# GENERAL TOPICS

I think it's safe to say that the shadow band lithograph is of a Sicilian house which Sig. Muller drew immediately after observing the total solar eclipse of 1870 Dec 22.

Can anyone translate the above passage, or can they offer any additional information? - Fred Espenak

From Chris O'Byrne

Using http://babelfish.altavista.com/, and applying some wetware processing to the results, I get a translation of something like this -

"The drawing attached which represents the building on which we see these shadows gives an idea of the phenomenon which it is impossible to reproduce in it's entirety, with these oscillations, its tremor, and its fast movement."

(Bablefish actually said "The drawing attached which represente the building on which we see these shades gives a idee well blade of the phenomenon which it is impossible A to reproduce in its verite, with these oscillations, its tremor, and its fast movement.")

So, no help there in determining the location... Chris.

From Wil Carton

Here I shall translate the French quotation of my friend Fred Espenak, about the image of shadow bands on a house during the TSE of 22 Dec 1870. Fred wrote: 'The woodcut is made from a lithograph drawing by Sig. (Diamilla)

Muller. In a letter accompanying the drawing, Sig. Muller says, "Le dessin ci-joint qui represente le batiment sur lequel nous voyons ces ombres donne une idee bien pale du phenomene qu'il est impossible a reproduire dans sa verite, avec ces oscillations, son tremblement, et son mouvement rapide.'"

Here is my translation into English:

"The painting added here, that represents the building on which we saw these shadows, give a quite weak impression of the phenomenon, so that it is impossible to reproduce faithfully, with its oscillations, its vibrations and its quick motion."

Sincerely yours, Wil Carton.

From Gerry Foley

I agree, with the minor changes as follows:

"The painting added here, that represents the building on which we saw these shadows, gives a quite weak impression of the phenomenon, which it is impossible to reproduce faithfully, with its oscillations, its vibrations and its quick motion." Gerry K8EF

From Dietmar Staps

In Volume XLI the Coordinates for Terranova are given as: 37 deg 3 min 56.2 sec north 14 deg 14min 15 sec east so Fred's identification with todays Gela is correct.

In an Palermo obs. report 1870 A. Agnello (in italian) published data about the coming eclipse. Like Fred Espenak's todays wonderful maps, A. Agnello prepared a very detailed map of the eclipse path in sicily, even with values for 0,10,20,....,110 seconds of totality. For many places in sicily tables are given.

For 3 observing stations, values are even more detailed. 2 are of no interest to our problem. The third is Betlemme near Ter-

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ranova (20-25km west, somewhere in the middle between Vittoria and Niscemi). The map indicates "Terranova (Betlemme)" .A even better choice, but I can't find this town, even on a good map of sicily, so it must be very small. Or something other than a town. A church (the translation Bethlehem could indicate this) ???. A church in Modica with this name is too far away. The small town of Santo Pietro with two churches could fit.

On the eclipse map both points (terranova and bethlemme) are located about 10 km north of the centerline and have experienced about 110sec totality.

Muller published >=3 reports about the observations: a letter to Ranyard "Ombres vacaillantes observées à Terranova" one in gazetta di milano 1874, no day no month given. The easiest one to locate may be a : Cacciatori, Rapporti sulle osservationi ... ecclisse 1870, Palermo 1872. I try to get a copies of these or someone of this list could help. greetings dietmar staps, wiesbaden, germany

From Julien Onderbeke To SEML Date 02.10.01 RE **Hybrid eclipses** hortarosa@pi.be

Yesterday I read the first part of the SENL of September 2001. Patrick printed one of my mails to him about annular-total solar eclipses. The text was in Dutch. I guess that language is difficult to read for most of the subscribers. Therefore I give a translation.

AT-ECLIPSES

More than one year ago there was a discussion on the SEML about Annular-Total eclipses. Most of them begin as annular eclipses, become total near the middle of their path and are again annular at the end. The reason is that the points where the axis of the shadow cones touch the earth's surface are further away from the moon at the beginning and the end of the central eclipse than in the middle (in normal cases).

This effect can also be seen with total eclipses which have smaller paths and shorter durations of totality at the beginning and at the end than they have in the middle of the path.

With annular eclipses, it is vice-versa.

In old Nautical Almanacs I couldn't find the name annular-total. I guess it were Oppolzer and Ginzel (in the second half of the 19th century) who introduced this kind of eclipses. They called them RT-eclipses (in German : ringförmig-total). Annular-total eclipses from the 1850's are called annular (in rare cases total) in the Almanacs.

In Van den Bergh's papers (1950's), I saw for the first time the name hybrid eclipses, which is maybe better chosen as you can read in what follows. Fred Espenak uses the same name.

In fact most AT-eclipses are ATA-eclipses. In the Canon of Solar Eclipses, 1898-2510 from Jean Meeus, W. Vanderleen and CC Grosjean, one can read that the AT-eclipse of 2013 Nov 3 begins as annular, becomes total is stays total for the rest of its path. This eclipse can be named a real AT-eclipse. In this case the moon must be approaching the earth quite rapidly during the eclipse. We can expect that TA-eclipses also exist.

More astonishing is the fact that the maximal duration of the total phase is nearly 1m40s. In the Meeus-Mucke canon (1983) I found four cases in which the duration of the total phase of a hybrid eclipse exceeded 1m40s. I was surprised because I always thought that the total phase of a hybrid eclipse always had a duration of a few seconds.

With a duration of more than 1m30s, we have to say that those eclipses must be considered as "serious" total eclipses.

In many works about solar eclipses, you can read that the duration of a (real) TSE has a maximum of 7m31s and that of an ASE 12m30s. I wonder if someone has ever calculated and proved a maximum duration of the total phase of a hybrid eclipse. It seems that 1m50s is an absolute maximum. Maybe some of you can give the answer?

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From Peter Tiedt

I am sure that someone more qualified than I will be able to expand on this.

Solar Eclipse Ver 1.40 provides the following on this eclipse. As can be seen the eclipse is annular for less than a minute before becoming total and remaining total. Also, this eclipse is pretty near the equator.

Unfortunately it goes through some pretty inhospitable parts of Africa!

Therefore the maximum duration of 1m40s must be pretty close to the limit for duration of an AT (or ATA) eclipse.

I am sure that there will be more comments on this soon - it is an interesting topic.

ANNULAR/TOTAL SOLAR ECLIPSE OF 2013 NOV 3
SAROS # 143 CENTRAL LINE DELTA T = 76.6 Sec.

| U.T. | Longitude | Latitude | Duration | Altitude | Width | % OF |
|---|---|---|---|---|---|---|
| HR:MN:SC | ø ' " | ø ' " | MN:SC | ø ' | (km) | AREA |
| 11:05:10 | -71 13 14 | +30 26 10 | 00:04 | +00 00 | 4.2 | 0.9988 |
| 11:06:10 | -63 11 55 | +28 01 16 | 00:04 | +07 36 | 4.0 | 1.0011 |
| 11:07:10 | -60 05 11 | +26 58 15 | 00:08 | +10 45 | 7.3 | 1.0021 |

Peter Tiedt rigel@stars.co.za Visit my website at http://www.eclipse.za.net

From Fred Espenak

>In old Nautical Almanacs I couldn't find the name annular-total. I guess it were Oppolzer and Ginzel (in the second half of the 19th century) who introduced this kind of eclipses. They called them RT-eclipses (in German : ringförmig-total). Annular-total eclipses from the 1850's are called annular (in rare cases total) in the Almanacs. In Van den Bergh's papers (1950's), I saw for the first time the name hybrid eclipses, which is maybe better chosen as you can read in what follows. Fred Espenak uses the same name. In fact most AT-eclipses are ATA-eclipses. In the Canon of Solar Eclipses, 1898-2510 from Jean Meeus, W. Vanderleen and CC Grosjean, one can read that the AT-eclipse of 2013 Nov 3 begins as annular, becomes total is stays total for the rest of its path. This eclipse can be named a real AT-eclipse. In this case the moon must be approaching the earth quite rapidly during the eclipse. We can expect that TA-eclipses also exist.

I concur that the first usage of the term 'hybrid' in describing annular-total eclipses was the Dutch astronomer van den Bergh ("Periodicity and Variation of Solar (and Lunar) Eclipses", Tjeenk Willink, Haarlem, Netherlands, 1955).

Although I used the term 'annular-total' in my 1987 publication "Fifty Year Canon of Solar Eclipses: 1986 - 2035," I have since adopted the term 'hybrid' on my web-site and in future publications. It is short, distinct and (I find) a bit more explanatory that the long, mouthful term "annular-total" which tends to puzzle people.

>More astonishing is the fact that the maximal duration of the total phase is nearly 1m40s. In the Meeus-Mucke canon (1983) I found four cases in which the duration of the total phase of a hybrid eclipse exceeded 1m40s. I was surprised because I always thought that the total phase of a hybrid eclipse always had a duration of a few seconds. With a duration of more than 1m30s, we have to say that those eclipses must be considered as "serious" total eclipses. In many works about solar eclipses, you can read that the duration of a (real) TSE has a maximum of 7m31s and that of an ASE 12m30s. I wonder if someone has ever calculated and proved a maximum duration of the total phase of a hybrid eclipse. It seems that 1m50s is an absolute maximum. Maybe some of you can give the answer?

During the 7,000 year period -2999 to 4000, I find four instances of a Hybrid eclipse with a duration of 01m45s. I've tabulated the results below.

Local Circumstances at Greatest Eclipse

Longest Hybrid Solar Eclipses: -2999 to 4000

| U.T. Greatest Eclipse Date | Type | Saros # | Gamma | Mag. | Sun Path Center Lat. | Long. | Alt ° | Width km | Dur. |
|---|---|---|---|---|---|---|---|---|---|
| -0437 Dec 17 | 05:48 | H | 54 | 0.132 | 1.017 | 16.0S | 94.3E | 83 | 60 01m45s |
| 1199 Jan 28 | 08:49 | H | 108 | 0.004 | 1.017 | 16.2S | 51.5E | 90 | 60 01m45s |
| 1423 Jul 08 | 00:42 | H | 117 | -0.117 | 1.016 | 14.9N | 170.3E | 83 | 55 01m45s |
| 3264 Aug 14 | 00:42 | H | 175 | -0.301 | 1.016 | 3.4S | 167.4E | 72 | 58 01m45s |

I have also added a web page which lists the local circum-

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# GENERAL TOPICS

stances at greatest eclipse for all hybrid eclipses with a duration of 01m30s or more. You can find this page at: http://sunearth.gsfc.nasa.gov/eclipse/SEcatmax/SE-2999-4000MaxH.html - Fred Espenak

From Wil Carton

Hybrid Eclipses, Estimation of max duration of total phase on Earthbound location:

1. The max hybrid Solar eclipse occurs when the apparent Lunar diameter, as seen from the center of the Earth, is a minuscule fraction smaller than the apparent Solar diameter, let us say: equal (the intermediate level of the lunar surface, between the deepest valleys and the highest mountains along the limb). The eclipse starts as a broken annulus central eclipse on the Earth surface (terminator).

2. Then, in the case that the shaduwpath enjoyes a perfect line-up of Sun, Moon and Earth, the moon will in the centerpoint of the path closer to the surface of the Earth by 1/60 of its distance (one Earth diameter). Then the apparent Lunar diameter will look 1/60 larger for an observer on that location. The apparent lunar diameter will be somewhere intermediate between its extreme values of perigee and apogee, because only then the hybrid form is possible. Let's say 30 arcminutes = 1800 arcseconds. This enlarged with 1/60 means that the diameter has gained 30 arcseconds extra.

3. The angular speed of the moon, as seen from the center of the Earth, is about 0,55 arcseconds per second of time. The gained 30 arcseconds will be passed in 30 / 0.55 = 54,5 seconds of time.

4. But the location where the maximum occurs on the Earth surface, rotates in the tropics with a speed of 40000 km / (24 x 60 x 60) sec = 463 meter/sec eastward, that is about 46% of the speed of the overtaking lunar shadow. This enlarges totality with a factor 100 / 46 = 2,16. Multiplication 2,16 x 54,5 seconds (step 3 above) gives: 117,7 seconds.

Thus, this rough estimate gives an highest duration of 1 minute 57,7 seconds, for the total phase. Not yet taken into account is the possible decrease of the lunar distance, if it is moving to its perigee, during the nearly two hours between the entrance of its umbra on Earth and the point of maximum duration on Earth (where the eclipse occurs right overhead in the Zenith). Has somebody any idea, how many or few arcseconds this can add to the apparent lunar diameter? Wil Carton, Holland.

From Wil Carton

Subject: correction hybrid eclipse duration

Sorry, My step 4 is wrong. The multiplication factor 100 / 46 is nonsense. The duration of the total phase of an hybrid solar eclipse is lower: The lunar umbra has a speed of about 1000 m/s, the rotation in the tropics has a speed of 463 m/sec, so the umbra overtakes with 1000 - 463 = 537 m/sec. The duration multiplying factor is 1000 / 537 = 1,862. This multiplied with 54,5 (see my step 3 where I wrote 30 / 0,55 = 54,5 seconds) delivers 101,5 seconds = 1 minute 41,5 seconds. Thus the correct value is 1 minute 41,5 seconds.

Compare this with Espenak's empirical value ( 1 min 45 sec) from his seven millennia survey. Wil Carton. Met vriendelijke groet / With kind regards,

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From Eric Flescher To SEML Date 24.10.01 Re **Shadow bands original source**

I found my original source for that illustration of the shadow bands on the house. Crdit is the American Museum of Natural History

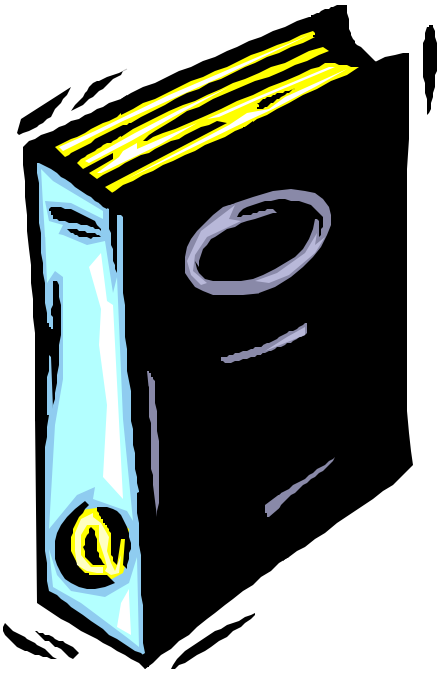
Solar Eclipses: A sight to see (Time, Space, and Matter Science Reading Series) webster edition McGraw Hill no author (c) 1969

I think I picked it up when I used to go to New York city at the Hayden Planetarium.

It says (summarized) on p.4 below the picture

shadow bands

"During the 2 or 3 minutes before an eclipse becomes total , it is often possible to see shimmering, wave like bands of laternating light and shadow flitting over the ground and on the sides of buildings. They are sometimes also seen immediately after totality as well. Know as shadow bands, they seem to move in the same direction in which the moon's shadow is moving (in africa 2001 I saw them moving in the direction NW in which the shadow was coming from) but moving slowly at about 6 to 8 miles an hour. They don't always occur at every eclipse. A mystery connected with shadow bands is that not everyone can see them (I did not in Hungary 1999 while others could) when they do appear; one observer may seem them clearly yet another nearby may see nothing (I can vouch for that). The cause of the bands seems to lie in the atmosphere above the earth, but precisely how they develop has not yet been clearly established. ONe explanation is that they are related to the changes int he density of the air following the sudden drop in temperature when an eclipse begins. Thought I might add that in about the painting and info.



I have 23 links on my shadow bands page to sites and info about shadow bands including info on the 2001 results from Dr.Strickling's excellent work and others. I hope to add more to add more soon. If you have a page with your shadow bands info let me know and I will add it to http://members.aol.com/kcstarguy/blacksun/shadowbands.htm

From : "Patrick Poitevin" <patrick_poitevin@hotmail.com> To : SOLARECLIPSES@AULA.COM Subject : [SE] **SEDates** Date : Tue, 30 Oct 2001 06:53:07 +0000

Hi, Some Solar Eclipse realted Dates:

November 9 - 11: Solar Astronomy weekend from Movember 9 - 11 in Burton Manor College on the Wirral peninsula. Contact tel +44 151 336 5172 or enquiry@burtonmanor.com

November 5: East Antrim AS, Thompson School, England, 8pm. The Sun from SOHO by Prof. Gerry Doyle. Contact John McConnel tel +44 28 92 61 99 36.

