

SOLAR ECLIPSE NEWSLETTER

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Solar Eclipse Mailing List

Dear Eclipse-Chasers

I am pleased that it has been possible to get the newsletter out in time, ready for the off. The mailing list has been so busy, with all the questions and answers, therefore with nearly 100 pages, I have tried to keep pictures to a minimum. Everyone must be so busy preparing and expectations are high. We of course wish everyone clear skies, and we are looking forward to the reports and pictures in July. For Michael and Laura it will be the first eclipse experience excluding the partial at Christmas.

The first few items have been raised con-

cerning Costa Rica in December. As usually with eclipses the next one is already in people's thoughts. It makes the years go by even faster.



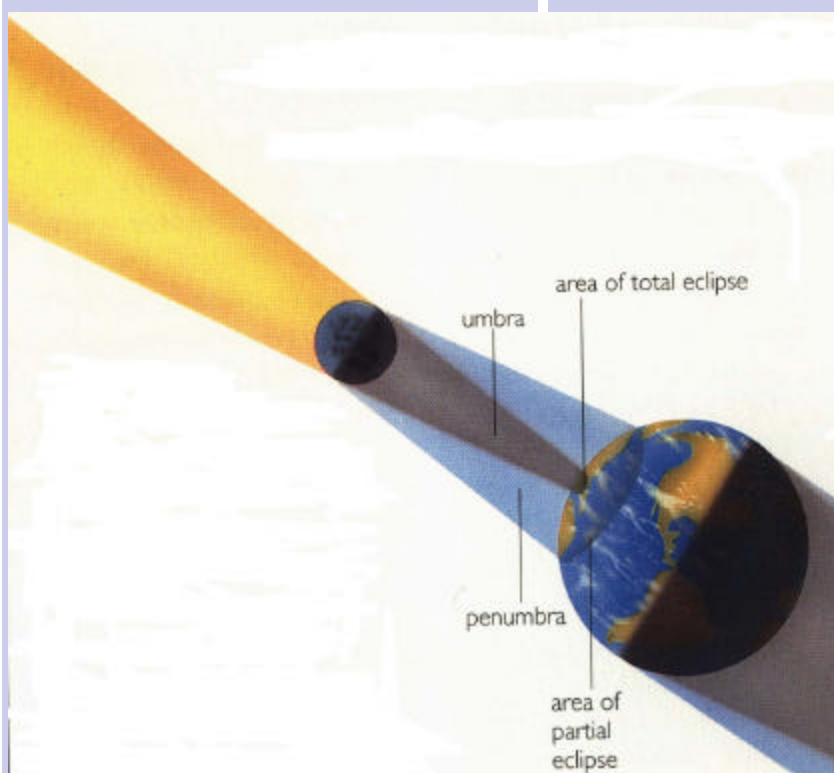
Again all I can say is we wish everyone clear skies and safe return, be careful and keep vigilant, and things so go to plan. Don't forget the malaria, or some first aid items, and some spare shades for the locals.

The Solar Eclipse Mailing List

The Solar Eclipse Mailing List (SEML) is an electronic newsgroup dedicated to Solar Eclipses. Published by eclipse chaser Patrick Poitevin (patrick_poitevin@hotmail.com), it is a forum for discussing anything and everything about eclipses.

Thanks to the voluntary efforts of Jan Van Gestel of Geel, Belgium, the Solar Eclipse Mailing List (listserver) has been in operation since 10 December 1997. This is the first mailing list devoted solely to the topic of solar eclipses on the internet.

You can send an e-mail message to the list server solareclipses@Aula.com, which will then forward your e-mail to all the subscribers on the list. Likewise, you'll receive email messages that other subscribers send to the listserver. Only subscribers can send messages.



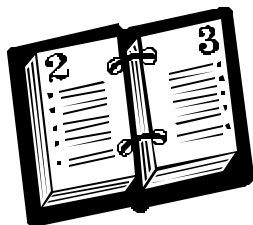
And enjoy!!!!!!

Please keep the message solar eclipse related when you return, I do expect to be very busy!!!!!!!!!!!!!!

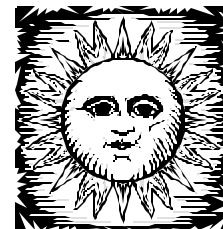
But do keep the messages coming in.

Patrick & Jo

ECLIPSE CALENDAR



JUNE 2001



Dear All, Please find herewith the solar eclipse calendar for June. If you have any additional information, queries or remarks, please drop me a mail.

June 03, 1239 "The sun was obscured on Friday at the 6 th hour of the day, and it lasted for a while between the 6 th and 9 th hours and it lost all its strength and there was as though night. There appeared many stars, and then the Sun grew bright again of its own accord, but for a long time it did not regain the strength that it usually has." Ref. Anales Toledanos Segundos, FRS 97.

June 03, 1239 "while I was in the city of Arezzo, where I was born, and in which I am writing this book, in our monastery, a building which is situated towards the end of the fifth latitude zone, whose latitude from the equator is 42 and a quarter degrees, and whose westerly longitude is 32 and a third, one Friday, at the 6 th hour of the day, when the Sun was 20 deg in Gemini and the weather was calm and clear, the sky began to turn yellow and I saw the whole body of the Sun covered step by step and it became night. I saw Mercury close to the Sun, and all the animals and birds were terrified; and the wild beasts could easily be caught. There were some people who caught birds and animals, because they were bewildered. I saw the Sun entirely covered for the space of time in which a man could walk fully 250 paces. The air and the ground began to become cold; and it (the Sun) began to be covered and uncovered from the west." Ref. Ristoro d'Arezzo, Della composizione del mondo, FRS 97. Many other cronic could be find in Italy (Anales Caesenates and Storie Fiorentina, IV and Archivo de Duomo di Sienna), Portugal (Chronicon Conimbricense, III).

June 03, 1239 From Montpellier, France; Zurita, Anales de la Corona de Aragon: "The King (James the Conqueror) entered the city of Montpellier on Thursday the 2 nd of June of the year 1239; and on the next day, Friday, between midday and the ninth hour, the King writes that the Sun was eclipsed in a way people did not remember ever having seen before, because it was entirely covered by the Moon and the day grew so dark that one could see stars in the sky." Ref FRS 97 page 400.

June 03, 1239 From Split, Croatia: (Thomae Historia Pontificum Salonitanorum et Spalatinorum): "At the same time, AD 1239 on the third day from the beginning of the month of June, a wonderful and terrible eclipse of the Sun occurred, for the entire Sun was obscured, and the whole of the clear sky was in darkness. Also stars appeared in the sky as if during the night, and a certain greater star shone beside the Sun on the western side. And such great fear overtook everyone, that just like madmen they ran about to and from shrieking, thinking that the end of the world had come. However, it was a Friday, the 30th day of the (lunar) month. And although the same defection of the Sun appeared throughout the whole of Europe, it was not however spoken of in Asia and Africa." Ref. FRS 97, pages 401.

June 04, 1769 Six hours after the transit of Venus there was a total solar eclipse. This solar eclipse was total in Scandinavia. Venus should have been projected in the corona of the sun. The planet was about one solar diameter from the edge of the sun. The next corona transit of Venus will be June 6, 2263. This is just a corona transit and not a transit of the planet over the solar disc. Venus is about one solar radii from the eclipsed suns disc. For a Mercury corona transit you have to wait till 3269 and 3853. (ref. ENB 09/98)

June 07, 1434 In the Java Sea, near longitude 115 degrees 45 arcminutes East, latitude 5 degrees 15 arc minutes South, four total solar eclipses were visible in a time span of 13.7 years: on 7 June 1434, 30 September 1437, 23 January 1441 and 5 March 1448. Ref. JM 9/99.

June 08, 1937 At the total solar eclipse of 8 June 1937, Charles H. Smiley, Brown university, procured small-scale photographs, with a 4 inch f/1 Schmidt camera at an altitude of 14.000 feet, that showed a double wedge of light extending along the ecliptic from the sun. The almost vertical band of light may be identified with the zodiacal light. (ref. SaT 1/2-1938, SaT 3/1954)

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ECLIPSE CALENDAR

June 10, 2002 The path of the 10 June 2002 annular eclipse crosses its successive Saros eclipse of 21 June 2020 one Saros later. Ref. FE Canon.

June 11, 1983 Total Solar Eclipse in Indonesia. The Islamic month Ramadan started the same day of the eclipse. Mathematically the Ramadan should start the day after. The Islamic month is after each 12 lunations. Exact date for June 11 1983 is 29 Cha'ban (month 8) 1403 which is just before Ramadan. The last eclipse which was during the month Ramadan was the partial solar eclipse of July 20, 1982 (28 Ramadan (month 9) 1402). The last total solar eclipse was July 31, 1981 (29 Ramadan (month 9) 1401) while the last annular eclipse on August 10, 1980 (28 Ramadan (month 9) 1400). The next solar eclipse in the month Ramadan will be the partial solar eclipse of December 25, 2000 (28 Ramadan (month 9) 1421), which is the forthcoming Christmas Eclipse. The next annular eclipse will be on December 14, 2001 (28 Ramadan (month 9) 1422) and the next total solar eclipse on December 4, 2002 (29 Ramadan (month 9) 1423). Of course, the total solar eclipse of November 23, 2003 on the Antarctic, and also in the month Ramadan, will not reflect live of the Penguins... (ref. ENB 6+7/98)

June 13, 1760 Last Total Solar Eclipse on a Friday 13 th. Last solar eclipse was a partial in 1974. The next solar eclipse on a Friday 13 th is in July 2018, also a partial solar eclipse. There are 24 solar eclipses on a Friday the 13 th between 0 and 3000. Of which 13 partial, 9 annular and 2 total solar eclipses. The most odd is the one of 13.03.313, which was an annular eclipse. June 13, 2132 is the next Total Solar Eclipse on a Friday 13 th.

