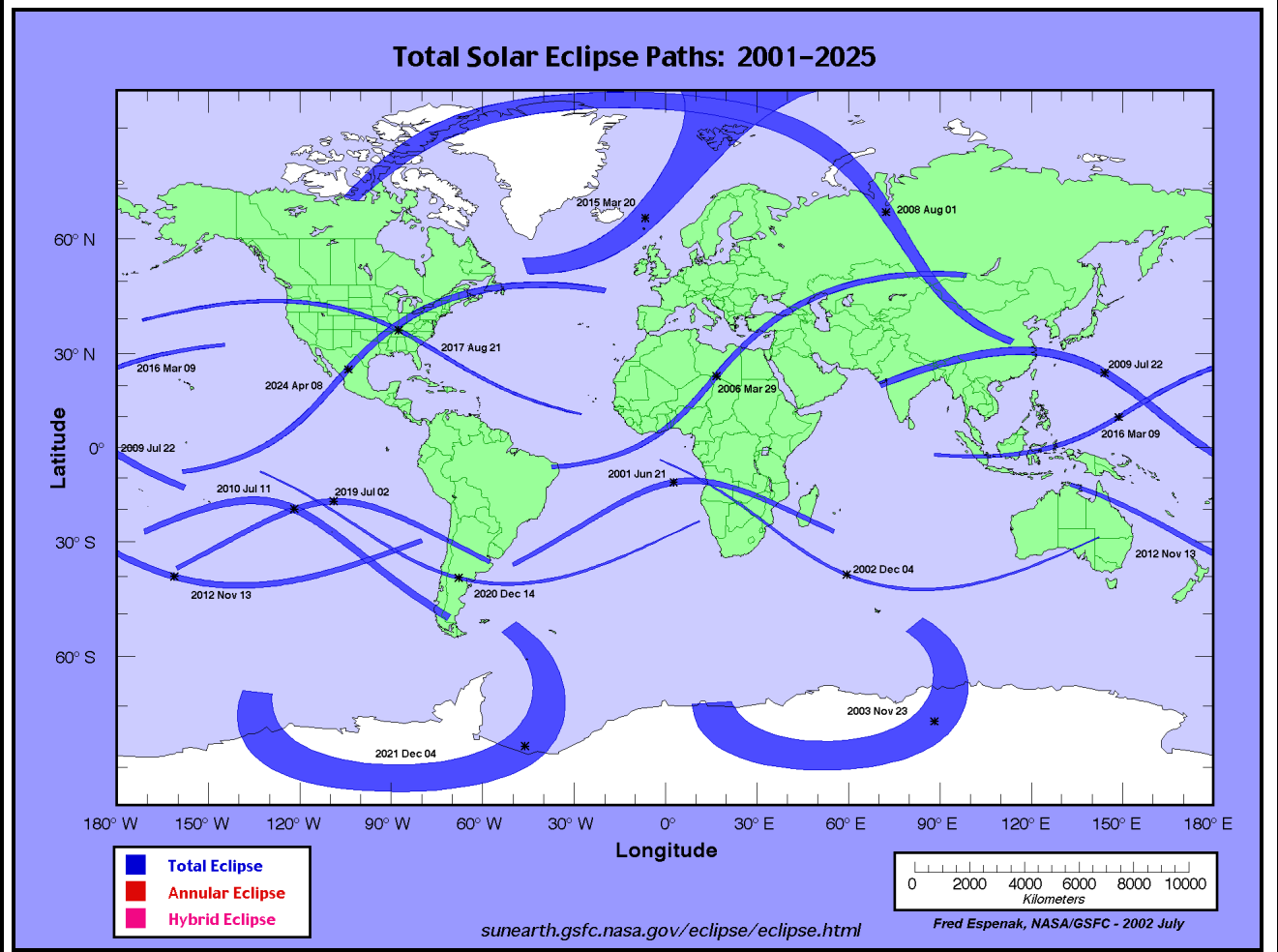
The short catalog of long hybrid eclipses is posted at: <http://sunearth.gsfc.nasa.gov/eclipse/SEcat/SEhybrid.html#longest> - Fred Espenak

From: Jean Meeus

Thanks to Fred for his replies. His maps are really splendid. Concerning hybrid solar eclipses: I made some calculations about this subject in October 2001, but unfortunately it was too late for inclusion in my second "Morsels" book (whose last sheets were sent to the publisher in September). Consequently, the subject will be delayed to a third Morsels book, if ever I write one!

I found 655 hybrid eclipses between the years -2000 and +3400. The longest duration of totality at such an eclipse was found to be 108 seconds, at the eclipse of -979 August 13. This is eight seconds longer than at the hybrid eclipse of 2013 November 3.

Closer to the present time, I found 105 seconds totality at the hybrid eclipse of 1423 July 8, and 104 seconds on 1564



SETalk

June 8. Jean Meeus

From: Rybrks1@cs.com

Buried in the last sentence of my exceedingly long discussion last March about conventional new moons being extended saros series was a query that Jean Meeus has now resolved: Can a single *eclipse* be total-annular or annular-total? I called it a weird hybrid. Nov 3, 2013 answers that.

The other question was: Can any solar eclipse *saros* transition from a string of totals to a string of annulars *without* a hybrid eclipse in between? (or vice versa)

Excerpt of my personal notes from last March:

Completely different question for later....can a conventional saros that changes from total to annular (or reverse) ever make the transition without having a hybrid eclipse?

Some saroses are all totals, more are all annulars, most are a mix. I suppose a saros could be all totals until just before the last central eclipse and then this last central eclipse is purely annular because the Arctic bulge is so small (compared to the equatorial bulge) and so the shadow length from the moon changes very little. Also, the flip flop could happen at the start of a conventional saros. So both transitions should be possible without a hybrid. Must check that.

I checked saros numbers 1 through 200 but all transitions do it with a hybrid. The saros that comes closest to not having a hybrid is Saros 124 at the end, Oct 3 1986. (And Saros 142 at the start) They are all totals but this last one is barely a hybrid...annular / total / annular. How about a weird hybrid ?..... I suppose an Arctic hybrid theoretically could start as annular, transition to total from the small bulge, and if the moon has moved enough in half an hour then not go back to being annular. Ray Brooks

From: Michael Gill

Thanks to Fred and Holly for these wonderful maps.

They are a useful tool for uncovering little subtleties about eclipses that otherwise I would probably have overlooked.

I love how the colours fluctuate from map to map. Notice how red the 1841-1860 map appears thanks to the broad annular tracks at high latitudes, while the 2061-2080 map looks bluer. Australia looks nice and blue in the 2021-2040 map, while in the same map South America looks red.

I noticed on the 2041-2060 map that the 2052 TSE and the 2053 TSE overlap. The 2053 TSE track starts at the sunset point of the 2052 TSE. It is almost like the umbra resumes its journey across the Earth's surface following its 1.5-year interruption!

I wondered if such pairings needed to be near the equinox, but then I found the 1835-1836 duo (November).

I looked for other pairings like this in these maps. The 2045-2046 TSE pairing came close, as did the 1965-1966 two-some, but these tracks do not line up as exquisitely as the 2052-2053 duo. One Saros interval before (China) and after (Pacific) the 2052-2053 pair there were near misses.

Others pairs found were 1892-1893 and 1947-1948.

I wonder if someone else (with a similar mind to me) has already looked for pairings such as these (where the umbra touches down at the point where it left the Earth on its previous visit)? Can there be any trios out there?

Tabulated data certainly has its place, but these beautiful maps are real gems. I look forward to more maps being posted.
Michael Gill

SETalk

From: Rybrks1@cs.com

All these marvelous and entertaining maps from Fred and Holly almost compel one to think in terms of saros series.