November 7: Lancaster & Morecambe AS, England, 7h30 pm. The Sun by Dr. Robert Walsh. Contact Mike Armstrong tel +44 1524 383 288.

November 12: Wolverhampton AS, England, 7h30 pm. The Sun by Neil Morris-Hobley. Details Michael Bryce tel +44 1562 742 850 or see http://www.wolvas.org.uk

Please contact the above. We would appreciate if you refer to the SEML. Thank you. Best regards, Patrick

# GENERAL TOPICS

**Verslag SEC2000** From Wil Carton

Unieke eclips-conferentie trok zonnefysici en amateur-eclipswaarnemers door Wil Carton Meer eclipsliefhebbers dan ooit buiten eclips tijd waren zaterdag 14 en zondag 15 oktober 2000 van heinde en verre bijeen in Antwerpen. Aanleiding: de "International Solar Eclipse Conference" in het conferentie-centrum "'t Elzenveld". Het initiatief ertoe en de organisatie ervan namen de Vlaamse amateur-astronoom Patrick Poitevin en zijn echtgenote Joanne Edmonds kort na de 1999-eclips op zich. Professionele zonnefysici en amateur-astronomen fascineerden elkaar met een programma van in totaal 27 presentaties waaronder drie eclipsvideofilms en vijf PC-presentaties met vanuit ruimtesondes gefilmde zonsuitbarstingen. De 160 deelnemers kwamen uit Australië, India, de Filippijnen, Japan, Canada, de Verenigde Staten, Venezuela, Zuid-Afrika, Zambia, Zimbabwe, het Verenigd Koninkrijk, België, Denemarken, Duitsland, Frankrijk, Nederland, Italië, Spanje, Slowakijë, Roemenië, Zweden en Zwitserland.

In de afgelopen kwart eeuw zijn expedities naar zonsverduisteringen ingrijpend veranderd. Tot 1970 ontmoetten hoofdzakelijk beroepsastronomen elkaar in afgelegen oorden op aarde voor hun rendez-vous met de maanschaduw. Sindsdien stroomden ook in steeds groteren getale amateur-astronomen en toeristen uit welvarende landen toe in de totaliteitsgordel. Vluchtige contacten, gelegd bij de aangrijpende momenten van totale zonsverduistering, zetten zich in de jongste vijf jaar voort dankzij internet en e-mail. Patrick Poitevin zag in 1980 zijn eerste totale zonsverduistering en sloeg sedertdien niet één meer over. Hij begon in 1997 een email-adresgroep "Solar Eclipse Mailing List" en bracht zodoende eclips-enthousiastelingen in verbinding met elkaar, zowel beroeps als amateurs uit alle windstreken. Omdat er in 2000 geen centrale zonsverduistering op aarde is, organiseerde hij deze conferentie en bracht hen zodoende in rechtstreeks persoonlijk contact met elkaar. Het jaar 2000 is een "scharnierjaar" tussen de Euraziatische zonsverduistering van 11 augustus 1999 en de Zuidafrikaanse eclips van 21 juni 2001. Terugblikken naar de voorbije en vooruitzichten naar de komende zonsverduistering domineerden het voordrachtenprogramma. Corona-fysica kwam aan bod evenals eclips-cinematografie, eclipsmythen uit de Oudheid, eclipsberichten uit opgegraven kleitabletten en orakelbeenderen, naast video's van de eclipshype in europese media, van de religieuze eclipsseances bij de zombie-achtige Druïden in Cornwall en de "Allahu akhbar" scanderende moella's in Iran.

Voor het maandblad ZENIT kan mijn overzicht beperkt blijven tot een op de natuurwetenschappelijke aspecten gerichte selectie. Namens Estec uit Nederland presenteerde Bernard H. Foing de ESA-video "Black Sun Highlights, results from ESA Eclips 99 campaign". De ESA hield in augustus 1999 een op het Europese publiek gerichte public relations campagne met als trekpleister de zonsverduistering. De video liet zien hoe ESA-functionarissen filmbeelden van zonsuitbarstingen, gemaakt door de SOHO, vertoonden op eclipsmanifestaties in Noyon, Thionville, Straatsburg, Stuttgart, München, het Balaton Meer en Boekarest. SOHO is een ruimtesonde tussen de aarde en de zon, op ongeveer anderhalf miljoen kilometer van de aarde, vier maal zo ver als de maan en dus nooit zelf getuige van een natuurlijke eclips. Aan boord maakt een coronograaf continu beelden van de uit de zon "spuitende" gasfonteinen (streamers), met behulp van een donker schijfje dat de zon afdekt en zonder de hinder van aardatmosferisch strooilicht.

Prof. Eijiro Hiei uit Japan bestudeert sedert 1963 coronawaarnemingen tijdens eclipsen, thans ook in combinatie met zonne-observaties vanuit satellieten, zowel in het zichtbare licht als in het uiterste ultraviolet en röntgenstraling. Bij de eclips van 3 november 1994 in Zuid-Amerika keek hij vooral naar de waaiervormige poolstralen boven de noord- en zuidpool van de zon, zowel vanaf de grond in Paraguay als tegelijkertijd vanuit de Yohkoh satelliet met diens zachte-röntgentelescoop SXT. Vanaf de grond waren de poolstralen duidelijk te zien, maar vanuit de SXT nauwelijks, wat erop wijst dat de temperatuur van de poolstralen ver onder de 2 miljoen graden Kelvin blijft. Ten tijde van de 1997-eclips in Mongolië verkreeg Hiei observaties van de Extreem Ultraviolet Telescoop (EIT) van de SOHO. De poolstralen waren duidelijk te zien, met name in de spectraallijn van acht à negen keer geïoniseerd IJzer beter dan van veertien maal geïoniseerd IJzer. Met dit gegeven laat zich een karakteristiek temperatuurinterval afgrenzen en het suggereert voor de poolstralen een temperatuur van ongeveer 1 miljoen graden K.

Serge Koutchmy van het Institute d'Astrophysique de Paris-CNRS gaf een overzicht van zijn spectraal-analytische studies

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# GENERAL TOPICS

naar turbulentie en oscillaties in de corona, op zoek naar fundamentele mysteries van de verhitting van de corona en het massaverlies. Hij observeerde 14 totale zonsverduisteringen vanaf 1968. Bij de eclips van 11 augustus 1999 had hij de ontwikkeling van een coronagebied met hoge lussen en holten waargenomen, van waaruit zeven uur later een grote coronale massa-uitworp ("CME") plaatshad die werd vastgelegd door de SOHO. Opmerkelijk genoeg zat er boven die plek geen helmvormige streamer, en dat sluit bij de interpretatie alvast een aantal geopperde mechanismen uit. Vanuit de zaal werd gevraagd wat er te zien zou zijn geweest als de CME tijdens de eclips zou zijn opgetreden. Koutchmy antwoordde dat dit gebeurde tijdens de eclips van 16 feb 1980: bij de totaliteit in Afrika zag men zo'n CME in de vorm van een tennisracket, anderhalf uur later tijdens totaliteit in India waren alleen de twee "spaken" nog zichtbaar en was de "lus" weggeblazen. Voorts ontvouwde Koutchmy zijn interpretatie van golven in de middencorona, op grond van Dopplerverbreding in lijnprofielen van de groene 530.3 nanometer spectraallijn van dertien maal geïoniseerd IJzer. Dat is de beroemde corona-lijn die vóór de ontraadseling in 1942 door Bengt Edlen en Walter Grotrian, gedurende driekwart eeuw de zonnefysici voor raadsels had gesteld en was toegeschreven aan een onbekend element ("coronium"), waarvoor echter geen plaats meer vrij was in Mendelejef's Periodiek Systeem. Koutchmy's expeditie deed op 11 augustus 1999 z'n werk gedurende de twee minuten korte totaliteit nabij Chadagan in Iran. Een afzonderlijke video toonde ons de hele ambiance: de tot vlakbij de expeditie-tenten samengestroomde dorpelingen met hun gemurmel, het snel invallende schemerdonker, de aanhoudend klikkende camera-sluiters, de korte Franse collegiale aanwijzingen, met op de achtergrond de niet-aflatende roep "Alla hu akhbar" van een Iraanse geestelijke gedurende de hele totaliteit.

Voyto Rusin van het Slowaakse Astronomische Instituut te Tatranska Lomnica besprak de huidige status van zijn corona-onderzoek tijdens eclipsen en doelstellingen voor vervolgonderzoek, in het bijzonder van protuberansen, corona-dynamica, corona-oscillaties en de tijdsafhankelijke variatie van streamers over de breedtegraden op de zon. Hij puzzelt vanaf 1973 aan onbeantwoorde vragen in de corona-fysica: het mysterie van de kolossale temperatuurstijging van zesduizend graden aan het zonsoppervlak tot de meer dan een miljoen graden in de corona; de vorming en verdeling van coronastructuren in relatie met fotosferische activiteitsgebieden eronder; de vorming en ruimtelijke gerichtheid van coronastreamers en hun verband met de zonnewind; polarisatie, de ruimtelijke samenstelling van de corona uit plasma en stof; de verdamping van stof nabij de zon. Veel materiaal van de 1999-eclips wacht nog op nadere uitwerking, maar toch gaat Rusin's hart nu al uit naar de 2001-eclips, om voortgezet statistisch waarnemingsmateriaal te krijgen met groter oplossend vermogen van zowel expedities op de

grond (in Afrika) als vanuit satellieten. Voor mijzelf was het een heuglijk terugzien van deze bescheiden geleerde, nadat ik hem in juli 1991 had ontmoet in het internationale eclipskamp bij La Paz, Baja California. De Mexicanen hadden hem destijds voorzitter gemaakt van een groot publiek forum aan de vooravond van de langdurige zonsverduistering van 11 juli 1991.

Jay Pasachoff, veteraan van 29 zonsverduisteringen, concentreert zich op de chromosfeer en corona, recent met bewegende SOHO-beelden van de uit de zon "spuitende" gasfonteinen en de tijdens de eclips op aarde gemaakte momentopnamen van de corona-streamers. Op SOHO-beelden bedekt de donkere schijf van de coronograaf zowel de zon als de naaste omgeving tot ongeveer twee radiï, dus ook de binnencorona! Eclipsfoto's nu maken op spaarzame ogenblikken de aansluiting mogelijk van SOHO-beelden met momentopnamen van de binnencorona tot aan de maanrand, dat is maar ongeveer één procent buiten de zonsrand. Op zijn composietfoto's van de 1998-eclips en 1999-eclips paste deze prachtig in elkaar, als een Russische pop. Dit levert verbeterde schaalverdelingen van de routine satellietwaarnemingen en dieper inzicht in de structuur van de buitenste zonslagen. Hoe variëren temperatuur en polarisatie in de corona? Waarom is het ijle corona-gas twee miljoen graden heet? Kunnen we van coronastructuren het spoor terugvolgen naar hun 'voetafdrukken' op het zonsoppervlak?

Frederic Clette van de Koninklijke Sterrenwacht in Brussel presenteerde uitkomsten van de polarimetrie-campagne op 11 aug 1999. Van Frankrijk tot Iran lukte het 15 van 28 groepen, met zowel amateurs als beroeps, om foto's en CCD-opnamen te maken door polarisatiefilters die geautomatiseerd over zestig graden werden verdraaid. Gedurende anderhalf uur tijdens de voortschrijdende zonsverduistering is zo het verloop bepaald van de electronendichtheid tot op 2,5 zonneradiï. Dit leert voor hoever de corona bestaat uit electrisch geladen, licht uitstralend gas, en welk aandeel

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# GENERAL TOPICS

komt door lichtverstrooiing aan neutraal gas en stof.

De andere sprekers belichtten meer aardse zaken: Jay Anderson uit Canada sprak over de weerkundige invloed van de met supersonische snelheid voorbijkomende maanschaduw op de aardatmosfeer. Volgens hem zijn de verhalen
over de opstekende eclipswind onjuiste mythen. Integendeel zwakt de wind tijdens de eclips af. Echter de temperatuurdaling is bij een voor de helft verduisterde zon al duidelijk merkbaar, en waarnemers ervaren dan een kille wind bij het naderen van de totaliteit. Fred Espenak, de maker van de eclipsberekeningen en landkaarten in de NASA-eclipsbulletins, keek vooruit naar de 2001-eclips in Zambia en Zimbabwe, en legde uit hoe zijn maanprofielschema kan worden gebruikt om Baily beads te voorspellen en zo goed en langdurig mogelijk te observeren. De fraaie natuur, beperkte infrastructuur en de politieke/economische onrust in de totaliteitsstrook van 2001 werden uiteengezet door Peter Kalebwe uit Zambia en Francis Podmore uit Zimbabwe.

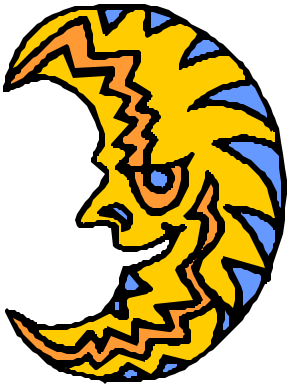
Paul Maley van het Johnson Space Center propageerde het waarnemen van Baily Beads op de grens van de totaliteitsstrook in plaats van op de centrale lijn. Zijn film van de 1998-eclips op Bonaire toonde hoe een briljant parelsnoer van Baily Beads tientallen seconden langzaam onderlangs de donkere maanschijf voorbij wentelde en kiekeboe speelde met het Doerffel- en Leibnitzgebergte nabij de maanzuidpool. Oogheelkundige Ralph Chou uit Canada rapporteerde over oogschade bij twintig mensen die in zijn land in 1979 zonder eclipsbril/filter hadden gekeken. Bij sommige patiënten herstelt een ingebrand netvlies zich na weken of maanden, bij andere niet. Hoe dat komt is niet bekend. Hij adviseerde producent Rainbow Symphony om voortaan filterbrillen zonder oorhaken te maken: als mensen het filter niet op hun neus kunnen zetten, moeten ze het in de hand houden en kijken ze slechts met tussenpozen in plaats van continu. Barrie Jones uit Engeland onderzoekt schaduwbanden bij eclipsen om de theorie te toetsen dat dichtheidsfluctuaties in onze atmosfeer op grote hoogte er de oorzaak van zijn. Hij doet dat met een array elektronische lichtsterkte-meters die de schaduwbanden met hoge gevoeligheid registreren, zowel qua tijdsintervallen als qua intensiteit. Zijn metingen suggereren dat de schaduwbanden niet een gevolg zijn van interferentie van de laatste zonnestralen langs de scherpe maanrand. Blijft over dat de oorzaak in onze dampkring schuilt. De theorie voorspelt o.a. de vorm ervan, afhankelijk van de boog-spanwijdte van de laatste zonnesikkel, maar toetsing is lastig omdat geslaagde video-opnamen uiterst zeldzaam zijn.

Een totale zonsverduistering veroorzaakte in vroeger eeuwen schrik, angst en ontsteltenis. Uit de Oudheid zijn eclipswaarnemingen overgeleverd uit China, het Midden-Oosten en Midden-Amerika. Een jonge tak van sterrenkunde, Archaeo-astronomie, houdt zich er mee bezig. Drie sprekers verzorgden hierover vier presentaties: Ed Krupp uit de V.S., Felix Verbelen uit België en John Steele uit Engeland, respectievelijk over de mythologie en uitleg van eclipsen als onheilspellend voorteken, de Maya-kalendercodering van jaartallen, en de tijdaanduiding van hoe laat na zonsopkomst of voor zonsondergang de eclips z'n hoogtepunt had. Steele las van papier een presentatie voor van de zieke Francis Stephenson over de lange termijn vertraging van de aardrotatie, die blijkt uit de oostwaartse afwijking van de totaliteitsstrook van waargenomen ten opzichte van berekende oude eclipsen. Jammer genoeg kon ik door Stephenson's afwezigheid niet de vraag stellen, waarom hij voor zijn nieuwe boek "Historical Eclipses and Earth Rotation" dezelfde oude zon- en maanbaanformules uit resp. 1895 en 1954 had gebruikt als voor zijn proefschrift van 1972, ofschoon er tussen 1982 en 1988 nieuwe, nauwkeuriger algorithmen zijn ontwikkeld en gepubliceerd doorhet Bureau des Longitudes in Parijs.