June 14, 1938 Death of William Wallace Campbell (1862-1938), American astronomer. Had many eclipse expeditions. The Royal Society also mentions 14 or 15 June 1938. (ref. DD 6/98, Rc 1999)

June 14, 2151 Next total solar eclipse with possibility of seeing Aurora Borealis. Up to now no aurora has been seen during a total solar eclipse. There have been attempts before during solar eclipses of 29 June 1927, 30 June 1954, 20 July 1963, 10 July 1972 and , 22 July 1990. The solar eclipses need to be close near the aurora zone, the sun altitude must be favorable, solar activity preferred near maximum and the angle of the eclipse track to the zone not too large. Between 1950 and 2000, there are 9 eclipses of which 4 favorites (see above). The recent eclipse of 9 March 1997 was not that favorable. The next after this of 2151 will be June 4 2160. (ref. SaT 3/1954 and 12/1953)

June 15, -0762 (763 BC) Assyria: "Insurrection in the City of Ashur. In the month of 'Sivan', the Sun was eclipsed..." Ref. The Assyrian Chronicles, FRS 97.

June 15, -0762 (763 BC) "On that day, says the Lord God, I will make the sun go down at noon and darken the earth in broad daylight." Ref. Amos, Chapter 8, verse 9 (Old Testament)

June 16, 0364 Four minutes of totality for those in the north of Scotland. This ranked as the 11th longest British total eclipse in the period 1 - 3000AD, and had a high altitude of 53°. The eclipse track traveled across Norway, Sweden, Latvia, Lithuania and Russia. (ref. SW- UK Eclipses)

June 16, 0885 The Chronicon Scotorum states "An eclipse of the Sun; and stars were seen in the heavens." is the 3rd longest British total eclipse in the period 1 - 3000AD at nearly 5 minutes. It had a 300-km wide track, which meant that virtually all of Scotland would have seen this eclipse. The eclipse track traveled across Norway, Sweden, Finland and northern Russia. (ref. SW- UK eclipses)

June 16, 0885 The maximum theoretical length for a British total eclipse is 5.5 minutes. The eclipse of June 16, 885 lasted for almost 5 minutes and the same will be true for the Scottish total eclipse of 22 July 2381

June 16, 1406 The last total solar eclipse in Belgium (current borders) is June 17, 1433. The total solar eclipse of June 16, 1406 was the one before in Belgium.

June 16, 1806 José Joaquín de Ferrer (Spain), observing at Kinderhook, New York, gives the name corona to the glow of the faint outer atmosphere of the Sun seen during a total eclipse; he proposes that the corona must belong to the Sun, not the Moon, because of its great size. Ferrer also states, that during the total eclipse of 1806, the irregularities of the moon's surface were plainly discernible. (ref. History of Physical Astronomy)

(Continued on page 4)

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June 16, 1806 Tecumseh's Eclipse. The Shawnee chief Tecumseh realized that the only hope for the various tribes in east and central North America was to join together. He was ass by his brother-Tenskwatawa -a "prophet" who called for a rejection of the "white ways" and a return to traditional values. Tenskwatawa was ready for Tecumseh had learned from explorers that a total Solar Eclipse was to occur. Tecumseh ordered the Great Spirit to release the sun. Ref.: "An Account of 1806, June 16 eclipse from a sorrow in our heart: A life of Tecumseh" by Allan W. Eckert.

June 17, 1433 From al-Maqrizi, Islamic: "On Wednesday the 28 th of Shawwal, the Sun was eclipsed by about two thirds in the sign of Cancer more than one hour after the afternoon prayer. The eclipse cleared at sunset. During the eclipse there was darkness and some stars appeared ... On Friday night the 14 th of Dhu I-Qu'da, most of the Moon was eclipsed. It rose eclipsed from the eastern horizon. The eclipse cleared in the time of the nightfall prayer. This is rarity - the occurrence of a lunar eclipse 15 days after a solar eclipse." The solar eclipse was on 17June 1433, while the lunar eclipse on 3 July 1433. Ref. Encyclopedia Britannica.

June 17, 1433 From Al'Asqalani, Inba'al-Ghumr bi 'Bna al-Umr: "On the 28 th of (the month of) Shawwal, the Sun was eclipsed after the 'Asr (afternoon) Prayer and continued until the time of sunset. It cleared up after the conclusion of the eclipse prayer, which I led in the Great Mosque. Then the sun set and we prayed the Maghrib (sunset0 Prayer in the mosque. When the eclipse prayer was concluded, I sent a witness to ascend the minaret of the mosque to see if the Sun had cleared. He returned, saying that it had cleared completely." Ref. FRS 97, pages 446.

June 17, 1433 In Scotland known as the "Black Hour". Although covering all of Scotland, this eclipse went well into north-east England down to north Yorkshire. Even though the eclipse was nearly four and a half minutes on the center line (the 6th longest British total eclipse in the period 1 - 3000AD), it must have still been over three minutes in Yorkshire. (ref. SW-UK Eclipse's). The reference about the Black Hour account was in The Story of Eclipses by George F. Chambers, 1899, which refers to the Phil. Trans, vol. xl p. 194 of 1737. But following book mentioned the eclipse in Scotland as "Black Friday": Total Eclipses of the Sun by Mabel Loomis Todd, 1894 which refers to History of Physical Astronomy, London, 1852, p. 365. In Celle, near Hanover in Germany a cronic says: On the 17 th June of the year 1433 there have been a terrible solar eclipse on the 5th degree of Cancer. The sun passed 4 or 5 degrees of the solstice point. The total sun was eclipsed, covered by the Moon, in the tail of Draco. This eclipse was also the last Total Solar Eclipse in Belgium since 1999.

June 19, -0548 (549 BC) "Duke Hsiang, 24 year, 7 th month, day chia-tzu, the first day of the Moon. The Sun was eclipsed and it was total." Ref. Ch'un-ch'iu, book IX (Chinese), FRS 97.

June 20, 0540 Totality at following 8000 meters summits: K2 (Chogori), Nanga Parbat, Gasherbrum I (Hidden Peak K5), Broad Peak (K3) and Gasherbrum II (K4). The total solar eclipse of 20 June 1582 is only total at K2. The next totality at K2 is on 8 March 2733. Ref PA 6/00.

June 20, 0540 "the sun darkened on June 20 th, and the stars showed fully nearly half an hour past nine in the morning." Ref. The Anglo-Saxon Chronicles and collated by Anne savage, CLB Publishing Ltd.

June 20, 1061 "On Wednesday, when two nights remained to the completion of the month Jumada, two hours after daybreak, the sun was eclipsed totally. There was darkness and the birds fell whilst flying. The astrologers claimed that one-sixth of the Sun should have remained (uneclipsed) but nothing of it did so. The Sun reappeared after four hours and a fraction. The eclipse was not in the whole of the Sun in places other than Baghdad and its provinces. Ref. Ibn al-Jawzi, Islamic, encyclopedia Britannica.

June 20, 1955 Longest total solar eclipse is lasting 7m 31s but has never been observed. But the total solar eclipse of 20 June 1955 lasted 7m 8s in the Philippines.

June 20, 1955 In a used bookfair Eli Maor found a slim book entitled, "Has the Earth a Ring Around It?" The author, one Frank G. Back, was a friend of Einstein and once raised with him the question, why does the moon look so dark during a TSE - or conversely, why does the background sky look so bright? Einstein encouraged him to do some spectroscopic measurements at a future eclipse, which the author did at the June 20, 1955 eclipse over the Philippines, the longest in many years. He did his experiments from within the canopy of a T-33 training jet that chased the Moon's shadow at 600 mph, thus prolonging the duration from 7 min. 8.6 sec. to 12 min. 15 sec. As far as I know, this - and not the famous Concord flight of 1973 - must have

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been the first successful attempt to chase the Moon's shadow from an airplane with the expressed purpose of prolonging the eclipse. The author did confirm that the background sky is much brighter than it "should" be theoretically, and he tried to explain this by hypothesizing that a ring of diffuse particles is orbiting the Earth beyond the Moon's orbit!