I spent some more time looking at the question I posed last week (and last March) of whether a solar eclipse saros can evolve from a series of total eclipses to a series of annular ones (or vice versa) *without * having any hybrid eclipses between them. (I did not see any chapters on this detail in either of Jean Meeus' delightful Morsels books.)

I chose not to examine eclipses that have low gamma values (middle of the saros) since in order to transition from a total to annular there, in only one saros increment (18 yrs 11 days) the Moon would need to change its distance from Earth by nearly 4,000 miles (or whatever the radius bulge for that particular gamma). A change of 4,000 miles (6,400 km) is not possible in a single saros increment since it takes 66 saros increments to migrate from perigee to apogee, or about 450 miles (720 km) average per saros increment. The peak change in Moon-Earth distance per saros increment is midway between the apsides at about 750 miles from eclipse to eclipse.

So I concentrated on high gamma values near the top and bottom of Earth. Knowing that the gamma values change very little for eclipses near Earth perihelion, I looked there also. So now I had a where (top or bottom) and a when (near perihelion).

I began somewhat discouraged since the inspection I did last March of Saros 1 through 200 came up empty—i.e., all transitions in those 200 series included at least some hybrids. But around perihelion time, gamma values change so little on average that I became encouraged. They average around a 0.004 change which, near Earth's top/bottom, would correspond to only a 350 mile or more change in required Moon distance... so the average and peak distance changes would work there. Then I found a partial eclipse on Jan 12, 2290 with a ZERO change in gamma value versus its predecessor. Even though it was a slight partial, now it seemed very, very possible. Had that been a non-central total eclipse then only a few miles of distance change by the Moon would have made the next eclipse a non-central annular and not a hybrid.

As I continued looking at Saros 200 through 300 I found three series that had only 1 hybrid in the transition; Saros 219, 231 and 268 but no prize. (Saros 253 had 15 consecutive hybrids! As expected, those 15 hybrids center on a gamma near zero)

I got to Saros 300 with no luck, then bingo! Saros 308 ends the series with a transition from total to annular without a hybrid eclipse. Oct 27, 7420 is total and Nov 7, 7438 is annular. A few other astronomy programs also list them distinctly as total and annular and neither as hybrid. The total eclipse begins with a duration of 2 seconds, peaks at 36 secs and ends with 5 seconds. The annular begins with 14 seconds duration, reduces to 8 seconds then back to 14 again.

Delta T would only change what longitude this occurs but the question I have is this: Is this too far in the future to predict and too close to call? The gamma for the annular eclipse according to EclComplete is 0.9935. This is even closer to missing Earth than the Oct 3, 1986 eclipse in Iceland!! I suppose even if it eventually really has a gamma of 1.0001 that would suffice as a non-central annular. Raymond Brooks

From: FRED ESPENAK

World Atlas of Solar Eclipse Paths

The "World Atlas of Solar Eclipse Paths" has been expanded once again. My summer intern Holly Schurter and I have just added ten new maps covering the 18th and 23rd centuries. The atlas now covers the years 1701 through 2300 with thirty maps. The URL address of the index page is:

<http://sunearth.gsfc.nasa.gov/eclipse/SEatlas/SEatlas.html>

Please contact me with any comments or corrections. Regards, Fred Espenak

A
S
E

2
0
0
2

Report and pictures of AE200206 on SEWP

From: Patrick Poitevin To: SOLARECLIPSES@AULA.COM Date: Sun, 30 Jun 2002 21:59:23

Hi, Jo's report and some pictures of the annular solar eclipse 10 June 2002, Chimo (Mexico) can be found on our Solar Eclipse WebPages (SEWP).

<http://www.j.w.edmonds.btinternet.co.uk>

Please see as well links to other reports (still under construction). Best regards, Patrick

Mexican ASE : photos taken at 1250 mm focal ...

From: ccmlt To: SOLARECLIPSES@AULA.COM Date: Tue, 09 Jul 2002 19:11:04

Dear friends, I finally got the photos taken from that famous beach near La Cruz de Loreto last june ... Never too late !

The photo were taken with a Meade etx 90 Mak at 1250 mm focal (german EQ mount, no motor drive), on Kodak Royal 100 iso. 1/4 and 1/2 sec. From the roll, I chose 2 rather nice images, despite cloud's blurring. Hope you like them ' ; -) What a thin crescent !

You can see the first photo here : <http://astrosurf.com/carnets-astronome/> And the other one here (bottom of the page, or direct click on the first photo) : <http://astrosurf.com/carnets-astronome/eclisol/2002/eclimex2002.htm> Sincerely, Christophe Marlot



Jo and Corona, Eclipse poster in PV and Family Barr and Jo and the Hard Rock Café in PV

All pictures June 2002 by PP



More June 10th photos

From: Dave Schmahl To: SOLARECLIPSES@AULA.COM Date: Tue, 09 Jul 2002 22:20:45

Dear list, I'm new to this email list, so I wanted to share some of my pix of the June 10th Annular that I took from near the center of town in Puerto Vallarta. My website, www.schmahlconsulting.com also contains links to other astro photo projects I and others have dabbled in over the years. Some of the links are still "under construction", but I hope to fill them in one of these years. Best wishes to all, Dave Schmahl, Vista, CA.

From: Alejandra León-Castellá

Your page is very nicely done. I specially like the easy loading and presentation of the thumbnails, so people can have an overview and rapidly choose what they want to focus on. Regards, Alejandra León Castellá San José, Costa Rica

T
S
E
2
0
0
2

South Africa

From: Nives Schabort To: SOLARECLIPSES@AULA.COM Date: Tue, 02 Jul 2002 11:15:16

Hi Patrick, Just to let you know we haven't forgotten about your request. All of the inns canvassed are sold out for that week, but I am asking friends with properties in the area to help out. I am sure we will have something in the next 2 weeks (might be on the couch or in a tent, but it will be in a good spot).

Would you post the message we sent a while back on your notice board for other members. It may be a great opportunity for those who haven't been on safari, to take a holiday. Please let us know. Best regards, Gordon and Nives, CapeScout

Great Knus about the December 4

From : "eclipse98" <eclipse98@earthlink.net> To : <patrick_poitevin@hotmail.com> Date : Thu, 04 Jul 2002 17:25:59 -0400

Fellow Eclipse-o-philes, I am please to share two great pieces of knus with you about the upcoming Total Solar Eclipse on December 4, 2002.

Hole in the Sky Tours has secured an even better price for the Africa Eclipse cruise. With one full pay passenger, the second person pays nothing for the cruise portion (must still pay port fees of approximately \$380). The add-on airfares have also been reduced, making the entire package more affordable than ever! We will depart on Saturday November 23, 2003 and begin our tour with 2 days of safari in beautiful Kenya. The comfortable and gracious Marco Polo will be our home as we visit Zanzibar, Madagascar (endangered black lemurs!), with 4 ports in South Africa. The tour ends on December 12th. If you have had any desire to see this eclipse, make your reservation now as there are very few cabins left. For additional details see our web page: www.holeinthesky.com

The other good piece of news concerns those of you who would rather visit Australia. We have combined forces with Totality Tours to offer a 15 day/14 night trip that includes stops in Adelaide, the Outback (to view the eclipse), Ayers Rock, the Great Barrier Reef and of course beautiful Sydney! The cost of this tour is \$4,095 USD (pp-double occupancy) which includes airfare from Los Angeles! An optional 5 day/4night extension to New Zealand is offered for \$575 USD (pp double occupancy). Full itinerary details and reservation forms are available on our web page: www.holeinthesky.com

Finally, I would like to thank those of you who have passed our name along to your friends who might be interested in joining us for this, or a future trip to "stand in the shadow of the moon". Please pass along our web address, and tell them to be sure and visit the section with photos and stories from previous eclipses. Thank you! Clear Skies, Jerry Levy

Ceduna Coordinator

From: rcurkpatrick@ceduna.sa.gov.au To: SOLARECLIPSES@AULA.COM Date: Tue, 16 Jul 2002 13:07:10

Greetings I am Rob Curkpatrick and I have been working on the events surrounding the total solar eclipse of 4th in South Australia, Australia. My main responsibility has been with Ceduna, but I am now co-ordinating various activities and events in other parts of the Outback as well (on behalf of the South Australian Government). There has been a lot of activity over the last 6 months and although we still have much more to do,we are pleased with our progress, and have a reasonable idea of what to expect.