Sensatie, emotie en publieke opwinding zijn vaste ingrediënten bij elke totale zonsverduistering, met in de huidige welvaartsjaren de subcultuur van de "eclipse chasers", de eclipsverslaafden die hun spaarpot leeg en de aardbol rond reizen om ze allemaal te zien en te beleven. Dia's en video's van dit aspect verluchtigden de conferentie dankzij de lezingen van David Berghmans (België), Juan Casado (Spanje), Daniel Fischer en Gernot Meiser (Duitsland), John Hopper (V.S.), Jean Lariviere en David Makepeace (Canada), Olivier Staiger (Zwitserland). Alles bij elkaar hield het lezingenprogramma ons op zaterdag en zondag van 8:30 uur tot 19:00 uur ons bezig, met slechts korte pauzes voor koffie, lunch en thee. Entree en onderdak kostte mij 190 dollar en dat was aanmerkelijk goedkoper dan de door mij bezochte acht zonsverduisteringen. De conferentie was uniek, leerzaam en intensief. Maar niet één van de film-, video- en CCD-beelden kunnen de aangrijpende, overweldigende ervaring van de visuele eclipswaarneming evenaren! Wel zijn mijns inziens CCD-opnamen van het diamantenring-effect het best haalbare van dit super-contrastrijke verschijnsel. Ik hoop er weer bij te zijn in 2006 als de maanschaduw niet veraf langskomt (over Turkijë)

# GENERAL TOPICS

From Fred Espenak To SEML Date 04.10.01 Re **Lunar eclipses of Historical interest**



Some of you may have visited my web page for "Solar Eclipses of Historical Interest" at:

http://sunearth.gsfc.nasa.gov/eclipse/SEhistory/SEhistory.html

I would like to produce a complementary page for "LUNAR Eclipses of Historical Interest."

Some of the candidate lunar eclipses for this page include:

-0412 Aug 27 - "Siege of Syracuse"
0033 Apr 03 - "Crucifixion of Crist?"
1453 May 22 - "Fall of Constantinople"
1504 Feb 29 - "Columbus' Eclipse"
1917 Jul 04 - "Lawrence of Arabia's Eclipse"

Can anyone make suggestions for any additional lunar eclipses of historical interest which should be included on this page? Please include the exact date (if possible) and a short description of the eclipse's historical significance. Thanks, - Fred Espenak

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From Wil Carton

Fred, I shall look in my literature for lunar eclipses of historical interest. On this moment I can immediately respond with a lunar eclipse in AD 1967, when Surveyor 3 stood on the lunar surface and observed this eclipse as a total eclipse of the sun behind the Earth, and relayed an image back to Earth. Newspapers here published that poor image, I remember. This was the first time in history that a manmade instrument observed an eclipse from another world in space than from the Earth and gave us an image.

Furthermore, I remember to have read somewhere about a lunar eclipse in history, during which an occultation of the planet Jupiter occurred, and has been chronicled.

*(Continued on page 40)*

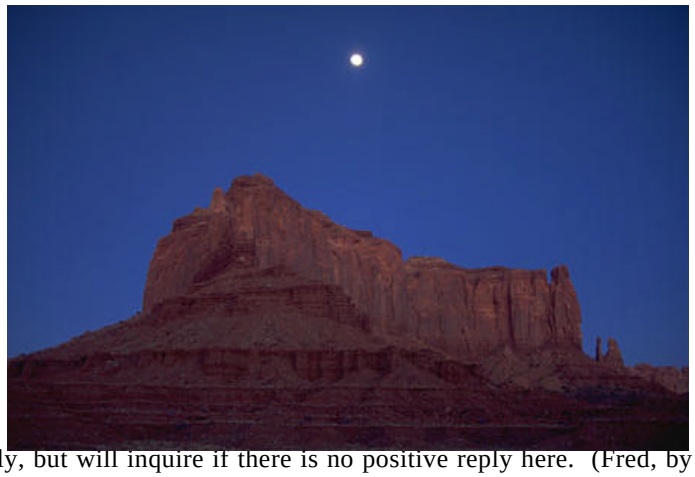
# GENERAL TOPICS

About medieval solar eclipses, I can tell that here in Holland a certain Drs. J. Buisman publishes thick volumes "Duizend Jaar Wolken, Wind en Water in de Lage Landen" ("Thousand Year Clouds, Wind and Water in the Netherlands") about the wheather during the entire Second Millennium, and each volume (4 published so far, till about 1675) has also quotations of solar eclipse observations by Westeuropean monasteries, accompanied by a table of computed eclipse dates and obscuration characteristic. It is copy right protected, as a project of Mr. Buisman in cooperation with the royal meteorological office KNMI in De Bilt, Netherlands. I do not know their e-mail address.

By head I remember quotations of 2 Aug 1133 and of 17 June 1433. Wil Carton.

From Glenn Schneider

Wil & Fred, The "poor" nature of the near-RT Surveyor 3 imagery was due to the need/desire to get the "raw" images into the public domain ASAP, i.e., into newspapers and elsewhere very soon after they hit the ground. The downlinked TV images, described at:



http://nssdc.gsfc.nasa.gov/nmc/tmp/1967-035A-1.html

were VERY significantly improved in post-processing, and the resulting data products are described on the same site as above. Note that the principal investigator for this experiment was Eugene M. Shoemaker, one of the great planetary scientists of our times, who after his passing, can appreciate the view Wil describes:

http://www.lpl.arizona.edu/~carolyn/tribute.html

I would be very curious to recover the image Wil wrote about. Is there a copy readily available to anyone on SEML? In note that David Williams at Goddard SFC is the contact for this data set. I do not know him personally, but will inquire if there is no positive reply here. (Fred, by chance, do you know him? Goddard is a big place, but maybe you do? He is at Code 663). Glenn Schneider gschnder@mac.com

From Ted Saker

Hi Mr. Eclipse: Nice license plate. <G>

I nominate the Total Lunar Eclipse of November 25, 1863. This one occurred during the night between the first and second days of the Civil War Battle of Chattanooga. US Grant, having improved the fighting abilities and morale of the army after its defeat at the Battle of Chickamauga, took Lookout Mountain from the Confederates in an engagement known as the "Battle Above the Clouds" during the first day's fighting.

The outcome of the battle was still in doubt, though. Despite losing their positions on Lookout Mountain, the Confederates were entrenched at the base of Missionary Ridge southeast of the city and occupied the ridge in force with artillery emplacements at the top. They felt that the eclipse was a good omen for them since they were closer to heaven than the Yankees. The Union forces were less certain of their situation. Even though they were buoyed by the sight of the Stars & Stripes unfurled atop Lookout Mountain, they felt the situation confronting them at Missionary Ridge too closely resembled the situation at Fredericksburg the year before (a ghastly Union defeat). Also, the very recent setback at Chickamauga still weighed heavily on the minds of the Union Army of the Cumberland.

The next morning, the Army of the Cumberland received orders to move against the Confederate rifle pits at the base of

*(Continued on page 41)*

# GENERAL TOPICS

Missionary Ridge. The Army of the Cumberland

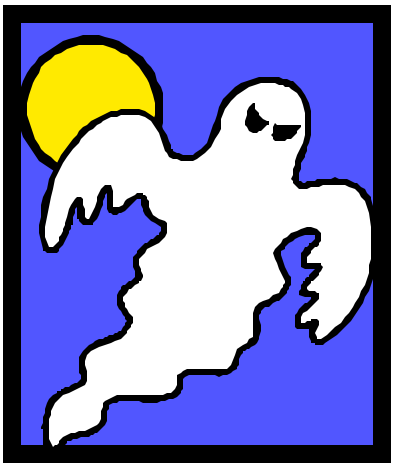
was still smarting from its humiliation at Chickamauga and believed it had to expiate that stain upon its honor. The Army of the Cumberland overwhelmed the Confederate rifle pits and, without orders, proceeded past the pits and up Missionary Ridge. This assault routed Braxton Bragg's army from Tennessee, and accomplished a very improbable Union victory.

Both Union and Confederate soldiers viewed the eclipse with more than a bit of superstition. Each side interpreted the event as a harbinger of victory or defeat to come. Even in the modern age, celestial events cause people to revert to a time

when such phenomena portended dramatic changes in human affairs.

From Lloyd Franklin

There is a picture of this image at the following website: http://www.lpl.arizona.edu/~rhill/alpo/eclstuff/observeeclipses/chapter15.htm - Lloyd Franklin



From Glenn Schneider

Thanks so much for the pointer. I actually had heard of these images before, but had never seen them. Quite fascinating in their own right and in historical context. Of course, it's easy to "create" an eclipse in space - but this has its special place in history. It's got my vote, Fred. At least with these sort of eclipses we will never have to argue about "annular/totals" vs. "hybrids" or other such nomenclature! Glenn Schneider

From Jim Huddle

Here are my candidates:

1. Columbus's OTHER lunar eclipse: During his first voyage, Columbus timed the lunar eclipse of 1494 Sep 14 in order to measure his longitude. His measured longitude was 23 degrees (1400 miles or 2200 km) west of his actual position. When he used the same method with the lunar eclipse of 1504 Feb 29 during his fourth voyage, his result was 37 degrees too far west. I don't know why his results were so poor; apparently Amerigo Vespucci used a similar technique with more success in 1499. See: Young, Warren, "Measuring Longitude, Columbus Style," Sky & Telescope, September 1996, p.70, in which he describes how this method was used successfully by public school students in Youngstown, Ohio, during the lunar eclipse of 1992 Dec 9.

2. Apparently Charles G. "Chinese" Gordon had bad luck with eclipses, both lunar and solar. According to Schafer, Bradley E., "Lunar Eclipses that Changed the World," Sky & Telescope, December 1992, pp. 639-642, "Chinese" Gordon was a mercenary. In 1851, he was helping the Manchus put down the Taiping Rebellion. Schaefer calls Gordon a skillful leader and a military genius, who won many victories for the Manchus. With one rebel position left, Gordon launched what he hoped would be a final assault, hoping that the full moon would benefit his plan of battle. But wouldn't you know it? A deep partial eclipse occurred, spoiling the illumination Gordon had counted on, and frightening his Chinese soldiers. "Chinese" Gordon was thrashed, and his troops suffered many casualties. Schaefer goes on to point out that in 1884-1885, Gordon was engaged in the defense of Khartoum (then, as now, capital of Sudan) when a solar eclipse occurred and demoralized his men. The city fell, and Gordon himself and many of his men were slaughtered. It is apparent to me that eclipses ARE bad war omens - but only for one side. I am sorry to admit that I have not taken the time to research the exact date of either of these eclipses.

3. In the same article, Schaefer mentions that lunar eclipses have been associated with the deaths of Herod, Caesar Augustus, and King Henry I of England, but he doesn't give the dates of these eclipses, and I have not looked them up.

Schaefer concludes his article on world-changing lunar eclipses by pointing out that Plutarch felt that the reason people become frightened during eclipses is that people don't understand the reason why the sky is getting darker. Schaefer refutes

# GENERAL TOPICS

Plutarch's position; he feels that eclipse phobia arises because it looks like the stability and natural order of the universe is being disrupted.

We've discussed eclipse phobia in this forum before. But Schaefer refers to Revelation 6:12. Now 6:12 is my birthday, and Judges 12:6 came up in my Physics class yesterday, so I took this as an omen. I looked up Rev. 6:12 to discover if the omen is good or evil, and I read, "...the sun became black as sackcloth, the full moon became like blood, and the stars of the sky fell to earth...." Now, I like solar and lunar eclipses, and I'm hopeful about the upcoming Leonid meteor storm (sorry, Europe, but you had 1999) so I think this is a GOOD omen. For me, anyway. Just don't be on my other side! Jim Huddle

From Jan Pieter van den Giessen

What do you think of the following (http://www.thehistorynet.com/Vietnam/articles/12962_text.htm): Fire also lit up the night sky over the Cambodian capital for the first time since January 30 . Then, during a lunar eclipse, FANK weapons had chattered for nearly an hour to chase away the legendary frog monster devouring the moon; over 200 were killed or wounded by flying metal. This time, enemy recoilless rifle shells and free-flight rockets streaked into the city from three directions for almost two hours. Seven sections of Phnom Penh were hit, with 150 and 200 rounds striking FANK positions near Pochentong airport. The fire and smoke blanketed 102 dead, 208 wounded and 400 homeless. Repeated jabbing kept the capital's defenders off-balance--grenades were lobbed into military dependents' housing and, two days later, at a soldier-laden bus, with 11 slain and 66 hurt.

B.t.w. has anybody a suggestion which year this was? It must be between 1972 and 1973. But according following articles http://news.bbc.co.uk/hi/english/sci/tech/newsid_612000/612949.stm and http://news.bbc.co.uk/hi/english/uk/newsid_1106000/1106830.stm it must be 1974.

From John Hopper

If saving the 2-image sequence to disk, be careful: although it looks like it might be just one image file, it's actually two... carefully lined up. John Hopper

From Brian Garett

This eclipse had to have been the total lunar eclipse of January 30, 1972. There was no lunar eclipse on January 30 in 1973 or `74. Brian

From Joe Rao To Eclipse Canada Date 09.10.01

I don't know if this would count as an eclipse of "historical interest" but I seem to recall that at the January 1972 total lunar eclipse, that the Vietnamese shot their guns and cannons toward the Moon in order to chase away the "giant frog" that was devouring it. I would assume, however, that this was merely a symbolic gesture!

And speaking of lunar eclipses . . . during the July 6, 1982 eclipse, a friend of mine had his radio tuned to the old Larry King overnight radio show (on the Mutual Network). Somebody called in to ask "If we're seeing a total eclipse of the Moon on our side of the Earth, does this mean that the people on the other side of the Earth are seeing a total eclipse of the Sun?" It actually took Larry about 20 seconds to consider this, before finally coming to this conclusion: "I'm not 100% sure, but I don't think so . . . " -- joe rao

# GENERAL TOPICS

From PP To SEML Date 25.10.01 Re **Index SENL October 2001**

Hi, Please find herwith the index for the October 2001 issue of the Solar Eclipse Newsletter (SENL). Any comments, please let us know. Any contributions, please send to joanne_edmonds@hotmail.com

PS: For the convenience of the files, keep SEML messages to the same subject title and do not change on reply subjects. Thank you.

Index SENL October 2001 at http://sunearth.gsfc.nasa.gov/eclipse/SENL/SENL200110.pdf (Index of all SENL at http://www.mreclipse.com/SENL/SENLinde.htm of http://www.MrEclipse.com) .../...

From Eric Flescher To SEML date 20.10.01 Re **Sungrazer comet near sun**

There is a picture of a recently discovered sungrazer comet near the sun taken with with the SOHO.

SOHO coronagraph images of Friday morning's CME reveal more than just solar activity: there's also a comet! You can see it in the full-sized movie as a faint dot at the 4:30 o'clock position moving toward the Sun. This comet -- discovered by Sebastian Hoenig -- is a "sungrazer." Above: The comet developed a long tail as it neared the Sun. look for it at 4:30 position http://www.spaceweather.com/images2001/19oct01/comet_c2_big.gif Dr. Eric Flescher

From Eric Flescher To SEML Date 171001 Re **First total a small world**

I saw my first total at Arasaig , Nova Scotia in July of 1972. My friends and I chose a small mountain overlooking the Northumberland Straits. We were the first ones up that mount-knoll and camped there for several days. It overlooked the Straits and was right on the centerline. Saw a great first eclipse and the clouds rolled in 5 minutes after totality. Took some pictures and it was a first successful total for me , first of now seven. There as a rainbow type prominence that I took a picture of, very discernable on my photo. Has anyone ever seen such a shape at another eclipse?

A few days ago, I talked with Robert S. who I met online. As we talked on the phone, I mentioned that I saw my first one in Nova Scotia in a small town called Arasaig. He said "Arasaig- on small hill?" I said "yes." He said he was there on that hill knoll as well with a guy named Bill. I said yes that was a guy I went up with. I could not believe it. It so happens that we got there first and then some other people-men, women and some children, about 12-15 other people to view the eclipse came up. Bob was one of them. Gosh- what goes around comes around -small world.

You never know who you are going to meet online with these listserves. Dr. Eric Flescher (KCStarguy@aol.com)

From Robert Slobins

Yes, I am the one Eric met in 1972. It turns out that we all came from the same area-- Providence, RI/Fall River, MA.