June 21, 0019 The millennium opened with a superb mid-morning eclipse of over 4 minutes duration. It ranks 8th longest British total eclipse in the period 1-3000AD, and holds the record for the eclipse with highest altitude at 59° elevation. This eclipse is broadly similar in track and time of day to the forthcoming August 1999 European Eclipse passing through central Europe and across the northern Black Sea. (ref. SW-UK Solar Eclipses)

June 21, 0122 Joint 3rd shortest British Total Solar Eclipse in the period 1-3000AD, this 75 km wide eclipse occurred late on midsummer's day, and would have been nonetheless spectacular for 20 seconds for the inhabitants of the Faroe Islands. However it could have passed unnoticed by most of the UK, although as totality passed between the Shetland and Orkney Islands their inhabitants must have noticed a significant darkening. (ref. SW- UK Eclipses)

June 21, 0400 An eclipse of the Sun on 21 st June, recorded by Cicero. "On the nones of June the Sun was covered by the Moon and night." Ref. BAAJ 06/00, Encyclopedia Britannica.

June 21, 1629 The Chinese were able to predict eclipses, but not well. Imperial astronomers ,who had failed to anticipate an eclipse in 1610, predicted a Solar Eclipse for this date. Jesuit missionaries, however, insisted that the prediction was an hour early and that rather than lingering for 2 hours the eclipse would last only 2 minutes. The Jesuits were correct. As a result, the emperor ordered that the Chinese calendar be revised.

June 21, 1874 Death of Anders Jons Angstrom (1814-1874), astronomer and physicist of Sweden. Famous for spectroscopy and spectra analysis. He found a relation between the fraunhoferlines in the Solar spectra and the discontinue spectra of hot gasses. He detected several elements in the Sun's atmosphere. He published in 1868 the atlas of the solar spectra. (ref. DD 6/98, Rc 1999)

June 22, 1633 Galileo Galilee appears for the Inquisition because he defends the heliocentric world of Copernicus. (ref. DD 6/98)

June 23, 1191 "In the month of June, the Vigil of the Nativity of St John the Baptist (June 23), the 9 th day before the Kalends of July, on the 27 th day of the Moon, at the 9 th hour of the day, the Sun was eclipsed and it lasted for three hours; the Sun was so obscured that the darkness arose over the Earth and stars appeared in the sky. And when the eclipse withdrew, the Sun returned to its original beauty." This was an annular solar eclipse. Ref. Stubbs, Gesta Regis Henrici II et Ricardi (1867), FRS 97.

June 24, 1778 The first total solar eclipse recorded in the United States when the track passed from Lower California to New England. According to Thomas Jefferson, the eclipse was clouded out in Virginia. This is considered the first total solar eclipse in British Colonies and which lasted four minutes over the middle Atlantic and New England States. (ref. +ENB012)

June 24, 1940 Death of Alfred Fowler (1868-1940), British astronomer and physicist. Studied spectra of the Sun. (ref. DD 6/98, Rc 1999)



June 25, 1275 "Te-yu reign period, 1 st year, month VI, day keng-tzu, the first day of the month. The Sun was eclipsed; it was total. The sky and Earth were in darkness. People could not be distinguished within a foot. The chickens and ducks returned to roost. (It lasted) from the hour szu (9 - 11 h) to the hour wu (11 - 13 h); then it regained its brightness." And "The Sun was eclipsed; it was total. Stars were seen. The chickens and ducks all returned to roost. In the following year the Sung dynasty was extinguished." Ref. From Sung-shih, FRS 97, pages 257, 258.



Galileo

(Continued on page 6)

ECLIPSE CALENDAR

June 26, 1424 Of the 20 total eclipses to visit the Orkneys and Shetland Islands in the period 1 - 3000AD it was the 13th longest in the whole of the UK at 3 minutes 56 seconds it was surpassed in Orkney by those of 364, 885, 1185, 1433, 2681. The eclipse track traveled across Denmark, Germany, Poland, Ukraine, Moldavia, and the Black Sea. (ref. SW-UK eclipses)

June 26, 1824 Birth of William Thompson (Kelvin), British physicist. Known for his absolute temperature scale. (ref. DD 6/98)

June 26, 1883 Death of Sir Edward Sabine (1788-1883). Mentioned a correlation between sunspots and magnetic disturbance on earth. (Ref. Rc 1999).

June 28, 1451 Sort of the American version of the Medes and Lydians. The Seneca and Mohawk tribes were preparing for war when a total solar eclipse swept over both their camps late in the afternoon of this early summer day. Both immediately sued for peace. (ref. DB 6/97: "A star Called the Sun" by George Gamow)

June 29, 0512 Totality at following 8000 meters summits: K2 (Chogori), Gasherbrum I (Hidden Peak - K5), Broad Peak (Falchen Kangri - K3) and Gasherbrum II (K4).



June 29, 1818 Birth of Italian astronomer Angelo Secchi (1818-1878). Photographed eclipse of 18 July 1860, studied sun spots. (ref. DD 6/98, Rc 1999)

June 29, 1927 Gellivara 1073: Minor planet discovered September 14, 1923 by Johann Palisa at Vienna. Named for the small town Gällivare in Swedish Lapland where in the year 1927 astronomers from several countries observed the Total Solar Eclipse of 1927 June 29. Named by the astronomer J. Rheden and endorsed by Anna Palisa. (ref. VK 6/97)

June 29, 1927 If you really speak about England, then the total solar eclipse of 29 June 1927 was the latest indeed. This short eclipse has not been observed by many people. Weather conditions were bad. The centerline was in the north of Wales, Preston and north England.

June 29, 1927 From Dorothy Sabin near Clitheroe, England: "I was so enthralled with this celestial shadow tearing across the world that I almost forgot everything else. Hurriedly, I looked above my head. The sky was dark blue, flecked with mother of pearl clouds, wonderfully luminous. I turned east, and there in the sky, between patches of bright cloud was a black disc entirely surrounded by living flames. I did not notice Baily's Beads, neither did I see the corona. I had not eyes for anything save those leaping, glowing flames. It seemed hardly more than a second or two that they were visible, for the Moon slipped by, and a tiny slit of Sun appeared; instantly it was broad daylight once more. The eclipse was over. Down the hillside we scrambled, our thoughts and minds full of the great sight we had seen. It was not till we see the morning papers that we learned how disappointed thousands of people had been." Ref. Anow, vol. 2, nr 2.

June 29, 1970 Contact lost with first German satellite Azur. Studied interaction between solarwind and earth's atmosphere. (ref. DD 6/98)

June 29, 1972 Launch of Russian satellite Prognoz 2. Studied sun and roentgen.

June 30, 1535 In "Name in the Window" Margaret Demorest proposes that Shakespeare's sonnets, nos 1-109, incorporate a calendar for the years 1501-1609, each sonnet corresponding to a year. Peter Nockolds has investigated the 3 appearances of the word Eclipse. "Clouds and eclipses staine both Moone and Stunne, And loathsome canker lives in sweetest bud." This Solar Eclipse was not visible from London. (ref. ENB012)

June 30, 1954 Felix Verbelen: "mijn" eerste, bewust waargenomen zonsverduistering deze was van 30 juni 1954. Het werd voor mij een onvergetelijke gebeurtenis. Ik was toen een schoolknaap van pas 9 jaar en alhoewel het een woensdag was werd er toen ook in de namiddag naar school gegaan...". First solar eclipse of Felix Verbelen.

(Continued on page 7)

ECLIPSE CALENDAR

June 30, 1954 The last total solar eclipse in Britain was 30 June 1954. The about 3 minutes totality was visible in the Faroes and the southern line was crossing the northernmost Shetland. Many people in England do remember this eclipse and is mistaken as total for those, which saw a large partial eclipse. The eclipse track traveled across Norway, Sweden, Lithuania, Byelorussia, and Russia.

June 30, 1954 Total Solar Eclipse in Scandinavia. Jupiter was invisible and behind the solar disc and which is a very rare phenomenon. Sun, Moon, Earth and Jupiter were on one line. Occultation of Jupiter by the Sun during the complete time of the eclipse. Disappearance of Jupiter June 30, 1954 at 9h03m and reappearance on July 1, 1954 at 2h15m. First contact of the eclipse was at 10h09m and fourth contact at 15h03m. (ref. H&D 1953, JM)

June 30, 1973 During the eclipse in Kenya, an object has been photographed. It was detected with several cameras and on more photographs. Till now, the object has not been classified, and it has been called the Dossin-Heck. During the same eclipse Henry C. Courten (New York) and E. M. Pittich (Tzech Republic) did similar experiments to detect sun-grazing comets.

June 30, 1973 Scientists use a Concorde supersonic passenger jet flying 1250 miles (2000 km) an hour over Africa to extend the duration of solar eclipse totality to 74 minutes, 10 times longer than can be observed from the ground. The Moon's shadow moves over the Earth at over 3000 km/h. The white corona was studied on board of the Concorde 001. (ref. L Astronomie SAF, 4/1975 p 149)

June 30, 1973 Several teams of scientists studied the reactions of people in Africa and South America were surprised to discover the similarity of traditions in places so far apart.