The Ceduna Website has been upgraded and is online. Please have a look at www.ceduna.net

Regards Rob Curkptrick Events Co-ordinator Eclipse in the Outback, Australia

From : "eclipse98" <eclipse98@earthlink.net>

Fellow Eclipse-o-philes, My email yesterday included two errors, one that was obvious and trivial, and second kind of important. The starting date for the eclipse cruise is November 23, 2002, not 2003!

Our travel partner for the Australian Trip is Twilight Tours, led by the very experienced Joel Harris. For full itinerary details please visit our web page: www.holeinthesky.com

Finally, I would like to thank those of you who have passed our name along to your friends who might be interested in joining us for this, or a future trip to "stand in the shadow of the moon". Please pass along our web address, and tell them to be sure and visit the section with photos and stories from previous eclipses. Thank you! Clear Skies, Jerry Levy President Hole in the Sky Tours

T
S
E

2
0
0
2**Eclipse trip to Australia**

From: Henrik Glintborg To: "solareclipses@aula.com" <solareclipses@aula.com> Date: Thu, 04 Jul 2002 12:07:30

Just to inform that I still have some tickets for my solar eclipse trip to Australia November 25 to December 14.

25: Copenhagen - Singapore

26-28: Singapore

29-02 December: Sydney (citytour, Ballet Swanlake at Sydney Opera House, Blue Mountains, Echo Point, Three Sisters, Sydney Observatory)

02: Adelaide (citytour)

03-05: Ceduna (ECLIPSE!)

05: Port Augusta

06-07: Coober Pedy (city tour)

08-09: Ayers Rock (Olgas, Sounds of Silence dinner)

09: Henbury Meteorite Crater Reserve + Alice Springs

10: Alice Springs (citytour)

10-13: Cairns - Great Barrier Reef (Kurunda, Cape Tribulation)

13-14: Singapore - Copenhagen

Price per person in shared double room: DKK: 35495, Euro: 4777, \$: 4670

If interested, please contact me for further information: hg@etc.dk Regards - and clear skies! Henrik Glintborg EtC Space & Nature Copenhagen, Denmark

Eclipse knus

From: eclipse98 To: Solar Eclipse Newsletter <solareclipses@Aula.com> eclipse@hydra.carleton.ca Date: Fri, 05 Jul 2002

We have secured new lower pricing for the eclipse cruise off the eastern coast of Africa. Details on our web page: www.holeinthesky.com Also, we have teamed up with Totality Tours to help co-promote a fabulous extensive tour of Australia for those who wish to view the total eclipse at sunset in the Australian Outback. Again, full itinerary details available on our web site. 5 months to go as of today! Clear Skies, Jerry

From : "Hole in the Sky Tours" <holeinthesky@earthlink.net>

Dear Eclipse-o-philes, Thank you for the great response to my last email. There are now only 7 cabins left on the cruise, so if you are even remotely interested in seeing the total solar eclipse on December 4, 2002, take a look at the web page for all of the details: www.holeinthesky.com This tour features 2 days of safari at the beginning of our trip, and 3 days in Cape Town at the end. In between we will enjoy several relaxing at sea, stops in Zanzibar, Nose Kombe, Madagascar and 3 other cities in South Africa.

There are also only a handful of slots left on the Australian Outback eclipse tour which will be led by Joel Harris. This tour features Sydney, Adelaide, Ayers Rock and the Great Barrier Reef in addition to seeing the eclipse near sunset in some of the most dramatic scenery in the Australian Outback. The weather forecasters finally agree that 2002 will be an El Nino year. This is good news for both eclipse viewing sites, as it suggests the weather will be clearer in both locations! Clear Skies, Jerry Levy President Hole in the Sky Tours

p.s. Please refer your friends who might be interested in 'standing in the shadow of the moon' to our website: www.holeinthesky.com Thank you!

Eclipse article in the paper last weekend

From: Geoff To: SOLARECLIPSES@AULA.COM Date: Sat, 13 Jul 2002 05:56:18

Hey, Thought you guys might be interested in an article I found in a paper last weekend on Saturday (SORRY I can't remember what paper- but it was either the Weekend Australian or Sydney Morning Herald).

It was just about how they plan to "soften music" during the eclipse so scientists could calibrate equipment. Apparently at Lyndhurst there is a 4 day trance festival on during the eclipse, and the music is going to be stopped during the eclipse.

If any one wants more information I can type out the article, but it was not a very informative article, and as usual for science articles, very badly written. They say that and I quote: "Two South Australian towns, Ceduna and Lyndhurst, are the only places in the world where the eclipse can be seen on December 4." What about the Atlantic, Africa, the Indian Ocean, or anywhere along the lengthy path from the bottom South Australia all the way into New South Wales / Queensland?

I think they meant the only two TOWNS in AUSTRALIA , rather than the only two PLACES in the WORLD :) -- Geoff

From: Marc Weihrauch

Hello everybody, the problem with the media Geoff describes is not uncommon. In Germany 1999 they tried to tell us that the next solar eclipse in our country was in 2081. That may be true for a TOTAL solar eclipse in Germany, but as you all know the next SE here will occur on May 31, 2003.

Almost everytime I read an article about astronomy in the paper, hear or read a report on the radio or on TV, and it's not trade press, I find serious mistakes. I wonder how much I may believe of what they scribble in other subject areas... Best regards Marc

From: Michael Gill

The article is filed in the Sydney Morning Herald's ten-day archive and can be read at the following URL for another few days: <http://www.smh.com.au/text/articles/2002/07/05/1025667059967.htm> Michael Gill

From: Dale Ireland

Hi After reading the article I am wondering why "NASA scientists" are having the music stopped in Ceduna. Is it really that big a problem to solar eclipse viewing equipment? Couldn't the scientists set up a couple kilometers away from the music? I mean the eclipse path is rather large. Sort of like building your house near an airport and then complaining about the noise. Son, this here eclipse path just aint big enough fer the both of us. Dale

From: Jay.M.Pasachoff@williams.edu

I don't know about others, but I asked for quiet for a couple of hours before and during the eclipse. In Romania, the volume of the rock music in Ramnicu Valcea was overwhelming and we could hardly hear ourselves communicate. I'm not a NASA scientist, but maybe somebody used that as a shorthand. We are dependent on a fixed site and electricity and will be set up for a week or two in advance, so it is not easy for us to go out of town. Jay Pasachoff PS: Dale, when can you post the results of the fogging of that film I took to Ceduna and back for you?

From: 76630,2206

Marc: Don't believe much of anything that the mass press puts out.

Their reporters are not interested in the facts. I have had several encounters with reporters regarding astronomical events: eclipses and aurorae mostly, and am clear that many of them could not care less about what I said.