We were very, very lucky. It is the closest I ever came to a full cloud-out. 1991 and 1999 were near-misses too, but the clouds were not as solid as 1972's.

Now, I have to review my images. I do not recall a 'rainbow' or loop prominence. However, a loop prominence is common enough; I have seen enough loops throughmy H-alpha setup. --Robert B Slobins

From Bill Kramer

I was on the Olympia in 72 and had a 4.25" Edmunt f/10 reflector with me. There was a very bright prominence that even showed up as a "pink spot" in my 200 mm lens images (on a ship you can't use long focal lengths with ease). The prominence was a large loop in the scope and very bright on one edge with a darker color (laser red) towards the outer edge.

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# GENERAL TOPICS

That was my first total solar eclipse - that image is burned into the memory. The corona was very chaotic as well with a large streamer in the same direction as the prominence. -Bill Kramer

From Glenn Schneider

1972 was my first cloud-out - a few km west of Cap Chat, Quebec - so I obviously did not see this prominence. I'm not quite sure what you mean by a "rainbow" prominence, was it a loop structure such as the brilliant one seen in the 1998 eclipse:

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_88/ECLIPSE88_REPORT.html?

or more collapsed like the double hedge-row prominence in 1979:

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_79/ECLIPSE_79.html ?

> A few days ago, I talked with Robert S. who I met online. ... I saw my first one in Nova Scotia in a small town, ...He said "Arasaig- on small hill?" ... small world.

And, speaking of 1988 and small worlds. It was Robert Slobins who, after the 1988 eclipse, first really motivated me to design and build an automated eclipse photographic setup, which has become "Umbraphile".

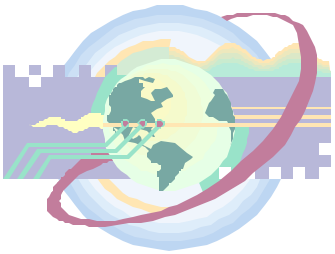
http://balder.prohosting.com/stouch/UMBRAPHILE.html

We shared a hotel room one night as we both had over-night lay-overs in, I think, LA (but Robert can correct my memory if it was somewhere else), and started discussing that subject. He could tell you the real story of how ROSE, the prototype for Umbraphile, was named as the acronym for "Reprogrammable Observer for Solar Eclipses" was really a reach, even for me. So, since he is now on the SEML, a public thanks are in order. Thanks, Robert. With, it seems, the

majority of eclipse photographers going the digital route, I'm not sure how long

it will be before Umbraphile becomes obsolescent, or at least will have to metamorph to keep up with the times. I'm still strongly a proponent of film (call me a dinosaur), but I hear Kodak is soon to discontinue my favorite, Kodachrome 25, in the not too distant future. Anybody here interested in a big order to stockpile and freeze? Glenn Schneider

From Glenn Schneider



Earlier: >...seen in the 1998 eclipse:
Intended: ...seen in the 1988 eclipse:

-GS-

From Robert Slobins

Bill: The laser-red color towrd the outer edge means that most of that part of the prominence was hydrogen (6563 A). If a darker color, it means that we were looking down the prominence rather than across.

Prominence color is generally a hot pink: a complex color caused by the addition of the hydrogen and helium lines. Gravity holds the heavier elements down close to the solar surface; the hydrogen and helium can get carried higher because of their lightness. You can look at my flash spectra images and 'add' the red, yellow, blue and violet lines to get an idea of the proper color. Red+blue = magenta, and the violet lines pull the colormore toward the blue. The yellow He line pulls the color red-ward.

Now, Bill, just how did you avoid seasickness from looking at the eclipse through the telescope? -Robert B Slobins

# GENERAL TOPICS

From Robert Slobins

To address Glenn's comments: I believe that 'rainbow' means 'loop'. I have seen enough of them through the Coronado filter I own.

Do note that on 4 August 1972 there was a great auroral display. It was my first, as seen from Fall River, MA. This occurred 25 days after totality.

I believe now that Glenn and I did share a room in LA on the lay-over.

As far as the naming of 'ROSE'... At the time, I was involved with one Rosaria 'Rose' Tambone--a girlfriend. Although we had been together over a year, it was clear that she was not even supportive of my work or even cared what I was about. An exa m-ple: I watch the sky. She watched soap operas, even on the job, and what she did not watch, she taped and watched at night.

However, she had no problem about using me as a means to her ends. I would provide her with stud service, but unlike an ani-mal, I would have to give up all of my activities to raise this family.

We broke up within two months of the 1988 eclipse. I heard that she nailed down a Wall Streeter.

Clearly, this woman--and I use that term generously--was not only wrong for marriage, but also mechanical. So, it was and is appropriate to call a mechanical device 'ROSE'.

I did marry better. Elisabeth has seen three totals so far and has been invaluable on the 1998, 1999, and 2001 expeditions. A l-though no scientist or technician (her dialogue during totality last June is borderline Lucy), she does know how to keep things in order, loves to travel, and makes friends with the natives (V-E-R-Y critical!). She is my director on-site--yes, she gets to be 'the boss' during total solar eclipses.

You all can see what we have done, and what we look like, at this URL: members.aol.com/catalog2001/eclipsehome.html

Regarding the demise of Kodachrome: Good! Velvia works just as well for H-alpha work, and you don't have to mail it out for processing and risk its loss. I use Fuji NPH and NPS film for totality; I get 11-12 stops of performance from it. I saw a trial scan of the 2001 images from a Nikon 4000; we may kiss the multiple overlays of images we have seen goodbye!

As soon as digital equipment gets to high resuolution and high latitude, I will not be using digital cameras on eclipses. Also, the electronics are somewhat delicate. I would not take such toys into such exotic places that the next decades' worth of eclipses will cross. However, ROSE, or Umbraphile can be modified not only to sequence the exposures but also download them to something like a Ti- Book computer. Robert B Slobins

From Bill Kramer

> Now, Bill, just how did you avoid seasickness from looking at the eclipse through the telescope?

Easy, only look when the roll of the ship is at the max or min - and use as wide a field eyepiece as possible! (-:

From Eric Flescher

The prominence was like a loop structure, I call it the shape of the raindow arc. It looks in my picture like the structure that erupts from the sun during the opening sequence on Voyager (Star Trek TV program) that the Voyager flies through. It is very pronounced and it is on my site.

Also last nigtht (Wed) , I showed off a multimedia 6 minute video version of the 2001 eclipse to hundreds at my Macintosh multimedia festival. It went well. I had African music, video from totality, ring of fire sequence, people observing, a few pics of Victoria Falls, my pic that was in Astroomy magazine October. I used Imovie 2 with macintosh laptop and used transitions

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# GENERAL TOPICS

(dissolve, opening circles etc) and effects. An interesting questions after was: (1) Was the total eclipse sun really pulsating like that (the corona) or did you enhance it make that with the camcorder? ans. No it was not enhanced. The corona shows a lot of movement.

From Robert Slobins

Does the corona show THAT much large-scale movement in 3-1/2 minutes?

If you go to the MLSO web site, you can get a 'movie' of the day's K-corona movements. Matter in the corona flows outward.

Dr. Pasachoff--if you read this news list, please comment. Robert B Slobins

From Glenn Schneider

Eric, There is something wrong here. Given the sort of angular resolution I would expect you might get from your camcorder (from one to a few arcseconds) it is a virtual certainty you did not record any changes in the coronal structure over the ~210 seconds of totality.

You speak of "pulsations". To me this implies changes in recorded intensities rather than locations or structure of features within the corona. Without the benefit of seeing your video, I might venture a guess that your camera had some sort of automatic exposure compensation mode active and may have been trying to compensate for changes in the background (or field-average) light level as the eclipse progressed from second to third contact. -GS-

From Gerry Foley

Does the corona show THAT much large-scale movement in 3-1/2 minutes?

If you go to the MLSO web site, you can get a 'movie' of the day's K-corona movements. Matter in the corona flows outward.

<snip>

SE listers please forgive me if you have read this before.

At http://home.columbus.rr.com/gfoley/eclipse.html

is an account of my eight TSE's. After the first really good view of a TSE in 1970 (my fourth) my wife and I went to Paspebiac, Quebec, on the south shore of the Gaspe, in the hope of seeing the 1972 TSE. The night before eclipse we sat in the motel room of Prof. Waltmaier, of Zurich, who at the time was custodian of the Zurich Sunspot Number. It was his 28th trip to a central line of a TSE. I was at the time working with the National Bureau of Standards (now NIST) on high speed optical pyrometry. I asked Prof. Waltmaier if there was any interest in making dynamic measurements of the corona during eclipse. He replied that he did not think so, that the corona was the same at the end of totality as at the beginning. I said that I sensed a pearly quality to the corona, and wondered whether this arose because of variations in the corona itself, or was a terrestrial atmospheric effect. The professor paused for several seconds, and then said "I've never had the chance to look." During 28 TSE's he had ad his head under dark cloths and never glanced at the sky. We were totally clouded out that year, but I have had wonderful views of three succeeding eclipses in 1973, 1998 and 1999. I still think I sense a kind of rippling motion in my view of the corona. Gerry K8EF

From Robert Slobins

Could the rippling motion be due to the atmosphere? After all, the area in the lunar shadow is cooler than that outside; that is why we have shadow bands. Robert B Slobins

# GENERAL TOPICS

From Wil Carton To SEML Date 17.10.01 Re **Solar eclipse on ancient engravings**

Stig, The program Emapwin of the Japanese Takesako shows the same result as the program WinEclipse of the Austrian Scsribany: Denmark laid entirely within the totalitybelt, and all eclipse contacts took place with the sun above the horizon in Denmark. The curve of First Contact at Sunrise laid over England. The totalitybelt began in the Atlantic Ocean not far west off the Irish coast, sweeped centrally over Great Britain, the northern part of Holland, the northern coast of Germany, entire Denmark, turning northward over entire Finland, to finish in the Arctic Sea. Wil Carton.

From Stig Linander

Thanks a lot! As far as I understand eclipse geometry, it depends on the value of delta-T chosen for the calculations. And if Emapwin and WinEclipse use the same value, they'll probably come up with the same result. Apparently, Guide 4.0 uses a different value for delta-T.

There's an article - in Danish - about those rock engravings at: http://www.ancient-astronomy.dk/oktmag99.htm A picture of the Herrestrup Stone at: http://www.ancient-astronomy.dk/herrest2.gif An interpretation of the star pattern at: http://www.ancient-astronomy.dk/herrest1.gif Best regards, Stig.

From Wolfgang Strickling

Hello all, older Guide versions use completely wrong delta-T for very old periods. For calculating ancient eclipses it is totally useless! At least up to version 5.0. Version 6.0 with actual patch seems to use correct values. A simple test is the "Babylon-Test": On april 15 -135 (= 136 b. C.) there was a total eclipse to be seen in Babylon. If your software does not show this, it uses wrong delta-T.Note that delta-T is not exactly known for very old times thousands of years ago. So calculated results will be unvertain at all. Best regards, Dr. Wolfgang Strickling

From Wil Carton

Stig, In the final decade of the 20th century researchers attained agreement about the lunar acceleration in longitude: n-dot = -26,0 arcsec/cy*cy. Yes, The delta-T remains the most speculative quantity. That is the accumulated clock error between an uniform clock and the clock of the not-unform rotation of the Earth around its axis.

Guide version 4.0 seems quite old to me. The current version is 7.0. I have Redshift version 3 Dutch, the newest is version 4 English. My Redshift 3 says: For Copenhagen, geographical position 12°34' East, 55°41' North. Date: BC 1596 (=-1595) March 18. Sunrise: 7h02m in local timezone (UT+1 hour). First Contact: 9h29m, solar altitude 18 degrees. Maximum eclips: 10h40m, solar altitude 24 degrees. The planetariumprogram shows a small solar crescent south of the dark moon. Magnitude estimated by me about 97%. This means that the totalitybelt already bent northward before it could have reached the Danish island where Copenhagen is situated, and implies that the entire totalitybelt laid some degrees westward. This implies that Redshift computes a lower positive value for Delta-T than Emapwin does and also than WinEclipse does. Both Emapwin and WinEclipse showed the Copenhagen island within the totalitybelt, between the central line and southern limit, although their results are not identical (example: WinEclipse draws the curve of First Contact at Sunrise over the middle of England, Emapwin draws it somewhat west from the Eastcoast of England, a typical Delta-T difference of about one and a half degree in longitude, equivalent to 6 minutes of time).

This ancient record could be a very very important observation!! Prof. F.R. Stephenson has no such an old record analysed in his 1997-book "Historical Eclipses and Earth's Rotation". Even the famous Ugarit clay tablet is younger! It is famous by its cuneiform text "The day of the new moon in the month Hiyar was put to shame. The sun went down (in the daytime) with Rashap in attendance" and on the reverse side "(This means that) the overlored wil be attacked by his vassals." Fitting eclipses for this record could have been that of BC 1012 May 9 in the late afternoon (my interpretation and also of Wayne Mitchell), or the eclipse of BC 1223 March 5 (interpretation of astronomer T. de Jong and historian W. van Soldt), or the eclipse of BC 1375 May 3 (interpretation of Sawyer and Stephenson).

I cannot translate the Danish article on the website you meant. Now I ask you:
1. How did Michael Larsen deduct BC 1596 (-1595) March 18 as the date of that old engraving on the Herrestrupstenen?

*(Continued on page 48)*

# GENERAL TOPICS

2. Why does he interprete the cross as a totaly eclipsed sun? The engraving shows some constellations and the Milky Way... but in my own eight observed total solar eclipses I have never seen stars weaker than Altair and Deneb!
3. How could he exclude other possible dates, especially less distant dates?
This is very important!
4. How certain is the engraving that the eclipse was total? 5. How is this rock linked in relative chronologies by archeologists and/or historians? How sure is the interpretationstep to an absolute chronology that indicates an epoch of about one and a half millennium before Christ?? Please Stig, translate the article in English! Was the article serious? It was published in an issue "nr 11, 1 october 1999": that was in the slipstream of the public excitement after the 11 August 1999 solar eclipse.

If it is serious, then it could be very important for not only me, but for Prof. F.R. Stephenson of the University of Durham, who dedicated his entire career to the study of ancient astronomical records, but had neither doubtless observations earlier than BC 763 in the Middle East nor in Europe. Wil Carton.

From Stig Linander

> For Copenhagen, geographical position 12°34' East, 55°41' North.

The village of Herrestrup is located west of Copenhagen - about 11°36'E, 55°48'N.

I've made a short resume in English of the main points of the article (http://www.ancient-astronomy.dk/oktmag99.htm):

The Herrestrup stone was found in 1874 and - just like other ancient engravings - haven't been deciphered. However, a probable interpretation is that it shows a TSE happening early the morning of 18/3 1596 B.C. If that interpretation is true, the stone is 500 years older than previously assumed.

Last year (1998) the Herrestrup stone was reinvestigated by the Danish National Museum and they found previously unknown figures on the stone. These figures - together with studies made by the Swedish astronomer Göran Henriksson on Swedish engravings - make the interpretation reasonable.

The Herrestrup stone is about 1 m wide and about 73 cm high and is of reddish granite. (http://www.ancient-astronomy.dk/herrest2.gif)

The dog- or horse-like figure at the left on the stone is the constellation Perseus, immediately above that Cassiopeia in two smaller figures, below - marked as a larger groove - the eclipsed Sun. To the left on the uppermost ship, the constellation Lacerta is shown as a cross-like figure. (http://www.ancient-astronomy.dk/herrest1.gif)

The upper row of stars of Andromeda and the two uppermost stars of the Pegasus-square are shown as the uppermost large ship. The lower row of stars of Andromeda and the two bottom stars of the Pegasus-square are shown as the next large ship. The ship to the right of the eclipsed Sun are stars from Pisces, while the ship at the buttom is made up of stars from Aquarius.

Deneb constitute the stern of the ship to the upper right.

During the eclipse it wasn't possible to see all the stars shown in the engravings. But - if the interpretation is true - the people making the engravings had sufficient astronomical knowledge to know the sky from the brightest stars alone.

During the eclipse, all planets except Mars were visible. On the rear side of the stone there are a number of grooves showing the positions of Venus, Mercury, Saturn, Moon/Sun and Jupiter during the eclipse. There's also a small cluster of eigth grooves - showing the correct position of the Plejades.

> 1. How did Michael Larsen deduct BC 1596 (-1595) March 18 as the date of that old engraving on the Herrestrupstenen?