June 30, 1973 Observation of rainbow during total solar eclipse. Observation from a chartered Chessna plane and at an elevation of 11500 feet: About three minutes before totality, a rainbow was seen to the west. The rainbow was very easy to see and the colors were quite brilliant. After totality a sundog (mock sun) was seen. These were very interesting phenomena. From the account The June 30, 1973 Total Solar Eclipse From Suriname, South America by Michael Reynolds in ref. Solar and Lunar Eclipse Observations 1943 - 1993 edited by Francis Graham (1995)

June 30, 1973 Roger Tuthill and Harvard astronomer Donald Menzel received a Legion of Merit award from the president of Mauritania for educating the local population about the eclipse. (ref. SaT 12/99).

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

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

>June 03, 1239 "while I was in the city of Arezzo, where I was born, ...

gmf: It is remarkable that the latitude and longitude should have been so described this early. The current latitude of Arezzo is 43 deg 28 min North. The longitude quoted must have used Baghdad or Mecca as the reference meridian (which is strange in Italy). Jerusalem is now 23 deg 20 min east of Arezzo.

>June 17, 1433 In Scotland known as the "Black Hour".

gmf: If this means 1999AD (or CE) the word "since" does not seem appropriate.

>June 21, 0400 An eclipse of the Sun on 21 st June, recorded by Cicero.

gmf: I find Cicero's dates to be 106-65 BC, so it seems unlikely that he would have recorded an eclipse which occurred 465 years after his death.

>June 30, 1954 Total Solar Eclipse in Scandinavia.

gmf: This eclipse began at dawn in Minnesota, USA. The track left the United States near Copper Harbor, Michigan, on the Kewenaw Peninsula in Lake Superior around 8 am, where fog rose to obscure the corona. See

<http://home.columbus.rr.com/gfoley/eclipse.html>

I find Patrick's summaries of the month very interesting. Thanks, Gerry K8EF

GENERAL TOPICS

From: Eric Pauer <pauer@bit-net.com> To: Solar Eclipse Mailing List <solareclipses@aula.com> Sent: Wednesday, May 23, 2001 3:48 PM Subject: [SE]

"Awesome - The Official Video of the 1999 Eclipse"

The 52-minute video, "Awesome - The Official Video of the 1999 Eclipse" by York Films, is very well done. In short, it shows the plans/preparations, circumstances, and results of the eclipse through the North Atlantic, Great Britain, France, Germany, Austria, Hungary, and Romania. There is a brief story about how each of these countries prepared for the eclipse, and then how E-day worked out for them. Interestingly, there is no mention of the Asian countries that enjoyed totality (Turkey, Iran, Iraq, Pakistan, India) which was a bit odd. There are nice interviews of professional astronomers including Fred Espenak, Jay Pasachoff, John Mason, and amateurs as well. The video shows a Romanian couple getting married during totality, near the point of maximum eclipse. There is also a piece about the mayors of two neighboring French villages in the path of totality vying to promise the best eclipse experience. There is some nice video of the sky and corona from the various locations along the path. After viewing it, you get a feel of the excitement of the eclipse experience. I would recommend it to anyone interested in eclipses. I'm glad I got it.

FYI, I purchased "Awesome - The Official Video of the 1999 Eclipse" from <http://www.videostreet.co.uk> for £9.49 (GBP). Unfortunately for me, it came in PAL format, so I had it converted to NTSC so I could view it here in the U.S. on my VCR. Regards, Eric



From: Patrick Poitevin <patrick_poitevin@hotmail.com> To: SE Mailing List <SOLARECLIPSES@AULA.COM> Sent: Thursday, May 31, 2001 10:17 PM Subject: [SE]

CD-ROM Proceedings SEC2000 ready

At last ...

The CD-ROM, Proceedings of the SEC2000 conference Antwerp is ready for shipping. Those who attended the meeting will receive the CD-ROM free of charge. To make sure your address is not changed since your SEC2000 October-November, please let me know your exact mailing address.

The CD-ROM will not be commercialised but it is my intention having a limited amount of copies available at Totality Day 2001 on 11 August in the Open University of Milton Keynes. To avoid shipping costs, if you will attend Totality Day 2001 and you are one of the SEC2000 participants, please let me know, and we bring your copy.

Please drop me a private mail. Best regards,
Patrick



From: Jean-Paul Godard <jean-paul.godard@noos.fr> To: <solARECLIPSES@AULA.COM> Sent: Tuesday, May 29, 2001 6:50 PM Subject: [SE]

Micro-eclipse

Sylvain Weiler reported on mailing list "Astrocam" that he succeeded to capture the transit of an artificial satellite in front of the sun. While doing an "avi" file with a webcam, he saw a point crossing the solar disk during 2.1 sec.

Have a look to his picture: <http://www.egroups.fr/attach/1110142/15949/gs-111=01=1110142/10-1-4-114/image=jpeg/20010523%20164231%20TU%20Sun%20PH2redIRBTUC%20Montage%20satellite.jpg>

Possibly the smallest and the shortest transit captured. As involving a satellite of earth, is it related with this mailing list ?? ;)) Cordiale-ment / Regards, Jean-paul.godard@noos.fr

GENERAL TOPICS

From: Starman <4starman@home.com> To:
<SOLARECLIPSES@AULA.COM> Sent: Tuesday, May
22, 2001 2:50 AM Subject: [SE]

Ancient eclipses near Jerusalem

A friend recently wrote me this note: "Linda and I were wondering where we might find info-- about a possible eclipse near Jerusalem in the years between 20 and 40 AD. We have been wondering if indeed there was an eclipse the day of the crucifixion of Jesus."

Does anyone know of solar eclipses that might fit the bill? And I'd be glad to pass on any thoughts on the issue. Thanks! Dennis

From: Eric Pauer <pauer@bit-net.com>

Check out Fred Espenak's pages on historical eclipses and the total solar eclipse of 24 Nov, A.D. 29, visible from Jerusalem:

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

<http://sunearth.gsfc.nasa.gov/eclipse/SEhistory/SE0029Nov24T.3.gif>

It is at about the right time and place! Eric

From: Evan Zucker <ez@MrTotality.com>

I don't know anything about that eclipse, but looking at those URLs it appears the totality passed just north of Israel and, therefore, Jerusalem. Perhaps it's simply too large a scale to be able to tell for sure. Evan H. Zucker

From: Jean Meeus <JMeeus@compuserve.com>

The question is not new. In the course of the years, several people posed me that same question. Probably they were trying to "prove something" ???

I find the following eclipses visible at Jerusalem from A. D. 20 to 40. The dates are given in the format year-month-day. After the date, the magnitude of the eclipse at Jerusalem is given.

20 Dec 3	0.780
26 Feb 6	0.730
27 Jan 26	0.122 (at sunset)
29 Nov 24	0.964
33 Sep 12	0.252
34 Sep 1	0.269
38 Jun 21	0.064
39 Dec 4	0.093



All are partial eclipse, but that of November 24 of the year 29 was deep partial, and it was total not far from Jerusalem. But it was in November, not in March or April. So what? Jean Meeus

From: J.P. van de Giessen <jpvdgiessen@gelrevision.nl>

Hi all, There is a small book written about this question by Humphreys, see my site http://home.gelrevision.nl/~jpvdgies/Oth_Religion.html for an online version.

A reference in the Bible could be Acts 2 vs 20 where St Peter refers to Joel 2. Jan Pieter van de Giessen

From: Onderbeke Julien

About the Eclipses near Jerusalem in the 1st century :

It is known that men have often tried to explain the full darkness at the moment of Jesus' death (as written in the gospel of Luke) tried to explain as a total solar eclipse.

F.K. Ginzel investigated a lot of work in it in his *Astronomische Untersuchungen über Finsternisse*. He could only find the TSE of 0029 Nov 24. Because a lot of descriptions in the gospels refer to springtime, this date is difficult to accept.

On the other hand, Eastern, the date of the resurrection of Christ, which should have taken place at the third day of his death (not the third day after his death because the Romans count the day from his death, a Friday, also) is always associated with a full moon. Since Nicea in 323 AD, Eastern date is the first Sunday after the Full Moon on or after the vernal equinox (which is March 21st for the church). But for a solar eclipse, we need a New Moon!

Ginzel has also sought for a great lunar eclipse in those days near Jerusalem.

Maybe the following explanation is more plausible : Luke wrote his gospel more than 30 years after Christ's death. But in the year 0059 on April 30th, there was also a TSE crossing Cyprus and Syria. Even on December 27th of 0083 there was a TSE in the region. It is known that Luke travelled a lot together with Saint-Paul through Minor Asia. According to his lifetime it is probable that he didn't see the eclipse of 0029 but that he saw both eclipses of 0059 and 0083, even within the path of totality. So it is possible that he was very impressed and associated the darkness of Jesus' death with a TSE.