(Continued on page 108)

T
S
E

2
0
0
2

For example, CNN messed up the facts on last month's annular. It was sad and left me wondering just what passes for an American education. With the way things are going, I am anticipating human sacrifices on 21 August 2017. ;-)

The British were not much better. They drove Ralph Chou nuts before 11 August 1999 declaring how unsafe looking at the eclipse would be under ANY circumstances. Instead of preparing for our tour, he had to travel too frequently to the UK to fight its medical establishment. --Robert B Slobins

From: Mike Simmons

I was at work at a local planetarium/observatory in Los Angeles during a partial solar eclipse in the 1970's while my wife was in an open space in front of the planetarium with other visitors. I had given her a solar filter to use for observing the eclipse. Later that night during one of the local television station's report on the eclipse they said that some people insisted on looking at the Sun despite being warned that it was unsafe. Illustrating the point as the reporter spoke, the video zoomed in on my wife looking at the Sun through the safe solar filter I'd given her! Mike Simmons

From: Dave Schmahl

It seems you don't even need a high school education to be a repoter.

From: B0802Alex@aol.com

Hi all! Newspaper-articles about astromical events of general interest in the German yellow press sounds almost very fantastic...and wrong. One more example here. When I returned from the last years TSE in Zambia, a German paper wrote about that, and here are only the highlights from that article:

The headlines started with big letters: "What' s going on with the heaven's above? Millions of people feel fear about the total solar eclipse in Africa - Planet Mars stands as close as never before to the Earth - Our moon takes cover. Enormous: At night, a very dark heaven will be found, because the moon stands behind the earth and will not be lighten by the sun. In the night before solstice, Jupiter,Saturn an Venus can be found in a line together. Is this the reason for pretended aliens in Serbia?"

Reading articles like these reinforce the aversion of most of the readers against serious reports. But unfortunately, this upstanding rubbish found its readers a million times. Best regards Alexander Birkner www.kernschatten.info

From: FRED ESPENAK

I'm going to Africa not Australia for December's eclipse. However, I wanted to comment on Dale's email.

The eclipse path in Ceduna is actually rather narrow (about 35 km from edge to edge). For all practical purposes travel is limited to the coast road. Furthermore, most people don't want to be too far from the center line or they will lose precious seconds of totality. Finally, an eclipse expedition has certain requirements including electrical power and shelter from the hot Sun. Put this all together and you realize that your location of viewing site is severely restricted.

During the June 2001 eclipse, I chose an observing site north of Lusaka for my group of 80 people. We scouted this site out many months in advance of the eclipse. About two months before the eclipse, I learned that there was to be a huge music festival with thousands of people just 4 kilometers away from our accommodations and observing site. By this point in time, it was too late for us to move because there was nothing else available for a group our size.

I contacted the music festival organizers and expressed my concerns about loud music and its interference with our eclipse observations. They reassured me that there would be no problem. When we arrived at our observing site and accommodations one day before the eclipse, you could clearly hear the LOUD music which continued unabated throughout the entire night. I have trouble enough sleeping before an eclipse but the constant monotonous base beat all night long allowed me now rest at all. Thankfully, the music did stop shortly before the eclipse and then resumed shortly after.

(Continued on page 109)

I can only say that I will now go to great efforts to make sure that I am never again so closely situated to a group/organization which causes so much disruption and distraction to the spectacular experience of totality. Fred Espenak

From: Glenn Schneider

T
S
E

As I am not planning to observe from Ceduna, and though my research funding and compensation for my "functional work" comes from NASA I am an employee of the state of Arizona, I am not really sure I am qualified to respond to this question. With that caveat, my only complaint might be with the choice of music. I usually bring my own tunes to set up and calibrate my equipment to as some "popular" selections are not always conducive to the atmosphere of an eclipse. Post-eclipse, my somewhat customized version of UMBRAPHILE imports and plays an MP3 of the Beatles "Here Comes The Sun" after third contact. However, in the excitement of the moment I don't think I ever have heard it in situ. cheers, Glenn Schneider <http://nicmosis.as.arizona.edu:8000>

From: Jörg Schoppmeyer

2
0
0
2

I am the same opinion as Fred. And it is a shame that the headquarter of this solipse-people is in Germany. So Germany organized the biggest group of "eclipse-spoilers" for Africa and again for Australia ! Can't they hear enough music at home ? Are they really interested in observing eclipses ? I don't think so. Joerg Schoppmeyer

From: rcurkpatrick@ceduna.sa.gov.au

The claims that "rock and roll has been banned forever by NASA in Ceduna" is absolute nonsense. Yes, we were asked by a few people to keep the noise down in the town center for a few hours before the total solar eclipse. No problem. The event organisers in Ceduna have always been of the view that the festive side of things takes a back seat to the wonderful natural phenomenon that we are going to experience. So, no problem. Nobody mentioned NASA. There will be some low key entertainment, but the party will really start when the sun goes down. The media must have been having a quiet day, so the story had blown way out of proportion. The publicity for Ceduna has been enormous, but please don't think it was done deliberately. Regards Rob Curkpatrick Event Coordinator Eclipse in the Outback www.ceduna.net (Events Page)

From: Mike Murphy

Just for the record, Solipse are not organising any festival in Australia nor in Africa for the Dec 2002 eclipse. They are arranging a free festival in Poland in August/September if you are interested. ;-) - Mike

Eclipse Glasses

From: rcurkpatrick@ceduna.sa.gov.au To: SOLARECLIPSES@AULA.COM Date: Tue, 16 Jul 2002 13:06:32

To the several people who have sent me details on purchasing eclipse glasses, you may be interested in the attached document which has been released by the South Australian Government.

Regards Rob Curkpatrick

The Environmental Health Branch of the Department of Human Services endorses the following statements provide by The Royal Australian and New Zealand College of Ophthalmologists (RANZCO).

NO SAFE WAY OF DIRECTLY VIEWING AN ECLIPSE

Australia's medical eye specialists warn that there is no safe way of directly looking at any eclipse of the sun.

Dr Stephen McGovern, Chairperson of the South Australia Branch of The Royal Australian and New Zealand College of Ophthalmologists (RANZCO) says:

People should not look directly at any eclipse of the sun, with or without sunglasses, welder's masks, or any other device not specifically designed to observe the sun.

(Continued from page 109)

These do not provide protection from the risk of developing permanent damage to the eyes.

Other devices, such as binoculars and telescopes, also do not provide protection.

People may not be aware of damage occurring as the visual damage from viewing an eclipse directly is not accompanied by pain. There are no pain receptors on the retina inside the eye.

Apart from the lack of pain, there may be no immediate indication that vision is being affected, as the permanent effect of viewing the eclipse directly may not be apparent until days or weeks later.

There are, however, two indirect ways of observing an eclipse:

1. By closed circuit television
2. By projecting an image on to a piece of paper through a pinhole in a piece of card- while looking away from the sun

Note: There are some specially designed solar filters through which it may be safe to observe the eclipse. People should seek appropriate, expert advice about suitability before using any such device for this purpose. 11 July 2002

From: Dale Ireland

This really too bad, another case of Political Correctness overwhelming the truth. Telling people that they can't watch a total eclipse without fear is pretty disgusting. I see their motives but does that justify publishing a patently false statement from the government. I think the public is smart enough to understand the real explanation. Dale

From: Mick Wolf

Dale, I quite agree with you...the so called political correctness is a lot of bull. Mick.

From: Glenn Schneider

As I am sure not everyone on SEML can read the attachment sent by Rob, I am taking the liberty of re-sending it here (appended below) as plain text (and as Pat had asked for regarding posting formats).

What is striking to me is that apparently NOTHING has changed in a quarter century. This is exactly the sort of mis-information by mis-direction by omission which caused millions of Aussies in Melbourne and other areas no miss the Australian TSE in 1976. Though others on SEML may have seen my earlier re-positngs from the popular Australian press for that event (at least for those who did not "heed" such dire warnings), but if not - or to refamiliarize yourself with what Rob has forewarned us what we may be up against do see: http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_76/ECLIPSE_76_SCARE.html

Seems the only thing which has changed is the person who holds the chair at RANZCO. What a shame (or should I say sham). Glenn schneider

From: Crocker, Tony (FSA)

It's improved a little bit. At least there was the note at the end about specially designed solar filters. But the "dark secret" appears to be that no government authority seems to be willing to say in print that it's safe to look with naked eye during totality. I remember in Hungary sometime after first contact my wife asking, "Are you sure it's safe not to use these (the eclipse shades) when it's total?" She was really worried when our 10-year-old got lost 30 minutes before totality without shades, thinking he would be tempted to look too early. Fortunately we found him in 20 minutes.