*(Continued on page 49)*

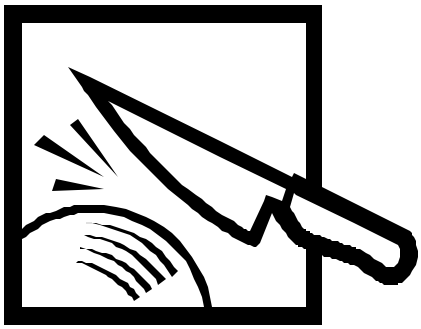
# GENERAL TOPICS

I suppose it's according to the interpretation.

> 2. Why does he interprete the cross as a totaly eclipsed sun? The engraving shows some constellations and the Milky Way... but in my own eight observed total solar eclipses I have never seen stars weaker than Altair and Deneb!

The cross isn't the eclipsed Sun. The eclipsed Sun can be seen just "looking" over the stone on herrest1.gif. I don't think the engravings show the Milky Way. It's shown on herrest1.gif - I think it's artistic licence ;-)

> 3. How could he exclude other possible dates, especially less distant dates?



I suppose the engravings didn't fit.

> 4. How certain is the engraving that the eclipse was total?

Nothing is certain. It's only an interpretation - a theory.

> 5. How is this rock linked in relative chronologies by archeologists and/or historians? How sure is the interpretationstep to an absolute chronology that indicates an epoch of about one and a half millennium before Christ??

It's beyond my abilities to give an answer on that.

> Was the article serious?

Yes. The article calls the theory "a probable interpretation". Nothing more. Hope this helps. Best regards, Stig.

From Jan Pieter van de Giessen

Stig and others, I found on the following website http://www.google.com/search?q=cache:w9KB4DKZGEI:ww5.et.tiki.ne.jp/~koremaru /OX/V-abs.htm+eclipse+1596+18+march+BC+swedish&hl=en (a japanese website only in cache on www.google.com) and http://www.lpl.arizona.edu/oca/abstract.htm this text.

Henriksson, G. (Uppsala University) In 1991 I found that the total solar eclipses on 3 March 1596 BC and 6 July 1230 BC are depicted in Swedish rock carvings. The bright planets appear as cup marks in correct relationship to the representation of the sun. All total and annular eclipses between 2000 and 500 BC in Sweden are now identified, also some partial eclipses which covered more than 0.95 of the sun's diameter. A sun symbol to the left of the constellation Orion has been interpreted as a supernova. A supernova of the same date has been described on Chinese oracle bones. By combining the information in these texts with the position on rock carvings of the full moon when the supernova exploded, it has been determined that the supernova appeared 9 November 1355 BC. Its position agrees well with the supernova remnant PKS0646+06. The periodic comet Encke was very bright in the Bronze Age and appears often in rock carvings. Earlier it was known only from 1786 AD, but can now be identified as far back as 1758 BC With the help of the improved orbit, it can also be recognised in about a dozen places in the Chinese chronicles fran 600 BC to 1600 AD.

Further I found the following website about an solar eclipse in 1596 BC: http://www.symbols.com/encyclopedia/08/081.html

Is there a relationship between these findings and the Herrestrup stone? The Swedish rock carvings (the Ales Stenar) are discussed in detail on http://fermi.phys.ualberta.ca/~amk/as/aleseng.html

And at last is there some more information about the Herrestrup stone? Jan Pieter van de Giessen, Astronomical Books Online www.giessen.f2s.com

From Stig Linander

# General Topics

Jan Pieter, Thanks for the links (and the jokes ;-). Interesting reading.

> And at last is there some more information about the Herrestrup stone?

I haven't heard of any news. I'll ask the webmaster of www.ancient-astronomy.dk. Best regards, Stig.

From Eric Pauer To SEML Date 24.10.01 Re **Venus and Mercury transits**

Does anyone know if there any good web references for the upcoming transits of Venus across the solar disk on 8 June 2004 and 6 June 2012? Also, any references on the solar transits of Mercury (7 May 2003, 8 November 2006)? Specifically, I'm interested in contact times, minimum separation, global regions of visibility, history of past transits, etc. I know the Fred Espenak does have some brief info at: http://sunearth.gsfc.nasa.gov/eclipse/OH/transit99.html Thanks, Eric

From Mike Simmons

Eric, A few that may be of interest:

IOTA document on the transit of Venus on 8 June, 2004 http://www.lunar-occultations.com/iota/2004venus/2004venus.htm

Transits of Venus http://ds.dial.pipex.com/eclipse99page/trans.htm

Transit of Venus on 8 June 2004 http://www.users.zetnet.co.uk/pete/Venustransit.htm

Transit of Venus, 8 June 2004 - Data http://canopus.saao.ac.za/~wpk/tov1882/tovdata_e.html

The1882 Transit of Venus: Observations from Wellington, South Africa. http://canopus.saao.ac.za/~wpk/tov1882/tovwell.html

Iran -- a country I visited for the solar eclipse in 1999 and have maintained contacts with -- appears to me to be an ideal location for the Venus transit on June 8, 2004. I will definitely be there and I will probably be taking a group along to tour the country for the transit, dark sky observing with local amateurs and touring historical and natural sites. I have no specifics on the 2004 trip yet but my 1999 eclipse trip can be seen at http://webpages.charter.net/msimm/Iran/Eclipse99/Report.html. I'll be adding more on astronomy activities there and US-Iran cooperation for amateur astronomy and public outreach and education soon. I'll report here when I have more eclipse-related content (which I hope will be soon). Mike Simmons

From Peter Tiedt

Eric Don't know if you run "Occult". It is a fine piece of freeware and portrays the transits very well. I am not sure of where to get it, but there will surely be someone in the group who does. Peter Tiedt

From Evan Zucker

Here are a few I've accumulated:

http://www.users.zetnet.co.uk/pete/Venustransit.htm
http://ds.dial.pipex.com/eclipse99page/trans.htm
http://ds.dial.pipex.com/eclipse99page/venus.htm
http://eclipse.span.ch/transit.htm
http://www.amazon.com/exec/obidos/ASIN/0691048746/o/qid%3D958190382/sr%3D8-1/ref%3Daps%5Fsr%5Fb%5F1%5F1/103-6063148-6527022

-- EVAN

From Jim Huddle

I'm going to append my "webliography" on the June 8, 2004 Transit of Venus to those of Mike Simmons and Evan Zucker so you'll have them all in one place. My Yahoo! search ("transit of venus) last night returned 17,400 responses, many of which are astrological in nature, many others of which are erotic. With a topic like this, you're gonna have that.

Let me point out that transits are unlike solar eclipses in that everyone sees the transit at about (but not exactly) the same time: The earliest exterior ingress contact (beginning of the event) listed in the U.S. Naval Observatory's table of local circumstances (see the first web site in my list, below) is at UTC 05:06:30.3 (in Fiji) and the latest listed in that table is exactly 14 minutes later (San Fernando, Spain). The earliest exterior egress contact (end of the event) in the table is at UTC 11:22:06.6 (Yellowknife, Canada) an the latest is 10 minutes 37.1 second later at Montevideo, Uruguay. So, while precise contact times are very helpful, they are not absolutely necessary: Get to where you're going about 04:00 UT, set up your toys, have a little something to eat, and enjoy a nice liesurely transit. These are not frantic, fast-paced events like TSEs.

Like lunar eclipses, transits are visible from about half the earth. Since they last a long time (the 2004 event will last over 6 hours), it is not necessary to fin a place

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# General Topics

with long duration - weather, political stability, and "vacational desirability" are more important considerations for transit observing. Mike Simmons likes Iran, and he's had several good experiences there, so he's going back. I've always wanted to see Abu Simbel and to cruise the Nile River, so I will be leading leading a Nile Cruise from Aswan (where Eratosthanes measured the size of the earth) to Cairo (International City of Mystery and Intrigue) and the Pyramids (where James Bond 007 fought Jaws for the first time). We will have two Questar telescopes and will observe the transit from near the Aswan High Dam. More info is available at the Innovations In Travel web site in my list below.

One last thing: the apparent diameter of Venus is about 1/30 the apparent diameter of the Sun; you should be able to detect the perfectly round spot on the sun without magnification (but WITH solar filter!) but you will want to take a telescope for this event. Jim Huddle

Here's my Webliography; Mike Simmons's and Evan Zucker's are below:

1. U. S. Naval Observatory Astronomical Applications Dept, Data Services web page: Scan down to the "Miscellaneous" category, and you'll find links to a map showing the area of visibility and to a table of local circumstances for the 2004 Venus transit. Both are PDF files. http://aa.usno.navy.mil/data/

2. David Sellers's readable account of how to find the solar parallax from observations of a transit of Venus will be found at: http://www.dsellers.demon.co.uk/venus/ven_ch1.htm/

3. " The 1882 Transit of Venus: Observations from Wellington, South Africa" has a photo taken during the 1882 Venus transit and much else. http://www.saao.ac.za/~wpk/tov1882/tovwell.html.

4. Info about Eli Maor's book, "June 8, 2004 -- Venus in Transit." http://pup.princeton.edu/titles/6795.html

5. A well-designed web page about the 2004 Venus transit, by the Orpington Astronomical Society. http://www.chocky.demon.co.uk/oas/venus.html

6. The page for the trip I'm leading for Innovations in Travel can be found by clicking on "Venus Transit" in the green banner at the top. http://www.innovationsintravel.com/netscapeindex.html

7. Prof. Dr. Udo Backhaus of the University of Koblenz requests collaborators for an experiment to measure the distance to the sun during the 2004 transit. For more info, contact Prof. Backhaus at backhaus@physik.uni-koblenz.de. http://www.uni-koblenz.de/~backhaus/VenusProject.htm

8. Association of Lunar and Planetary Observers, Transit Section webpage. There is nothing - yet - about the Venus transit, but there is alink to their page about the 1999 Mercury transit.http://www.lpl.arizona.edu/~rhill/alpo/transit.html

Mike Simmons provided this list:

9. IOTA document on the transit of Venus on 8 June, 2004http://www.lunar-occultations.com/iota/2004venus/2004venus.htm

10. Transits of Venushttp://ds.dial.pipex.com/eclipse99page/trans.htm

11. Transit of Venus on 8 June 2004http://www.users.zetnet.co.uk/pete/Venustransit.htm

12. Transit of Venus, 8 June 2004 - Datahttp://canopus.saao.ac.za/~wpk/tov1882/tovdata_e.html

13. The1882 Transit of Venus: Observations from Wellington, South Africa.http://canopus.saao.ac.za/~wpk/tov1882/tovwell.html

These are Evan Zucker's contributions:

14. http://www.users.zetnet.co.uk/pete/Venustransit.htm
15. http://ds.dial.pipex.com/eclipse99page/trans.htm
16. http://ds.dial.pipex.com/ eclipse99page/venus.htm
17. http://eclipse.span.ch/transit.htm
http://www.amazon.com/exec/obidos/ASIN/0691048746/o/qid%3D958190382/sr%3D8-1/ref%3Daps%5Fsr%5Fb%5F1%5F1/103-6063148-6527022

And of course, Fred Espenak's page on the transit, which Eric Pauer mentioned in his original e-mail asking for this webliography:18. http://sunearth.gsfc.nasa.gov/eclipse/OH/transit99.html

From Jerry Levy

Eric, I recommend Eli Maor's book: June 8, 2004 Venus in Transit. It provides an excellent background of the science behind the reasons for a transit, the (fascinating) stories of the 5 previously visible transits in recorded history and of course information on the upcoming June 8, 2004 transit. Jerry

From Mike Simmons

Excellent information, Jim. I'm saving your references

*(Continued on page 52)*

# General Topics

to review later. The differences between searching for eclipse and transit observing sites are important. But I have one comment.

> Like lunar eclipses, transits are visible from about half the earth. Since they last a long time (the 2004 event will last over 6 hours), it is not necessary to fin a place with long duration - weather, political stability, and "vacational desirability" are more important considerations for transit observing.

While half of the world will be able to see a transit at any one time, the area that will get to see the entire transit is much smaller. With the recent transit of Mercury it didn't matter too much where you were -- if you saw ingress then you'd probably see egress since the duration wasn't that long. As you point out, the Venus transit takes much longer. An observer that has the Sun high in the sky for ingress may miss egress altogether since the Sun will either be very low or have already set six hours later when the transit ends. Thus it is desirable to be at a longitude where the Sun is close to the meridian at mid-transit, i.e., the middle of the event occurs near the middle of the day. Being at a latitude where the Sun gets fairly high at noon will obviously help, too. The Middle East is very well located for this event. Of course, much of the Middle East can be very hot in June so picking someplace with a relatively moderate climate will help. Many countries have mountains or forests despite our usual view of the whole area is low desert. I think the whole region enjoys pretty clear skies at that time .

Enjoy your trip to Egypt, Jim. It sounds fabulous (someplace I've always wanted to go, too). Mike

From : "Vic & Jen Winter, ICSTARS Inc." <webmaster@icstars.com> To : SOLARECLIPSES@AULA.COM Subject : [SE] **Occult Software** Date : Thu, 25 Oct 2001 00:49:07 -0500

For those Astronomical League members, you may want to check your May 2001 Edition of the REFLECTOR. This was the edition with the Milky Way on the cover.

We ran an article on page 11 from the International Occultation Timing Association (IOTA) about David Herald's Occult prediction software. The version is up to v.4.2 now and very advanced from earlier DOS version editions.

You can contact either IOTA webmaster, Rob Robinson (webmaster@lunar-occultations.com) to burn you a disk for the cost of $5USD inside the US.

or you are free to download the program from ftp: //lunar-occultations.com . Please contact Rob if you download the program. They are trying to keep track of users.

It's a very good tool if you get to know the program, to create calculations for all sorts of occultations.... including our favorite occultation of all - Solar Eclipses.Clear Skies, Jen Winter

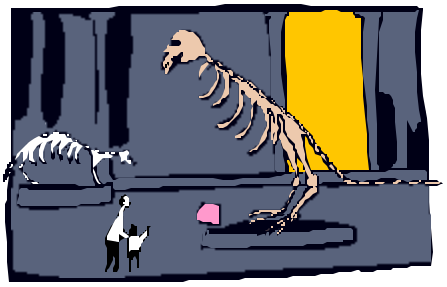
From Jan Pieter van den Giessen To SEML Date 27.10.01 Re **Historical Eclipses**

Hi all, I found the following observations of solar eclipses by Jesuits in Canada:

Solar Eclipse September 1, 1663 at Quebec (http://www.canadiana.org/cgi-bin/ECO/mtq?id=8accc01cdc&display=07582+0011 and http://www.canadiana.org/cgi-bin/ECO/mtq?id=8accc01cdc&display=07582+0041) Reference: : Thwaites, "The Jesuit relations and allied documents: travels and explorations of the Jesuit missionaries in New France, 1610-1791 the original French, Latin, and Italian texts, with English translations and notes", Reuben Gold, 1853-1913. 299 pages. (Cleveland : Burrows, 1899.)

Solar Eclipse in April 19, 1670 Observed by Allouez in the Wisconsin Forrest in the neighbourhood of Wolf river. Reference: : Thwaites, "The Jesuit relations and allied documents: travels and explorations of the Jesuit missionaries in New France, 1610-1791 the original French, Latin, and Italian texts, with English translations and notes", Reuben Gold, 1853-1913. 311 pages. (Cleveland : Burrows, 1899.) (http://www.canadiana.org/cgi-bin/ECO/mtq?id=8accc01cdc&display=07588+0016 , http://www.canadiana.org/cgi-bin/ECO/mtq?id=8accc01cdc&display=07588+0017 and http://www.canadiana.org/cgi-bin/ECO/mtq?id=8accc01cdc&display=07588+0243)

Further I found and interesting story about the Dene-Dindjie indians who hold a festival when there is a lunar eclipse (http://www.canadiana.org/cgi-bin/ECO/mtq?id=8accc01cdc&display=15864+0060) Do someone know a little bit more about these festivals? Jan Pieter van de Giessen



# General Topics

From Eric Flescher To SEML date 20.10.01 Re **Number of eclipses seen**

He had seen 28 by 1972? I know Glenn has seen 22 (?) - I wonder what the record is of seeing the most total eclipses by a person? I know I am only a "middling" when it comes to this group (I have seen 8 totals, 1972,1973, 1979, 1991, 1998,. 1999, 2001 and one annular 1994).

From Pierre Arpin

Jay Pasachoff is the undisputed champion in this category with 21 eclipses under his belt.