Maybe Fred can make a map of both TSE or maybe a map

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GENERAL TOPICS

with the three paths of totality. It would be very interesting!
From Julien Onderbeke

From: Onderbeke Julien

More eclipsenews in de 1st century AD. F.K. Ginzel found 8 central eclipses in the Medittereanian region. According to the Mucke-Meeus Canon of Solar eclipses, the dates are

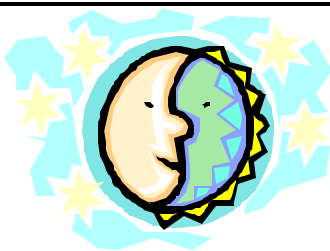
0029 Nov 24 : total
0071 Mar 20 : annular-total
0049 May 20 : annular
0075 Jan 05 : total
0059 Apr 30 : total
0080 Mar 10 : annular
0067 May 31 : annular
0083 Dec 27 : total

I used the Eclipse Winmap program to draw the areas of totality or annularity. It is curious that there is a place, within the actual borders of Syria, near the Iraqi border (I guess a latitude of + 34° and a longitude of - 40°, thus 40° east of the Greenwich meridian) where 4 central eclipses have been seen within a period of 54 years! (the totals of 0029, 0059 and 0083 and the annular one of 0080).

It is quite acceptable that Luke didn't see the 0029 eclipse but that he saw the total eclipses of 0059 and 0083 as well as the annular eclipses of 0049 and 0067.

Therefore I suggested Mr. Fred Espenak to add the maps of some of these eclipses to the eclipses of historical interest, or maybe a map with the regions of totality or annularity. Although I guess it's hard to find time for Fred, now that he's preparing a trip to southern Africa. To all the eclipse travellers : clear skies on June 21st. As I'm a teacher in mathematics, I will be correcting examinations on that day!

PS : In the 50 year Canon of Solar Eclipses 1986-2035, you can see on page 59 that in a small region in the Atlantic Ocean, near the Brazilian Coast, 3 total solar eclipses will be seen from the same area within a period of 15 years (2045-2046-2060). The 2045 and 2046 eclipses even within 1 year, which is quite exceptional. As far as I know this must be a very rare event in a very short period. Julien Onderbeke, Oude Weg 208, 9870 ZULTE, BELGIUM



From: Hal Couzens <hal@dneg.com> To: <SOLARECLIPSES@AULA.COM> Sent: Monday, May 14, 2001 7:52 PM Subject: [SE]

Another Beginner Question

or two! What is the difference (visual, temporal etc) between seeing the eclipse exactly on the centre-line and seeing it closer to the northern or southern extremity of the path of totality?

Is there any time/place at which any/many members of this list meet up? Out there or elsewhere, before, during, after?

Are the shadow-bands extremely difficult to see let alone photograph? Any hints on what to do to try and 'catch' them. Thank you, Hal

From: Assoc Prof J R Huddle <huddle@usna.edu> Please see notes interspersed below, Jim Huddle

> What is the difference (visual, temporal etc) between seeing the eclipse

Totality lasts longer near the CL, but "edge effects" including Baily's Beads & Diamond Ring (which is the last of Baily's Beads plus the inner corona) last longer and are better observed near the path edge. Nearly everyone on this list will recommend that you go to the CL. I concur if this is your first total, but I wish more seasoned observers would be willing to try the edge. It is a different experience, but not all will agree that it is a worse experience.

> Is there any time/place at which any/many members of this list meet up? Out

I hear tell that list member Olivier "Klipsi" Staiger has volunteered to buy any and all a coldie at the bar at the Intercontinental Hotel in Lusaka after the eclipse, but I hate to speak for him. I think that hotel has >1 bar, so you'll have to look around, but eclipse guys are obvious. I will be in the bush in Zimbabwe, so will miss seeing you guys.

> Are the shadow-bands extremely difficult to see let alone photograph? Any

I will let others who have succeeded in capturing the shadow bands on film and/or tape answer this one.

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

Madden responds to Huddles challenge . . .

For two eclipses I have tried to observe the shadow bands without luck.

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Quoting "Totality" [Littman, Wilcox, Espenak, Oxford University Press, New York] "They are one of the most peculiar and least expected phenomena in a total eclipse. Many eclipse veterans have never seen them."

However, in Turkey in 1999, someone showed a video (apre eclipse) in which the shadow bands were CLEARLY visible on the sand of the beach of Lake Hazar. Had I been looking at that moment, I would have certainly seen them. I was amazed that they looked just as I had envisioned them: like the ripples on the bottom of a sunlit swimming pool. The only difference was that they seemed to move slightly faster. The effect did not last long however and the contrast is quite low. They may be more difficult to photograph than video-graph.

We'll see. This year I will devote one of three video cameras expressly for the purpose of capturing shadow bands (if there are any). If anyone has suggestions on technique other than " . . .don't forget to put down a white sheet." I am eager to hear them. madden/rochester

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

The shadow band video mentioned in Mr. Madden's note were imaged across the rocky beach at Lake Hazar. This unusually HIGH CONTRAST, HIGHLY TEXTURED surface was likely responsible for the visibility of the effect in this video. Many of us remember the unusual, narrow little rocks lining the beach of the Lake. The shadow bands visible on the video made the rocks appear to shimmer and wink similar to the scales of a fish. Many friends have noted that the bands are more visible on the surface of water, where the ripples add contrast. I would vote for a field of view high in textured surface over a white sheet were I the one videotaping.

In examination of the video and the effect photographed, I cannot imagine any way to depict the effect in a still photo, as the visual effect is that of a flickering lighting change. - Hopefully as soon as I project this opinion, someone will dispell the myth by producing an amazing photo!

We have a copy of the video on-file here, but are not the videographer and don't have rights to distribute it. Clear Skies! Jen

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

As someone who has only seen one TSE (and there is of course a long list of things I didn't do that I should have), I'm not yet tempted to stray far from centerline. But I'm curious about those who have. Would you do it again? If so, how frequently, or under what circumstances (very long eclipses,

maybe)?

From: Bill Ronald <ronaldb@home.com>

George, Eric Strach, Liverpool Astronomical Society, successfully recorded shadow bands at Knipbaai Beach in Curaçao on 26th February, 1998. According to his webpage report, he used a "polaroid filter combined with an UV filter." He thought that either the bands were very pronounced or that the "polaroid" filter increased the contrast. I am not sure what he means by "polaroid" filter, perhaps a "polarizing" filter of some type? I have sent him an e-mail asking for more information. See this URL for the report:

<http://www.liv.ac.uk/~ggastro/SB.report.html>

I thought that I would set up a Hi8 videocam this time too, and if a filter will increase the odds I certainly want to use one. Bill

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

"Polaroid" is the name of a polymer that has been stretched in such a way that the long molecular chains are oriented in a certain direction. This causes the filter to absorb light that has its electric vector parallel to the chains. It does not absorb light with the electric vector pointed perpendicularly to the chains, so polaroid polarizes light by removing one polarization component. It is fairly inexpensive; Edmund Scinetific sells it. Click on <http://www.edsci.com/> to check their online catalog.

The corona is also polarized. My student in Aruba (1998) captured this on video by putting a polaroid filter over the video lens, and rotating the filter at 10-second intervals. If you get good data images, there are ways to extract electron densities in the corona from them. I might just tuck a 5 x 5 cm piece of polaroid in my pocket and look at the corona through it for a few seconds. Has anybody tried this before? Jim Huddle

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

Not on purpose, but I was wearing polarized sunglasses at TSE 1999. The corona looked like lace, with definite small holes. I didn't think of the explanation then and tilt my head to watch the polarization change. I was awestruck by this unexpected appearance (vs. web composite pictures I had seen) and particularly by the prominences, which looked laser red and were way brighter than I have seen in pictures.

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



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Some of the confusion is that "Polaroid," with a capital P, is a brand name for sheet polarizer. Edwin Land, in--I think--the 1930s, invented a cheap way of making polarizing material and invented the name Polaroid for it and for the company he formed to market it. Many people mistakenly use the word "polaroid" when they should use "Polaroid." When Land went on to invent instant photography, he used his existing company name to make the "Polaroid Land" camera.

You don't need a video camera to photograph polarization of the corona. The inner corona is highly polarized because it is composed of light scattered off electrons. It is called the K-corona from the German word for "continuous" because the scattering by electrons at millions of degrees Doppler-shifts the spectral absorption lines from the solar photosphere so much to both shorter and longer wavelengths that they are blurred out. One of my experiments at the 1999 and 2001 eclipses was to measure that polarization and, after determining how much of the corona was the K-corona, to use other spectral measurements to make a map of coronal temperature. See www.williams.edu/astronomy/eclipse01 and www.williams.edu/astronomy/eclipse99. Leon Golub discuss the matter technically in our 1997 text "The Solar Corona." Anyway, you can mount sheet polarizer over any camera telephoto and take photographs at angles of 0, 60, and 120 degrees rotation. But to get any real data out of it, you have to make some device to accurately control the amount of polarization. Jay Pasachoff

From: Stephen Russell <smr@cse.unsw.edu.au>
I observed the 1994 eclipse from the southern limit. It is a very different experience. The diamond rings last a long time, and there were Bailey beads for almost the whole time. The chromosphere was also visible for the duration of totality.

Keep in mind that the duration of totality is not linearly related to your distance from the centerline. You have to go a large way towards the edge before you halve the duration. If you want to get the maximum totality experience, stay on the centerline (more accurately, find the maximum duration line). But if you want to see or photograph other phenomena, and can get the totality shots you want in 45-60 seconds, the edge is an interesting option.

