

From: Olivier "Klipsi" Staiger <olivier.staiger@span.ch>
 To: <SOLARECLIPSES@AULA.COM> Sent: Sunday,
 July 01, 2001 10:07 PM Subject: [SE] **partial eclipse as
 seen from Ascension Island**

see www.the-islander.org.ac/1542.htm for images of the deep partial eclipse seen on Ascension Island in the southern Atlantic Ocean.

From: Assoc Prof J R Huddle <huddle@usna.edu> To: Solar Eclipse Mailing List <SOLARECLIPSES@AULA.COM>
 Sent: Monday, July 02, 2001 2:10 PM Subject: [SE] **Preliminary report from Chewore**

I just returned from two weeks in Zimbabwe and Botswana, and before I read any other reports, I just want to say that of the six total solar eclipses I have seen so far, the 21 June 2001 Solstice Eclipse in Zimbabwe was the prettiest. We had no trouble traveling in Zimbabwe, our hosts were terrific, the weather at our eclipse site in the Chewore Safari Area of Zimbabwe was crystal clear, and the animals were fascinating. We are 24 happy (but exhausted) chasers of eclipses and wild animals! More later, Jim Huddle

From: Richard Bareford <bareford@yahoo.com> To: <SOLARECLIPSES@AULA.COM> Sent: Tuesday, July 03, 2001 5:08 AM Subject: [SE] **Eclipse Video**

I uploaded an MPEG movie clip version of a digital 8 video to my website at <http://www.geocities.com/bareford/subsun.html>

It's over 3.5 MB for less than 2 minutes of playing time, so prepare for a long wait if you don't have a fast connection.

I recorded it on the southern edge of the path, so totality is only about 70 seconds. It's interesting though watching the sun appear to move from East to West just behind the upper (southern) limb of the Moon. Richard Bareford

From: Mike Simmons <msimm@ucla.edu>

That's awesome! I've never seen a video from the edge before. Did that multiple diamond ring (or Bailey's Beads?) at second contact really last as long as it seemed in the video? Then I was wondering why the chromosphere didn't disappear from that side and reappear on the other. Finally, the second diamond ring appeared in the wrong place, too close to the first one! I knew it was from the edge and would be different but it didn't register at first. Great video. Mike Simmons

From: Richard Bareford <bareford@yahoo.com>

Mike, The timing of these features is somewhat subjective.

At what point does a diamond shrink to a bead and a bead grow to a diamond? I chose to measure from an optical artifact, the lens flare. When it was present there was a diamond. This was very apparent visually too. In my corrected vision great spikey diamonds were evident for an appreciable period around 2d and 3rd contacts. Stunning!

The original video goes on for much longer than the clip, which just shows the middle portion. I removed the solar filter 2 minutes before predicted totality and didn't replace it for some minutes afterward. This was the first time I'd used a video at an eclipse and what impressed me most was how much I could see before totality. After adjusting for exposure the large prominence on the eastern limb was immediately obvious. Incidentally, this tactic had no ill effects on the camcorder.

From our position on the southern edge of the path the solar limb was closest to the Moon's southern and more irregular limb (up in the images). This determined where the various edge phenomena developed. The beads and chromosphere appear to rotate counterclockwise along the lunar limb from about the 1:30 to the 10:30 positions, beginning and ending with diamond formations. Try placing your cursor at the start point and watch how things migrate west. Richard Bareford

From: Glenn Schneider <gschneider@mac.com>

Richard, That is quite a beautiful video. I was struck, technically, by the lack of CCD blooming (charge transfer along the columns of the read-out), which often plagues consumer-grade video cameras. Could you inform, specifically, as to what sort of camera you were using?

I was also very impressed in noting that the first "bead" of photospheric light prior to ("at"?) third contact, which is the lesser of the beads to the right of the bright central one (which begins to appear in frame 13:12:15/17), at a vertical angle of approximately -15° (counterclockwise from the image +Y axis) appears on close inspection to show up as early as frame 13:11:26/28. >From this MPEG at least, that point, perhaps a single pixel, appears white (photospheric) not pink (chromospheric) in that and subsequent frames. I would be interested to compare this, more critically, to the limb profile for your topocentric libration. Can you advise as to what the coordinates were of your observing site, and how accurately you think the time-stamp on your video is? Also, as I am particularly interested in this, is the small amount of image blur which occurs for a few frames around 13:12:07/28 due to atmospheric, or some impulsive vibration in/to the camera. A small point, but I am curious as that single "bead" seems to disappear in that piece of chromospheric arc - but I suspect that is just due to loss of resolution in a few frames.

Also, I don't understand the sequencing of the numbers to

(Continued from page 41)

the right of the seconds digits in the timestanp. I assume these are frame numbers within a second (rolling over at 30?) If so they are not uniformly spaced - which is why I am a bit confused. I presume when you converted to an MPEG you extracted only every N-frames, but that doesn't jive with the frame count. Also, what was the exposure time per frame?

Sorry for all the questions, but this is a great video, which I am sure everyone on Pat's list will appreciate.

Finally, was there any video compression done in making the MPEG? If an "original" has even higher resolution, with your permission I would love to get a copy of that to do a more critical analysis of the bead events? I can provide an ftp drop box for such a file, no disk space worries (up to about 50 Gig). We can take further discussion off-line from the [SE] distribution. WONDERFUL work. Cheers, Glenn Schneider

From: Crocker, Tony (FSA) <Tony.Crocker@transamerica.com>

As an observer of one TSE who asked veterans to compare edge to centerline a while back, I think this video makes a strong argument for edge if photography is a priority. We all know that photos don't do justice to totality, though. Perhaps we should view from centerline and set up a remote camera at the edge with Glenn's UMBRAPHILE program to get the best of both worlds.

From: Glenn Schneider <gschneider@mac.com>

Richard, To follow-up, I apologize for not having read the information you provided on your page ahead of viewing the video. I see some of the questions I had asked are already answered there.

Again, a spectacular video indeed. Thanks for sharing it.

BTW - It plays just fine under MacOS with QuickTime rendering (which is native) so a "Real" payer or, heaven forbid, a Micro-Soft media engine is not needed for those of us not Gatesified. Glenn Schneider

From: Dale Ireland <direland@drdale.com>

Richard, Wonderful video, and very interesting to view it at real time rather than time-lapse I so often see. may I make one suggestion? It appears on my screen to be slightly "flattened" vertically. Perhaps this is my viewer, do you notice the sun to be some what elliptical. If so this is because you saved it in a stock size that changed the aspect ratio from your original. I have done this many times. You need to look for the option to maintain aspect ratio and if this is not available to try different frame sizes until you find the ones that match your camera's aspect ratio and the Sun is round again. This will also improve the resolution of the final product. Dale

From: Glenn Schneider @ Home <gschneider@mac.com>

Dale, On my Apple 21" Cinema display Richard's image frames appear quite round with no noticable scale distortions. Maybe your monitor? -GS-

From: Odille Esmonde-Morgan <analog6@ozemail.com.au>

It was a little flattened on my monitor. too. I just 'pulled' the bottom of the windows player box down a bit and this corrected it. Thanks to Richard for a wonderful look for those of us not able to attend. I tried to load RealPlayer 8 from the web site but it will NOT load onto my machine, so this is my first 'live' look. Great effort, Richard, thanks again. Odille Esmonde-Morgan Canberra, Australia

From: Richard Bareford <bareford@yahoo.com>

Some information I omitted previously: Equipment: Sony Digital 8 Handycam, DCR-TRV320, focal length 3.7-92.5mm (25X optical zoom used with 2X teleconverter); 1/4 type CCD, approx. 460,000 pixels.

Settings: manual focus, 100 AWB, f28, 0 dB (manual exposure control, set very near the "-" end of the sliding bar control); I did not change any settings during the clip.

(Continued on page 43)

Glenn, the blurring you noticed on several frames near the end of the clip was a result of the image registration process. At this point in the recording I zoomed out with the intent of capturing the corona; however, I forgot to increase the exposure so all I achieved was a smaller image. For the clip I wanted everything to be the same size, so I registered these smaller images with a well-centered, full-size earlier one. The resulting magnification caused the blurring.

The original frame captures are in 901KB TIF files, and do look sharper than the MPEG images. Check out my photo album for ~100 KB JPEG versions of several of the same frames:

<http://photos.yahoo.com/bareford>

There are 108 frames in the clip, so the total is 97.3 MB, versus the clip's 3.5. That would take a while to send over my modem (it took 20 minutes to upload the clip). They make a nice slide show, though. The MPEG movie settings used were 352x240 for size and 256 KB/sec data rate. Any suggestions? Happy Fourth! Richard Bareford

From: Richard Bareford <bareford@yahoo.com>

Thanks for the suggestion, I'll check it out.

Another factor is inaccuracy in the image registration process. I used the 2-point (shift/rotate/scale) compositing option in Picture Window, and in some cases the program had difficulty refining the points I selected. This may have caused some distortion. Richard Bareford

From: Chris O'Byrne <obyrne@iol.ie>

And that was the very first message I have received from SEML since re- subscribing after returning from Madagascar! :)

Could someone re-send the URL? Or, better yet (probably), could the newsletter contain a list of all such URLs that are submitted to SEML concerning this eclipse.

As regards Madagascar, Morombe beach was cloud-free. And, being so close to the end of the eclipse track, the moon's shadow was absolutely spectacular. There was a very distinct and quite narrow dark cone that contained the sun - bright to either side of it, and tapering up to the sun. And, when totality had just finished, the sky to the north was distinctly darker than the sky to the south for a couple of seconds.

Isalo national park was cloudy, though we heard reports of people seeing varying amounts of the eclipse (including all of it) through holes.

It looks like Madagascar was actually one of the worst places to be (overall) from a weather point of view - http://www.sat.dundee.ac.uk/pdus/AV/200106211200AV2_n.jpg

But from a scenery and a friendliness and a major life/educational experience, it was second to none. It certainly blew away everyone in our group - so much so that the eclipse was almost a side-show! Chris.

From: Daniel Fischer <dfischer@astro.uni-bonn.de>

> could the newsletter contain a list of all such URLs that are submitted to SEML concerning this eclipse.

My own site at www.geocities.com/skyreports/zam2001 links to all the URLs that were posted here and on many other lists - quite a number in German, by the way, but you can always look at the pictures. :-) Daniel

From: Evan Zucker <ez@AbacusTotality.com>

>It looks like Madagascar was actually one of the worst places to be (overall) from a weather point of view - http://www.sat.dundee.ac.uk/pdus/AV/200106211200AV2_n.jpg

Isn't that exactly as forecast a year or more ago by Jay Anderson? Just like in 1999, insofar as western Europe was concerned.

Evan H. Zucker

From: Vic & Jen Winter, ICSTARS Inc. <icstars@icstars.com>

Close.... only Central and Eastern Madagascar were forecast as low weather prospects. Jay was actually IN Madagascar at the site with us because the Western coastline of Madagascar actually had better weather prospects by a percentage point or two. The most important detail is the high percentage of successful viewing by the greatest population of eclipse chasers. I think this was accomplished. Clear Skies! Vic & Jen Winter

From: Patrick Poitevin <patrick_poitevin@hotmail.com>

> Could someone re-send the URL? Or, better yet (probably), could the newsletter contain a list of all such URLs that are submitted to SEML concerning this eclipse.

The SENL does contain all solar eclipse related messages of the SEML, including the URLs. Besides the SEML, the SENL does contain solar eclipse messages of the HASTRO list, the Canadian list of Brian Brewer and personal messages. No need to say, that permission for SENL publication is arranged with all sources.

There will be the July SENL soon but as well a special eclipse edition. We are working hard ... Best regards, Patrick

From: Chris O'Byrne <o Byrne@iol.ie>

I think you will find that he predicted clear skies in Angola, getting increasing cloudy towards Moambique, clear again in Madagascar west of it's central mountainous spine, and cloudy again east of that spine.

The western half of Madagascar had better climate prospects than the whole of Mozambique. But, on the day, Moza mbique was a better place to be.

But, as the saying goes, climate is what you expect, but weather is what you get...

Just thank God we were not in Ranohira / Isalo N.P. We passed through Isalo on the way to Morombe, which entailed entering the eclipse track and then leaving it before re-entering it again east of Morombe. We re-entered it close to sunset on 20 June after 8 or so hours in the 4x4 going at an average of about 20kph - with still another 3 or so hours to go to Morombe! (shudder) Chris.

From: Stig Linander <linander@worldonline.dk>

Hi, I've added a few photos to my site about the TSE from Madagascar: http://www.linander.dk/stig/se2001_e.htm

The notorious "Ranohira cloud" can be seen in one of the photos. But we - well outside of Ranohira - were lucky. VERY lucky. Best regards, Stig.

From: Stig Linander <linander@worldonline.dk>

Hi Patrick, I'm really looking forward to those.

I don't know if you'll include my announcements of http://www.linander.dk/stig/se2001_e.htm in the eclipse edition OR you'll decide to include the text of the web page (IMO the latter is more interesting than the announcements).

IF you decide to include the text of the web page (instead of the announcements), then you'll probably find that the photos on the page aren't very interesting. Maybe you're more interested in the Madagascar Eclipse stamp shown on the page.

IF you're interested in the Eclipse stamp for the eclipse edition, then I can supply you with an image of higher resolution. IF you're interested ... Best regards, Stig.



Laura and Eric Brown in Zimbabwe

From: Kidinvs@aol.com To: SOLARECLIPSES@aula.com Sent: Tuesday, July 03, 2001 4:23 PM Subject: [SE] ...and I am back as well....

Hi, all.. this is Eric Brown, and I have finally returned home from what turned out to be one fantastic eclipse... absolutely perfect weather in Landless Corners, and an African Adventure never to be forgotten by me, or anyone else in my group. But I would like to add that Patrick can certainly ride an elephant!!!! I need a day or 2 to settle in, but I will report my observations in a day or so. Welcome home to all those that traveled to the wonderful countries of Zimbabwe, and Zambia. As I guessed, the people were wonderful, the weather fantastic, and the wildlife as wonderful as expected.

From: <johnleppert@peoplepc.com> To: <SOLARECLIPSES@AULA.COM> Sent: Tuesday, July 03, 2001 4:20 PM Subject: [SE] **Eclipse from Lower Zambezi NP**

Friends, My family (4) and 13 others traveling with Civilized Adventures (RASC-Calgary Centre) with host Alister Ling viewed the very nice solar eclipse (3'13" totality) at Kiubo Camp in the Lower Zambezi National Park of Zambia at 15o 45.745'S, 29o 14.034'E, and at 1251' MSL. Sky conditions were clear, and the temperature fell from 37o C to 20o C (90o F to 68o F) between 1st and 2nd contact. We divided our 13 day safari equally between Zambia and Zimbabwe along the Zambezi River, departing from Victoria Falls last Sunday evening. Most of our group have stopped in London on the way back to Canada and the USA for a few days. My family leaves for North Dakota Thursday. Australia next(2002)? John Leppert

From: Hal Couzens <hal@dneg.com> To: <SOLARECLIPSES@AULA.COM> Sent: Tuesday, July 03, 2001 5:56 PM Subject: [SE] **Well well well**

Hi All, Eclipse number two! And truly a vindication of my new-found passion (eclipse-chasing). After seeing the 1999 beauty in Hungary I did suspect that I had become an eclipse-chaser. Now after the wondrous African Winter Affair it is clear I am on that path. And am already panicing about December 4th 2002's weather patterns - how can one bear such a disappointment as cloudy skies?

I've just arrived back and have not yet got my prints and film back. Our (just 2 of us) trip involved a magnificent drive from Johannesburg through Botswana via the Okavango through Lusaka to Chisamba and back (via Vic Falls both ways - also worth it twice). Zambia must've been the friendliest country I have visited with Botswana just behind them.

We watched the eclipse from Chisamba village itself surrounded by locals only. It felt amazing to be in the heart of Africa and sharing this experience with the fortunates who were given the show sans travel. Though of course they are much less fortunate than us with our 1st world salaries etc. It was great to see their reactions and to give them the benefit of my (limited) knowledge. An incredibly intense and emotional day indeed which ended with a few beers in the Chisamba Social Club and dinner at one of the locals house. Poor poor poor but so welcoming. They would take no money and made us take a bag of sweet potatoes as a gift too. They were the sweetest I have ever had.