For more info go to rhis site : http://www.clocktower.demon.co.uk/tse/

From Joel Moskowitz

Yes, but if you'll look closely, Glenn has more time in the umbra.

From Michael Gill

John Beattie of New York and Derald & Denise Nye of Tucson also have >20 TSEs.

In Sky & Telescope's report on the 1998 TSE they write: "The Nyes started eclipse chasing in the early 1970s. They now have a combined total of 28 solar eclipses (21 totals and 7 annulars), spending more than an hour under the Moon's shadow."

http://www.skypub.com/sights/eclipses/solar/9802solarreport.html

I gather that Derald & Denise have chased all the central eclipses (four) since that one which presumably raises their totals to 23 TSEs and 9 annulars.

(I have a possible query about S&T's arithmetic here - if Derald and Denise started eclipse-chasing in 1970, then to reach a total of 21 TSEs by 1998 they would have presumably have had to have gone to the Antarctic TSE in '85 or maybe the region near St. Helena in March '87. At the March '87 solar eclipse the umbra only reached the Earth's surface over the South Atlantic - people in Gabon (where John Beattie was) only saw a diamond-necklace eclipse. So, perhaps Derald and Denise's eclipse-chasing started in 1970, but they were fortunate enough to have seen one at home prior to this?)

I don't know John Beattie's individual stats, but he and Glenn Schneider were amongst a small handful of people to get to the track of the solar eclipse of October 1986 (see Glenn's report at: http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_86/ECLIPSE_86.html ).

John told me that he doesn't even count the October '86 eclipse as one of his totals as they did not get complete photospheric extinction.

Do any of the participants in the June 30 1992 TSE eclipse flight from Rio (navigated by Glenn) remember the name of the Japanese participant who had a very high number of TSEs under his belt? Was it Osumu Oogee mentioned on Glenn's webpage?

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_92/ECLIPSE92_REPORT.html

I can't remember the guy's exact number but if he is still chasing eclipses he could have well over 20 TSEs.

There are a number of enthusiastic Japanese eclipse-chasers, but probably because of language and cultural differences we don't hear much about their exploits.

The last time Patrick posted a breakdown on the list of SEML subscribers there weren't many from Japan.

Bernard Milet of France and Craig Small of New Jersey are also in the 20+ club. Freddie Dorst of Germany and Ernie Piini of California must be around that number as well. The above mentioned Sky & Telescope URL mentions 101-year old Philip Carret as being a veteran of 20 successful totalities. He was on the 'Veendam'cruise ship for the 1998 TSE, and saw his first TSE in January 1925 - 73 years (904 lunations) earlier.

Several SEML members were on the 'Veendam' – anyone remember this guy? Sadly, I didn't get to speak with him but I do remember him wearing a 'I-saw-Halley's-comet-twice' t-shirt!

>From the S&T article it seems that the 'Veendam' carried several members of the 20+ club - Glenn Schneider, the Nyes, and Mr. Carret. I know that Craig Small was also on board (I was standing next to him and his wife). Quite an impressive grouping. Perhaps there were other members of the 20+ club on that vessel?

I hope I'm able to eclipse-chase when I reach 101! Michael Gill.

From Glenn Schneider

Eric, First, I don't consider eclipse chasing a Guiness Book of Records thing. I don't chase eclipses to "chalk up another one", but rather because it is the most exhila-

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# General Topics

rating, awe inspiring and humbling experience one can have. I could not image letting one go by without an attempt. In that regard I should set the "record" straight. First I have not SEEN 22. I have been under the umbral shadow 22 times since taking up eclipse chasing BUT have been cloud out 3 times (1972, 1977, and 1990). I am not sure, but I THINK Daryl Nye, also from Tucson (not living very far from me), MAY have the honor of the current record. I know he has been to more than I have (somewhere in the mid upper twenties) but I know he ha at least one, and maybe more, cloud out (s) as we were both rained on together in 1990 on Atka Island.

Digression: Earlier this year I went to see my physician about medications/innoculations for travel to Zambia. Hey said, "Oh! You know, another patient of mine just made the same inquiry. He is going to see a Total Solar Eclipse, what are you going for?" Turns out it was Daryl, of course. Now, talk about "small word". Go figure, two of (amongst) the most ardent umbraphiles have the same GP.

Anyway. Contemporary with me are John Beatie and Craig Small. I THINK John and I have been to all same TSE's, that is to say all except the 1985 Antarctic eclipse - but he saw 1990 by air and may be one up on me. Craig missed a couple during that interval BUT has never been clouded out.

Jay Pasachoff has a few years, and I am pretty sure, a few eclipses on me - but Daryl may inch him out. Daryl is not on this list, but I can ask him when I see him next, and Jay of course, can speak for himself.

Then again, I don't pretend to know everyone with this debilitating illness (umbraphillia), and certainly have "met" a many more thabks to SEML. Cheers, Glenn Schneider

From Michael Simmons

Glenn, Along with chasing every total eclipse, it seems to me that Daryl Nye chases any eclipse. Talking with him has given me the impression he'll travel just about anywhere in the world to be in the Moon's penumbra. I've asked him about it and of course the travel is enjoyable so it seems the eclipse is almost an excuse to go somewhere. Maybe you can check on this, too. Daryl might have made more eclipse trips than anyone, an interesting distinction in itself, perhaps. Mike Simmons

From Dale Ireland

didn't Donald Menzel have some incredible number like 50 I seem to remember something but not certain Dale

From Gerry Folley

Remember that Professor Waltmeier said he had never seen a TSE, and he did not say how many were clouded out, as he was at Paspebiac.

He said he went to a location one year ahead of the eclipse, and based on his observations at the exact time of totality minus l year, chose the site where he would set up a year later. I think he assumed that the altitude and azimuth of the sun would be near enough the same each year. He claimed he supplied data for grad students for years to come from each successful trip. What they were I did not discuss.

It was clear the night before eclipse, and I put my spectacles down on a chair and sat on them. The early morning of eclipse day I spent repairing the glasses. The nearest town of any size was 50 or more miles away. It was a great trip. Gerry K8EF

From PP

As Glenn mentioned, it is not the number of seen solar eclipses what counts, but the fun and pleasure of chasing in general. As some of you might know, I travel to nearly all solar eclipses, total annular and partial. I "had" to stop my successive sequence of solar eclipse chasing with the partial eclipse of February 2000 in the Antarctic. I witnessed 14 successive solar eclipses (annular, total, partial). In total I have seen 28 solar eclipses. Did not Levy observed a lot of solar eclipses? Best regards, Patrick

From Jay Pasachoff

Patrick--Thanks for the e-mail mentioning the number of eclipses for Dave Dunham and asking about Donald Menzel. I just wrote a paper about Menzel's eclipses for the Journal for the History of Astronomy, based on my talk at last year's Menzel Centennial Symposium. He saw 14 totals and 2 annulars.

My own total is 32, including 22 totals, 6 annulars, and 4 partials. Jay Pasachoff

From Alan Leighton

*(Continued on page 55)*

# General Topics

I notice that a lot of people on this list whom I KNOW were in Southern Africa this year have no result listed on the web page whose URL is given below. Although I am in no way connected with that extremely interesting page, I would encourage everyone to take a look, and if they want their 2001 results to be listed, to send an e-mail to the gentleman who has compiled it. Clear skies, Alan Leighton

> http://www.clocktower.demon.co.uk/tse/

From Evan Zucker

I'm thinking that 4 partials could be a record -- a record LOW! Most people can't help but be present for numerous partial solar eclipses in their lifetime, even though they may never look up. But Jay invariably flees partial eclipses so he can be within the path of annularity or totality. -- EVAN

From PP

Just for the records: David Dunham witnessed 15 totals. French professional Serge Koutchmy (was at SEC2000) observed 13 successful eclipses since 1068 and of which the Concorde eclipse of 74 minutes totality. He thinks that Waldmeier had over 25 groundbase trips, as well Pierre Bourge from France. Max Waldmeier had 22 totals in 1981 when Andreas Dill, son in law of Jean Meeus met him during the trip. See the obituary of Max Waldmeier in the SENL last year.

Koutchmy also mentioned to me the extreme observers as Bruno Altieri from ESA whom observed the eclipse at 5800 meter in 1994 and Molodensky whom observed the eclipse in Siberia in 1997 at minus 40 degrees C (I observed at minus 30 in Chinese Siberia). Last but not least, Prof. Eijiro Hiei from Japan (also at SEC2000) observed his first total in 1958. He considers himself not as a frequent observer of eclipses, saw in the meanwhile 10 totals. He will check on other Japanese eclipse chasers. Best regards, Patrick

From PP

Hi, Last week we had conversations about the number of solar eclipses. Rudolf Gulyaev, a good friend wrote following:

.../... Russian professional eclipse observers which are acting up-to-date: Anna Delone, Iraida Kim, Edvard Kononovich, Peter Shcheglov (all of Sternberg Astronomical Institute, Moscow State University), Michael Molodensky (IZMIRAN). Anna Delone had observed about 15 eclipses; the others had observed from 5 to 10 eclipses. .../... Best reagrds, Patrick

**Solar Eclipse Newsletter (SENL) 5 years**

Time flies. How fast did it went? I remember very well starting off the Solar Eclipse Newsletter in November 1996, now exactly 5 years ago. That time it was called <Eclips Nieuwsbrief>, the Flemish translation of Eclipse Newsletter. The SENL (that time ENB) started in continuation of the two monthly contribution of the Flemish Working Group Magazine (WGI). It was the objective having the SENL every two months. The SENL was in hardcopy and send to those whom were willing to pay the postage.

The first issue, November 1996, had 6 pages only and the majority was a compilation of readings and findings about solar eclipses. Solar eclipse related messages came from contacts all over the years. The first issue had reports of the partial eclipse of 12 October 1996. There were never been so many meteorological measurements during a solar eclipse before. The first trips and groups for the 1999 TSE were announced in the same issue.

Although the objective of being two monthly, 1997 was already an exception. A TSE 1997 special of the Siberian eclipse. Overall, that year, the SENL had 8 issues and by November of that year the SENL was monthly. The Solar Eclipse Mailing List was not yet existing, but year long eclipse contacts and friends had their contributions. Eclipse chasers, amateurs and professionals, such as Fred Espenak, Jay Anderson, Jay Pasachoff, Voyto Rusin, Daniel Fischer, Mark Margolis, Ed Krupp, Derryl Barr, Joel Moskowitz shared their experience. It was 10 December 1997 when the SEML started off with the help of Jan Van Gestel's server in Belgium.

The Solar Eclipse calendar was published since the first SENL issues, as well as the monthly Delta T update by Jean Meeus. In 1997 we held our first pre-TSE meeting and of course, after the first eclipse, we organized the first post-total solar eclipse meeting, The Dark Day (that time called De Duistere Dag).

The 1999 total solar eclipse had its preparation for eclipse glasses and contacts. But the 1998 TSE was due to be first, with announcements for trips and groups, info about plugs and current, addresses. Topics in the 1997 SENL varied as happy new year eclipses, Xmas eclipses, eclipse comets, Ramadan eclipses, eclipses from other planets, satellites and eclipses, SOHO news, Tin Tin and the 1944 eclipse, for sale, agenda, and magazine references. From the professionals, info about project JOSO. Besides the Flemish contributions, there were also the Francophone messages, but the ma-

*(Continued on page 56)*

# General Topics

jority was English.

The SEML expanded the volumes of the SENL since 1998. Besides the messages of SEML, ASTRO and the VVS list, the magazines and various contributions from friends, the SENL became a monthly source of SE information. The SENL had its first face lift in February 1998 but the hardcopy was still only distributed to those who paid the postage. The English language takes completely over in the SENL. Specials in the SENL such as Good Friday eclipses, eclipses on 29th of Feb, valentine's day eclipses, Friday the 13th eclipses. The 1998 annular and total with all information, and since March the reports of this last TSE. From then on the countdown for the big 99 TSE could start. Stamps, films, video's, live webcams but also the last eclipse in England, Israel and Jerusalem.

The SEML grew and in April there were 200 subscribes out of many different countries. The SEML status was regular published it the SENL. A second eclipse mailing list appears in July. Bryan Brewer launched in Canada his eclipse list and gives the permission to use the solar eclipse related contributions for the publication in the SENL. The HASTRO list gives the permission as well.

The year carries on and topics in the SENL are shadow bands, earth shine, diamond ring, rainbow and eclipses, aurora and eclipses, eclipses from space, sun occultations and corona transits, eclipses under the horizon, eclipse edge observations. More of the past the Concorde and the eclipse of the 70s, Thales, the 1912 eclipse, and eclipse software. Solar eclipse related webpages, groups, and trips, contacts, glasses, filters and safety. But as well SEML related as archive, off topics and rules for the SEML.

Eclipse language started off since October 1998 and ended up as a complete compilation on Fred' pages. In 1998 had as well, of course the annular eclipse reports, the remaining reports of the TSE 1998 and questions and preparations for the 1999 and 2003 TSE eclipse. Fred visited Belgium and plans were made having the SENL on his WebPages. Due to the 1999 TSE, the SENL expanded fast and became a big SE compilation of all mailing lists and contributions. The hardcopy disappeared and the SENL was only available for those whom downloaded from Fred's webpages. Every topic was separated to download on the SENL monthly issue. From then on the ENB became official the SENL.

Pained Globe by Jean Meeus was published in S&T but found its origin on the SEML and SENL. Practical questions on photography, darkness and calculations. General topics as movies and eclipses, eclipse safety, ancient eclipses, eclipse recording. Reports of the annular 99 eclipse found its way to the SENL. And plans for the next ones, as well as messages about solar activity, weather, transport, popularizing, press, accommodation, stamps, t shirts, gadgets, lots of 99 books, articles, etc.

For those hooked to projects, TECONET, measurements, experiments and conferences were published. Those still not decided that time: last minute plans and latest shots of the corona by SOHO. Jetting the eclipse, roadworks, and police arrangements helped the decision. The SEML owner asked for discipline and reminds, as usual, the subscribers on the rules.

Specific questions were when to remove the filters, timings, prominence photography, degree of darkness, calculation of f value, eclipses and bees, animal behavior, magnitude and chats. Thumb block, GPS and collectable and eclipse mania, paranoia, exhibitions, books, events and flights were other topics. The highest peak of SENL were the August and September 1999 issues.

First timers got their help on nearly every topic they touched, and the post eclipse messages and contributions were about successive eclipses, number of eclipses seen, mystery solved, and when is the next one? Messages about earthquakes, webpages, satellite images, photo's and video's but also about eclipse depression, clouds, back on the list and total failure. But of course positive notes, such as, it was great, clear sky, success, perfect, finally, truly great, and ... it was greeeeeeat.

The 99 TSE shadow just went and the preparations for the TSE 2001 took over. The Transit of Mercury on 15 November 1999 was a highlight as well. Seen by observers and seen by SOHO. Besides the successful transit, contributions on eclipses from Ayers Rock, Egyptian eclipses, Miami eclipses, next eclipse in Central Europe, and eclipses in Jerusalem. And solar neutrinos and the eclipse, projects, photographic techniques, coronal mass ejection and experiments by Noever. More on colors during eclipses, missing eclipse in NASA WebPages, early and later corona, and SECIS sees the eclipse. Even in the October issue there were still 99 eclipse reports and webpages. And ... Jay Anderson predicted the TSE99 perfect.

Ready for the 2001 TSE? Planets in the sky, weather, magnitude? Old engravings in rocks, first plate, Meton cycle and synodic month. Radio and the sun, eclipses under the horizon. Image processing, sun details, eclipses in 2000. The NASA 2001 is ready before the end of 1999 and the transit of Mercury is well reported as well as old and future transits of Venus and Mercury, No need to mention, as usual SEML 1999 had its off topic messages as well.

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# General Topics

Year 2000 is ready for the SENL. Historical transits, lunar eclipse, full moon of December bright, birthday of Jean Meeus, are the topics of the first issues. But as well bees and birds and eclipses, solar corona, 1961 eclipse, Martian eclipses, books, music, eclipse map for windows. SEML subscribers, status of the SEML, slightly off topics, shuttle launch on topic and SEConference in Antwerp. Trips to Africa and no TSE in 2000.