If you're interested, I have some photos of the 94 eclipse on my web site: <http://users.bigpond.net.au/smr/eclipses.html>
Cheers, Steve.

From: <JohnLX200@aol.com>
I've done some hard thinking on this subject recently, and will share my thoughts in the hope that one of us will get high-resolution shadow band shots at long last.

I think the main reason people don't do well taking still photographs of shadow bands, is that they don't use fast enough film or high enough shutter speeds. The better low-light performance of camcorders, not to mention the huge number of frames exposed, helps to make it quite a bit easier on video than stills.

It is very clear to me that a fast, fairly normal-length lens (e.g., 50mm f/1.whatever) and very fast black and white film is the way to go.

I have had a very good discussion back and forth with Barrie Jones, and I'll post my own thoughts on how I will try to capture high-resolution still photos of shadow bands below.

Best of luck to everyone, I think we may need it. John Hopper

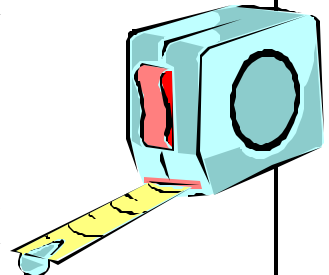
From: <Rayabrooks2@cs.com>
We were pushed about 60 percent to the north edge by the Russkies in 1997 which brings the edge of the Moon 60 percent closer to the photosphere but not much reduction in totality - we all agreed we kind of liked the added prominence show and we could see the shadow sweep to the south.

In 1999 the weather pushed us very close to within about 6 miles of the south limit and we only had 1 full minute of totality -it also was a very cool prominence show and a 15 second long bead. I still don't know what I like better - more totality or more edge phenomena. Ray Brooks

From: FRED ESPENAK <u32fe@lepvox.gsfc.nasa.gov>
George - You should also place a ruler, yardstick or some such measuring object along the edge of your white screen in order to give a scale to your video images. It is also important to indicate the cardinal directions so that the direction of the shadow band motion and orientation can be determined.

Over the years, I know that Sky & Telescope has published a number of shadow band articles as well as detailed suggestions on how to observe shadow bands.

See: S&T Jun. 1963, p.328-9
S&T Feb. 1970, p.132-3
S&T May. 1972, p.291-2
S&T Feb. 1984, p.?
S&T May. 1991, p.482-7
(excellent theory on shadow



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bands)

Good luck with your video and I hope to get a look at it! - Fred Espenak

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

Hello List, The August 1999 total solar eclipse was my first total eclipse and since I was so busy taking images I would never have seen the shadow bands either before or after totality. But because I was in a small group of eight people, who just happened to have a large (5x4 meter) white sheet with us where we all sat on, one of us noticed the bands some minutes before totality. I had read the descriptions of other people, as well as the phrase from "Totality", I was astonished by the appearance of the shadow bands. They are exactly as looking at the bottom of a pool on a sunny day.

Because we were with a small group of which I was the only one occupied with photography other people were on the lookout for the famous phenomena as shadow bands, the incoming shadow, diamond ring and Baily's Beads. As soon one of us saw something interesting he or she would shout it out loud. This really worked well for us as well as for people with us that didn't know what to look for or what to expect. So my advice is not to go alone and get yourself and your companions prepared for the things that can be visible during an eclipse. Regards, Cees Bassa

From: Glenn Schneider <gschneider@mac.com>

Hal, First. prepare yourself (if that is possible) for a truly amazing phenomena. No matter how much you read, hear, or try to learn about it, even from "old timers" like myself, there is no way the experience of totality can be adequately described.

> What is the difference (visual, temporal etc) between seeing the eclipse exactly on the centre-line and seeing it closer to the northern or southern extremity of the path of totality?

There are a number of points Jim Huddle has already touched upon regarding the (shorter) duration of totality and lengthening of the duration of the limb phenomena by situating yourself near a limit line. Let me add the following more subjective comment. The closer you are to being located near the center of the shadow cone the darker the sky will be, and the more symmetric the gradients of horizon coloration at mid-eclipse. The sky darkness varies enormously from eclipse to eclipse and location along the eclipse path. For any eclipse this depends in part, of course, to atmospheric conditions. Airborne dust and particulates scatter light from outside the path of totality inward - a situation we all hope won't occur from anyone's chosen eclipse site. And, similarly, scattering is increased by air-mass, so the closer the sun/moon is to the zenith (all else being the same) the darker the sky. This also depends on the width of the umbra. Generally, the wider the umbra (projected on the Earth) the darker the sky - for the same reason. The umbral width does vary across the eclipse path, but not very significantly in the regions across Africa where observer's will be located. If, however, you locate yourself near (or on) centerline, the sky will be darker than as you move toward either limit. This will, to some degree, enhance the contrast of the more tenuous (fainter) outer corona. It will also allow you to see stars a bit fainter than if you were located elsewhere. Now, some may disagree, as this is HIGHLY subjective, but I have noted that in the darkest-sky eclipses I have seen (Montana, 1979 for example) the coronal gradients visibly observed over the largest dynamic range were the greatest. It is also quite amazing to watch the band of diffusely Hydrogen-alpha tinged sky circumscribing the observer change - again this seems most noticeable near shadow-center).

I digress a bit here, and repeat something I have advised (probably on this mail list) to many others - particularly first-timers - many times in the past. The human eye/brain together makes a remarkable imaging instrument. The dynamic range of sensitivity is spectacular. You can see detail in full sunlight, and read by the light of the quarter-moon, which when you think of it in terms of illuminance, differ by a factor of a million. You can't of course do both at the same time. I'm sure you noticed this when you walk into a movie theater and trip over old popcorn bags, and later note that you have sat on a sticky candy wrapper only AFTER your eyes have become "dark adapted". Dark adaptation is not just an dilation of your pupils in response to the loss of illumination - but it is a physiological phenomena brought on by the secretion on rhodopsin in the eye, which changes the photochemistry of what's going on in your retina. Photopic and scotopic vision are very different. Unfortunately, you cannot switch to your "dark adapted" vision instantaneously. Though it varies with individuals, it can take 20-30 minutes before your eyes are > 90% dark adapted. How does this relate to observing a total solar eclipse?

An eclipse like this lasts, depending upon where you are, about 3-1/2 minutes. The sky will darken, likely, to a level like mid/late twilight over the space of several minutes before the onset of totality - with the greatest change in the last tens of sec-

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onds. Your eyes will BEGIN to dark adapt at that point, but will not be adequately up to the task even by third contact. The time-constant for dark adaptation is much longer than totality. What to do? This may sound silly - BUT IT WORKS. About half an hour before totality put an eye patch over one eye. Joel Moskowitz and I will argue (maybe here) as to whether to use your dominant or sub-dominant eye, but that is a fine-point. From the time you cover up (completely, no light leaks) one eye, that eye will begin to dark adapt. By the time totality arrives, a half hour later, it should be virtually fully dark adapted. Watch second contact with the eye patch in place. You do NOT want to remove the eye patch to watch the second contact diamond ring, or you will loose your dark adaptation (ever notice what happens to your eyes when you walk OUT of a movie theater). As soon as the second contact diamond ring is over take off the eye patch. You will be AMAZED at what your visual perception does. Your brain is receiving signals from a fully dark adapted eye, and one which is just beginning the process. It WILL merge the two input signals and you will see the outer corona to a much greater extent AND you will see the whole corona over a larger dynamic range. This all may sound a bit strange (or even silly) but I'll say it again IT REALLY DOES WORK, and the improvement in visual acuity over a much larger dynamic range is astounding. DO IT!!!

My recommendation for a first-timer is to stay on or relatively near the centerline. For this eclipse, for all practical purposes, this means within a few tens of kilometers. Limb phenomena are marvelously interesting, and prolonging them by observing near a grazing line is something definitely to consider - but I would not want to do that the first time around. Treat yourself to a longer totality, and experience Baily's Beads, Diamond Ring, the Chromospheric arc, edge prominences, etc. as the come and go at/near second and third contacts.

> Is there any time/place at which any/many members of this list meet up? Out there or elsewhere, before, during, after?

Hey! I had missed Olivier "Klipsi" Staiger's offer earlier (which Jim mentioned). I would love to meet y'all. I don't know if my schedule will allow it, though. Is there a proposed time/date for this gathering?

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From: Victor Reijs <geniet@IOL.IE> To: <HASTRO-L@WVNM.WVNET.EDU> Sent: Thursday, May 03, 2001 7:26 PM Subject: **cycles and periods**

Hello all of you, All of you know that there are periods and cycles in the sky related to sun and moon (tropical, synodic year/month, metonic, saros, precession, obliquity, etc. etc.). I assume that recognizing these cycles/periods will depend on the length of these periods/cycles and the cultural environment of the people who tried to unravel these celestial events.