We also had the pleasure of watching the Zambian News coverage of the days affairs. Quite an eye-opener and an insight into that country. If you missed it then I can relay the message from President Chiluba. He wanted to personally thank all the people of the world who travelled to his country to partake of this God-given event. It made him so proud to be able to welcome all to his land and to be able to share the experience with so many people with so much knowledge. It was a great day for all Zambians and Southern Africa.

As for THAT eclipse itself, incredible, again. My over-riding impressions of it was that it was that the sky was more purple than hungary's blue and not as many stars in evidence. But the temperature dropped much more than then and I was far more aware of the lighting change. This time I noticed that the night insects began their cacophony and the village roosters crowed as at duck and dawn. It was in small things like this that my presence added to the villagers experience. None had noticed it as extraordinary until I pointed it out. Lovely. And all of this caught on video. I recommend you all share an eclipse in the company of genuine locals at some time and partake of the local culture.

But now i am back in England am very keen to get into contact with any list members



who may be in England too. So if you are out there and wish to share your experiences please feel free to contact me on this e-mail. Best Regards, Hal Couzens

From: Dale Ireland <direland@drdale.com> To: Solar Eclipse List <SOLARECLIPSES@AULA.COM> Sent: Tuesday, July 03, 2001 6:08 PM Subject: [SE] **eclipse video reproduction**

Hello, For the past few eclipses I have tried various companies to combine and reproduce my videos, make copies, convert to and from other formats such as PAL. I have found a HUGE range of price and quality, up to \$60 per tape. I have been using a company for the last few years that is very reliable and reasonable. \$5 to copy a VHS tape (\$10 for the first copy then \$5 for each additional, \$12 for the first PAL copy) and this INCLUDES THE TAPE. They do VHS, 8mm, etc (not sure about digital capabilities). I am in no way connected with them, but if you need to make lots of copies of your eclipse tapes for friends or convert formats you might want to contact them, they are

ZYK Enterprises, 2617 5th Ave, Seattle WA 98121, phone 206-623-7473, fax 206-770-9322 Dale Ireland, mention my name, maybe I can get some free copies :)

From: McCann, Stephen <stephen.mccann@roke.co.uk> To: <byen00@earthlink.net> Cc: <SOLARECLIPSES@AULA.COM> Sent: Wednesday, July 04, 2001 1:15 PM Subject: [SE] **Birds on your eclipse web page & post 3rd contact corona**

Bob, Just to help you with a couple of birds on your excellent web page :- <http://www.comet-track.com/eclipse/sec101/sec101.html> The 'national bird of Botswana' is the 'Lilac Breasted Roller' and the vulture-like scavengers are 'Cape Vultures' Thanks for such superb pictures.

In addition to your discussion on the corona, have you seen the Sky & Telescope comments by Dennis di Cicco :- <http://www.skypub.com/sights/eclipses/solar/010621africa.html> who states that the corona was seen several minutes after 3rd contact. I've never heard of this before ? Kind regards, Stephen McCann

From: Peter Tiedt <Peter.Tiedt@npc-eagle.co.za>

Correction - The "vultures" are Marabou Storks

From: Johanna Kovitz <joko@pangolyn.com> To: <SOLARECLIPSES@AULA.COM> Sent: Wednesday, July 04, 2001 7:12 PM Subject: [SE] **Madagascar**

>It looks like Madagascar was actually one of the worst places to be (overall) from a weather point of view - http://www.sat.dundee.ac.uk/pdus/AV/200106211200AV2_n.jpg But from a scenery and a friendliness and a major life/educational experience, it was second to none. It certainly blew away everyone in our group - so much so that the eclipse was almost a side-show! Chris.

I concur! I was in Madagascar, paddling for 10 days out the Mangoky River (very remote) to our eclipse-viewing destination on a sandy beach outside the village of Ambiky, northeast of Morombe. After a long stretch of crystal clear days, the 2 days before the eclipse presented increasing clouds and caused great worry. But the weather cleared on June 21. We had a solitary cloud obscuring the moment of first contact, but the cloud dissipated within seconds and the rest of the eclipse was viewed in clear skies. From our location we viewed the sun over a picturesque stand of baobab trees. Only our small group (5 Malagasy, 5 westerners) was present. Unforgettable.

One sad note: Most Malagasy people, at least in the remote sections, did not see the eclipse. They were frightened not only by superstitions but even by the educational programs themselves. Those who were supposed to distribute eclipse viewers (for free) sometimes sold them for profit, and of course few could afford them. In the remote villages, no one we talked to had actually watched the eclipse! A guide in Fort Dauphin told me that 80% of the Malagasy people hid in their houses during the event.

I agree with Chris that the eclipse in Madagascar, stunning as it was, was actually eclipsed by the beauty of the land, the people, the culture, not to mention the unique species of plants and animals. I came home feeling transformed, and I want to go back. Still floating, Johanna

From: Brian Seales <brianseales@eircom.net>

Hi Everyone, I concur with Chris (I was with him) and Johanna about Madagascar. What a beautiful place to see an eclipse. We were also told that many of the Malagasy people were too scared/or misinformed to enjoy the eclipse and this was a great shame because all our group wanted to share the experience with them. I know our 3 guides thought it was the most beautiful thing they had ever seen and want us to send copies of our eclipse photos to them. The sunset of the 21st June was the most spectacular I have ever seen. A naked eye sunset, a bite out of the sun, a green flash (which some saw but not us, I blame the local rum), the sun disappearing into a tiny point of light to the cheers of those who had not returned to the bars. Worth every moment of planning and rough travel. I will definitely be going back to this wonderful country. Brian Seales

From: Gerard M Foley <gfoley@columbus.rr.com>

> One sad note: Most Malagasy people, at least in the remote sections, did not see the eclipse. They were frightened not only by superstitions but even by the educational programs themselves.

Not only in Madagascar. Many people I have talked to about eclipses think that one can harm one's eyes by looking at the sun/moon during totality. Many thanks to all who have reported on their African experiences. Gerry K8EF

From: Sheridan Williams <sheridan@clock-tower.com>

My 8th total eclipse at Morombe in Madagascar was probably the best ever. The perfectly clear skies, the beach location, the "dragon" detached prominence, the shape of the Moon's shadow, the low altitude (I still think they are the best), the sunset at 4th contact, the green flash all combined to make it an experience never to be forgotten.

Madagascar is a wonderful place and we saw literally hundreds of lemurs of various kinds, several humpback whales, dolphins, chameleons, etc, etc.

For those who doubted my choice of location, you missed something really special.

May I remind people to update their eclipse viewing statistics. Details on: www.clock-tower.com/tse

How did those brave few who went to Angola fare? Sheridan Williams



by Derek Hatch

From: <mike.foulkes@mmsuk.co.uk>

Dear all, just to complement Sheridan's comments on Madagascar and those others in the SEML who also went to the island.

Sheridan, myself and other friends decided to go there for a three week trip and we only arrived back in the UK Friday 6 July.

Apart from the potential of seeing a variety of wildlife, the major attraction for us going to the SW of the island for the eclipse was the weather prospects. Although Fred Espenak's guide for the eclipse indicated that the weather for the central and eastern regions of the island were not too good, the prospects on the south west coast were predicted to be almost as good as Angola and western Zambia. Hence our choice of Morombe.

However despite these good prospects, I suppose the reduced totality duration may have been a turn-off for many people. In addition, there appeared to be other negative perceptions on Madagascar as a viable eclipse observing site. On our flight down to Johannesburg, we met a large group going to Zambia. Several members of the group were convinced that totality didn't even reach Madagascar! I suppose at this point, some doubts did creep in to our minds as to whether we had actually booked the correct air tickets.....

After our arrival in Madagascar, we found that the government had made a major effort to bring awareness of the eclipse and its associated dangers to the general public. Even in the smallest villages, there were eclipse posters showing how to

observe the partial phases safely with eclipse glasses. However we obtained the impression that the vast majority of local people also believed that the danger during the partial phases also applied to totality as well. Indeed as Johanna Kovitz has noted in an earlier SEML e-mail, many people stayed indoors during the eclipse - probably out of fear or due to official recommendation.

We flew into Morombe on the day before the eclipse and encountered a bit of local bureaucracy. We all had to present our passports to a local police official for review. This was the only time in our trip we encountered this problem. We also noted plenty of locals out and about in the town and on the beach at our observing site. A member of our party - Hilary Bradt - even handed out free eclipse viewers to many locals to ensure that they could observe the eclipse in safety. However during the eclipse, no locals were to be seen, certainly around our beach observing site. A great pity really, as it would have been good to show local people a view of the partial phases through a telescope as at other eclipses.

Later during our trip we heard stories that in some areas, a siren was sounded at first contact. Many local people (often children and older people but not teenagers) then went indoors, only to re-appear again when a siren sounded again at fourth contact.

So after all the waiting, the great day arrived.

The conditions we experienced at Morombe lived up to the predictions, without a cloud in the sky. The only slight problem was a light sea breeze which may have affected long exposure photography.

Another friend - Paul Coleman was much further east in Isalo National Park where the conditions were less favorable due to some cloud. However after chasing some clear patches of sky he and his friends also managed to see totality.

I fully agree with Sheridan that this was a beautiful eclipse. The large detached prominence and corona and coronal spikes were excellent.

One friend of ours - Derek Hatch - used a Fuji digital SLR with a 500mm lens and tele-converter to photograph the eclipse. The achieved focal length was approximately 1600mm. The images obtained with this equipment are absolutely superb and there is of course the additional advantage of seeing the images immediately after they are taken and correcting exposures as required. I however was only using 'steam driven' technology (i.e. slide film) with a Televue Pronto giving a similar image scale. It will be interesting to compare these photos (assuming they come out OK) with the digital images.

I believe that Sheridan is going to put some of these images on his web page in the near future.

We nick-named the large detached prominence the 'Dragon' as it did look like a small dragon. This morning, I received a large blow up of Derek's digital image of this prominence and the dragon-like appearance is very noticeable indeed at this larger image scale.

Although we had a shorter duration of totality than mainland Africa, and the sun was only 13 degrees or so above the horizon at totality, there were some additional compensations.

Certainly observing the eclipse at a low altitude reduced neck strain and the appearance of the eclipsed sun over an ocean horizon was very pleasing.

Further, as totality proceeded, the sky below the sun (which included the easily visible Jupiter) remained dark but at some distance east and west were bright arcs rising out from the ocean horizon which delineated the edges of the umbra. This is one thing I will certainly remember from this eclipse.

For our location, fourth contact took place at sunset. Many of us (as Sheridan has already noted) also saw the green flash. Yes we had already had drunk some wine and Champagne in celebration of totality but I don't think this was the cause of us seeing the flash!! Derek also managed to capture this on a digital image, although very faintly.

On returning to the capital (Antananarivo) we found the local press coverage (both in Malagasy and French) of the eclipse rather interesting. The newspapers only seemed to cover the appearance of the eclipse as seen from the capital (where it was partial). There didn't appear to be any coverage of totality at all. There was also frequent references to the eclipse as the President's Eclipse (presumably referring to the president of Madagascar although I'm willing to stand corrected on this, as my French isn't

(Continued on page 49)

great. What he did to have the eclipse named after him I'm not too sure).

Probably like everyone else who went to see the eclipse, we were treated to some dark skies and fine views of the southern milky way. One place that I approve of very much is the Berenty reserve in the south east of the island. Here all power is turned off at 10 pm and so with no lights, dark skies.

Finally we were treated to a bonus. On Thursday evening (5 July) while waiting in a bar at Johannesburg airport for our flight home to London, we saw the partial lunar eclipse. People in the bar must have wondered what was happening as we, and some German observers returning from Zimbabwe, all rushed to the lounge windows with binoculars and cameras to observe the event. Two eclipses in 14 days is pretty good. Regards, Mike Foulkes

From: LN <to.ln@bigfoot.com>

Herewith my eclipse report. 2001 Eclipse from Bevaoy, Madagascar

This time I went together with my husband Paul and astro friend Roland to Madagascar to view the eclipse. The expectation was that most people would go to Morombe. To avoid the crowd we decided to approach the observation site from the north from Morondave, with a landrover, driver and Malagash guide, it took us 3 full days to reach the site, approximate 280 km. The "camel trophy type" tour was worth the effort, and fun in a way. We got ourselves a site with a good view to the NW horizon. Unfortunately our driver and guide didn't want to stop north of the central line, so we ended up south of the central line on the river banks nearby a place called Bevaoy. The coordinates were S 21°49'54.6", E 43°52'32.3" First contact started at 12h12 UT. The totality was complete at 13h26:06 UT and had a duration of 2 min 31 sec. The eclipse was recorded with a digital 8 camera and photographs were taken. Apart from that we didn't forget to look off course and to "live it" ourselves.

The locals were somewhat afraid of the event and only our Malagash guide had the nerve to actually look at the eclipsed sun. He was astonished. Although he kept on asking for assurance that it was not dangerous. We were lucky that day. The days before clouds were visible but the 21st showed us a all blue sky so we could observe the eclipse without interference. Being at the southern half of the earth it was strange to see the eclipse

approach from the left bottom to the right upper corner. Large sunspots were visible, even with the naked eye. Shadowbands were seen by others. The shadow was cone shaped and the horizon was as colored as previous eclipses. I noticed Jupiter, Canopus, Sirius and Pollux. No baileys beads could be seen, as could be expected being south of the central line. The eclipse seemed to have a very symmetrical corona. The inner corona was very bright. A large number of protuberances were seen. At 2 O'clock the largest was visible and stayed during the whole totality. Later more protuberances were visible at 7 O'clock (a double), 9 O'clock and 10 O'clock Immediately after totality was over the sky was bright again. I had expected a lesser spectacular return to daylight because of the approaching sunset but that wasn't so. During the partial phase the wind was very strong blowing from the direction of the sun. Strangely enough there was no wind during totality and no wind after that. But this might have been an every day thing because this wind drop in the evening was also noticed the day before. I recorded the pressure with my Garmin Etrex Summit GPS and it showed that during the partial phase until totality there was a pressure drop from 1293 to 1019 mbar. After third contact the pressure slightly rose again and stayed stable. Unfortunately I have no pressure readings of the day before. Our site was too far to the east so we missed 4th contact. In return we had a nice view of the crescent sinking behind the opposite riverbanks.

And as always the eclipse was over before we knew it. Luckily we can relive it when editing photos and video and off course it is time again to start planning the next one. Ellen Bruijns, June 2001

From: Gerard M Foley <gfoley@columbus.rr.com>

These numbers seem very unlikely. 1293 mbar is 1.276 standard atmospheres, which I take to be 38.18 inches of mercury, a pressure which I doubt has ever existed in the open atmosphere of the earth. 1019 mbar is 1.006 standard atmospheres, 30.10 inches, which is a common enough value around sea level. I think a drop in atmospheric pressure of 25 percent would accompany a storm of unparalleled ferocity.

The rest of the report is very interesting, and I am grateful for it. Gerry K8EF

(Continued on page 50)

From: Sheridan Williams <sheridan@clock-tower.com>

Thanks to Ellen Bruijns for her report from Madagascar, it was most interesting.

Ellen says: Being at the southern half of the earth it was strange to see the eclipse approach from the left bottom to the right upper corner.

Surely the path of the Moon across the Sun depends on whether the Moon is on the ascending node of descending node rather than the hemisphere it is being viewed from Earth.

Ellen also says: No baileys beads could be seen, as could be expected being south of the central line.

Surely the visibility of Baily's Beads does not depend on you being on the centre line. Sheridan Williams

From: Michael Gill <eclipsechaser@yahoo.com>

The V position angle (measured from the zenith point of the Sun's disc) of eclipse contact points is VERY dependent on from which hemisphere the eclipse is being viewed. This is what I think Ellen was referring to.

For those of us from the Northern Hemisphere, eclipses happen back-to-front down south! Michael Gill.

From: Glenn Schneider @ Home <gschneider@mac.com>

> Ellen says: Being at the southern half of the earth it was strange to see the eclipse approach from the left bottom to the right upper corner.