From: Mark

I think the problem is there are too many wrong ways to view the sun directly. So the political position is to say there is no safe way

(Continued on page 111)

T
S
E
2
0
0
2

to do it. We see this from the American Association of Ophthalmology two weeks before any solar eclipse in the US. By that time, we have supplied a ton of Eclipse Shades, and our phones start ringing off the hook for safety information from a lot of very nervous people. In the last conversation I had with a representative from the American Association of Ophthalmology, they agreed that our materials were assuredly safe, but again they could not guarantee that people would not make the wrong choices, so this remained there political line. In the document from RANZCO they do acknowledge the existence of materials that are safe for direct solar viewing. They should go one step further and recommend reputable sources.

Professional and amateur astronomers have been putting solar filters on the fronts of telescopes, binoculars and cameras for years. All this viewing is not only done with the naked eye but under extreme magnification. Naked eye viewing with a proper solar filter should be at least as safe. Clearly our technology and materials have improved since the 1976 eclipse in Australia. What we have been hearing is that Australia has become very litigious. So take the fear of looking at the sun, couple it with the fear of being the one who is going to get sued for telling someone to do it, and you have a country that is going to miss out on one of nature's most incredible events. Wake up folks...people have been naked eye viewing solar eclipse and sunspots for years with the proper solar filters...safely. Mark Rainbow Symphony, Inc. <http://www.rainbowsymphony.com> Ph# 818-708-8400 Fax# 818-708-8470 Quality Paper Eyewear and Specialty Optics

From: Glenn Schneider

You are 100% correct in your assessment of fear of litigation causing the suppression of information - at least through "official" channels. This, unfortunately, is not uncommon even (or particularly) here in the U.S., as Evan Zucker and others have discussed previously in this forum. However, I found the situation so appalling in Australia in 1976 it made my stomach turn. I don't know if you had a chance to read any of the representative articles from the Aussie papers I put on my server but the "Lock Up Your Children - Expert" tag on the one which said in part: "Kids have to be locked in doors for their own protection" etc. really sets the tone. I hope these kids who found themselves in window-less closets in 1976 turn around and sue the Australian Optometrical Association for the psychological damage done to them in the name of protection by the "expert" from the AOA. Am I too harsh? I think not. We pander too much to pseudo-science, urban myths, and common fears. It is our responsibility to help dissuade this sort of misguided thinking. That said, I now hope they will still let me into Australia later this year... -GS-

Post Eclipse Activities at Ceduna?

From: Geoff To: SOLARECLIPSES@AULA.COM Date: Sat, 13 Jul 2002 05:46:46

Hey everyone, Just wondering what (if any) plans people have for pre/post eclipse at Ceduna later this year. With 20,000 (?) people expected.. obviously not everyone will have accommodation, and I'm guessing lots of the Australian population will just be roughing it in their cars. I was wondering what everyone is going to do after the eclipse? Since it occurs at sunset everyone would probably be in the mood to go out for dinner rather than drive home. Is there any planned activities or meeting places for us all? And if there is.. how will they cope with all the crowds? --Geoff

From: Henrik Glintborg

Hi Geoff! I have been told by the organizers at Ceduna that there will be some kind of festive after the eclipse - a big party with fireworks etc. But I have also been told, that they want to keep it as a secret. As I am bringing a group of 80 people to Ceduna from Denmark to observe the eclipse, I would have liked to get just some information from the organizers - but no...

But I am looking forward meeting you in Ceduna. My group will stay at the "Tent City Satellite Village" (see www.cedunatours.com for more informations).

But, by the way, how many from this mailinglist are going to Ceduna for the eclipse? Henrik Glintborg EtC Space & Nature Copenhagen, Denmark hg@etc.dk

From: Fraser Farrell

Geoff (and everyone else), There are many activities planned for pre- and post-eclipse at Ceduna; in addition to the usual tourist

T
S
E

2
0
0
2

activities available in the region (fishing, surfing, diving, boating etc).

The Event Organiser for Ceduna is also subscribed to this list; so I will leave it to him to announce the final calendar of events. Whenever you're ready, Rob.

The Australian media have printed claims that concerts will be banned in Ceduna for the eclipse. This is bull... What will really be happening is that Ceduna will be kept "quiet" in the hours preceding the eclipse, so that the scientific parties can setup & calibrate their instruments.

Also there has been a -LOT- of work done already, by state & local authorities, on the general logistics involved with this temporary ~10x increase in Ceduna's population. I would forget about having a normal quiet evening out on the town. "Going out for dinner" will probably involve attending a giant outdoor barbecue or something similar, with thousands of other people, then watching the concert & fireworks and other things afterwards.

As for the Lyndhurst end, see www.outbackeclipsefestival.com. Disclaimer: Although these people quoted a lot of stuff directly from my website (and ASSA's) without attribution, I have no association with this event. cheers,

From: rcurkpatrick@ceduna.sa.gov.au

Henrick, There is no secret about our festivities in Ceduna. The details are on www.ceduna.net (Events Page). I'm not sure what will be happening at your "tent city", but there will be a lot of festivities in the town of Ceduna. Regards Rob Curkpatrick Event Coordinator

Woomera Australia (Eclipse 4.12.2002)

From: Jörg Schoppmeyer To: SOLARECLIPSES@AULA.COM Date: Wed, 10 Jul 2002 14:10:35

I just read on <http://www.atomicarchive.com/Almanac/Testsite.shtml> (you have to switch to 1951-1960) that Woomera was a test site for atmospheric nuclear tests. Is it that Woomera which is near to the path of totality ? Maybe it is dangerous to go in this area ? Joerg

From: Fraser Farrell

Jorg, No offence, but this particular topic gets inflated out of all proportion by the anti-nuclear fanatics. And because I have received a few other emails on this "nuclear contamination at Woomera" in recent weeks, I will answer this topic here and now.

These nuclear bomb tests by the UK government were conducted HUNDREDS of km to the west of Woomera, at a place called Maralinga, during the 1950's. The Maralinga region is near a geographic boundary where the flat treeless limestone of the Nullarbor Plain disappears beneath the red sands of the Victoria Desert.

To get there from Woomera you drive west for about an hour on a bitumen road to Glendambo, then continue west on a reasonably good dirt road for another 1.5 hours to Tarcoola, followed by another three hours on a 4-wheel drive track beside the transcontinental railway line, and then go north on another 4-wheel-drive track for another 1.5 hours. In short, you're not likely to end up going there accidentally during your Woomera visit....

Maralinga was chosen because of this remoteness, and the belief (now disproven) that any fallout would not go into the populated areas of Australia. Incidentally the Australian government of the day was very friendly to the UK government, and terrified of being overrun by the Menace Of International Communism, so in the 1950's there was strong political (and popular) support for these tests.

How things have changed. During the 1990's, the UK government were compelled to spend about \$300 million (Aust) to clean up their mess. The Aust government spent about \$100 million of their money (ie -my- tax dollars) on the Maralinga cleanup too.

(Continued on page 113)

T
S
E

Areas of lesser contamination were scraped clean, and this soil & plant life was buried in International Atomic Energy Agency-approved landfills on the site. Aircraft and other equipment that had been abandoned after the bomb tests were also put into these landfills.