SECalendar with replies extended, and history, NY 1925 eclipse, Lydians and Medes. Ready for a cruise for 2001, as well websites, hotels, webcams and malaria? Or bad movie eclipses, eclipses in movies, days of the week and eclipses, making love during an eclipse, stupid mistakes, driving during totality, people ignoring totality, grumpy and the eclipse, eclipse bloopers. Forget the camera, brightness of prominences, Venus visible in ND4, tape recorder, chats on the SEML and moonwatch.

Total lunar eclipse, brightness, clouded out, reports, and rating after the Lunar Eclipse. And longest apart seen TSE by a person, horses during eclipses, birds again, and animals in general. More on Egyptian eclipse, duration of historical eclipse crucifixion, and lunar eclipse reports, limb corrections and moon sized research. Feb 5 partial solar eclipse, video eclipse, 2001 airline costs, affordable, and magnitude.

SEC2000 preparations, and happy 30 anniversary for the 1970 TSE, the 1996 eclipse, the Venus transit 2004, the July partial solar eclipses, and hooked on the shadow, and video tapes about eclipses. A very unsafe way, the last ever solar eclipse, the eclipse of 29 July, El Nino eclipse, ancient eclipses, historical eclipse, conference in Paris, Emapwin, Vulcan, and again the partial solar eclipses in 2000. The TSE 2001 questions drinking the water, mapping coordinates, t shirts, unrest in Zimbabwe, Zimbabwe some hope, and eclipse cruise. Also the Maya, the 1895 eclipse, shadow bands, solar filters, sunspots, and off topic but beautiful.

Interesting 3 eclipses in 1 month, as well cathedrals, calculating eclipses, most privileged place, preparing lunar eclipse January 2000, dustdevils for 2001, websites, weather, economical, committees, trips, as well 2002 Africa or Australia. From the author, partial eclipses July 2000 again, films or feature films about eclipses, GPS waypoints, conference October 2000, and glasses for Africa. The SENL is in new colorful layout since November 2000 with Joanne Edmonds as editor. It is in pdf, with Photo's, graphs, humor, objects, etc. and still as pdf on Fred's WebPages

2001 is a new year, but continuing the new format of the SENL (pdf on the internet). Eclipses on other planets, techniques, DVD, imaging, and lunar eclipse reports from everywhere. The SENL special about the partial solar eclipse on Xmas December 2000 (22 pages in 3 parts pdf), including the Sunspotter test. All files are max 1MB and easy to download or print. Messages about partial eclipse chasing, info 2001 about renting cars, satellite views, best prices, tours, and cancel trip due to fuel problem in Zimbabwe. And cycles, ancient eclipses, extended SE-Calendar with comments and corrections. Totality Day 2001, another eclipse event organized and in continuation of the Belgian Dark Day, was in August 2001. More on eclipse art, green flash, eclipse puzzle, questions, longest total, off topic messages, health, safety eyes, safety country, and GPS.

What about eclipses on Mars, the 1912 eclipse, variation in predictions, negatives versus slide film, Hi8 versus Digital 8, projects for 2001, naming the child, eggs, beginners questions, eclipse glasses, why chasing, corona, Baily's Beads, diamond ring, crescents, shadow bands, temp measurements, annular Costa Rica? And African stamps, and all successful TSE 2001 reports in the SENL special. Extras on health, X ray machines, gadgets, t shirts, stamps, websites, pictures, videos, close ups, techniques, processing, and imaging. But also some feedback: request from SEML Owner, the status, graphs about the subscribers, SENL and SEML activity, and lessons to learn.

Post eclipse messages cam in later, as well finger eclipses, in early days, wordsearch by Laura Appleton, in August 2 years ago, compare prediction with images, slitdefraction, scientific results, Murphy's law for eclipses, best laid plans, what will I do on my next eclipse, and the question for quite a few is Africa or Australia.

Ready to produce SENL November 2001. Five years were gone. How further with the SENL. Of course we carry on with the format we have. In color and in pdf. We will keep the files smaller or around 1MB. We will have the usual TSE or ASE contributions, as well as the SECalander. We will use the headline SETalk for general topics, SEDates for meetings and conferences, and SEScannings for references in magazines, books or about video's and films. All SENL backissues, since November 1996, will be available in pdf within a few weeks only. We will continue preparing the next eclipse conferences SEC2004 and TD2003, both in The Open University of Milton Keynes, England.

And ... please keep those solar eclipse related messages coming ....

Patrick Poitevin (7 November 2001)

From Eric Brown Kidinvs@aol.com

*(Continued on page 58)*

# General Topics

Patrick..... I must tell you, as a member of this forum, that I find your posting very much OFF TOPIC.!!!! Please be careful with your future postings!!! OK, OK, OK.... Im just kidding. Your posting was like a journey bringing us all back in time when things were simpler, and calmer. I have been on the SEML for about 2 years, now, and the topics you have brought out of the closet brought a smile to my face...things that I thought were funny, and dumb, and just plain silly!!! It is almost always a treat to be brought down memory lane. And, yes....even some of the off topic stuff is worthwhile!!! All the Best... Eric Brown

# TSE 2003

From David Moser To PP Date 23.10.01 Re **Solar Eclipse target 2003**

ANTARCTIC NON-GOVERNMENT ACTIVITY NEWS (ANAN) NO. 57

ANAN-57: News as at 0600 UTC, Wednesday, 24 October 2001.

SOLAR ECLIPSE TARGET OF 2003 EAST ANTARCTIC VOYAGE [ANAN-57/02]

A company that specialises in tourism that is linked to astronomical events is offering its clients the chance to observe a total eclipse of the sun off the East Antarctic coast in 2003.

US-based Astronomical Tours and the Antarctic tour operator Quark Expeditions recently announced their plan for a month-long voyage of the icebreaker 'Kapitan Khlebnikov' that aims to be in the limited area of totality of the 24 November 2003 event. 'Khlebnikov' is one of only two tour ships that currently operate in Antarctic waters that is capable of handling the heavy ice conditions that are often found off the East Antarctic coast in the austral spring.

The narrow area where the moon's shadow, or totality, will pass over in 2003 is predicted to start south-east of Heard Island in the southern Indian Ocean soon after sunrise local time on 24 November. From there, landfall on the coast of Antarctica is near Russia's Mirny station, where totality is expected to last for just under two minutes. The path then curves inland over the Antarctic plateau before exiting the continent in the vicinity of India's Maitri and Russia's Novolazerevskya stations several hours later (ANAN-3/08, 1 September 1999).

The East Antarctic pack-ice zone experiences frequent periods of solid cloud cover during the austral spring, particularly in the early morning hours when the eclipse is timed to occur, and organisers of Khlebnikov's voyage will be hoping for abnormal conditions so that the solar event can be seen in full.

'Khlebnikov' is scheduled to leave Port Elizabeth, South Africa, on 5 November 2003 for the event and complete the journey in Hobart, Australia, on 3 December. The voyage is very similar to those that the ship has undertaken on numerous occasions in the Indian Ocean sector during the southern hemisphere spring over the last decade.

After leaving South Africa, the vessel is expected to visit the sub-Antarctic islands of Crozet, Kerguelen and Heard in the southern Indian Ocean, before it heads south towards the Antarctic coast in the vicinity of the Larsemann Hills in Princess Elizabeth Land where a visit to the Chinese station Zhong Shan is proposed. Australia's Davis station, in the Vestfold Hills to the north-east, is also listed on the itinerary, after which the vessel is to travel eastwards to an area in the pack-ice north of Mirny to observe the eclipse. A visit to that station is not mentioned in the schedule at this time, although one to Australia's Casey station in Wilkes Land (on the final leg of the journey to Hobart after the eclipse), is mentioned.

Interest has also been shown by several groups in observing the 2003 eclipse from a specially organised tourist overflight from Australia, similar to those that have been operating routinely now for seven seasons (ANAN-42/09, 28 February 2001). To date, however, no announcements have been made about such a proposal.

The Mirny region is well within the range of such an overflight, although the aircraft would probably have to stage out of

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# General Topics

Perth in Australia's west and there would be added costs of positioning the aircraft there from its home base in Sydney (on the east coast). Such a flight would, however, negate viewing problems caused by cloud as there would be a very high probability that the aircraft would be flying well above any weather in the area.

The cost of participating in the 'Khlebnikov' voyage ranges from $US18,995 to $US35,995 depending on the type of cabin chosen. These figures do not include airfares to South Africa to join the vessel or from Australia at the end of the voyage. Details of the proposed 2002-03 voyage are available on line at: http://www.astronomicaltours.net/ <http://www.astronomicaltours.net/> .

**Happy Thanksgiving** from Mark Peebler, Krysta and Maya

# Years SOLAR ECLIPSE NEWSLETTER

COSTA RICA 2001

From Alejandra Leon To SEML Date 19.10.01 Re **Costa Rican Eclipse web**

Dear eclipse followers, CIENTEC - a non profit costarrican organization- is preparing for the Annular Eclipse with a local educational campaign and the organization of sightings during the event.

We have reserved space in the northern boarder within the Santa Rosa National Park and close to the central line, in Nosara beach. Feel free to contact me if you plan to come to Costa Rica and would like to join any of these groups.

Meanwhile we have advanced with our WEB SITE and would like to thank all of the people who have helped us with information, images and links. The pages will be expanded to include a section in ENGLISH. Meanwhile it is all in Spanish. But we hope you dare to visit it and give us some feedback. Thank you in advance, Alejandra León Castellá, Fundación CIENTEC

From Mike Simmons To SEML Date 20.10.01 Re **Costa Rica eclipse trip**

I am passing this on to the list. This company specializes in small groups and has a trip to Costa Rica for the annular eclipse. I am not associated with this company but have met the owner, a very enthusiastic person who enjoys combining interesting travel with her hobby of astronomy. http://www.skycamping.com/ Mike Simmons

From : Alejandra León-Castellá <leonale@racsa.co.cr> To : SOLARECLIPSES@AULA.COM Subject : [SE] **support for Live WEB casts & gathering** Date : Thu, 25 Oct 2001 18:30:09 -0600

For all those coming to Costa Rica, CIENTEC is organizing a support program for those who will be doing Live WEB Casts. We can help you with local requirements.

Up until now we have received some responses from the list and seem to have 3 different groups that will view from both limits of the annularity and the central part.

We continue to dream of a gathering in Liberia, Guanacaste, prior to the eclipse. Please contact me if you are interested. Sincerely, Alejandra León Castellá Fundación CIENTEC

From Daniel Fischer To SEML Date 11.10.01 Re **Preparations for the Annular ...**

... are proceeding well, a helpful contact in the country has just told me: There will be

- a small conference in Liberia on December 12th where observers from Costa Rica as well as abroad can meet and plan for the event on the 14th,

- special access times to the nearby Santa Rosa National Park for eclipse observers (normally the park closes early in the afternoon), and even

- cheap accomodation for visitors inside the park (starting at $10.-).

The SRNP and especially its beaches are THE best observing location for this eclipse, according to my research, as you are in the best climate zone (Guanacaste area) AND close to the (Northern) edge of the zone of annularity where annular eclipses are best observed from (prolonged Baily's Beads, chromosphere).

My group from Germany is now 4 strong - how about others? There are no travel warnings against CR whatsoever (see http://travel.state.gov/costa_rica.html for the latest from the U.S. State Dept - which is always the most critical source), and especially for Americans a week or two in CR would be a fine way to get 'away from it all' ...

Daniel (who can forward a collection of recent e-mails from CR on request)

From : Alejandra León-Castellá <leonale@racsa.co.cr> To : SOLARECLIPSES@AULA.COM Subject : [SE] **Costa Rican WEB site expands** Date : Fri, 02 Nov 2001 21:31:23 -0600

Dear eclipse followers, We continue to work intensively on our local educational Campaign and invite you to visit our new web pages. Even thought it is in Spanish, you will find many illustrations and pictures.

Thank you to all who have contributed with images and information. Best regards, Alejandra

COSTA RICA 2001

From : FRED ESPENAK <u32fe@lepvax.gsfc.nasa.gov> To : SOLARECLIPSES@AULA.COM, eclipse@hydra.carleton.ca Subject : [SE] **New Web Site for 2001 Dec 14 Annular Eclipse** Date : Fri, 2 Nov 2001 12:47:20 -0400

I've just posted a new web page for the 2001 Dec 14 Annular Eclipse. This event will be partial for most of the USA and southern Canada while the annular path runs across the Pacific Ocean and Costa Rica.

I have predictions for hundreds of cities which include GIF's showing the appearance of the eclipse from each location. The web site is located at: http://sunearth.gsfc.nasa.gov/eclipse/ASE2001/ASE2001.html

Please let me know if you find any errors, typos or bad links. Thanks, - Fred Espenak

Fron Jean Paul Godard

Hi Fred, Is it possible to use some Besselian elements to calculate local circumstances in case of annular eclipse? If yes, where is it possible to have those related to 2001 Dec 14 Annular Eclipse?

From Alejandra Leon

Dear Mr. Espenak: This is great news for us. Now we can promote it from our Spanish Site. Anyone else who has a site with information in English is welcome to send us the URL, we will be including these soon.

If you are planning to come to Costa Rica, please let me know. We still dream with a gathering on Dec. 12th in Liberia, Guanacaste. Alejandra León Castellá Fundación CIENTEC

# AFRICA TSE 2001

From Eric Pauer To SEML Date 04.10.01 Re **2001 TSE video**

Has anyone heard of individuals, organizations, or companies selling (or planning to sell) amateur or professional videoes of the 2001 TSE? I'm interested in the NTSC format (North American), although I can get PAL format converted to NTSC if necessary. I would appreciate any information that could be provided.

Regards, Eric, Eric Pauer - pauer@bit-net.com - http://www.bit-net.com/~pauer

From Robert Slobins

Eric: I have a video, very amateurish, of the eclipse with the flash spectrum. I could make it available. Please contact me. Robert B Slobins, 76630.2206@compuserve.com

From David Makepiece

I have just completed a 30 min. film of my journey to Zambia in June which I have been selling as a souvenir to our group from the Royal Astronomical Society of Canada. It's called "Africa Total Eclipse" and it includes a wonderful continuous shot of totality taken from Malambanyama, Zambia, with both diamond rings!!

I would be very happy to make it available to any of you.

Please contact me directly at imoon@interlog.com Best to all, David Makepeace, Toronto, Canada, UmbraLog 1257

From Eric Flescher

Robert and all, I am putting together a video for educational purposes and schools that will include my 1998, 1999 and 2001 stuff. I will remaster all my videos and place them in a way to teach about eclipses and go along with my 10 myths of eclipse presentation. Flash spectrum to add would be be good so please send if you want. You would be listd in the the credits. If anyone else wants to contribute let me know.

First I am presenting a small remastered 10 minute much shorter show of my 1.75 video 2001 video to my Macintosh group in two weeks. They are showcasing my african logo of the trip on the front cover of their journal. I am presently thinking of ways to jazz it up for this high intensive multimedia driven group that I belong to.

Once this is done , I will start on this new Black Sun educational eclipse video version. It will be done with imovie2 on my mac as was the 2001 video.

I did miss the incoming 2001 diamond ring 2nd contact on video (eventhough I saw it) and some totality as my Hi 8mm cam blitzed

AFRICA 2001

out but I got the rest including shadow bands ever so faintly.

But for now I have to concentrate for the presentation in the next two weeks. I will showcase my video with about 5 other computer animations and other videos made with computers (of course macs!!!!).

From Fred Espenak To SEML Date 09.10.01 RE **Free copies NASA 2001 eclipse bulletin**

My office will soon be filled with copies of the new NASA 2002 eclipse bulletin, so I must make some room. I still have many copies of the 2001 eclipse bulletin which I must get rid of.

I will send copies of the 2001 bulletin to anyone who asks. You do not even need to send me an envelope or postage. Perhaps you know a teacher or a planetarium who could use 10 or 20 copies for a lesson on eclipses?