To avoid being unipolar hemispheric chauvinists, perhaps those of us from the North should view eclipses by facing south and bending over backwards. Thus, we would still see the moon cross from right-to-left. If we start practicing now, we should have strong enough backs for the next eclipse, and for those observing from Australia we would need to be so contorted for only half a minute. Well, off to my yoga class... Glenn Schneider

From: Vic & Jen Winter, ICSTARS Inc. <icstars@icstars.com>

>Although Fred Espenak's guide for the eclipse indicated that the weather for the central and eastern regions of the island were not too good, the prospects on the south west coast were predicted to be almost as good as Angola and western Zambia.

I thought I would interject a reminder about the invaluable weather data supplied in the NASA bulletins. Let us all remember that this great data is available thanks to the work done by Jay Anderson of Canada. Fred's work in calculations of circumstances, mapping and timing can stand alone for their merit, but he didn't produce the book alone. Jay definitely deserves proper credit for producing this information for us all. "Thanks, Jay." Vic & Jen

From: Sheridan Williams <sheridan@clock-tower.com>

You can see what we saw from Morombe in Madagascar at: www.clock-tower.com/eclipse2001 Sheridan Williams



From: Patrick Poitevin <patrick_poitevin@hotmail.com> To: SE Mailing List <SOLARECLIPSES@AULA.COM> Sent: Saturday, July 07, 2001 8:10 PM Subject: [SE] 2001 **eclipse on BBC2 with shadow bands**

From Ken Phillips: .../.... But they are captured on the BBC2 TV programme which is about our team being screened tomorrow evening (00.30 on Friday July 6, actually), repeated at 07.45 on Sunday July 8 and I think repeated again next Wednesday. It's called "Final Frontier". .../... PP

From: Mike Murphy <evmurph@zetnet.co.uk>

It's actually next transmitted at Friday 13th July 01:30 am (set your VCRs Thursday evening). Source: http://www.open2.net/science/finalfrontier/tv/tv_index.htm - Mike

From: <andy.hinds@talk21.com>

Hi all,I am a new subscriber to this page and i am seeking a copy on VHS as i dont have full internet access of The sky at night from june 24 2001 which covered the last eclipse as i missed it totally.the programme that is!! fortunately i saw the eclipse with my own eyes from a sight in northern zimbabwe without a cloud in the sky and as a result have some excellent photos to show and camcorder footage with cringeingly colourful commentary!!! Once i decide to buy a P.C I would share it with the world, till then it is post only im afraid. if you can help me out id be most grateful email me and ill send you my postal address and or phone no ta. ---Open Email - Email on your TV with talk21---

From: Evan Zucker <ez@AbacusTotality.com> To: <SOLARECLIPSES@AULA.COM> Sent: Monday, July 09, 2001 7:21 PM Subject: [SE] **Beautiful eclipses**

I've noted a number of reports from Africa and Madagascar making a point of saying what a beautiful eclipse this was, as if to give the impression (perhaps not intentionally) that this eclipse was more beautiful than some other total solar eclipses.

This raises the question: has anybody ever seen a total solar eclipse that was not extraordinarily beautiful?

Obviously, clouds or other weather conditions can adversely impact an eclipse experience. Apart from that, I would think that the number and size of prominences and the shape and size of the corona are the main variables. Is that what made this eclipse (uniquely?) beautiful? Evan H. Zucker

From: Govert Schilling <mail@govertschilling.nl>

Actually, to be honest, I didn't think this eclipse was particularly beautiful (although I would be the first one to say that every total eclipse is certainly an overwhelmingly beautiful phenomenon). I found the very large corona (with long streamers) in 1998 much more impressive. Also, at the 1999 eclipse, the corona was about as small as this year, but it had a more 'violent' appearance, which made it more impressive to me. --Govert

From: Peter Tiedt <rigel@stars.co.za>

Besides the things you mentioned, I believe that the location - mostly pristine Africa, untouched, with indigeneous flora and fauna in abundance. As an African, these things did not affect me as much as the Europeans, Australians and Americans, but certainly their impressions certainly included the above sentiments.

The exceptional clear weather over virtually the entire land path also contributed. Peter Tiedt

From: Olivier "Klipsi" Staiger <olivier.staiger@span.ch>

to me, 1994 was beautiful: it was my first total, and the coronal streamers were huge, several degrees long but 1995 was "not so beautiful". Of course I loved my travelling to Thailand and the eclipse was a great moment, but the very moment of totality was less spectacular, and shorter, compared to 1994. 1997 was a great trip (Mongolia), and for me the first time I met Ken Wilcox and Fred Espenak, and Jay Pasachoff. But totality was cloudy. Still, I was not disappointed, despite the blizzard. I loved it ! 1998 was a great eclipse, with those two bright "loose diamonds off the ring " - planets, and a Caribbean cruise - a great vacation ! And lots of clouds before totality - suspense à la Hitchcock ! 1999 ? don't mention it. rain in Stuttgart :-(my worst souvenir... 2001: great.

First time I really took time to look at prominences with binoculars. true, the last eclipse is often "the best I've seen" .. :-)

So, which is my favourite ?hard to tell, each eclipse and eclipse-trip is special in its way. Probably 1994 , even though memory vanishes, and I was unprepared for what I would see (I was a novice). But as far as the eclipse trips are concerned, my heart probably beats loudest for my july 2000 trip to northern Baffin Island for "just" a partial eclipse. Seeing icebergs and midnight Sun gave me an idea of what is to be expected in November 2003 for the total eclipse in Antarctica.... Gosh, I'm dreaming of that destination EACH and EVERY day and night !!! Klipsi

From: Gerard M Foley <gfoley@columbus.rr.com>

No. But, the circumstances surrounding the eclipse, the trip, the scenery, the other people can certainly affect the aesthetic response to the event. Gerry K8EF

From: Chris O'Byrne <obyrne@iol.ie>

For (I believe) everyone in our group who was with us in Bulgaria in 1999, it was not nearly as beautiful as 1999. The reasons I can think of -

- *) Bulgaria was our first - you always remember the first time!
- *) Madagascar itself blew us away
- *) The sky wasn't that dark, and so not as much of the corona could be seen. (I think I would prefer to be closer to the middle of the eclipse path in future, so that the sky overall is darker at mid eclipse - in Morombe, the sky was quite bright only maybe 30-40 degrees from the sun, as that part of the sky was outside the shadow)
- *) There was a lot of physical discomfort involved in getting to (and staying in!) Morombe
- *) There were not nearly as many people on the beach in Morombe as there was on Shabla beach in Bulgaria. I think a large crowd really helps...

Comparing with Bulgaria -

- *) The corona was magnificent
- *) We had beer, food, deck-chairs, ...
- *) It was our first (and, personally, I had been looking forward to it since I was 9 years old!).
- *) There was the noise of hundreds of people on the beach letting out a unified scream at 2nd contact! (Morombe was like a funeral in comparison) Chris.

From: Kidinvs@aol.com

I saw this eclipse from Landless Corners in Zambia, situated almost exactly on the centerline. Since this was a relatively short eclipse, and I had a group of 65 people, I felt it important to get as much "total" time as possible, because there were many eclipse virgins on my trip. Being so close to the centerline pretty much negated seeing Bailys Beads. This was also the first eclipse that I have seen where I did not see shadow bands, and this was my 7th eclipse... a bit disappointing.

HOWEVER... I think that every eclipse has its own special personality, if you will, and this one sure did. The detached prominence was huge, and a gorgeous color... and the band of prominences that appeared just before C3 was beautiful... almost like the Bailys Beads that were so obviously missing, this was like a strand of beautiful garnets. That is what I will remember the most.

And of course, the entire experience as a package... Africa was wonderful. The people, the food, the feeling will remain with me for a lifetime... Different than Turkey, but memorable just the same. And of course, I got to see Patrick ride an elephant. Who can top that????!!! Eric Brown

From: Thibault Mangold

Hi all, This eclipse was my second, but I cannot compare with the 1999's corona as I was clouded out. However, I would say that this 2001 eclipse was less dark than the previous cloudy one (according to my memory).

(Continued on page 53)

For my first view of the corona, I was amazed by its size. Is it a normal feeling at first time, or was this corona's streamers bigger than they used to ? I think the quality of the sky is very important to well see the streamers (we had a crystal sky in Mavuradonna). In Bob Yen's site - wonderful site! - , there is a picture that well renders this size (20 mm lens at mid totality, deep exposure). I was also astonished by the tremendous beauty of the bluish coronal streamers. Only several composite photographs can render a little of this wonder !

I took a little less than a minute to take some pictures at different exposures, and then watched the show. I even forgot to take my binoculars (I took them only a few seconds before third contact) !

First times are certainly special, but this eclipse day in a small village of the Zambezi vally near Mvuradonha, Zimbabwe was a total success. Thibault (from France)

From: Bill Kramer <bill@autocode.com>

I've now completed number nine (total solar eclipses). I am often asked which was the best. The answer that serves me best with those that have seen a total eclipse is "How do you compare something so beautiful with something else that was so beautiful and now exists as a surreal memory as well?"

So here's a nice way to think about it:

The first total solar was the most wonderful.
The last total solar was the most vivid.
All the rest were spectacular and awesome.

If you want me to judge which was best,
line them up again for a direct comparison,
without so much time in between them! -Bill Kramer

PS: TSE2001 and Trip report at <http://www.eclipse-chasers.com/e01/ec2001.htm>

From: <Jay.M.Pasachoff@williams.edu>

Being close to the centerline did not negate seeing Baily's Beads. It meant only that you saw them at the beginning and the end of totality for a few seconds each time, instead of having them throughout the duration of totality. Jay Pasachoff

From: Carton, WHC <Wil.Carton@corusgroup.com>

I did not chase to the recent African eclipse, but from my former experience I think to be allowed to conclude:

1. Intermediate solar activity shapes the most beautiful corona shape. They show the brightest and most irregular coronal streamers. This conclusion is supported by my observations of

(a) the intermediate corona's of the TSEs of 1961 Feb 15, 1963 July 20, 1991 July 11 and 1998 Feb 26, and

(b) the maximum corona's of 1980 Feb 16 and 1999 August 11, that both did not fullfilled my expectations because their size was quite small (but both were observed through thin cirrus),

(c) the minimum corona of 1954 June 30 that I didnot observe in the totality belt, but that had been compared by the Dutch amateur astronomer Sir Gratama, who compared in 1961 his three TSE's of 1954, 1959 and 1961 and judged the 1961 TSE the most magnificent eclipse.

2. Maximum solar activity might produce the highest number of visible prominences, as demonstrated in 1999, and is also shown in your website-pictures of the 2001 TSE.



(Continued on page 54)

3. Minimum solar activity produces primarily only long streamers in the sightline of the sun's equator, as shown in the TSE of 1954 June 30 by Sir Gratama.

In my order of beauty, my ranking is: 1991 was the best, 1961 was the second best, 1998 was the third best. Then follow 1963, then 1980, then 1999.

The most dark TSE was the cloudy eclipse of 1990 July 22 in Finland. It became ninety seconds pitch-dark. I could see absolutely nothing anymore, even not my hands! Wil Carton, HOLLAND

From: barr deryl <dbarr@nque.com>

When I am asked which of the 7 total eclipses that I have experienced do I like best, I use the parental hedge. For indeed, to me at least, eclipses are like children. And while they certainly have many, many similarities, each stands as unequalled within the scope of its own merits. But secretly, we all have a favorite child, and if you will pardon an extension of the children analogy, mine is the prodigal son of my provincial narrowmindedness: Bolivia 1994. Both the eclipses that I had viewed prior to 1994 occurred near or around the sunspot maximum. I had a preconceived idea of what totality should look like -- and those pictures drawn by Langley at Pikes Peak in 1878? Obviously the man suffered from too little oxygen to the brain. But at 12,000 feet on the Alti Plano during that November morning I saw a phenomenal stretch of a ghost-light corona that was so similar to Langley's drawings that I forgot all that I had planned to do and only gazed in eclipse-struck wonder. I have never seen a photograph of that eclipse that came even close to capturing those long, long diaphanous coronal spires. Unlike Wil Carton who said his favorite eclipses were those spawned during the transitional periods between sunspot minima and maxima (I know those words really don't exist, but they should), my favorite eclipses are those occurring near the minimum of the sunspot cycle, such as those in Bolivia in 94, and India in 95. I am certain that other SEML members have their own favorite eclipse period during the sunspot cycle, and their reasons and observations might prove interesting as well as provocative. Regarding the African eclipse, which I observed from the Peter Vicker farm near Chisamba, Zambia, slightly north of the center line: I will not dwell long on a report that could only echo what has been so eloquently said by a sizable number of list members already. Instead, I will only mention 4 brief items. 1st, regarding the discussion of Baily's Beads, did any other group note the bead that formed approximately 15 minutes before totality? The northern cusp of the sun was cut off by a lunar promontory. This was pointed out to me by one of the Allentown, Pennsylvania, Astronomy Club Members, a Mr. Paul Becker. We discussed rather or not this was technically a Baily's Bead. Based on the definition as presented and debated by several list members prior to this eclipse, I supported the idea that it indeed was. Feedback from others is welcomed. Unfortunately, no photograph was made of this event. And sorry to say, the exact time was not noted. 2nd, regarding shadow bands: This was the 3rd total eclipse in a row during which I successfully observed shadow bands. I personally think seeing shadow bands is like riding a bicycle. It seems impossible until you do it for the 1st time, and then it becomes 2nd nature. Were it not for the negative reports to the list of several very experienced observers, I was ready to conclude that shadow bands are present prior to and immediately following all eclipses, if one only knows how to look for them. 3rd, regarding the 360 degree sunset horizon: This will probably be the salient point of recall for me for this eclipse. No eclipse that I have observed has come even close to the brilliance of the horizon colors seen last June 21st. But perhaps, during the other eclipses, I simply wasn't looking. There is so very, very much to see, and so little time to see it! And yet a 4th item. I was intrigued to read Eric Brown mention that this was a relatively short eclipse. This really shows how our various perspectives of an eclipse differ, for I regarded it as being relatively long. My personal experience finds "average" ranging only from 2 -3 minutes. Anything that is over 3.5 is by my standards long. We will have to wait until the grand return of Saros 136 in 2009 to have anything longer unless we chase Saros 139 to its mid point deep in the heart of the Libyan Desert where, if I correctly understand weather conditions in that region at that season frequently produce quite severe sand storms. A special thanks to all of you who shared your experiences by word and picture. And an additional thanks to those kept at home by factors beyond your control. It is hard to miss an eclipse, and you have my sincere wishes that on 2002 Dec 4 you find yourself in the path of totality. But while many of you kept the home fires burning you also provided invaluable service with your weather updates and transmissions of other needed data to those of us in the field. The lines of Milton come to mind: "They also serve who only stand and wait." Clear skies to all in 2002. Deryll Barr

From: Crocker, Tony (FSA) <Tony.Crocker@transameica.com>

Perhaps more coronal detail is visible from very high altitudes. Was this true at Mauna Kea in 1991 (I read somewhere that Mt. Pinatubo eruption impaired sky clarity some)? Perhaps we should consider Tibet 2009 and the Tetons in 2017 as aesthetically advantaged viewing sites.

From: Evan Zucker <ez@AbacusTotality.com>

There is a trade-off to high-altitude locations. Although you are viewing through less atmosphere, the lack of atmosphere also results in a degree of hypoxia and, more important, has a significant adverse impact on low-light color perception.

This was demonstrated dramatically to me during physiological flight training in the U.S. Air Force. We were in an altitude (hypobaric) chamber. The lights were dimmed to simulate twilight, and our oxygen masks were around our necks (so we weren't breathing supplemental oxygen). We were holding a card with a lot of colors on it (colored bars, similar to a video test screen), and the pressure altitude was increased to 10,000 feet. We looked at the card for 5 or 10 minutes, and everything seemed normal. Then we were instructed to put on our oxygen masks, which fed us 100% oxygen.

It was a revelation, exactly like a floodlight had been turned on! The colors suddenly and vividly jumped out at us. We immediately realized how much our color vision had been affected by the lack of oxygen at 10,000 feet, which is a not very high altitude or elevation compared with (1) where we normally flew and (2) where many of us have observed and will observe eclipses. (I was at about 14,000 feet at Putre, Chile, in the Andes in November 1994.)