The regolith in the most severely radioactive areas -- the spots where the bombs were actually detonated -- was fused into glass using a robotically operated mobile thermic lance. A few heavily contaminated vehicles were cut apart and fused into the glass too. This procedure immobilises all radioactive particles & debris into a form that cannot blow away in the wind, and which will take about one million years to erode significantly in the Maralinga environment. Before then the radionuclides will have decayed to normal background levels.

Meanwhile, to keep the occasional tourists and the traditional inhabitants out, these fused areas have been fenced off with barbed wire, and radioactivity warning signs have been posted.

Frankly you should ignore this bomb fallout issue. There are much more important and likely hazards of the Woomera region to concern you.

2
0
0
2

For example, the intense UV from the Sun in early summer (because the ozone isn't there anymore), the possibility of 40 degree C shade temperatures in the daytime, and the animals (roos, sheep, cattle, etc) wandering on the roads at night. You also face a small risk of meeting some venomous snakes.

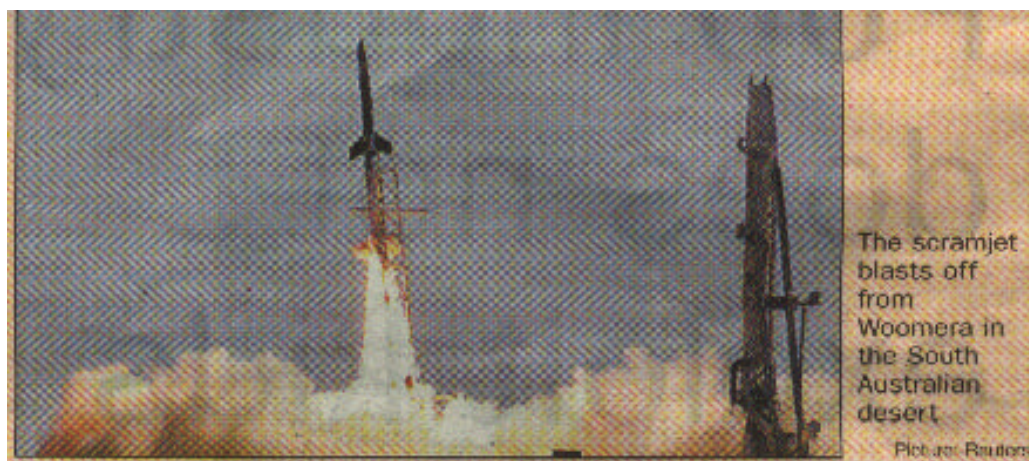
The Woomera Prohibited Area (the region northwest of Woomera) has been used for military tests and exercises for more than 50 years. And the danger from unexploded bombs/shells/grenades/mines is why eclipse viewing within this Area will be confined to the designated site near centreline at Koolymilka.

Alternatively you can view from the Stuart Highway between Pimba (Woomera's railway station) and Glendambo; or from the Woomera to Roxby Downs road. But bring everything with you, including water and shade, and beware of the traffic. Which includes 150-ton road trains.

Note for our European & American readers: the Stuart Highway is a bitumen road about seven metres wide, with traffic going in both directions, bordered by gravel edges 2-3 metres wide. Forget these preconceived ideas of "highway" being a multi-lane engineering masterpiece like the ones you have in your countries.

You have absolutely no reason to go to Maralinga. It only gets a partial eclipse on Dec 4, and there are many nicer places in South Australia to see a partial eclipse from that day.

And if you go into the Maralinga region in summer, then "stupid" is one of the more polite words that Australians would use to describe you... cheers, Fraser Farrell



Eclipse glasses transmittance testing

From: Fraser Farrell To: eclipses <SOLARECLIPSES@AULA.COM> Cc: ASSA-chat <assa-chat@assa.org.au>
Date: Sun, 21 Jul 2002 18:45:41

To all, Some transmittance test results for Rainbow Symphony Eclipse Shades (the new black polymer type), as reported by the University of NSW. In the absence of a specific Australian "solar viewing filter" standard, they instead tested the product for compliance with Australian Standard 1338 for welder's protective products.

Although the Eclipse Shades are definitely not recommended for use by welders (because they would fail the durability and protection-from-molten-splatter requirements of AS1338); they did meet the Standard's requirements for UV/visible/infrared eye protection. Arc welding and MIG welding, for example, requires the welder to stare at a molten blob that is about as bright as the sun's surface; and emitting lots of UV and infrared as well....

This test report courtesy of David Finlay (david@starfield.com.au) of Starfield Scientific & Photographic Services. David is one of the Australian importers for Rainbow Symphony products.

UV Radiation AS 1338.2
Transmittance characteristics -

313nm Maximum allowed 0.000076%
measured <0.000076% Pass

365nm Maximum allowed 0.000076%
measured <0.000076% Pass

Luminous Minimum 0.00044% Maximum 0.0012%
measured 0.0008% Pass

Transmittance limits -
200-313nm Maximum allowed 0.000076%
measured <0.000076% Pass

313-365nm Maximum allowed 0.000076%
measured <0.000076% Pass

365-380nm Maximum allowed 0.0008%
measured <0.0008% Pass

Visible and IR Radiation AS 1338.3

Visible Radiation
380-780nm right lens 0.0008% left lens 0.0005%
Shade number found 13.2

IR Radiation
800-2000nm Maximum mean allowed 0.4%
mean measured 0.41% Pass

Some background for the non-scientist readers:

1 nm = 0.000 000 001 metre. Or one millionth of a millimetre.

ultraviolet (UV) - wavelengths from 200nm down to 380nm. Practically everything shorter than ~200nm (ie extreme UV, X-rays) is absorbed high in the Earth's atmosphere.

visible light - wavelengths from 380nm (violet) down to 780nm (deep red). About one third of the Sun's energy is emitted as

T
S
E2
0
0
2

T
S
E

2
0
0
2

visible light.

infrared (IR) - wave-lengths from 780nm down to 2000nm. Solar radiation with wave-lengths longer than ~2000nm (ie: far infra-red, microwaves etc) also gets absorbed by the atmosphere.

Important caveat. As with all solar filter materials, the Rainbow Symphony product is not designed to protect you from the concentrated raw sunlight that can be collected by an unfiltered telescope or binoculars or camera. Place the filter material so that the sunlight goes through it FIRST; before it enters your equipment (or your eye). cheers,

Request for donation of eclipse viewers for Zimbabwe

From: F.Podmore To: solareclipses@aula.com Date: Fri, 02 Aug 2002 17:17:01

Hello Eclipse friends.... Following the most successful campaign I organized in UK for donations of eclipse viewers for TSE 2001, I am starting to get requests for eclipse viewers for this December. As I gave away all that were collected last year, I don't have any - and although a local company is manufacturing them (and I am verifying that they are safe) the price of at least Z\$250 each is far too much for rural children and adults. [The manufacturer has already made considerable donations to various charities.]

Would any of you be able to find and donate some? They could be posted to me, in SMALL quantities (no more than 20 per package) to try to avoid problems with customs - label them "Used Filter samples - No commercial value" or something equally innocuous.

Mailing address: use either of the ones below, at left or right.

And if you do post some, please email me to say what is coming.

Are there any other ideas for sources of viewers for free distribution?? There's no way I (or anyone else here) can pay for them - our foreign currency situation is very critical.

Thanks very much - please pass this email on to anyone you know who may be able to help. Francis

2002 Total Eclipse Trips

From: Gary Spears To: "solareclipses@Aula.com" <solareclipses@Aula.com> Date: Tue, 23 Jul 2002 22:15:14

Just wanted to let everybody know that there is still space available for the December 4th 2002 total eclipse. We are offering trips to both Africa and Australia.