Is there a good overview (URL, book, article) when in time these periods/cycles were recognized (and broadly/vaquely determined by duration) by the people? So I am looking for dates when these cycles/periods were first seen in literature/drawings/texts/etc. I am interested in the following periods/cycles:

- . tropical, sidereal, eclipse, anomalistic year
- . tropical, sidereal, anomalistic, draconic, synodic month
- . tropical, sidereal day
- . precession cycle
- . perihelion cycle
- . obliquity cycle
- . nodal cycle
- . apse cycle
- . diurnal tide
- . metonic cycle (first century BCE, I think)
- . saros cycle

It is a long list, I know. Thanks for your help. All the best, Victor

GENERAL TOPICS

Are the shadow-bands extremely difficult to see let alone photograph? Any hints on what to do to try and 'catch' them.

This was also discussed by several others on this thread. I would not concur that shadow bands are extremely difficult to see. The visibility of shadow bands varies enormously from eclipse to eclipse in a rather non-predictable fashion. The shadow bands seen in the March, 1970 eclipse in North Carolina were absolutely striking. You could not miss them. I've described them as "jail bars", others agreed. I have seen (but alas did not take) any photographs of the shadow bands from this eclipse. One appears in the May, 1972 Sky & Telescope article by Adrew Young - taken by Rev S.E. Haskillo on Tri-X film at 1/250 second on the side of his house. Visually they were enormously more apparent. I've seen shadow bands at a number of eclipses. Most confusing was in 1974 in SW Australia. Rather than replicate what I've said elsewhere about that I'll point you to: http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_74/ECLIPSE_74_REPORT.html Shadow bands can be seen for several MINUTES before and after totality. Many observers report seeing them longer after 3rd contact than before 2nd. I suspect there is an observational bias (or two) here. First, everyone is so keyed up at the approach of totality looking on the ground is not something many are doing - but AFTER - it is one more thing to see an anti-climax. And, I do believe even some extra moderate degree of dark adaptation helps there.

You definitely want to use a flat white surface. Using a "rough" one, which reflects diffusely, rather than specularly, would probably help. Let us know what you see - photograph. On the other hand, if this IS your first eclipse - DON'T photograph it. Enjoy it! If you do insist on photographing it budget some of your time to just sit back and take it all in. Cheers, Glenn Schneider (01h 02m 48.6s in Totality and hoping for more...)

From: Assoc Prof J R Huddle <huddle@usna.edu>
Teamwork also pays off in video: One guy concentrates on the contacts, one guy on the corona, one points his at the sheet for shadow bands, one goes for the flash spectrum, another tapes the reactions of the people.... Nobody can do it all, but if your GROUP plans and assigns tasks and pools tape, you can make a nice video to remember the experience by. Jim Huddle

From: Glenn Schneider <gschneider@mac.com>
Jim, In reply to your query on coronal polarimetry, I will risk re-posting, in part, something I said in January 2000, with a follow-up:

"The solar corona is indeed highly polarized, and from the polarization data one can map out and measure the magnetic

field. (For example, see recent papers like Esser et al, 1999 Astrophysical Journal, 510, pp. L63 [http://adsabs.harvard.edu/cgi-bin/nph-data_query?bibcode=1999ApJ...510L..63E&link_type=ARTICLE&db_key=AST]). The visual aspect, and of course, photographically captured morphology of the corona, its streamers, coronal holes, brushes, etc., will vary dramatically depending upon the orientation of the polarimetric analyzer. I.e., if you rotated your polarized sunglasses the corona would look VERY different. Indeed photography or viewing through a rotatable polarizer will capture these different aspects. If you want to do anything quantitative you must use 3 polarizer angles (120 degrees apart, to solve for all Stokes parameters), but for purely a neat visual comparison orient the polarizer along the solar equator, and then along the rotation axis. It can be pretty dramatic. I've done polarimetric photographic imaging in the 1976, 1980, and 1981 TSEs, though I've never watched with sunglasses! I too am nearsighted, and since I ALWAYS dark adapt with one eye by wearing an eye patch before totality, I went to contacts a long time ago."

Jay Pasachoff has just commented more about this today (in reply to your post as well), along with some links well worth seeing. His comment about getting "real data out of it" by accurately controlling the polarization rotation angle - or at least knowing what rotation angles were actually used - is very important if you really want to get any quantitative information out of this. While 120-degree rotations are optimal for extraction of the Stokes parameters (from which the polarization fraction, direction vectors, etc.) are derived - you CAN recover them if you do not have precise rotation control, but do have precise rotation measurement. Calibrating your polarizer is another matter. Don't assume it has 100% polarization efficiency. Beyond this I'll just point you to:

http://nicmosis.as.arizona.edu:8000/PUBLICATIONS/POL_PAPER.pdf

Which is: Hines, D.C., Schmidt, G.D., and Schneider, G., 2000, "Analysis of Polarized Light with NICMOS", Publication of the Astronomical Society of the Pacific, 112, 983. This was written for a different specific application, but can be applied and is germane here.

On the other hand, if you just want to LOOK at the corona through a polarizer, it certainly IS interesting to see how the structure changes with polarization angle. Glenn Schneider

From: Glenn Schneider <gschneider@mac.com>

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I would add to Jay's comment (below) that IF you want to do polarimetric imaging of the corona, I would NOT use a video camera - at least not most commercial CCD cameras. Most "consumer" CCDs use front-side illuminated sensors with a polysilicate epitaxy which is, unfortunately, fairly reflective in the optical. Normally, this is not a problem that you would notice. However, the back-reflection off the CCD surface tends to induce "instrumental polarization" due to multiple scattering (reflection) paths in the camera). Unless you have a well-tested (and calibrated) video (CCD) camera, I would suggest coronal polarimetric imaging best be done simply - with a film camera using refractive only optics (mirrors, also induce instrumental polarizations - they can certainly be calibrated out, but care must be taken).

From: Kidinvs@aol.com

.... So many questions from the "Eclipse Virgins".....I guess us veterans have done an excellent job in arousing new people's interest...lets keep it up. As a guy with 6 totals under my belt, I am very much looking forward to the short talk I will give in our tented village in Landless Corners the morning of E-Day. I just thought I would put in my 2 cents here.... If this is your first eclipse, you should take lots of pictures before the eclipse, and lots after. About 10 minutes before 2nd contact, safely put away your camera...and forget about it. There is NO photo that you could take, that will be a fair tradeoff for what you will miss in the sky, seeing with your own eyes. Set up a video camera instead, and leave it alone. You will get more pleasure LISTENING to the replays of your video, or some tape recording of the event, than any photos you are capable of shooting yourself. Listen to the birds, watch the animals, see if flowers close their petals. Stand very still, and feel the breeze brush across your face, and a moment or two later, another breeze but cooler this time. What was the drop in temperature?? Did the direction change?? I have seen shadow bands at EVERY eclipse I have been to, and they have always been against different backgrounds. I always put up a white sheet, but in Turkey, they were most prominent against the dark bus that we were traveling in...and I have seen them after 3rd contact every time as well... luck.... I dont know... but I am never fumbling with a camera.... I leave that to the pros. and... PS... If you are in an organized area with street lighting, or other automatic lights, make sure to see that the sensors for the system are shut down. These automatic lights will go on about 10 minutes before totality. You dont want that!!!! Have a great experience. I have NEVER met a guy after his first eclipse that didn't want to see another. And I have never heard anyone ever say... "been there, done that." I wish all the veterans on the SEML a safe and rewarding trip. And to the "virgins".... Your lives will soon be changed. You will experience nature like you have never before, and your lives will subtly change... I promise. I leave in 3 weeks..... see you all soon. Eric Brown

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

Simple solution: Go to every eclipse, total *and* annular - and for the total ones go central for the longest view of the corona (remember: What you get there is impossible to have with any groundbased instrument *and* space detector currently in orbit, so try to get as many seconds as you can), while for the annular ones get close to a limit, for stunning Baily's Beads shows, chromosphere and prominences. This is at least my strategy since 1999. Added bonus: twice as many eclipse holidays than when going only for the total ones. CU in Costa Rica in December? Daniel

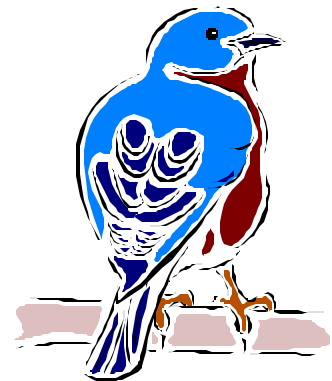
From: Hal Couzens <hal@dneg.com>

Just planning up a few things more... How do birds, insects and animals REALLY behave in a TSE? Obviously providing a suitably quiet scenario away from heaps of people.

My last, and only TSE was in the company of several thousand people (grim and quite distracting but also interesting seeing the effect it has on humans - humbling) so this time i am keen to be somewhere a bit more isolated. Thanks again, Hal

From: Kidinvs@aol.com

Briefly, these are some of the things I have noticed in the past.... Drop in temperature about 15 degrees F. from 1st-3rd contact... most coming close to 2nd. As usual at dusk, be careful of insect bites at this time... just like the real dusk. Birds head for their nests. Dogs and cats become very confused and usually seek shelter under chairs and the like. Flowers close their petals. Streetlights go on. Fish think it is time to feed... not to many beachcombers for this one. About midway from 1st to 2nd contact, look for the light to begin changing... sort of an eerie bluish/gray. Start to look for millions of crescent suns... in the trees, on the ground below trees, bring a straw hat, and allow the sunlight to pass through it and look for little crescents. ...and there is so much more... I cant even think Eric Brown



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From: Joel M. Moskowitz, M.D. <moskowi@attglobal.net>

> For two eclipses I have tried to observe the shadow bands without luck.