Bottom line: if you are viewing from a high elevation and do not have supplemental oxygen, you will probably see a lot less color in the prominences and other aspects of the eclipse (like the twilight horizon) than you would at a lower elevation. That's why I took an oxygen tank with me when I observed Halley's Comet from atop Haleakala in 1986. Evan H. Zucker

From: Glenn Schneider @ Home <gschneider@mac.com>

In 1994, in preparation for observing the eclipse from the Altiplano at 14,000 feet, I was taking (by prescription) Diamox. One of the side effects of diamox is pupil dilation. Yes! It was wonderful having 7mm pupils, one of which was dark adapted, for that eclipse. Pity high-altitude thin cirrus precluded taking full advantage of that. -GS-

From: Mick Wolf <mickwolf@picknowl.com.au>

Hello Evan, I was impressed by your description of high altitude effects on colour vision, I noticed similar effects in 1994 in Potosi, Bolivia, which is just under 15000 ft. I thought the colours were rather bleached, but other at that time dismissed it as pure imagination. The other effect I noticed was the "slow motion" of movement of visitors to the high altitude (after a day of climatisation), This effect was more noticeable in Hawaii, when we travelled by car from the base (9500ft) to the top of Mauna Kea (13500ft) in about 20 min. My wife suffered from the lack of oxygen in Potosi, but that's another story.. Mick Wolf.

From: Dr. Wolfgang Strickling <Dr.Strickling@gmx.de> To: <SOLARECLIPSES@AULA.COM> Sent: Monday, July 09, 2001 8:43 PM Subject: [SE] **2001 shadow bands**

Hi there, I put a brief videoclip (3sec, MPEG 1, 55 kB) of our video with the shadow bands, recorded in Zimbabwe on my website: http://home.t-online.de/home/Dr.Strickling/fl_sch.mpg

My website is still in German language, containing pictures of the corona and shadow bands and temperature/ wind and brightness measurements: http://home.t-online.de/home/Dr.Strickling/2k1_obs.htm Clear skies! Wolfgang Strickling

From: Evan Zucker <ez@AbacusTotality.com>

What a great video! I don't remember seeing another video that shows the shadow bands so clearly. Nicely done!

I also especially liked the time lapse photos on your main site showing all the phases of the eclipse, with the setting sun turning orange near the horizon. -- EVAN

From: Marc Bernstein

These are very different from the ones I saw in Aruba. From the video they appear to be quicker, narrower, shorter wavelength and to have a scintillating aspect.

How long before second contact or after third contact is this?

From: Dr. Wolfgang Strickling <Dr.Strickling@gmx.de>

Dear Patrick

> Wonderful movie and splendid webpage. German is no problem to me.

Thankyou! For those, who German is a problem: there is an english version of my page available: http://home.t-online.de/home/Dr.Strickling/2k1_engl.htm

> A request: Would you mind I show your movie at Totality Day 2001. Of course with reference to you. Would you mind we use one of your pictures for the SENL Special? Again, all credits to you.

No, you may use both (pictures and video) with referrence. Perhaps do you want to get a longer video sequence on CD?

There was a question concernig the time of observation: the shadow bands are visible on the original video form 15:15:03 to 15:15.33 (2nd contact at 15:13:34 incl. limb corr.) and from 15:16:45 to 15:17:03 (3rd contact at 15:16:40) Regards, Wolfgang Strickling



From: B Yen <byen00@earthlink.net>

I also noticed my shadow band video "peaked" at 2nd & 3rd contact. I think I can detect some fainter shadow-band activity prior to 2nd contact (& after 3rd contact).

I never would have observed shadow-bands visually, since I'm looking at the sun naked eye (to control the cameras, for getting Baily's Beads). I thought I saw a large dark band coming towards me (around 3rd contact), very large scale. (not the small ripples, seen in shadow band videos). Could this have been a shadow band? Bob Yen

From: Chris O'Byrne <obyrne@iol.ie>

I presume that they are on the video between 15:13:03 to 15:13:33 (and not 15:15:03 and 15:15:33 as above)

I always thought that the best time to look for shadow bands was 2 minutes before totality, as I was led to believe that they get fainter (less contrast) as totality gets closer. But your video and observations tend to suggest otherwise. I certainly did not believe that they would be visible within 5 seconds of 2nd and 3rd contact.

So, how does the contrast, brightness, and general observability of shadow bands change during the eclipse? I made a better effort to see them at this eclipse, but it now appears that I may have made my observations too far from totality... Chris.

From: Evan Zucker <ez@AbacusTotality.com>

That doesn't sound anything like a shadow band. I've seen them on several eclipses and read about them extensively. Without exception, they have always appeared and been described as small ripples, just like in that video. That is also consistent with their likely cause: the shifting of the point source of light by high altitude winds, similar to the patterns you see on the bottom of a swimming pool.

Without a more detailed description, I couldn't venture a guess as to what it was you saw. -- EVAN

From: Madden.G <iluvex@netacc.net>

List members, Most of what I would have to report on the 2001 TSE from Fringilla Camp in Zambia (15° 00' 00" S / 028° 09' 36" E) -- with the exception of the dramatic ambient temperature curve which I will address in a separate message -- has already been better said by others. However I want to elaborate on one point: after two disappointments (1998 and 1999) I have finally observed shadow bands.

Thursday June 21, 2001

Just after third contact our on-site weatherman (Mike Branick from NOAA in Norman, OK) yelled out "shadow bands!". I immediately stood up and did a 180 turn searching the ground area just around my location. And there they were. Amazing. Beautiful. Hundreds of them apparently moving in a generally westerly direction at a brisk speed.

Several days ago I had the first opportunity to view some of the dozen or so 8 mm video tapes I shot on this trip. One of the video cameras I brought to Zambia with me was dedicated to shooting an "area" sequence of the following:

1. Setup activities.
2. Ground level eclipse sequence -- including shadow bands if possible (for this purpose I set out a bright white cotton bed sheet with a book of known dimension in the northwest corner of the sheet.
3. Tear down activities.

All sequences were successful. In particular, I was amazed at the shadow bands imaging both before second contact and immediately after third contact.

Prior to second contact the bands become visible as fairly difficult-to-see but discrete changes in the whiteness of the bed sheet. The give away is apparent movement caused by the appearance then disappearance of 'contrast'. As more time passes however, the number of these contrast shifts increases both in number, degree of contrast and organization so that eventually they are well defined and unambiguously shadow bands. Now they are truly moving with respect to the ground. Movement is westerly. The rate (number) of bands is high and I would provisionally judge the speed at up to 25 mph. The separation between 'wavelengths'

(Continued on page 58)

is consistent and between 18 and 24 inches peak to peak.

I also notice that the bands on tape (meaning I did not notice this particular characteristic in situ) appear to have a 'radial point', that is the bands appear to be 'spokes' of a 'hub' some indeterminate distance off to the south). This gives one the impression that there is a rotational factor at play. I must stress, however, that this is highly subjective observation of mine and may be entirely irrelevant.

Immediately after third contact the same events took place with the exception that the bands are almost immediately well defined. At second contact they took some time to develop. It is quite obvious from this documentation that had anyone been looking they would have seen the bands well before second contact. Similarly they reappear just about the appearance of the second round of the Beads and last for 40 seconds by my reckoning. In time they subside slowly to disappearance. The post third contact bands are much easier to both observe and appear more robust ('contrasty') on the video tape. An interesting aspect of the bands is their symmetry. They are not 'confused' agglomerations of striations but rather an organized pattern.

In brief, this remarkable feature of a total solar eclipse is one definitely to be seen. Comparisons to sunlight on the bottom of a swimming pool are vague approximations at best. Shadow bands are entirely unique entities and must be thought of as such: nothing else I have observed in nature can relate to them.

I have sent the tape to a researcher for additional analysis. I will attempt to post vid caps of the best frames as soon as the tape is returned. I will let you all know the URL when it is ready.

EQUIPMENT AND LOCATION

The camera used for the "area" footage is a Sony TRV75 manually set to infinity. It was mounted on a tripod and located 50 feet due west of the principal photography/observing location. I used a Sony x0.6 wide angle conversion lens and the tape was Sony HI8 MP.

The sheet was the whitest queen sized (90" X 100") cloth I could find. I don't know if the 'whiteness' has any bearing on the imaging. However, while the bands were easily seen on the ground, which was grass and straw, they were much easier to see on the sheet. At least part of the reason for this must be the evenness of the surface texture.

LESSONS LEARNED

The initial appearance of the bands (prior to second contact), as viewed on tape, is very very subtle: barely visible changes in density or contrast combined with very slight 'movement' is how I describe it. If one was not looking for them they would certainly be very easy to miss. After third contact however they jump right out -- nothing subtle about it. Based on this, I'm guessing that most observations of shadow bands are after third contact.

If you have not seen shadow bands, try to take a few seconds just before and just after totality to observe them. If you have seen them in the past, let me know if your impressions are similar to mine.

Finally, many thanks to Fred Espenak for his recommendation on positioning and incident angle of the gamma video camera. George Madden, Rochester NY

From: Marc Bernstein <marc.bernstein@worldnet.att.net>

We often hear comparisons between shadow bands and the bottom of swimming pools. Just out of curiosity has anyone ever looked at the bottom of a pool during an eclipse?

From: Evan Zucker <ez@AbacusTotality.com>

I wanted to, in San Jose del Cabo 10 years ago today. I observed totality from the ground of a hotel, which had a large pool. To our amazement, on eclipse morning hotel workers erected a white sheet about 6 feet tall around the entire perimeter of the pool.

I asked an employee what it was for, and they it was to keep anybody from purposely or inadvertently seeing the reflection of the eclipsed sun! Presumably, the misguided theory was that catching a glimpse of the eclipse reflected in the water would cause eye damage. Meanwhile, the eclipse was plainly visible directly overhead. Evan H. Zucker

From: Michael Simmons <msimm@ucla.edu>

I was next to a pool in 1991, too, and I also considered it a hazard. But that was because there was no water in it and there was a crowd of observers with equipment set up all around it. I was sure someone would fall into the concrete pit during the excitement of totality and picture-taking. Fortunately, everyone stayed out of the pool and enjoyed the eclipse unharmed. I don't know why the pool was empty. Mike Simmons

From: Gerard M Foley <gfoley@columbus.rr.com>

I write completely from ignorance. The cause of the shadow bands may be well known, but not to me. Is it possible that they arise from interference between various of Bailey's beads? Gerry K8EF

From: Evan Zucker

Here are a few sources discussing the cause of shadow bands:

<http://www.flycapers.com/eclipse2001/glossary.html>: shadow bands A phenomenon sometimes seen briefly several minutes before and after totality as rapidly shimmering, irregular bands of shadow on the ground and walls. (A white surface helps make them more visible since shadow bands have low contrast.) Bands may be a few centimeters (1/2 to 2 inches) apart, up to a meter (a few feet) apart and travel a few meters per second (about 10 feet per second). The cause of shadow bands is probably the refraction or distortion of light from the thin solar crescent by the Earth's atmosphere. Even veteran eclipse observers do not always see them. They are also difficult to photograph. (Use fast film and a fast lens with short exposure times—1/250 second or less.) Most intense bands seem to occur over dry, warm areas rather than from coastal and shipboard areas. (Water surfaces may help to thermally stabilize air layers that would otherwise cause the bands.)

<http://users.erols.com/r/rcarag/solar/> Another interesting phenomenon is known as "shadow bands." Shadow bands are thin, undulating lines of shadow and light that scientists believe occur due to irregularities in the atmosphere that cause diffraction in sunlight. Such light and shadow is easily visible on a flat, outdoor wall or floor.

<http://www.exploratorium.edu/eclipse/what.html> When only a sliver of the sun is left, with only a few minutes to go until totality, you might notice long, straight bands of shadows moving across the ground. These "shadow bands" form from refraction, or bending of light in the earth's atmosphere similar to what you might see on the bottom of a pool of water. This is the same thing that causes stars to twinkle. With the sun only a long slit of light, the distortions in the atmosphere become visible as moving bands, parallel to the remaining slit of sunlight. They are usually very low in contrast and it helps to spread a white sheet on the ground to help viewing. They are VERY difficult to photograph. We've never seen any pictures of shadow bands. Of course, this could be because everyone has their cameras trained on the main event about to happen which is, admittedly, much more spectacular. Evan H. Zucker

From: Marc Bernstein

"Most intense bands seem to occur over dry, warm areas rather than from coastal and shipboard areas. (Water surfaces may help to thermally stabilize air layers that would otherwise cause the bands.)"

I'm not sure I agree with this. The excellent shadow bands I saw in Aruba were on top of a limestone outcrop a couple of meters from the ocean. Perhaps turbulence at high altitude is more of a factor than at low-level.

From: Gerard M Foley

Thanks very much for the response. The idea that variations in the atmosphere when illuminated by a slit source can give rise to interference bands is very persuasive. The light refracted by the atmosphere could have a degree of coherence not to be expected in the light from various of Bailey's beads. Gerry K8EF

From: B Yen <byen00@earthlink.net>

I thought I saw a report from the 1800's (in Italy?), which showed a diagram of a house. The ripples were large scale, all over the outside walls.

(Continued on page 60)

I'm pretty sure of what I saw (I don't think I was imagining it). It appeared over the river (in front of me, towards NW). I rechecked my wide-angle video, but didn't see it. It's possible I somehow imagined it. Bob Yen

From: Ted Saker Jr.

I agree with Marc. I saw (and videotaped) shadowbands on board ship between Aruba and Curacao on 26 Feb 98. I did not see any shadowbands in Bavaria on 11 Aug 99. I was lucky to see totality at all, though.

From: <KCStarguy@aol.com>

Greetings, Finally saw shadow bands for the first time in 7 total eclipses. Saw them north of Lusaka, near Chisambe. I shouted for everyone to look at there they were. First they looked like scintillating moving lines. After a few seconds they looked like drifting smoke. Someone said a writhing snake moving along. I tried to videotape them but even though I have commentary etc it does not seem that I caught them. They were amazing and lasted for about 4 minutes (Isn't that an unusually long time?). They brightened and then dimmed and just when we thought they were gone, there they appeared again. They flowed in a Northwest fashion and I wonder is there some relationship to the fact that the receding shadow was the other way and NW was in the direction the shadow came?

In 1999 In Hungary, several shouted "shadow bands" before 2nd contact but I could not see them at all. I think the fact there is a white sheet helped me see them with my contacts. I also videotaped the shadow coming from 50 miles away about as it blanked out horizon clouds and rushed towards us. This time the shadow was very shapeless and non distinct and not really noticeable. My report is below, Dr. Eric Flescher (KCStarguy@aol.com)

Greetings, Just got in from Capetown on Saturday 6/23/01 at 12:30 in Kansas after almost 24 hours of assorted travel by land, air, train and vans. Excellent eclipse by Dr. Eric Flescher (KCStarguy@aol.com) Date: 6/21/2001 Notes pics and information will be at: <http://members.aol.com/kcstarguy/blacksun/2001eclipse.htm>

Eclipse observations location: Karubwe near Chisamba, North of Lusaka, Zambia almost near centerline. GPS coordinates: 15° 05.5935'S, 28° 14.317'E. alt 3698 I think the town was yeah I recall that it was 2.4 off the centerline weather: Near perfect- no clouds, some smoke from some local fires on horizon.

Results:

with Panasonic digital- 900: digital video footage of the corona and outgoing diamond ring and tried to photograph shadow bands after 2nd contact. with Kodak 290 camera: Pictures of ring of fire, eclipsed sun in the background pictures (TIFF files for advanced processing and printouts).

Highlights:

- (1) shadow note defined as it moved in
- (2) good 2nd and 3rd contact diamond rings
- (3) saw shadow bands for the first time after 3rd contact and they lasted for more than 3 minutes. (I am analyzing my video to see if I caught them).