The Africa trip includes tours to the Garden side of South Africa including Cape Town and the Cape of Good Hope. Mr. Eclipse himself, Fred Espenak will be escorting this trip which ends up in Kruger Park where we will watch the morning eclipse from one of the greatest wildlife settings on Earth. You can go to our web page to see all the details: http://www.spearstravel.com/africa_2002_itinerary.htm.

Fred and I did a site inspection to Kruger this past March and met with Park officials who are working with us to provide an exclusive observing site on the center line near Shingwedze, see photos: http://www.spearstravel.com/africa_2002_sitepics.htm

The Australia trip will start in Melbourne and then travel to Adelaide. The sunset eclipse will be viewed outside of Glendambo. For details go to: http://www.spearstravel.com/australia_2002_itinerary.htm.

For more detailed eclipse information on these eclipses make sure and visit Fred's site at <http://sunearth.gsfc.nasa.gov/eclipse/TSE2002/TSE2002.html> or visit www.spearstravel.com.

Space is limited so you might want to inquire soon. Gary S. Spears Executive Vice President CWT/Spears Travel 500 S. Keeler Bartlesville, OK 74003 918-336-2360 www.spearstravel.com

2002 eclipse updates now online

From: Fraser Farrell To: ASSA-chat <assa-chat@assa.org.au> Cc: eclipses <SOLARECLIPSES@AULA.COM> Date: Fri, 26 Jul 2002 22:47:55

To all, After a longer than expected gestation; my site reports for the 2002 December 4 total solar eclipse in South Australia are now online: <http://astronomy.trilobytes.com.au/2002/eclipse.htm>

This FIRST instalment contains:

- A detailed and corrected topographic map of the Stuart Highway west of Woomera, with the path of totality plotted on it (after corrections for Delta-T, altitude, atmospheric refraction, and lunar limb profile). Plus numerous photographs - including panoramic mosaics - of various potential viewing locations (including centreline), road distances as measured to those locations, and detailed written descriptions of the terrain.

- As above, for the road from Woomera to Roxby Downs and the Andamooka district.

- Some information on eclipse viewing access to the Woomera Prohibited Area and the activities therein.

- Minor corrections to my long list of eclipse circumstances for various Australian locations.

I hope this stuff helps answer some of your questions about viewing the eclipse from the South Australian Outback. Enjoy! Fraser Farrell

From: Dave Schmahl

Dear Fraser, I just want to thank you for your efforts in providing the information on the South Australian TSE on your site. The descriptions of the roads and viewing sites, and the maps you have allowed us to download, are just terrific! Because of this information, I've been able to plan my trip with much more clarity than I thought possible. Please keep up the excellent work! Sincerely grateful, Dave Schmahl

From: Odille Esmonde-Morgan & Warwick Lawson

Fraser A big thank you, which I'm sure is echoed by the other list members, for the amount of work and time you must have put in on your extraordinary site. Odille Esmonde-Morgan Canberra Australia

From: Fraser Farrell

To all, Minor corrections:

- The link to NRMA's info on Cameron Corner works again. It seems they did a big website update of their own on Saturday!

- Some of you were having trouble with the photos at the end of the Stuart Highway Location Report. My fault...I omitted a closing tag which some web browsers need for proper rendering of the page.

- Several of you reminded me of www.eclipses.info. It's in the links now.

If you haven't been able to access the pages yet, note that for the first ~40 hours after they went live, astronomy.trilobytes.com.au got about 25 times as many visitors as usual. No problem for the webserver itself, but its uplink got saturated. But the TRANS-MIT light has turned off several times this evening so I guess the first rush of enthusiasm is over...

I do intend to do a similar report for Lyndhurst (Leigh Creek to Marree, and the west end of the Strzelecki Track). And if time and my funds permit, for the Ceduna district too. I'm regarding the latter as lower priority because of the various Ceduna scouting reports already online. cheers, Fraser Farrell

A \$5000 cruise to the 2003 annular eclipse ...

From: Daniel Fischer To: SOLARECLIPSES@AULA.COM Date: Tue, 02 Jul 2002 21:26:21

... is being offered by Betchart Expeditions in California - while not listed on www.betchartexpeditions.com this tour is being promoted by the Planetary Society in a flyer coming with the latest Planetary Report magazine. The cost of the 2-week cruise on a Russian vessel varies from \$(U.S.) 4545 to 5595, not even including the flight to Iceland where the journey begins: I wonder whether this is the first offer for a tour to an *annular* eclipse in this extreme price range.

Betchart plans to observe the eclipse near Grimsey Island (just north of Iceland), going for the longest annularity - apparently no one has told them that annular eclipses are more fun near the edge of the zone. They will try to get the (very low) eclipse from the open sea, but - as it says cleverly in the small print - "fog or clouds could obscure the eclipse." Oh, really ... ? :-)

Daniel (who's still favoring the Shetland Islands, for 1/10 of that price)

From: Evan Zucker

I lived in Iceland for 13 months from 1984-85, and I can tell you that there weren't a lot of sunny days or clear nights there.

Of course, the good part is that nearly every clear night in winter the aurora was visible because Iceland lies beneath the permanent aurora oval, and when the aurora was not visible there was a great view of the night sky because there weren't a lot of bright city lights. (Since I was a pilot, I got to see the aurora when I was flying at night, regardless of clouds.)

While the mobility of a ship obviously can help seek out whatever clear patches may exist, I fear that trying to see the Iceland eclipse from the ground may not have much better prospects, and very likely worse, than the outlook was for the June 10 eclipse from Mexico. Evan H. Zucker San Diego, California

From: Olivier "Klipsi" Staiger [save contact](#)

>the 2-week cruise on a Russian vessel

do you know the name of the ship ? Klipsi

2003

From: KCStarguy@aol.com To: SOLARECLIPSES@AULA.COM Date: Wed, 24 Jul 2002 15:08:39

I really liked Phi Harrington's Book Eclipse. He says this 2003 will be extremely low angle - on horizon or 3 degrees up. Reykjavik will get 3 min 36 min of annularity. The shadow will appear to be moving backwards east to west rather than west to east. The effect, he says, is caused by shadow crossing the Earth's surface beyond the North Pole (after crossing over the top of the pole). It is a diagram showing this arrangement on P.150.

Any information about whether this eclipse will have a lot of Bailey's beads etc? Dr. Eric Flescher (kcstarguy@aol.com) <http://www.ericblackssuneclipse.com>

31-May-2003 Annular eclipse

From: Katherine Low To: solareclipses@aula.com Date: Mon, 29 Jul 2002 19:51:52

Hi, This message is related to the 31-May-2003 Annular eclipse. A friend of mine is running his own tour operator company, specialised in adventurous and not so easy destinations. One of his specialisation areas is the Nordic region including Iceland and Greenland. According to his rich experience, chances of seeing the eclipse from Iceland will be slim. He thinks that Greenland

A
S
E

will have much better opportunity. This seem to correspond to the table of Jay Anderson: <http://home.cc.umanitoba.ca/~jander/ann2003/table1.html> : 37% chance from Jakobshavn (the former Danish name and currently called Ilulisat). The climat at the West-coast of Greenland is reportedly more stable than Iceland. Of course there are drawbacks. The cost for flying to Ilulissat from Europe alone will be around 1100 Euro and staying in Greenland is very expensive.

2 suggestions are made and could be worked out by him, if sufficient people are interested:

Option 1). 4-day stay in Ilulissat only. Price: around 2500 Euro per person.

Option 2). 2-week trip in Greenland with some traveling in the country: between 4000 to 4500 Euro per person.