Just email me off line (not on SEML) with your address and the number of copies of the 2001 bullet which you would like to receive. Thanks, - Fred Espenak

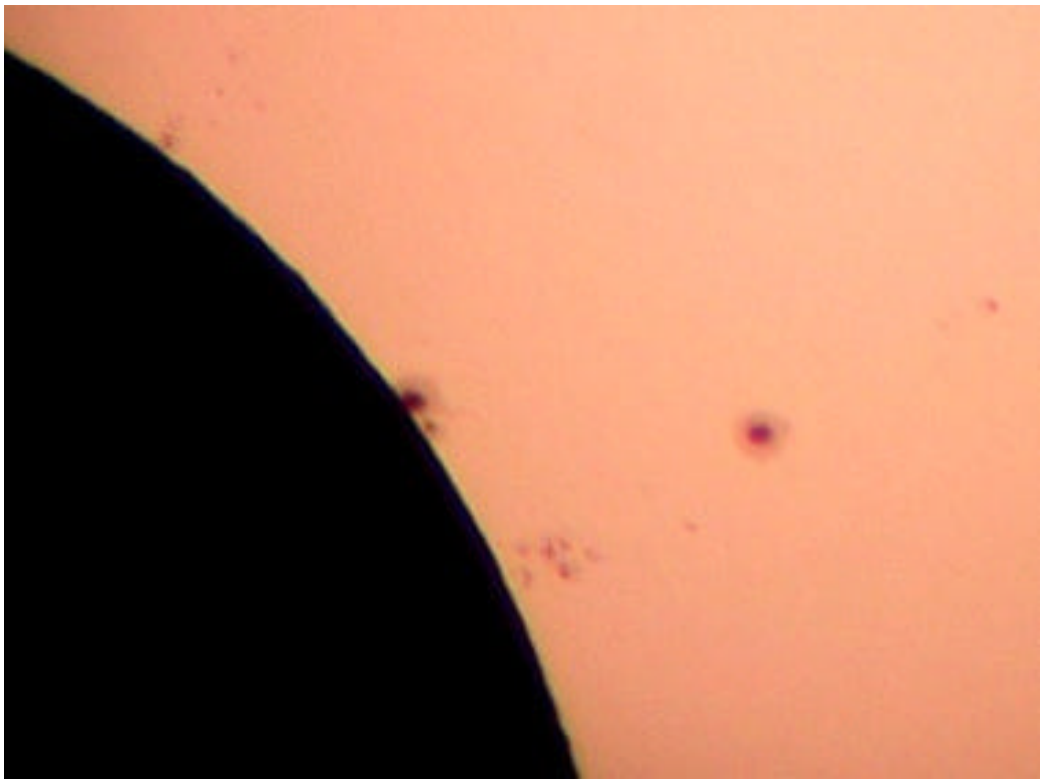
From Harvey Wasserman To SEML Date 05.10.01 Re **Shipments from Zambia**

Did anybody ship anything from Zambia to the US? Have you received it yet? Packages are missing. Please respond directly, to keep traffic off the group. Thanks, Harvey Wasserman, onsite@toast.net

From Fred Bruenjes To PP Re **Webpage Fred Bruenjes**

See http://www.moonglow.net (see especially http://www.moonglow.net/eclipse/)

Following images are from Fred Bruenjes: Composite, and sunspots



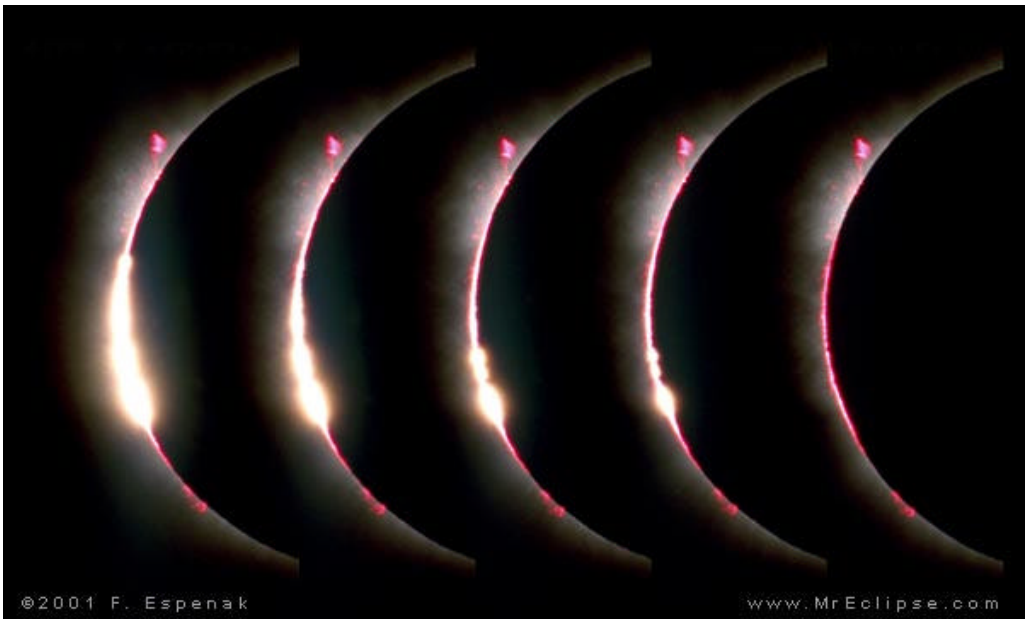
AFRICA 2001

From : MrEclipses@aol.com To : SOLARECLIPSES@aula.com Subject : [SE] **New 2001 eclipse photos** Date : Fri, 12 Oct 2001 07:47:45 EDT

Greetings all - I invite you to visit my new web gallery of photographs of the 2001 total solar eclipse. I've posted about two dozen of my best photos on a pair of web pages at: http://www.mreclipse.com/TSE01reports/TSE01galleryA.html and http://www.mreclipse.com/TSE01reports/TSE01galleryB.html

4.2 1 Geminorum

You'll find quite a variety of images there since I photographed the eclipse using nine 35mm cameras. Five of these were programmable so they could run unattended during totality. The others were operated manually by me so I was quite busy!




There are some composite images of the corona, close-ups of Baily's beads & chromosphere, and montages of the partial phases. Wide angle shots show the local environment including people and trees with the eclipsed Sun above. I've even made some composites of the eclipse corona with SOHO images made just before totality.

The big delay in getting these images on the web was due to the 2002 eclipse bulletin which occupied much of my time the past two months. I'm happy to say that it is now complete and is at the printers. It should be ready for distribution in 7-10 days (or less) so you should expect to receive your copy it 2-3 weeks.

Please take a look my 2001 photo galleries which I hope you'll enjoy. - Fred Espenak

AFRAUSTRALIA 2002

From : FRED ESPENAK <u32fe@lepvax.gsfc.nasa.gov> To : SOLARECLIPSES@AULA.COM, eclipse@hydra.carleton.ca Subject : [SE] **NASA Eclipse Bulletin - Total Solar Eclipse of 2002 Dec 04** Date : Thu, 25 Oct 2001 12:34:37 -0500

New NASA Bulletin for Total Solar Eclipse of 2002 December 04

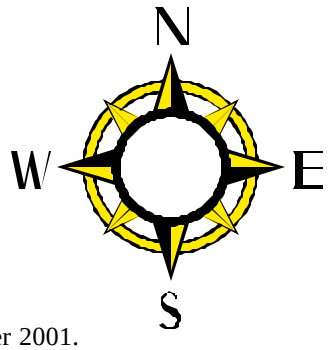
On Wednesday, 2002 December 04, a total eclipse of the Sun will be visible from within a narrow corridor which traverses the Southern Hemisphere. The path of the Moon's umbral shadow begins in the South Atlantic and crosses southern Africa. After traversing the southern Indian Ocean, the path sweeps through southern Australia where the eclipse ends at sunset. A partial eclipse will be seen within the much broader path of the Moon's penumbral shadow, which includes most of Africa (excluding the north), parts of Indonesia, Australia and eastern Antarctica.

A new NASA solar eclipse bulletin covering this event is now available. "Total Solar Eclipse of 2002 December 04" (NASA TP 2001-209990) is a 77 page publication containing detailed predictions and includes besselian elements, geographic coordinates of the path of totality, physical ephemeris of the umbra, topocentric limb profile corrections, local circumstances for about 400 cities, maps of the eclipse path, weather prospects, the lunar limb profile and the sky during totality. Tips and suggestions are also given on how to safely view and photograph the eclipse. NASA's eclipse bulletins are prepared in cooperation with the IAU's Working Group on Eclipses and are provided as a public service to both the professional and lay communities, including educators and the media.

Single copies of the bulletin are available at no cost and may be ordered by sending a 9 x 12 inch SASE (self addressed stamped envelope) with sufficient postage (12 oz. or 340 g). Use stamps only; cash or checks cannot be accepted. Requests within the U. S. may use the Postal Service's Priority Mail for $3.95. Please print the eclipse date (year & month) in the lower left corner of the SASE. Requests from outside the U. S. and Canada may send ten international postal coupons to cover postage. Exceptions to the postage requirements will be made for international requests where political or economic restraints prevent the transfer of funds to other countries. Professional researchers and scientists may order the bulletins directly (no SASE is necessary). An order form for this publication can be found on the web at: http://sunearth.gsfc.nasa.gov/eclipse/SEpubs/RPrequest.html

Other eclipse bulletins currently available are:

"Total Solar Eclipse of 1995 October 24" (NASA RP 1344)
"Total Solar Eclipse of 1997 March 9" (NASA RP 1369)
"Total Solar Eclipse of 1998 February 26" (NASA RP 1383)
"Total Solar Eclipse of 1999 August 11" (NASA RP 1383) - a few left
"Total Solar Eclipse of 2001 June 21" (NASA TP 1999-209484) - a few left




The entire contents of the 2002 bulletin will be available online sometime in November 2001.

There is also a special web site with additional 2001 eclipse information and maps at: http://sunearth.gsfc.nasa.gov/eclipse/TSE2002/TSE2002.html For more details, contact Espenak.

From : FRED ESPENAK <u32fe@lepvax.gsfc.nasa.gov> To : SOLARECLIPSES@AULA.COM, Subject : [eclipse] **PDF version NASA 2002 Eclipse Bulletin** Date : Wed, 31 Oct 2001 13:53:03 -0400

A PDF version of the NASA bulletin for the 2002 total solar eclipse is now available online. You can download it at:

ftp://umbra.nascom.nasa.gov/pub/eclipse/021204/TP2001209990.pdf .

I believe that the PDF file is around 3.5 MB in size.

An html web-based version will follow in the coming weeks. - Fred Espenak

AFRAUSTRALIA 2002

From : Jean Marc Larivière <jeanmarc.lariviere@sympatico.ca> To : EclipseListServer <solareclipses@aula.com> Subject : [SE] **Light level during sunset eclipse** Date : Thu, 25 Oct 2001 21:50:41 -0400

Those of you who are also subscribed to the francophone eclipse group will recognize this thread but since the critical mass of experienced umbraphiles is greater on this list I thought it would be useful to post my query here.

The environmental light level changes from one total to the next, influenced by a number of factors, as has been discussed at other times. But to what extent does a sunset eclipse influence light levels. Can those who have already experienced a sunset total, dare I say, shed some light on this ? When the umbra falls more perpendicularly one witnesses the 360 degrees 'sunset horizon'. What about the appearance of the horizon during a sunset eclipse ? Jean Marc

From PP

Hi, I have witnessed the total solar (sunset) eclipse of 30 June 1982 at the horizon of Uruguay. It was a wonderful experience. I have described it before in recent SEML conversations. See below the SENL issues with pages and sites.

In regard of the horizon: The horizon in pitch black or dark in front of you, there where the eclipse occurs. Though, at the opposite, the colors and lights appears as for a normal sunset. I did not witness any color variations at that side of the horizon of the eclipse sun.

See also following SENLs with topic title and pages:

1998 09 Sunset eclipses 13
1999 03 Eclipse versus sunset 11
1999 08 Sunrise sunset eclipses 7
1999 08 Sunrize sunset 87
2001 07 2002 Sunset eclipse in Australia 14 http://sunearth.gsfc.nasa.gov/eclipse/SENL/SENL200107.pdf
2001 08b 2002 Sunset eclipse in Australia 41 http://sunearth.gsfc.nasa.gov/eclipse/SENL/SENL200108B.pdf

Best regards, Patrick

From Stig Linander

I've only seen two TSEs, 1999 in Hungary with the Sun high in the sky (www.linander.dk/stig/se1999_e.htm), and 2001 in Madagascar with the Sun only 10 degrees above the horizon - close to sunset (www.linander.dk/stig/se2001_e.htm).

The sky was much brighter in 2001 than in 1999. I don't know why, but I don't think it was because of the "low" Sun. Maybe someone on the list can give an explanation.

In 1999 we experienced the 360 degrees 'sunset horizon'.

But in 2001 the horizon in the direction of the Sun was dark during the beginning of totality. My wife Birgit recorded the totality on video, so it's documented. About 30 seconds after second contact the horizon starts to get a reddish hue. About 1 minute after second contact the horizon is the 'sunset horizon'. And during the rest of totality the horizon gradually brightens. Best regards, Stig.

From Robert Slobins

Stig: Since I have not seen any total solar eclipse with an altitude less than 18 degrees or so, I can not corroborate your experiences. However, I can make a few comments, and invite the List members to contribute thereafter.

1--In 1999, we were dealing with humidity. (In fact, the %^$)&^*% Romanians brought our group, against our orders, into Bucharest where we viewed all of totality through a patch of altocumulus.) Humidity at any level of the atmosphere detracts from atmospheric trans- parency. This is especially true when it becomes part of aerosols: sand or pollu-

*(Continued on page 66)*

tion paritic les.

This would, of course, cut down on the coronal visibility.

In 1996, my first view of Comet Hyakutake was from a dark-sky site on Hatteras Island, NC. A strong storm with a trailing cold front had passed by earlier, and at midnight, I saw a grand view of the comet (the wind chill was -20 C; temperature, 0 C). It looked just like what one would see in a textbook photograph (except that the darkroom workers NEVER burn in the head). I could clearly see details in the disconnected, curved, and bent tail, and the tail streteched at least 40 degrees. (I do not have my notes available now.)

As the evening wore on, I noticed that the sky got a little duller and less of the comet was visible in what otherwise were perfect skies. I recall seeing a longer tail because the moon set (moonlight interference is not a problem during eclipses.) Back at the motel room, I saw why this happened on the Weather Channel: the area of extremely dry air behind the storm and front passed into the Atlantic, and moisture at 34,000 feet (10,000 m) had come in. This moisture was never enough to produce cirrus, but enough to interfere with the perfect visual view.

In 2001, most of the eclipse path was under a strong, cold and dry airmass that came in from Antarctica. At Hwange Park on 17 June, there was frost on the ground at sunrise. There was no upper level moisture apparently anywhere on the track. This is why we all saw and photographed a big corona, regardless of smoke haze (our group was downwind of a brush fire!)

In 1998, from Aruba, it rained two hours before totality. The rain cleaned the atmosphere enough to allow us to see and photograph streamers just about to the planets (helping the photo composition). Of course, we did NOT call for a sky cleaning service!

In 1994, from Sevaruyo Bolivia at 3838 meters, I photographed the eclipse through a band of cirrus for the first half of totality. My images show no evidence of clouds; indeed, the corona in my prints (20X enlargements), including the polar rays, fill the entire frame.

Contrast this to the Indian eclipse of 1995: There was no doubt as to the weather, as in 1970 and 2001, the skies were severe clear. Yet my coronal images show a smaller extent of corona. Our elevation: 300 meters.

Therefore, we are dealing with the very complex issue of atmospheric transparency and seeing. This is much more a meterological matter than an astronomical one. --Robert B Slobins

From Pierre Arpin

I was in Columbia, in Aguazul in the llanos at the foot of the Andes, for the oct 12th 1977 solar eclipse with the sun at 6 degrees at the time of totality.

That was a pretty short totality, 53 sec and clouded out, but I noticed that the landscape was very clear beacause the path of totality was very narrow and the projected shadow on the groud very elongated.

When totality occured the moon shadow made a column about 60 degrees wide

At the end of totality the shadow lifted up in the sky and noticed that the receding shadow casted a brown dome at the east horizon.

That was a very frustating totality because

1- The sky was very clear above us but clouds have acumulated over the Andes
2- The sun appeared in a hole 15 sec after totality. :-(

From Robert Slobins

So Pierre --where would YOU go next year, given your experience?

*(Continued on page 67)*

Joanne & Patrick

*Solar Eclipse Mailing List*

**WE'RE ON THE WEB AT**
http://www.Mr.Eclipse.com/SENL/SENLinde.htm

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# TSE 2002

*(Continued from page 66)*

To the rest of the forum: just how much smaller will the sun appear compared with the moon in Australia? (I ask this because I wonder, as was India, that more of the chromosphere would be generally visible during totality and that the hot stuff just above the chromosphere would also be seen throughout totality.) -Robert B Slobins