Other highlights of the trip:

- (1) Victoria Falls (got some great digital shots)
- (2) Capetown is gorgeous.
- (3) Cape of Good Hope, Seal Island and Penquin beach.
- (4) Safari ride and animals.
- (5) People in Zimbabwe and Zambia
- (6) Train ride

From: Assoc Prof J R Huddle <huddle@usna.edu>

Has anyone tried to make a quantitative measurement of the shadow bands' wavelength, frequency and wave speed from a videotape? Seems to me that you should be able to measure all three of these quantities directly from a videotape. Of course, wavelength * frequency should equal wave speed. Has anyone tried it? Jim Huddle

(Continued on page 61)

From: leighton@gmx.net

On board the Rydam in middle of the Caribbean in 1998, we saw spectacular shadow bands on the funnel. It was the first and only time I have seen them. 1979 near Yakima - translucent clouds; 1991 Baja - perfect conditions at beach; 1999 France - heavy cloud).
Alan Leighton

From: Assoc Prof J R Huddle <huddle@usna.edu>

It was asked, "Is it possible that they [the shadow bands] arise from interference between various of Bailey's beads?"

No, in order to have a perceptible interference pattern, the sources of light that are interfering must share a definite and constant phase relationship. (We say the light sources must be "coherent".) The light shining through one valley on the moon is completely independent of the light shining through a different valley, so those two light sources have a phase relationship that is random and varying in time: They are not coherent. Therefore, no interference pattern will be visible when light from two different Bailey's beads interfere. For the same reason, you won't see an interference pattern if you shine two different lasers at the same spot on a wall.

If we want to demonstrate an interference pattern in the physics laboratory, we usually start with a single coherent light source and split it into two (or more) sources that are coherent with each other. In Young's experiment, for example, you do this by passing the light from a point source through two narrow slits that are close together. The fact that you used a point source guarantees that the beams from the two slits will be in phase at the slits. But when the beams recombine on a screen some distance away, the phase between the beams is different for different points on the screen. Your eye - and your camera - can see the pattern, because at any given point on the screen, the phase difference is constant in time, depending only on the difference in distance to that point from the two slits. In the Michelson interferometer, light from a point source is split into beams moving in perpendicular directions by a half-silvered mirror. When the beams recombine, you can get constructive or destructive interference depending on the difference in the lengths of the optical paths taken by the two beams. Both of these are described in detail in college physics textbooks, so I'll let the interested reader pursue this at more depth on her own. (Do you find anything about Lloyd's mirror? It is one of my favorite interference demos, but these days, it is discussed only rarely in textbooks.)

The bottom line is that the sun is not a POINT source, so the light from different beads is not coherent, so they don't produce a visible interference pattern. Jim Huddle

From: Mike Simmons

We saw shadow bands in 1979 a little southwest of you near Goldendale under clear skies (which lasted about 20 minutes). I didn't notice them in Baja in 1991 either but they were seen in 1999 in Iran. Mike Simmons

From: Madden.G <iluvex@netacc.net>

Hang on Jim. I'm working on that right now. We also have a known dimension on the sheet to use as a baseline. George Madden

From: B Yen <byen00@earthlink.net>

I put a ruler, aligned with N-S (roughly) on the white background, for my shadow-bands video. So, direction & spatial-freq, wave speed can be measured. My video is zoomed-in, so I have some image scale to play with. (but, the shadow bands are faint).

I would be interested in letting *qualified* people like yourself, to analyze the video for me. I'm tied up with projects right now.
Bob Yen

From: Dale Ireland

Mike, You were at Goldendale in 79? Were you at the observatory? Remember Rockin Roland? I didn't see the bands, we didn't have any space for a sheet. The Goldendale observatory staked out 10ft by 10ft squares of ground, each with an electrical outlet (12v drives were rare) for as I remember \$30 a plot. We were in the middle of a crazy group of frantic photographers. Dale

(Continued on page 62)

From: Glenn Schneider @ Home <gschneider@mac.com>

No, but in 1991, I know of one fellow in Cabo San Lucas who actually jumped into a swimming pool DURING totality and took a picture of the eclipse from underwater with one of those Kodak throw-away underwater cameras (rated to ~ 10ft depth). I must say that is something I have never done - nor plan to do for that matter! Glenn Schneider

From: Mike Simmons

Dale, I wasn't at the observatory but nearby in a motor home that we had driven from LA (me, my wife and three kids). I didn't want to be stuck at one place because I thought the weather made mobility imperative -- no setting up required, just watching. IIRC I couldn't take the motor home up to the observatory site anyway. As it turns out, we made a last-minute dash for clear skies from Hwy 97 south of Goldendale towards the west to get into clear sky. I heard there was a small cloud that covered the Sun shortly after second contact but have heard more recently that there were only a few seconds of totality lost so which is right?

My "we" below should really read "they". My wife, Sherri, tried to get my attention just before second contact, tapping my shoulder and asking about something but I didn't want to be distracted from watching second contact phenomena. It turns out she and the kids were seeing some sort of odd, squiggly shadows moving across the road and all over the white motor home and she wondered what they could be. I'd forgotten all about shadow bands. I endured hearing first-hand descriptions of shadow bands from the non-astronomers in the family for another 20 years before I saw them myself in 1999, this time because my wife knew what they were and shouted "Shadow bands!" while the rest of us were looking up. Mike

From: McCann, Stephen <stephen.mccann@roke.co.uk>

Gents, The TV program 'final frontier' mentioned last week on this list, (BBC2, 01:30 BST Friday 13th July) also contained footage of shadow bands taken on the roof of the physics department of the University of Zambia, Lusaka.

I had a go over the weekend, with TV screen, paper, pencil and amateur enthusiasm to determine some values, but only got a rough bearing of the direction of travel of the bands which was 48deg west of the sun +- 5 deg. The bands were of too low a contrast to measure the wavelength properly, but a very crude guess was 30cm.

However, I do have a VHS video of this program, which I'm willing to lend to anyone doing a proper analysis of shadow band footage and/or I'm sure the BBC may assist with enquires for a copy. Kind regards, Stephen McCann

From: Barrie W. Jones <b.w.jones@open.ac.uk>

This Final Frontier programme (BBC2, 01:30 BST Friday 13th July) was produced in association with my own university (The Open University, UK), though it was through a suggestion by Ken Phillips (Rutherford-Appleton Labs UK) that the producer sent me a good VHS of the programme, including the shadow bands sequence. The recording is amongst the best I have seen of shadow bands in motion, though it remains to be seen to what extent details of the delicate two-dimensional band structure can be extracted. Barrie W Jones

From: Barrie W. Jones

Shadow bands are a result of the interaction of the light from the thin solar crescent near totality with the slight spatial and temporal variations in the refractive index of the atmosphere. Consider a single point on the solar crescent. The light from this point, passing through the atmosphere, will be weakly focussed on the ground at certain points, and defocussed at other points, so you would get a mottled pattern. You then superimpose the pattern from all the points on the crescent, and the result is not quite uniformity. The pattern is band-like because of the elongation of the solar crescent - it is more of a line source than a disc.

The variations in refractive index are caused by atmospheric turbulence borne along by winds. Atmospheric turbulence up to an altitude of a kilometre or so above ground level contributes to the bands. Barrie W Jones

From: Carton, WHC <Wil.Carton@corusgroup.com>

Jim, In 1962 I was a student and had to perform an experiment with the bending of light along a sharp edge. The light source was mercury vapour. When I gradually cut off the beam, my measurements of illumination did not show a rigorously proportional weak-

(Continued on page 63)

ening intensity to zero, but with sinuslike ruffles around the edge of total shadow. A textbook of Prof. Van Heel about "Technical Optics" told the theory of the wave character of light to explain this pattern.

Moments before and after totality of the TSE of 1991 July 11, I saw such a pattern on the ground (but extremely magnified to some meters large shadowbands) enveloping the umbra immediately. It passed with the speed of a whip lash. Then immediately I thought back to the experiment where I cut off the beam of light. Here in nature, the moon's edge acted as the sharp edge, not within the few meters of a laboratory, but from a distance of 360,000 km and shining on my horizontal plane only eight degrees out off the Vertex.

On this Mailing List I have told my interpretation and trigonometry of the pointsource solar rays along the moon's limb, shining on the ground with an base angle of 82 degrees, how large the ground distance is between two rays that arrive with a half wavelength difference (300 nm). From my memory the answer was two or four meters, I do not remember precisely.

Jim, what do you judge about this interpretation?? Wil Carton.

From: Alyn Kelley <alyn@well.com>

has a TSE ever been observed from the space shuttle? seems to me that if shadow bands were observed in space it would resolve this. Alyn

From: Michael Gill <eclipsechaser@yahoo.com>

A TSE has been observed from space but not from the Space Shuttle.

Jim Lovell and Buzz Aldrin observed the total solar eclipse of November 12th 1966 from the Gemini XII spacecraft.

The rendezvous with the umbra was amongst the mission objectives before launch and the astronauts were to photograph the eclipse if it did not interfere with the rest of their assignments. However a two-day launch delay (November 9th to 11th) meant the eclipse would coincide with a planned high altitude portion of the spaceflight, so their eclipse plans were discarded.

However, after launch the main engine burn to put the spacecraft (docked with the Agena vehicle) into a higher orbit was cancelled, so the eclipse rendezvous was hastily restored to the flight plan.

Travelling at over 7km per second, the spacecraft was inside the umbra for only a few seconds. Here is their 'diamond ring' picture (click the thumbnail to enlarge)... <http://images.jsc.nasa.gov/images/pao/GT12/10074596.htm>

For those interested in reading more about this spaceflight, try the following URL... <http://www.hq.nasa.gov/office/pao/History/SP-4203/ch15-5.htm>

I've seen no reports of shadow band observations on this flight. According to Barrie Jones, "Shadow bands are a result of the interaction of the light from the thin solar crescent near totality with the slight spatial and temporal variations in the refractive index of the atmosphere."

That would rule out any shadow band observations from space. Michael Gill.

From: Mike Simmons <msimm@ucla.edu>

Wasn't there an observation of the 1999 eclipse from Mir? I have a picture that I believe was taken from Mir but I have no details of the observation. Mike Simmons

From: Evan Zucker <ez@AbacusTotality.com>

The photo taken from Mir was of the umbra on the Earth, not of the eclipse itself. Similar photos have been taken by satellites of just about every eclipse since 1970. That's the first eclipse for which I remember seeing such a photo; it was published in National Geographic. Evan H. Zucker

From: Barrie W. Jones <b.w.jones@open.ac.uk>

(Continued on page 64)

The phenomenon described below is due to what is called Fresnel diffraction. The lunar limb does indeed cause Fresnel diffraction in sunlight. Some decades ago, Fresnel diffraction was considered as a possible cause of shadow bands, but the form of the Fresnel pattern at the Earth's surface does not match shadow band observations. By contrast, the atmospheric turbulence theory fits the observations rather well. Barrie W Jones

From: Carton, WHC <Wil.Carton@corusgroup.com>

Thank you Barry, I saw and enjoyed the webcast videoclips of shadowbands, made during the Zambesi-eclipse last June. Very interesting and well recorded, my compliments! I admit that THESE shadows show similarity to the pattern in a swimming pool. But these ghostly shadowbands lasted some MINUTES and look very DIFFERENT from the highspeed shadowbands that I saw only a few SECONDS during the TSE1991 in Baja. Question: is it possible that I saw indeed Fresnel diffraction, in other words that I saw a different phenomenon than "your" atmospheric shadowbands? I remember an observation by the Dutch amateur Vastenholt, of an occultation of Aldebaran, a star and thus a perfect pointsource. Visually the occultation by the Moon happened instantaneously. But Vastenholt's highspeed electronic equipment yielded a lightcurve that showed the diffractionpattern during the occultation lightfall period of 1/125 seconds, and that could be clearly distinguished from atmospheric scintillation in the preceding moments. (This diffraction at the lunar limb caused problems to Vastenholt who wanted to determine the angular size of Aldebaran.) In 1991 in Baja I had a free panorama to the west, with a sandy plane in the foreground and a maizefield in the background. The lunar umbra passed with a speed of 600 meters per second. Could I have seen a with 600 m/sec passing pattern of Fresnel diffraction, or is that too quick? Many years ago I was a baseball player. Then the challenge for the hitter was to observe and react with lightning speed to the pitch, coming from 18m45cm with 100 km/h speed or more. Wil Carton.

From: Barrie W. Jones <b.w.jones@open.ac.uk>

I will have to dig into my files to get the details of Fresnel diffraction due to the Moon eclipsing the Sun. However, I'm just leaving to teach at a residential school for a week, so can't do anything until I get back on 30 July. In the meantime, does anyone else have (or can calculate) the details and circulate them? Barrie

From: Richard Bareford <bareford@yahoo.com <mailto:bareford@yahoo.com>>

This discussion about shadow bands and Fresnel diffraction reminded me of a photo I took of the 1994 May 10 annular eclipse. I've added it to my webpage at: <<http://www.geocities.com/bareford/subsun2.html>> For those with slow connections have patience; I'm new at page building.

The image is a 35mm Kodachrome 64 slide, shot at the prime focus of my 1000mm f10 SCT, with a 2 power teleconverter for an effective focal length of 2000mm. I didn't record the exposure time but I estimate it was about 1/250 sec. Taken near the center line, moments before 3rd contact it shows multiple shadowy arcs running parallel to the lunar limb for about 30 degrees, centered on the contact point and superimposed on the remaining sliver of photosphere. In addition, lunar edge features appear to be dimly replicated along these arcs just above the contact region.

Maybe it's just camera vibration, but I've never seen anything remotely similar in dozens of my eclipse photos taken with the same setup at different sites. I did an experiment using a slide projector and a blackened slide in which I cut a narrow slit. When the projected image of the slit was slightly defocused multiple dark lines appeared in the opening, parallel to the edge, very much like in the eclipse photo. Poor focus thus seems a likely explanation; however, I've yet to remember to refocus after removing the solar filter at any eclipse. So all my pictures are probably a little out of focus and shakey, yet the dark arcs appear in only one.

Now there are some things unique about the circumstances of this picture. I had missed a matching shot at 2nd contact, and this was the only annular eclipse I've ever successfully photographed. Perhaps there is a critical moment during annular eclipses just after 2nd contact and just before 3rd contact when the gap is sufficiently narrow and optimally shaped to produce these lines in slightly defocused cameras.

But then there is this Fresnel diffraction phenomenon. Is it possible that the lines are not an internal artifact but actually produced at the lunar limb or in the atmosphere, itself acting like a poor lens? I'd be curious to know if anyone has seen similar images. A Also trying to capture such an image might be an interesting project for this December's annular eclipse.

Incidentally, I've added a link to a selection of my African wildlife pictures (from elephants to termites) at; <<http://www.geocities.com>

(Continued on page 65)

com/bareford/subsun.html> Richard Bareford

From: Mick Wolf <mickwolf@picknowl.com.au <mailto:mickwolf@picknowl.com.au>>

See Sky +Telescope, May 1991. Mick.

From: Richard Bareford <bareford@yahoo.com <mailto:bareford@yahoo.com>>

I've added two links to my 1994 annular eclipse page, <<http://www.geocities.com/bareford/subsun2.html>>, showing Fresnel diffraction in the laboratory (Georgia State University), and during an occultation of a star by the moon (Harvard).

The effect on the star is for its image to briefly flicker then brighten immediately before occultation. Apparently the same phenomenon occurs during a solar eclipse when and where the sun/moon gap is thinnest. In a total eclipse this would be just before 2nd contact on the moon's east limb, and just after 3rd on the west limb. In an annular eclipse the reverse would hold; i.e., just after 2nd on the moon's west limb, and just before 3rd on the east.

In a total eclipse the narrowest gaps are at the ends of the solar crescent. At 2nd contact the diffraction effects should begin at the extremities and converge quickly toward the crescent's center. At 3rd contact there would be a brief connection at the center, a split and then disappearance towards the ends.

In an annular eclipse at 2nd contact diffraction would begin at the tips of the sun's converging crescent and join above the moon's trailing edge. At 3rd contact they would begin at the moon's leading edge and then be squeezed out to either side as the sun's crescent reforms. This last circumstance is what I may have recorded.

The appearance of diffraction is evidently overwhelmed by the diamond ring and Bailey's beads events, which occur at about the same time and place. However, using a filtered telescope the phenomenon might just be visible for an instant as a set of parallel fringe bands arcing above the lunar limb at its closest approach to the sun's limb.

As has been stated in previous postings this phenomenon is probably not directly related to shadow band formation, but it may be in the same category with respect to the scarcity of good photographic observations. List members may want to examine their image archives for instances. Perhaps these were dismissed originally as artifacts. Comments? Richard Bareford

From: Scott <hdemann@yahoo.com> **From Busanga Plain**

Hello All, Just returning from Zambia where I saw the eclipse for the Kafue park near the centerline.