In case you are interested in one of these possibilities, please mail me privately. Pls, note that I have no commercial interest at all in this organization, just looking for convenient ways to make our common dreams come true. Best regards, Kris Delcourte

2
0
0
3

Partial sunrise 2003

From: Marc Weihrach To: Finsternisliste <solareclipses@aula.com> Date: Fri, 26 Jul 2002 22:50:39

Dear eclipse chasers, I know everybody's busy about the TSE2002 and the fascinating topic of hybrid eclipses, but I want to ask you a question about the "partial sunrise" of May 31, 2003. This is probably a question to those of you who have experience with low-altitude-events:

What will it look like? Well, I know what a partial eclipse looks like, but what may I expect the sky to appear?

In my home town Halle (Saale) at 12°E, 51.5°N we will have

First Contact at 2:32 UT 2.75° below the horizon

Sunrise (about 50% eclipse magnitude) at 3:01 UT (right at the horizon, I assume)

Maximum (86.7%) at 3:27 UT 2.5° above the horizon

Last Contact at 4:26 UT 10.5° above the horizon

Such a deep partial will surely affect the colour & brightness of the sky. Towards maximum eclipse the sky should get slightly darker, but at the same time the rising sun should make it brighter. What do you think we will see? Will the early brightening stagnate at some point, will it even get darker again? Will we notice the beginning eclipse before sunrise by some subtle change in the dawning skies?

Any ideas would be appreciated.

(By the way, on August 11 we will arrange a "Dark Sunday" here to remind the public of the TSE1999 and to prepare them for 2003. Just in case one of you happens to be in the vicinity I'd be happy to welcome you! In that case please contact me by private mail.) Best regards Marc

Path of totality may 31, 2003

From: Frank To: SEML <Solareclipses@aula.com> Date: Thu, 04 Jul 2002 21:01:53

Dear list, I am looking for an accurate map showing the path of totality when it passes through or near Scotland on May 31, 2003. Does anyone know where I can find such a map (I already went to see Espenak's page, where I found a global map, but I'm looking for a detailed one). Thanks, Frank Smits Frakke.smits@pandora.be

From: Michael Gill

Frank, Sheridan Williams has a local map of Scotland showing the annular portion of this eclipse:

<http://www.cloctower.demon.co.uk/eclipse2003/>

Fred Espenak has a page under construction for this eclipse. I would suggest you bookmark...

<http://sunearth.gsfc.nasa.gov/eclipse/ASE2003/ASE2003.html>

...Then check back in August.

Michael Gill



A
S
E

2
0
0
3

Subject: Re: [SE] Path of totality may 31, 2003

Frank - Did you see the two new maps I recently posted at:

<http://sunearth.gsfc.nasa.gov/eclipse/OH/OH2003.html>

The first map is a high resolution global map of the entire Earth:

<http://sunearth.gsfc.nasa.gov/eclipse/OH/image/SE2003Fig2.gif>

The second map is a close-up of Europe, UK, Iceland and Greenland:

<http://sunearth.gsfc.nasa.gov/eclipse/OH/image/SE2003Fig3.gif>

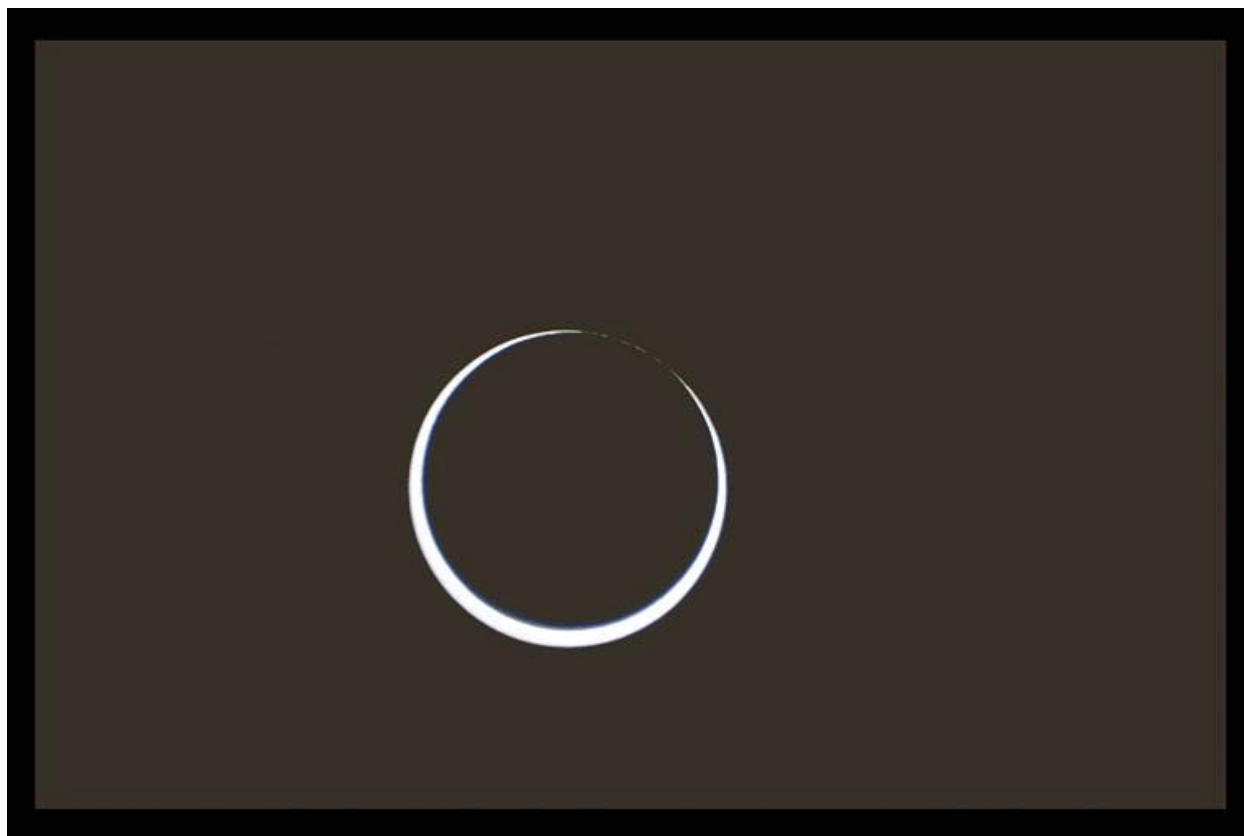
I have new maps for Scotland and Iceland which I will post next month on my ASE2003 web site:

<http://sunearth.gsfc.nasa.gov/eclipse/ASE2003/ASE2003.html>

Please check back in August. - Fred Espenak

From: Sheridan Williams To: SOLARECLIPSES@AULA.COM Date: Sun, 14 Jul 2002 14:35:42

Full details of the 2003 annular eclipse through Scotland can be found on my website. www.clock-tower.com/eclipse2003 Sheridan



Annular solar eclipse 29 April 1995 by Patrick Poitevin



Joanne & Patrick

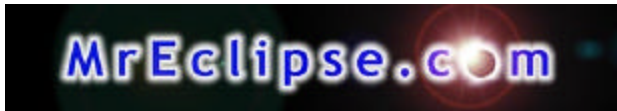
The sole Newsletter dedicated to Solar Eclipses



THE SOLAR ECLIPSE NEWSLETTER IS A MONTHLY NEWSLETTER ABOUT SOLAR ECLIPSES EDITED BY PATRICK POITEVIN & JOANNE EDMONDS. FINANCIAL SUPPORT FROM THE RAINBOW SYMPHONY.



THE ELECTRONIC VERSION OF THE SOLAR ECLIPSE NEWSLETTER IS AVAILABLE ON THE WEB PAGE OF FRED ESPENAK.



THE SOLAR ECLIPSE NEWSLETTER IS FREE OF CHARGE, BUT IS NOT AVAILABLE IN HARD COPY.

Some memories from Mexico anno 2002 (pictures by PP)