Very exciting stuff. Did anyone else get swarmed by mosquitos during the totality? The birds looked lost, and the Puku males were in a mating frenzy just after the 3rd contact. The temperature, according to our primitive instruments went from about 30 before the 1st contact to about 15 during. Scott

From: B Yen <byen00@earthlink.net> To: <SOLARECLIPSES@AULA.COM> Sent: Tuesday, July 10, 2001 9:57 PM Subject: [SE] **TV documentary on Botswana**

At 3pm Pacific time on Discovery Channel/DirectTV, there is a program "Rivers of Life, Rivers of Death". It's about the Chobe River in Botswana (where I camped out at). I believe Dec 2002 eclipse goes thru this area.

When I got back 1.5 wks ago, I saw some related programs on Africa. On PBS, they had a documentary about Livingstone (I taped it). Then, a motorcycle program went to Botswana, to do a motorcycle safari (!). Everyone was talking in glowing terms about the experience.



Herder and Bus from Holland in Zambia

From: <heinzscs@kerberos.ccc.at> To: <SOLARECLIPSES@AULA.COM> Sent: Wednesday, July 11, 2001 9:38 PM Subject: [SE] **Zambia Eclipse**

I was a participant of a short trip from Austria to Lusaka Airport with immediate return after very short 3 minutes and 27 seconds of totality. Some pictures at: <http://home.ccc.at/heinzscs/sofi01.htm> (sorry only in german) Heinz Scsibrany

From: Cees Bassa <C.G.Bassa@phys.uu.nl> To: <SOLARECLIPSES@AULA.COM> Sent: Wednesday, July 11, 2001 10:59 PM Subject: [SE] **Preliminary Report, Pictures and APOD**

Hello List, Finally, after being back for 1.5 weeks, I've uploaded a preliminary report and pictures on my eclipse experience. I've been to Zambia to view the eclipse, which was very successful, and view Africa from Zimbabwe. Report and images can be found at: <http://www.astro.uu.nl/~bassa/>

Today one of my eclipse pictures was selected "Astronomy Picture of the Day", take a look: <http://antwrp.gsfc.nasa.gov/apod/ap010711.html> I'm very grateful to have one of my pictures on this site. More coming soon so keep checking. Regards, Cees Bassa

From: Michael Simmons <msimm@ucla.edu>

Congratulations, Cees. A beautiful image. Did anyone notice that this is the 10th anniversary of the "Great" eclipse of July 11, 1991? I think they chose a good date for your great APOD! Mike Simmons

From: Cees Bassa <c.g.bassa@phys.uu.nl>

Hello List, Finally I've got my report and pictures on the 2001 eclipse completed. <http://www.astro.uu.nl/~bassa/> Have a look and tell me what you think. Regards, Cees

From: Ben Hope <benj_hope@hotmail.com> To: <solareclipses@Aula.com> Sent: Wednesday, July 11, 2001 11:44 PM Subject: [SE] **lack of advancing shadow**

I'm new to the list so hello everyone,

A few friends and myself were lucky enough to be on a hill just North of Lusaka looking North West over a plain to view the total solar eclipse on 21.6.2001.

It was stunning as you would expect but I was disappointed by one aspect. I had told everyone to expect to see the moon's shadow speeding towards us in the seconds running up to totality. I had read about this effect a number of times and seen it on the clouds off the coast of Plymouth during the total eclipse of 1999 in England. However nothing hap-

pened this time - it just went dark very quickly and I was wondering why.

The only possible reasons I can think of are as follows:

- It was hazy and this could have diffused the light so that the edge of the shadow was less distinct.
- The exact arrangement of the Sun-Moon-Earth system and the irregular shape of the Earth could mean the the shadow was "out of focus" at that particular time and place.
- I was fairly near the central line of totality. Perhaps this affects the speed at which it turns from light to dark and consequently how distinct the shadow is.
- The passage of the shadow was simply too slow at this point during the day
- the shadow effect only really being seen towards the beginning and end of its path (ie in Angola and Madagasca) when the shadow travels a lot quicker.
- Perhaps the sky was too clear. Would a few clouds have helped?

I would really appreciate it if someone could clarify this for me - it's been bugging me ever since. Thanks, Ben.

From: Evan Zucker <ez@AbacusTotality.com>

I've always thought that it was a bonus -- definitely not a sure thing -- to be able to perceive the shadow approaching. I think you need just the right combination of factors to be able to see it. There are two different ways to perceive the shadow: on the ground and in the atmosphere.

I think the most important factors are an observing site at a high elevation over the terrain where the shadow is coming from and the atmospheric conditions. The speed of the umbra is also a factor; near the beginning and end of the totality path the umbra is moving too fast, but that shouldn't have been a problem at Lusaka. Evan H. Zucker

From: Pierre Arpin

On the basis of my own experience of solar eclipses chasing I can give a hint of an explanation.

It is easier to see the advancing shadow for a morning totality instead of an afternoon one.

Why ?

During a morning eclipse (Feb 26th 79 in Manitoba and Nov 3rd 1994 in Bolivia) the shadow came from a point opposite of the sun and therefore was not attenuated by the glare of the sun even if the glare is very reduced par the eclipse.

If you observe an eclipse very late in the afternoon the shadow will be very difficult to see.

In 79 and 94 the coming shadow was like a tunderstorm coming very fast

In Zambia I never saw the incoming shadow. The landscape darkened progressively until totality arrived.

Do you agree ?

From: Judy Anderson

Dear Ben and All, The most fantastic advancing shadow that I have ever seen was in southern Peru in 1994, which was an early morning eclipse. It was a hilly desert area and you could see the dark shadow contrasted against the light soil moving very fast like a giant snake. That was one of the most memorable things of that eclipse for me. My roommate and I took the sheets off our beds and spread them out, but I have yet to see shadow bands. Judy Anderson, Mobile, AL USA iceclipses@home.com

From: Mike Murphy <evmurph@zetnet.co.uk>

Hi Ben, I was near Chisamba, on top of the hill next to the Solipse festival and also saw no advancing shadow despite having a plan that included looking for it. After 3rd contact I was chatting to a chap there and he did see the advancing shadow. He described it as very impressive, "like something out of a science-fiction movie" and also said that it moved very fast.

I concluded that I had been looking in slightly the wrong direction and/or missed it as the excitement of 2nd contact arrived. Anyway, I saw plenty of shadow in Cornwall in 1999, I was very happy to have clear skies for this one. - Mike

From: Hole in the Sky Tours To: eclipse@hydra.carleton.ca
Sent: Thursday, July 12, 2001 4:03 PM Subject: [eclipse]
TSE 2001 Photo and Writing contest!

Due to the fabulous response to the first Hole in the Sky Photo and writing contest , we have decided to do it again! [To see the winners from the last eclipse contest, go to www.holeinthesky.com/99contest]

Categories:

Photography: Black and White or Color [digital images and composites accepted]

Writing: Short stories, poems, anything you like

Deadline:

Entries must be received by: August 31, 2001 Send entries to: eclipse98@earthlink.net Hole in the Sky 2001 Photo and Writing Contest

Please include your name, address, phone number and email

address with the location of where you witnessed the eclipse, and if your entry is a picture, please include they type of camera, film and lens (or type of telescope). You may include any other information the you think is interesting.

Award 1st and 2nd place prizes will be awarded in each category and winning entries will be posted on the Hole in the Sky Web site

Other stuff:

Anyone who viewed the June 21, 2001 eclipse is eligible to enter, you need not be a participant in the Hole in the Sky Tour

Decision of the judges is final. Contestants grant permission for thier work to be published on the Hole in the Sky web page, without transferring anyrights of ownership.

From: Greg Babcock <gregb@iccom.com> To: <SOLARECLIPSES@AULA.COM> Sent: Saturday, July 14, 2001 10:50 PM Subject: [SE] **close up**

Here is my close up effort. I may try to do more with image later. <http://www.synrgistic.com/eclipse2001/prom2001.htm>
Greg Babcock

From: Mick Wolf <mickwolf@picknowl.com.au> To: <SOLARECLIPSES@AULA.COM> Sent: Sunday, July 15, 2001 9:33 AM Subject: [SE] **Lucky 13**

LUCKY 13

Total solar eclipse- 21-6-01, as observed from Mvuu Lodge, Zambia.

13 was a lucky number for me , I left Adelaide on the 13th June and joined a group of 13 eclipse chasers in Sydney, from where we flew to Johannesburg,joining the 13th day safari tour to Zambia to view my 13th solar eclipse. Because of the uneasy situation in Zimbabwe we travelled through neighbouring Botswana, where we stopped for two days in Tuli National Reserve.WE had morning, sunset and night trips to see the spectacular wild life.The most impressive was the night sky, perhaps the darkest sky I have ever seen.It was realy phenomenal to see the stars so bright and in such a quantity. The second best was the "green flash" when the spotlight shone into the leopard's eyes (that was the only "green flash" I have seen in the last 30 years.

The weather was very good for the whole trip and there was not a cloud in the sky during the eclipse,which we observed 2 or 3km from the HQ of the Mvuu Lodge near the Zambesi river Because of the 12kg limit on the laggage I bought a light weight tripod prior to departure.This put the limit on the number of exposures I could take - I had to wait

10-15 sec. after a change in shutter speed. The 5.6 ,500mm Maksutov lens with 2x converter and Canon T90 camera proved to be too much for the tripod. Remember for the future - solid tripod is more important than socks and shirts. The viewing through the camera was excellent - 20x mag. The eclipse, of the same saros as the 1983 eclipse in Indonesia, was much brighter and the Bailey's beads were rather dimmer and fewer than in the past eclipses. There were many smallish prominences. Perhaps the TSE was not the most beautiful, but still impressive and certainly deserved our party's toast in champagne and vodka. May the eclipses be great.

See you in Ceduna, Australia, in 2002. Mick.

P.S. I am still struggling to put the slides on the net.

From: <andy.hinds@talk21.com>

I don't know what the problem [actually i do !!!] was to do with zimbabwe, I was a bit weary myself [my wife included!] about the recent problems with white farmers but we had no problems at all except my suitcase went missing at en route to vic falls. But apart from that i fell in love with the place, we had a brilliant view of the eclipse except that we had a group of the local villagers crowded around my equipment!! I had to warn them of the impending excitement and they were very obliging!!! There were shadow bands but i was too busy looking skywards to notice!!

From: Jean-Paul Godard <jean-paul.godard@noos.fr> To: <solaRECLIPSES@AULA.COM> Cc: Martine TLOUZEAU <tlouzeau@noos.fr> Sent: Sunday, July 15, 2001 11:15 AM Subject: [SE] **Eclipse trip to Nyamapanda (Zimbabwe)**

We've made a short report about our trip to Zimbabwe.

http://uranoscope.free.fr/tse2001/index_english.html

We were 44 from the "French astronomy association". (AFA) Staying in Harare, we travelled to Nyamapanda on the E day (200 km north east of Harare, close to Mozambican border, close to central line).

Full blue sky, Shadow bands, eclipse crescents,

I made a video, but experienced a lot of problem:

- No equatorial mount to follow the sun during partial phases due to baggage limitation to 10 kg on last flight (Chartered)
- Not enough preparation to locate the right focus with and without screen (Focus difficult to appreciate on a very narrow screen, without enough resolution)
- Difficulty to manage exposure (screen was not sufficiently efficient to keep the exposure wheel in a convenient zone)
- Lot of stress (and no check list available) before second contact: I took of the screen but forgot to restart the cam.
- I discover that before 3rd contact, but neglected to refocus...

Most of the Pictures are from Martine TLOUZEAU...

I'm actually reprocessing the video to obtain:

- accelerated clip of the partial phase (C1-C2)
- still picture of totality For this I use a kit of tools developed by Webcam users to enhance astronomical pictures. I hope to be able to show something!

Still happy to see that! That was Fabulous! Cordialement / Regards, Martine et Jean-Paul



By Olivier Staiger

From: Vic & Jen Winter, ICSTARS Inc. <icstars@icstars.com> To: <SOLARECLIPSES@AULA.COM> Sent: Wednesday, July 18, 2001 3:55 AM Subject: [SE] **Eclipse Pix posted**

Finally getting pretty processed and corrected eclipse pix up and online. <http://www.icstars.com/Mad/eclipse/eclipse.htm> is the lead page with our Corona shot. Clear Skies, Vic & Jen

From: B Yen <byen00@earthlink.net> To: <SOLARECLIPSES@AULA.COM> Sent: Monday, July 23, 2001 12:02 AM Subject: Re: Fw: [SE] **any post-eclipse after-effects from Lariam?**

[this message is sent to SEML, for the benefit of any other eclipse chasers who have had Lariam side-effects. Please get in touch with me, if you have had similar symptoms. It caused a car accident, which might have had an unpleasant ending]

"Vic & Jen Winter, ICSTARS Inc." wrote: Bob, Most side effects we had in our group (and in our family) were in the area of motion sickness / disorientation problems. We noticed that a larium taken the day BEFORE a long bus ride or a bumpy flight was making us queezy or disoriented the following travel day. One lady even tried to get hers changed in Mad because it "weirded her out too much" foggy, fuzzy and dizzy feeling for about 48 hours afterwards. But she had a different effect with later pills. Our personal experiences showed that taking the pill with a LOT of food made an improvement, or waiting an extra day to take it if there was upcoming seasickening travel.

My "day" was Thursday, I know I missed it by one day, & took it last Friday (my last Lariam, 4 wks after leaving Africa). My accident happened on Saturday, so it would be consistent with the above "next day" syndrome. On Sat, I drove to my friend's place (astronomy instructor at CSULB, has a nice astronomy online course with book & CD), to talk about our science project (education related), show him eclipse videos. I remember driving along, & feeling sleepy. I mean like really out of touch. Then the accident happened (the car in front of me stopped suddenly). Boom, all of a sudden I saw the car in front of me, braked...

At my friend's place, I was alert & talking. But, when I laid down horizontally, to look at his big-screen TV, I fell asleep! (my friend said "wake up!"). On the way back, I felt the "nodding off" sleepy sensation again. I get the same feeling, when I'm sleep-deprived. But, there was something very peculiar & intense. I remember being at a stoplight, & I *couldn't* concentrate on the car in front of me (I tried & I tried)...it's like I was in a daze. When the light went green, the car in front moved, but I didn't notice. Then, when it was a good 20 ft away, I noticed it, & went on thru the intersection. (it's like I was suspended in some kind of sleep). Now THAT felt weird, something I never experienced. Like I was out of touch with reality. (anything right in front of me was oblivious). It seems as if I were sitting in a stoic, unmoving position (like when you're driving), it would come on. I went to a bookstore afterwards, & was alert. No "nodding off".

I think what may be going on is a *combination* of sleep-deprivation & the Lariam (agrees with other symptoms reported). If so, I have a potential legal case against the drug company (the accident was unpleasant, for both parties. the car in front of me, really got "wadded up". The gas tank was exposed, I'm amazed it didn't blow up in a ball of fire). I know enough about science, to think that it's a combination of factors. (if many drugs are taken, they will "interfere" with each other). My brother-in-law is a developmental biologist (at Emory Univ, coincidentally that's where the CDC is located), & he told me "there is no theory in biology!". I.e., getting from point A to point B biologically, can be accomplished by several paths. (the probabilistic-nature of Nature). The Lariam effect, would not be "clear-cut", & would affect different people differently (some not at all).

I think it's kinda like the controversy about the genetically-engineered foods. (you can make a full grown trout in 1 year. a 2yr normal trout is half the size!). The criticism is that, we don't know (& may never know) the full effects of gene-altered foods. How would you test this, a 60 yr survey? (with good statistics) How do you know, that some underlying (unknown) effect is going on, that could pop up generations from now. (in future generations). I look at the site given by Joanna Kovitz & Daniel Fischer <http://lariaminfo.homestead.com/>, & I think there is enough to suggest something, i.e. Correlation. In the model (Coincidence... Correlation...Causality), I think there is at least correlation. (it's beyond coincidence, or "anecdotal evidence"). In a worst case scenario, you could have an Andromeda Strain like disaster, which could wipe out the human race. The recent Foot-and-Mouth disease. AIDS (& Ebola) are retro-viruses, that were dormant in African jungle (I think).

I was reading about disease prevention, & the researchers were saying a disaster from a super-virus was right around the corner. Unsettling. (one comment by a scientist was a dire warning. also, see the article at end of email). That's Nature: bodies are being invaded by viruses, organisms, & our immune system is continually fighting them back (24 hrs a day). Nature is about organisms conflicting & competing. (I saw that in the Africa eclipse. Animals eating each other). That's simply survival of the fittest. viruses mutate, & drugs are no longer effective..the virus wants to survive. So, we have to come up with new drugs. It's an ongoing battle.

For my professional work, I'm involved with Complex Systems, artificial life, genetic algorithms (on computer), so it's very related & interesting. I even emailed Jay Pasachoff, about cellular-automata models, in explaining the superheating of the near-limb corona. I spent the last 1.5 weeks talking to physicists, geophysicists, meteorologists, computer scientists, mathematicians at Caltech & other universities. There's a new revolution in simulation/modeling in engineering, sciences. I completely lost interest in updating my eclipse material! (there's a ton of sequences to be scanned & uploaded). I'm on the trail of something really interesting, & it may have big interdisciplinary appeal to all of the sciences (eclipses included). Ironically, the Africa Eclipse contributed to my new-found Science "voyage of discovery", I had somewhat of a Darwinian experience over there. The eclipse, variety of animal & plant life, the Southern Sky...I was unknowingly doing experimental physics! On the British Airways flight back home, I saw an article in the magazine about mutating mitochondria, as an indicator that Africa was the *single* origin of human life. (there's a competing theory, that there were several originations, by a researcher in Univ of Michigan)

Ironically, I just found out Alan Leighton (on SEML), is really Robert Leighton's son. (Caltech physicist & dept head, who helped in the production of Feynman's Lectures on Physics. I didn't know that. I had a fantastic Physics 106/107/108 physics curriculum at Univ of Illinois, created by Leo Lavatelli, who went to Caltech/undergrad with R. Leighton, late 1930's. My interest in astronomy came from my high school/college physics curriculum. In high school, it was the Harvard Program on .xxxxxx, which had a story about the discovery of Comet Ikeya-Seki. That's how I got hooked on comets..then astronomy..then eclipses). I had been emailing Alan for over 2 yrs, without realizing this! As a matter of fact, I only found out a few months ago that John Leppert/SEML is the nephew of Ella Leppert, who was a renowned teacher at my high school, which has some illustrious alumni. 3 Nobel Laureates & George Will/ABC News. I had known about John for a few yrs, but never knew. Small world.

Anyway, the last month has been pretty intense. It's changed my life completely. The eclipse hobby has jump-started my science projects. Unfortunately, the Lariam gave me a jump-startle! (I'm still nervous, thinking about how things coulda been worse. Maybe a serious injury or worse).

In short, the African Eclipse was.. "stimulating". I'm pretty excited.

PS

Below is some stuff about how \$\$ is tied into the medical establishment. (there's a similar effect, in the science research establishment, where I dabble in)

>From CBSNEWS.com: Drug Trial Dangers?

- * Doctors Often Get Paid To Do Drug Trials
- * Drugs Can Sometimes Worsen Patients' Health

April 1 CBS Dr. Marcia Angell says money is at the root of drug trial abuses.

(CBS) Patients taking experimental drugs in clinical trials often don't know the doctors administering them are usually paid by drug companies - and that the drugs can sometimes worsen their health, Steve Kroft reports.

Increasingly, the ones doing these studies are no longer PhD researchers at large universities. They're family doctors looking for extra cash - doctors like Robert Fiddes, who had a small practice in southern California. Susan Lester was one of his study coordinators. She says that he had 30 to 40 trials going during her time there. She says that drug companies were paying him anywhere from \$50,000 to \$250,000 per study.

Dr. Fiddes eventually gave up treating patients altogether, because drug companies were paying him more money to experiment on patients than HMOs were paying him to heal them.

Tom Parham was one of those patients. His family doctor, who was one of Fiddes' partners, told him there may be some problems with his prostate, and suggested he go see Dr. Fiddes to enroll in a study on an experimental prostate medicine.

The doctor neglected to tell Parham that his history of heart problems put him at great risk if he took this medication.

Lester says she noticed on Parham's records that he had this problem, and says she told Dr. Fiddes. According to Lester, Dr. Fiddes said that Parham could participate anyway.

(Continued on page 71)

A few days later, Parham felt sluggish and went back to the doctor's office. She took him off the medicine. A few days later, though, his pulse dropped very low. He went to the hospital, where he was told he needed a pacemaker immediately.

To avoid getting into trouble with the government, Dr. Fiddes removed any reference to Parham's "long history of bradycardia" from his medical records. Parham had no idea this was going on behind the scenes, and he certainly didn't know Dr. Fiddes and his partners were getting money for turning him into a guinea pig.

Finding patients like Parham, and keeping them, grew increasingly difficult, especially as more and more studies rolled in. So, Lester says, they started to lower their standards on who qualified for a clinical trial.

She says that in one high blood pressure study, they used people who didn't have high blood pressure.

In one arthritis study, Dr. Fiddes was required to have a radiologist read the X-rays of potential research subjects to verify that they had a specific knee problem that was being studied. Dr. Fiddes could not find enough patients who qualified, so he asked the company that was sponsoring the drug trials if he could read the X-rays - they said yes.

“All of a sudden, miraculously, all of the patients qualified for the study,” Lester says. She says he falsified the data.

Dr. Fiddes got even more creative. When he couldn't find patients with ear infections for an antibiotic study, he just ordered up bacteria from an outside lab and faked the specimens.

Based on a hodgepodge of real and fake data, Dr. Fiddes wrote papers that appeared in several reputable journals. Dr. Marcia Angell, former editor of the *New England Journal of Medicine*, says cases like Dr. Fiddes are disturbing, but unfortunately not isolated.

Lester eventually blew the whistle, and after federal regulators raided the office, Dr. Fiddes was convicted of "conspiracy" to commit fraud, sentenced to 15 months in prison, and stripped of his medical license.

Government officials who oversaw this case admit Dr. Fiddes may never have been caught if Lester hadn't put her career on the line and come forward.

Dr. Greg Koski, who runs the government's Office of Human Research Protection, says it's unfortunate but the system depends on whistleblowers. Koski's agency was upgraded recently and he now reports directly to the Secretary of Health and Human Services. The change was made last year, he said, to make sure that cases like the one involving Dr. Fiddes don't happen again. But his office has only 30 employees to watch the entire industry.

That industry involves about a million human research subjects. But several recent government studies have found that not all these so-called "volunteers" know what they're volunteering for, or even that they're volunteering.

The need for human study subjects has gotten so great that the pharmaceutical industry has resisted virtually any regulation that would make their job more difficult. Even major universities, which are supposed to oversee their own research studies, often have a financial stake in the drug being tested and stand to make millions in royalties if that drug is approved.

According to Dr. Koski, this creates a situation in which a university stands to make millions of dollars on a drug that it partly owns. This same university appoints a review board to evaluate it.

That, says Dr. Koski, is exactly why they're not the ones who should be engaging in the research. © MMI Viacom Internet Services Inc. All Rights Reserved.

We have our last pills to take today, but we're waiting until we finish our 20+ hour drive to ALCon and will take them tomorrow. Clear Skies, vic & jen ICSTARS Astronomy - <http://www.icstars.com> Astronomical Tours - <http://www.astronomicaltours.net> Editors of the Astronomical League Reflector - <http://www.astroleague.org> "May starlight always fall on your path."

From: Fabio Pettinati <fabio@best.com>

There have been some horror stories about Lariam, and its side effects. In my case, I took all the required doses and the only thing I

(Continued on page 72)

noticed was difficulty in sleeping properly for one or two days after each dose. Now, while in Angola, my sleeplessness might have been caused by excitement or simply the less than ideal accommodations. Upon returning home (San Jose, CA) I noticed some dizziness. It took me perhaps one week to be back to normal. The joke here at home is that since I crossed from the southern to the northern hemisphere, my brain was spinning the wrong way :-). Fabio Pettinati

From: Richard Monk <richard.i.monk@ntlworld.com>

Nothing too remarkable. I noticed that it took my body clock longer to re-adjust back to UK time after only 2 weeks away - up at 3.30am and dog tired at 8.30pm!

No adverse reactions to Coriolis though! Rgds, Richard Monk

From: Peter Tiedt <Peter.Tiedt@npc-eagle.co.za>

This may be almost off topic - but I feel is on topic for 2002 as it may certainly prevent some people taking the wrong medication.

I have noticed (from Bob and others) that they were on Larium for their visit to Zambia.

It would be interesting to compare the various drugs prescribed - I was prescribed Daramal (1/week) and Paludrine (1 per day) by my local GP, who was hesitant to prescribe Larium.

AAMOI, I stopped taking the drugs as soon as I left Zambia as I was not bitten at all. I have done this several times on visits to malarial areas if I did not experience any bites. The best prevention for insect borne diseases is to avoid being bitten :-) and I used fume coils and deodorant stick type repellents copiously.

Let me know (offlist) and I will compile a list of treatments used and remail to the list. Peter

From: Kidinvs@aol.com

...as long as people are asking, I have taken Larium on 3 previous trips to Africa with no ill affects at all, however, I have used Malarone on my last 2 visits because of the bad press that Larium has gotten, I did fine with the Malarone as well. Eric Brown

From: Kidinvs@aol.com

... Paludrine will be very difficult, if not impossible to find in the US, as I researched this topic months ago to find alternative drugs to Larium for participants in my tour. Eric Brown

From: Schambeck, Christian <C.Schambeck@medizin.uni-wuerzburg.de>

The strange side effects of Mefloquin (Lariam) are well known. Most patients tolerate this drug, some do not. However, there is an alternative, suitable as malaria prophylaxis in WHO zone C: Atovaquon/Proguanil (Malarone). The drug has to be taken daily, prophylaxis begins 2 days before departure and ends 1 week after arrival at home. As studies showed, Malarone is very efficacious, has only a few, very harmless side effects. For a longer stay it may become expensive (compared to Lariam). I recommended Malarone. Prophylaxis by repellents (Autan) should not be omitted, of course. Christian M. Schambeck, MD

From: Jean-Paul Godard <jean-paul.godard@noos.fr>

We were aware of potential difficulties using Lariam. Before departure, we set up a private mailing list to exchange between participants to "AFA" trip to Zimbabwe. (French astronomy association) (<http://www.cieletespace.fr/front/default.asp> follow "Muzezuru link" There is a picture of Martine and me sitting)

One of the thread of the discussion was about lariam and potential side effects, particularly loss of visual accuracy... Some of us returned to doctor, to change the prescription to "Savarine" which need a more contraignant daily pill but without side effects.

If you look through "Google" about Lariam, you will discover a lot of complaints!!! Hope you feel better... Cordialement / Regards

(Continued on page 73)

From: Madden.G <iluvex@netacc.net>

For whatever value it is worth to those heading back to Africa next year, my wife and I were on the Malarone regimen described below and observed no unusual effects whatsoever (other than a deep sense of loss after third contact). The only inconvenience was remembering to take it every day.

Our sympathies to those who have had side effects from other medications. George Madden

From: Patrick Poitevin <patrick_poitevin@hotmail.com>

Dear All, Please do keep messages solar eclipse related. Although the topic might be eclipse expedition related, post eclipse effects of such kind are not tolerated. Thank you for your understanding.

Any reaction or comments are welcome, though, send them to me and not to the entire list.

And ... keep those solar eclipse related messages coming... Best regards, Patrick

From: Josep Masalles Román To: SOLARECLIPSES@AULA.COM Sent: Saturday, July 14, 2001 12:28 AM Subject: [SE] **Photos solar eclipse 21 june 2001**

Photos Solar eclipse 21/june/2001 Kafue (Zambia) <http://www.ictnet.es/+jmasalle/es2001juny21.htm>

From: Josep Masalles Román

My website about the observation of the Solar Eclipse in Kafue (Zambia)

<http://www.ictnet.es/+jmasalle/>
<http://www.ictnet.es/+jmasalle/es2001juny21.htm>

Clear skies, Josep Masalles

From: Stig Linander <linander@worldonline.dk> To: Solar Eclipses <solareclipses@aula.com> Sent: Monday, July 23, 2001 9:36 PM Subject: [SE] **Orientation of eclipse photos**

Hi, I've enjoyed all the marvellous photos of the 2001 TSE on the web. But I'm somewhat puzzled by the orientation of some of the photos.

As I saw the eclipse from Madagascar - close to sunset - the largest prominence was located at 2-o'clock position. On the African continent that prominence must have been located a little bit further "down the clock". That's exactly what can be seen at Val and Andrew White's web page, e.g. "Out of Totality": http://www.vanda.demon.co.uk/travel/africa2001/totality_out.htm

But other photos show the largest prominence at other positions.

Fred Espenak has it at 10-o'clock position, see <http://www.mreclipse.com/TSE01reports/TSE01Espenak.html> Are these

photos oriented after the ecliptic?

Mel Bartels has it at 9:30 position, see <http://zebu.uoregon.edu/~mbartels/eclipse01/se01-se.html> Are these photos flipped horizontally? Best regards, Stig.

From: Dale Ireland <direland@drdale.com>

Stig, It just depends on whether they put the zenith up, or Celestial north up, or the Sun's pole up, they are all different orientations. It just depends Wwaaaassssuuuuuppppp. (you have to know American television to get that joke) Dale

From: Stig Linander <linander@worldonline.dk>

Hi, ... due to severe overweight problems I had to leave my 400 mm and the converter at home :-)

Well, it's nice to know what's up, and I still have the suspicion that some photos are mirrored/flipped - not just rotated. Best regards, Stig.

From: FRED ESPENAK <u32fe@lepvox.gsfc.nasa.gov>

The Sun's disk rotates with respect to your local zenith as it rises, transits and sets. Since observers were scattered from Angola to Madagascar, the Sun's disk appeared rotated approximately 65-70 degrees for observers between these extremes.

On the other hand, if your camera is equatorially mounted, then you eliminate this rotation. In my photos, I used an equatorial mount and I oriented my camera with celestial north at the top. However, the zenith position on the Sun's disk as seen from my observing site in Chisamba, Zambia was actually about 127 degrees east of north (measuring counterclockwise on the Sun's disk). This means that the Sun's southeastern limb was actually at the top of the disk as seen from Chisamba. - Fred Espenak

From: Katherine LOW <katherine.low@worldonline.be> To: <SOLARECLIPSES@AULA.COM> Sent: Thursday, July 12, 2001 9:18 PM Subject: [SE] **Back from Zambia/Malawi**

Hi everyone, Katherine and I are back in Belgium since yesterday after a 4 week stay in Zambia and some extra days to relax at the lake of Malawi. I just finished reading all the eclipse messages from this mail list and am glad to see that almost everyone had a splendid and unobstructed view on this first eclipse of the new century.

The same goes for us. We observed the eclipse near Lufupa in North Kafue National Park in Zambia. The location was really unique: a prototype African landscape consisting of a vast plain with the classic ilala palm trees, some puku antilopes passing by, plenty of birds, a swarm of bees, the sound of hippos, etc. I will post a full report in a few days. Tomorrow I will send my films for development and hope something good will come out. This time I concentrated on getting a landscape photo with the wideangle lens: I tried to capture the horizon with the ilala trees and the eclipsed sun by bracketing through the different shutter times.

I did not read any report from Mozambique. Did nobody get there? Cheers, Kris Delcourte

From: Katherine LOW <katherine.low@worldonline.be>

Hello, Please have a look at my Zambia 2001 eclipse album, taken at Lufupa in the N. Kafue National Park, at the following URL: www.picturetrail.com/krisdelcourte My full eclipse report will still follow in some days. Regards, Kris Delcourte

From: Katherine LOW <katherine.low@worldonline.be>

Pls, find below my eclipse report from the event. As you can see, I started writing already during the trip but it still took a while to complete the story with final editing.

Dark skies over the savannah of Kafue National Park ZAMBIA.

It's the 22 June 2001, one day after the 'big African Eclipse'. I am writing this report sitting under a thatched shelter overlooking the Kafue River at the 'Lufupa Camp' in Kafue National Park, with its 22,400 square kilometers being Zambia's biggest national park. Feeling very satisfied...

Three days ago, on the 19 June, we arrived late at this campsite, after a long drive from Lusaka over Zambia's rough roads. We were completely exhausted after roughing through the long, winding and dusty tarmac roads with lots of pot-holes. Finally, we reached the gate and it was completely dark. We still had to finish the last 60 kilometers over a dirty track, adding a supplementary night safari to our program. We spotted a hyena and a jackal en route. Eventually, we pitched our tents around 21:00, about 3 hours after sun set.

On 20 June, the day before the eclipse, we did a game drive in the early morning and another game drive in the late afternoon. During this last game drive, we discovered a big plain along the Lufupa river, just a few kilometers from the camp site in the direction of Moshi. The plain is stocked with wildlife: plenty of pukus and impala antelopes, hundreds of waterbirds feeding on the receding water of some landlocked lagoons. On the plain grows the typical African savannah grass which at this time of the year, the beginning of the dry winter season, is long and brown-coloured. Grey termite hills could be found sprouting everywhere out of the ground like pins of a fakir's seat. Some bushes and some trees break the monotony of the plain. Here and there, the gracious lilala palms (also called "doomed palms") assembled together like small islands in the middle of an ocean. "This would be a great spot to observe the total eclipse", we all agreed. We imagined seeing the shadow coming from the west over the plain. To me, it offers the ideal dream landscape: the African lilala palms as the foreground in the middle of the African savannah and of course completed with a totally eclipsed sun with a brilliant corona in the sky!

We arrived at this place with a group of seven people from Belgium plus a local driver and a local bush cook. The trip has been organised by the amateur observatory 'Urania' from Antwerp, Belgium. Most of us are amateur astronomers with some experience in eclipses, our tour guide is a real wildlife and bush expert but a novice to eclipses.

On the day of the eclipse, all of us were restless and couldn't wait to leave... so, we took off already in the morning to find a nice spot next to a group of doom palms. Until the day of the eclipse, we weren't worried at all about the weather. For the past week, all days in Kafue National Park experienced perfectly blue skies with not a single cloud. Hence, on the 21Jun-2001, the weather remains unchanged from the previous days. We started assembling our instruments. After some time, it looks like we are not the only

(Continued on page 75)

ones who have 'discovered' and fell in love with this surrounding of natural beauty. Selfishly, we looked with fear as we noticed new cars heading in our direction in a big cloud of dust: are they going to station themselves right in the middle of our view? Katherine anxiously guarding from top of our Unimog truck which is now acting as the watch tower. It was a big relief each time the intruder passed by. Just as we are coming close to first contact the unavoidable happened: a big overland truck stationed himself in the middle of the plain and in my landscape picture. I have to move closer to the ilala palm trees to rid the unsightly vehicles out of my way. Since I am the only one concentrating on landscape shots, hence, I have chosen this particular spot and, standing all alone near the palm trees, which is more than 100 meters away from the group. In the midst of this wilderness, I prayed that the lions won't start hunting during these few minutes of totality!

Since this special environment offers such a big variety of animal life, I felt the urge to record the time and observe the behaviour of some of the animals, mostly birds. Here follows a recap in short cut diary style (local times in minutes, rounded up) during the event itself:

13:35 - First Contact

13:50 - A herd of puku antelopes passing some 50 meters by my observation post

14:08 - A forktailed drongo is sitting in a dead bush next to me, now and then flying up (to catch insects) and going back to its branch. Later I noticed that this is its normal behaviour.

14:13 - A couple of white-fronted bee-eaters sit on top of a tree a bit further. Same as for the drongo: they fly up from time to time and go back to their branch. Once again quite normal behaviour. We are now some 20 minutes after first contact.

14:14 - A zooming sound that starts like a mosquito buzz soon turns into an approaching piper aeroplane: a dark swarm of killer bees is approaching.

They are not interested in eclipse chasers and are just passing by.

14:25 to 14:27- A juvenile bateleur is circling in the sky, looking for prey.

14:29 - Life at the savannah is getting aware that something special is going on. There are some moments when the silence is complete: no bird whistle, not even from the noisy pigeons, no cricket sound, nothing. After a break of a few minutes, the choir resumes its tune. This is happening a few times until totality. From now on there is also a clear reduction in the activity of the tsetse flies that had not seized to pester me.

14:47 - A tawny eagle is circling around.

14:55 - Last observation of the tsetse fly before totality.

14:56 - Cry of the African fish eagle.

14:58 - Some doves fly in my ilala palm trees. The colours become unreal.

15:00 - Some more pigeons fly up. It is getting very silent. I can feel the tension of a ghost movie. Cool! 15:01 - From the Lufupa river, a few hundreds meters behind me, hippos started their familiar nightly snorting sounds. We are now 4 minutes before totality.

15:02 - I hear the roar of a lion, also coming from near the river. Was that far enough, away from me to keep my attention focused on totality? Interesting but panicky... 15:05 - The last beams of solar light form a magnificent chain of Baily's beads and finally a diamond ring that lasts for several seconds. I start now my photographic program at a shutter speed of 1/2000 of a second with the 28 mm 2.8 wide angle lens and a working diaphragm of 5.6. I am using Fuji Sensia slide film of 100 ASA. After the diamond ring, I move the shutter speed to 1/8 of a second and I take now shots by doubling the shutter speed each time up to a maximum of 15 seconds. Then I go down again to 1/8 of a second.

In the middle of totality I get a shock: 2 doves began to fly up from the ilala trees right in front of me with loud flapping wings. The hippos keep snorting, one more lion roar! The fish eagle cries. After my photographic session, I have enough time left for watching with the binoculars, enjoying the corona and the prominences. The big prominent prominence at the top right of the sun (around 2 o'clock) is clearly visible with the naked eye. To the left side of the solar disk there are several (I count 4) smaller prominences that are quite symmetrically distributed along the left limb of the moon (from 7 to 11 o'clock). They popped out from behind the lunar disk as the moon is shifting over the sun. The corona is very symmetric as expected for a solar maximum with long streamers. The horizon turns orange and the sky into a dark, dirty blue. I find it quite dark and cannot read the LCD readings on my camera. On the other hand I don't see many stars. They must probably be hidden behind the palm trees. Needless to say that it is now much cooler than sometime before totality, however I did not notice any wind at all. 15:09 - Through my binos, sadly, I could see the southern edge of the lunar disk becoming brighter, announcing the end of totality. I move away the binos and take some more shots of the final diamond ring at a shutter speed of 1/1000 of a second. The diamond ring lasts again for several seconds. So fast this eclipse was over! While I am still admiring the dark sky in the eastwards direction, a hamerkop is flying over. The snorting of the hippos appears to decline. One last lion roar.

After this episode, I collected my camera and tripod and return very satisfied to join the group. Time to celebrate with a glass of champagne. Everybody is very excited and relating his own personal experience. Our local guide is still looking for the lion from the

(Continued on page 76)

top of the Unimog but failed to sight it.

Once again, it was a really fantastic spectacle, and especially, combined with this unique wilderness experience making this an outstanding eclipse!!! Short and sweet memories...very contented....the feeling is beyond description.

Unique enough to come back to Africa next year? or will it be Australia?

We still have to finalize our next site for 04 December, 2002... till then..... Kris Delcourte

From: Evan Zucker <ez@AbacusTotality.com>

Kris, I really enjoyed reading your report about all the wildlife. I can certainly understand your discomfort with hearing a nearby lion's roar. Evan H. Zucker

From: FRED ESPENAK <u32fe@lepvax.gsfc.nasa.gov>

Kris Delcourte's eclipse report and a wonderful eclipse landscape photograph appear on my web site at: <http://www.mreclipse.com/TSE01reports/TSE01Delcourte.html> Thanks to Kris for allowing me to post his excellent eclipse report and photo! - Fred Espenak

From: Anne Marigold To: 'solareclipses@Aula.com' Sent: Wednesday, July 25, 2001 2:52 PM Subject: [SE] **eclipse T-shirt**

Did anyone manage to get a T-shirt with the Zimbabwe Eclipse 2001 logo on? Cheers,Anne

From: Bill Kramer <bill@autocode.com>

Yes, they had a selection of them at the Harare Int'l Airport in the duty free area the day following the eclipse. There were plenty left when we departed that evening. Best part is the back of the shirt which reads "I saw 2001 Eclipse". I couldn't pass on it.

The logo is a black silhouette of the country with a colored swash through it along the centerline. The colors are the national colors of Zimbabwe. -Bill Kramer

From: David Makepeace

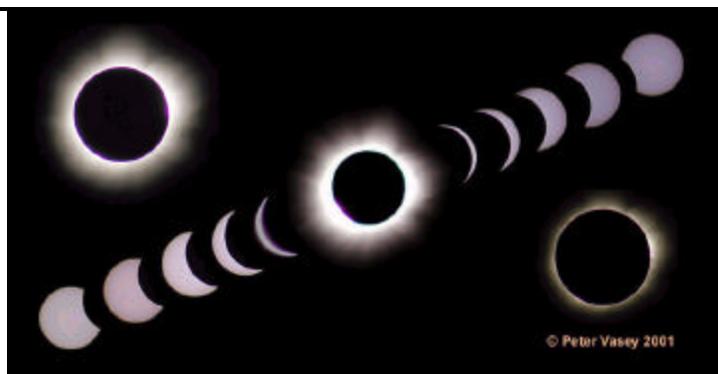
Big Time Eclipse T Lover. Yes - I did. ????? David Makepeace

From: Kidinv@s@aol.com To: SOLARECLIPSES@aula.com Sent: Wednesday, July 25, 2001 6:32 PM Subject: [SE] **June, 2001 info and photos..**

Thanks to Bill Kramer, who helped me rebuild my site, there are now photos and observations from our trip into Zambia for the last eclipse. There is also information on the plan for 2002. Rick Brown

From: Peter Vasey <petevasey@btinternet.com> To: Patrick Poitevin <patrick_poitevin@hotmail.com> Sent: Thursday, July 26, 2001 12:51 AM Subject: Re: **Africa Pages**

Hi again, everybody, The South Luangwa wildlife photo page is now on line at <http://www.petevasey.btinternet.co.uk/Luangwa.htm> Thanks for responding to my last e-mail - hope you enjoy these pics as well. Quite a lot - the page takes several minutes to load all the thumbnails. But hopefully you'll find it worth the wait, and it'll fire you up for December 2002! Best wishes to all, Peter. <http://www.petevasey.btinternet.co.uk>



From: Mike Simmons <msimm@ucla.edu> To: <solareclipses@Aula.com> Sent: Thursday, July 26, 2001 5:00 PM Subject: [SE] **Astronomy Picture of the Day**

Congratulations to Vic & Jen Winter for having their great photo of second contact from Madagascar chosen as today's NASA Astronomy Picture of the Day! <http://antwrp.gsfc.nasa.gov/apod/ap010726.html> Mike Simmons

From: FRED ESPENAK <u32fe@lepvox.gsfc.nasa.gov> To: <SOLARECLIPSES@AULA.COM>; <eclipse@hydra.carleton.ca> Sent: Friday, July 20, 2001 6:49 PM Subject: [SE] **Espenak's 2001 African Eclipse Web Site**

Greetings all! First of all, may I congratulate everyone on an exceptional eclipse experience. I've seen many first rate reports and excellent photographs, often taken with modest equipment. We were truly fortunate to have such good weather along virtually all of the African path.

I've been quite busy with work since I returned from Africa, as well as fighting off a case of pneumonia (fortunately, I'm recovering nicely). I have now managed to put some early images onto my web site along with a report that I hope catches some of the flavor of the African eclipse experience in Zambia.

The web site URL is: <http://www.mreclipse.com/TSE01reports/TSE01Espenak.html>

I will be adding more photos in the coming weeks since I've only begun to process my images (I just got my last roll of eclipse photos returned yesterday!).

I also wrote and illustrated a report on the June eclipse which has just been published in the August issue of Astronomy Now. I was literally writing that article on the jet trip back from Africa three weeks ago! - Fred Espenak

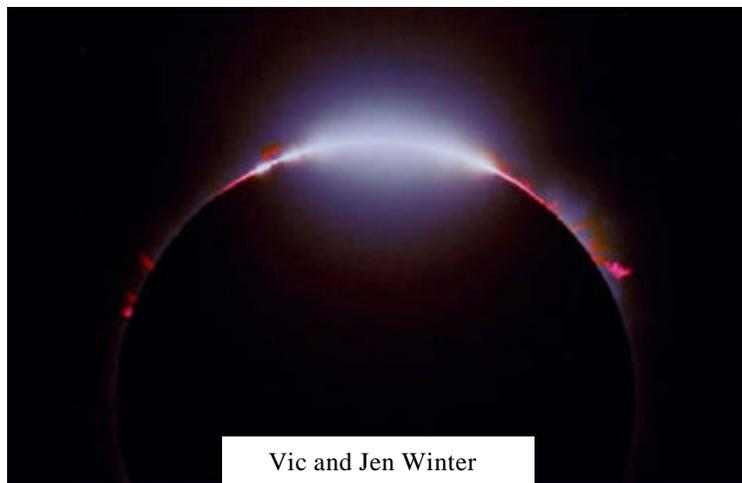
From: Mel Bartels <mbartels@efn.org>

And I have my eclipse pages up now too! <http://zebu.uoregon.edu/~mbartels/eclipse01/se01.html> Mel Bartels

From: FRED ESPENAK <u32fe@lepvox.gsfc.nasa.gov>

I have just posted a new page on my web site which gives links to some of the best photographs and reports of the 2001 total solar eclipse. The URL address is: <http://www.MrEclipse.com/TSE01reports/TSE01reports.html>

I do not claim this list to be exhaustive but rather a personal selection of my favorite 2001 eclipse sites. If you



Vic and Jen Winter

know of any particularly good 2001 eclipse web sites which are not listed here, feel free to contact me about them. Please include the complete URL address/link, the city & country where the eclipse observations were made, and the webmaster or group affiliation of the website, if possible.

I have also posted a few more of my 2001 eclipse images on this page. Of special note is the solar corona photograph. I've used Photoshop to exaggerate details and structure in the corona at the expense of a realistic 'naked eye' view. I also computer processed my negatives to reveal features on the un-illuminated side of the Moon as photographed during totality. Using Photoshop, I've combined this image of the Moon's face with the enhanced corona image to reveal details hidden to the unaided eye.

For a more realistic version of the corona, see the image posted with my 2001 eclipse report at: <http://www.MrEclipse.com/E01reports/TSE01Espenak.html> - Fred Espenak



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From: Peter Tiedt <Peter.Tiedt@npc-eagle.co.za> To: SEML (E-mail) <solareclipses@aula.com> Sent: Monday, July 23, 2001 3:00 PM Subject: [SE] **2001 Reports**

I have tried to place links to all the individual and group reports mentioned in this list, and they can be found at the bottom of my page

www.eclipse.za.net/html/2001_report.html

My apologies if I have left anyone out! Please let me have a URL and I will add it to the list when next I update. Peter

From: Andrew White <andrew.white@aeat.co.uk>

Peter, You may like to include our report and pictures (eclipse, site, newspapers) on your links. We observed from Nr Chisamba.

<http://www.vanda.demon.co.uk/travel/africa2001/africa2001.htm>

Best wishes, Val and Andrew White

From: Peter Tiedt <rigel@stars.co.za>

So far, thanks to several members of this group, I have managed to find 37 separate reports on the 2001 solar eclipse. These links can be found on my 2001 Report page.

See http://www.eclipse.za.net/html/2001_report.html

Please advise any broken links / corrections / additions. Peter Tiedt

From: Gerard M Foley <gfoley@columbus.rr.com>

This excellent page is not always available, probably due to problems connecting to an African server. It would be great if Peter would consent and someone (not me!) would volunteer to mirror his page on a server outside Africa. Gerry K8EF

From: Stig Linander <linander@worldonline.dk>

> This excellent page is not always available, probably due to problems connecting to an African server.

I agree, it's an excellent page with excellent photos, but even if it's possible to connect, it takes forever to download because of a slow connection (about 2K/sec).