Only 2? I have seen 7 totals, and I have YET to see shadow bands. Hopefully, June 21.... Joel M. Moskowitz, M.D.

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

This would be a good technique if one could see Baily's beads, chromosphere, and prominences at most annular eclipses. But most annular eclipses do not have sufficient coverage of the solar photosphere for that. I see that the eclipse magnitude at the Dec 14 eclipse is 97%; I think that the remaining 3% will make it too bright to see the phenomena. One just sees a ring through a solar filter. It is still fun--i recommend it--but don't count on seeing Baily's beads, chromosphere and prominences.

From: Bill Ronald

Regarding my enquiry to Eric Strach about his use of a "polaroid" filter, which might have increased the visibility of shadow bands, Eric just answered with the following:

"I used a polarizing filter (circular type) factor 2. I calibrated it on some cumulus cloud which were in abundance before the eclipse and kindly disappeared well before second contact." Bill

From: Dale Ireland <direland@drdale.com>

You can see Baily's beads at an annular, at least "photospheric" Bailey's beads. I have a photo I took of them from the 1994 annular <http://www.drdaledale.com/eclipses/images/an01.jpg> So me people claimed they saw chromosphere but you would really be flirting with eye damage to try it because it requires looking without a filter. Not smart. Dale

From: Glenn Schneider <gschneider@mac.com>

A bit long, but I hope some will find pieces of this useful:

There has been a litany of excellent material written on photographing total solar eclipses, from the esthetic to the highly technical, both in print and on the Internet. Yet, many of us, even "old timers" such as myself, continually find new and inventive ways to screw up. So, I thought I would take a few moments to share with you my personal "Things To Do or Not To Do" when photographing a total solar eclipse. Some you may have seen before, either from me or others, but the bear repeating or retelling. Some are from my own personal history of goofs (as evidenced by the "stupid mistakes" thread which went around this mailing list a bit over a year ago). I will leave it to your imagination as to which those might have been.

This post is for FILM photographers - videographers may as well hit the DELETE button in their e-mail client. As far as we have come with digital sensors, in my opinion nothing yet compares with good old film for dynamic range, saturation, resolution, freedom from defects (love those CCD blooms from charge transfer...). But this is not a film vs. CCD post - each has its place. This is primarily for those new to eclipse photography, but ever some veterans may find some goodies here. It is not intended to be a "how to photograph the eclipse" so much as "things to not do to make your photographic attempt a nightmare". I would urge others on this list to share their best (or worst) ideas and experiences as well. So humble offered, I'll begin:

FILM PREPARATION

You've spent thousands getting to Zambia (or wherever) - don't blow it by lack-of-care in film handling along the way. A key elements to not having great post-eclipse angst is to prepare and protect your hard-earned eclipse film(s) against loss or destruction even before you leave home. Several of these items are related, but I group them as some ultimately have common preparatory solutions. This requires you to decide ahead of time not only what kind of film you would use but to select, purchase, and prepare the specific rolls you will use for the eclipse.

Most of us today have our films commercially processed. This means at some post-eclipse moment when you are back

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home de-compressing from our travels, we put our film canisters in a mailer or drop them off at our photo processor or laboratory. They then are OUT OF OUR CONTROL. Do your palms sweat and do you get paranoid the instant this happens?

Disaster scenarios; Do you fear that:

1) you have sent out what you think will be GREAT pictures of that spectacular diamond ring, and you'll get back snapshots of Bertha Kindall's retirement party at Omaha National Bank? Actually, what you fear most is getting back snapshots of UNKNOWN origin - which means YOUR eclipse pictures have vanished into the ether. And dear old Bertha (or whomever) is tossing those "what's this big black dot with the white smudge around it?" pictures into her trash can.

2) you get back your beautiful eclipse images, and the all have been had the sun sliced right in half, because the machine (or operator) mis-registered the first image, not being able to tell a black sky from a frame-edge border?

3) your slides (or prints made from negatives or sildes) have colors or hues that just don't look right, and you're not quite sure how to correct them in post-processing?

All of these can be obviated by a simple precaution - take an ID/reference image as the FIRST exposure on the roll. This will likely mean you will get 35 eclipse pictures rather than 36 (unless, like me, you know your manual-load camera well enough to normally squeeze out 37 by judicious [reduced] use of film-leader. Specifically, after you load the film you will use for the eclipse into the camera take a big piece of cardboard and write your name, address, phone number, e-mail and, I suggest: "REWARD: \$XX.XX {you fill in the amount} for return if lost" in dark bold easy-to-read text on the card. Then in a normal daylight scene, hold up the card (or better have your spouse or girl/boy friend who likely looks much better than you do {as you want to attract Bertha to look at this picture, if she gets it later by mistake}, and with the card taking up at least 2/3 of the frame (for easy readability) take a picture of it (and him/her/ the background scene). NOW you've got film-return insurance. When Bertha gets your film by mistake, she (unless she is particularly nasty - but that's why you offered the reward) will undoubtedly contact you. Well, maybe she will contact your spouse girl/boy friend as you are likely to be in a cardiac care unit if your eclipse film was lost. Anyway you get the point. While you are at it, put some red/green/blue/black (or cyan, magenta, yellow, black - or both) color swatches on your "ID card" - this will give you a color calibration against which you can do your controlled re-printing (or Photoshopping) with confidence.



Along the lines of ID/reward, you should do the same on the outside of the film cassette(s) using a stick-on label. That way, when your bag is pilfered at the Harare Arms Guest House and the film canister lies discarded in a rat-ridden alley, after it is picked up by a passer-by there is a good chance you will get it back. Before going on, I should say that taking a normal "daylight" scene as frame #1, will allow Goober Jones to set the Joe's Pharmacy, Dairy and Film Processing Store to set up the Print-O-Matic so as NOT to slice through your negatives or slides when he runs them through the machine. (OK, you're going to send them to a reputable lab, of course, but even they to can [and have] made this same mistake). I would say, and REALLY suggest however, you mark the outside of your processing envelope - and the stick-on ID label you put on the film cassette (but now not over the bar-code that the film processing machine reads...) with "*DO NOT CUT* {or ELSE!}" Well, maybe leave off the "or else". You will of course get back your slides or negatives in a roll. In fact, IF you are intending to do positive prints, you may NOT want to have prints made when the negatives are first processed. You can also write "DEVELOP ONLY *DO NOT PRINT*."

You can then examine the negatives (before or after you cut them yourself) and decide which ones you want to print (as all may not have turned out well - let's be not too overoptimistic), and on what format to print them. ALSO, whether you are doing slides or prints at this point you may want to also order a PHOTO CD (a Kodak processing product). You can have a PHOTO CD made from uncut negative/slide film, and its a great way to reduce handling of the original material. IF you intend to do digital processing of your images make sure you get a PHOTO CD, not a PICTURE CD. They are different products, and the PHOTO CDs are of higher fidelity (resolution and photometry) then the PICTURE CDs. If you only want an electronic way to "quick look" your images and maybe e-mail them to your Aunt Bertha (Oh! That's where you know her from) who would not really appreciate your black-dot pictures anyway then a PICTURE CD would suffice.

FILM SELECTION/HANDLING

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Decide what kind of film you will use. Then if there is a choice (as there is with Kodak products) buy the "Professional" films. Standard emulsions like Kodachrome, etc. at all the "standard" film speeds are available in both "regular" (eg., KR-64) and "professional" (eg., PKR-64), variants. This is NOT just a marketing ploy, but "professional" is a misnomer. There regular films (at least Kodak's are exceptionally good), but the "P" series are better. First, when you buy a "P" film from a photo reseller you can be 99.999% sure that it is well in-date and has been kept cool (likely refrigerated) for extended life - not thrown on a shelf next to the animated Robo-Cop circa 1990 at the check out counter of your local K-Mart. More importantly, the P series films are the cream of the production run crop, as evidenced by witness sensitometry and densitometry during the quality assurance phase of manufacture and selection. For more details go to: <http://www.kodak.com/cgi-bin/webProductTypes.pl?type=Films> and follow the links for the Professional (or if you want to compare Consumer) films. Others will surely suggest films from other manufacturers - this is just from my own experience, and I will admit a bias toward Kodak emulsions. So, while I am not making a recommendation for a particular brand/type of film (my favorite happens to be the venerable Kodachrome 25-P, but I won't digress further), don't decide on eclipse morning to try out the new Rhino-Color 64 you purchased in Lusaka. Indeed you should have decided ahead of time on an exposure sequence (exposure time and/or f/stop variability) which will drive the selection of your film speed.

All contemporary medium-speed films have very fine granularity compared to those of only half a Saros ago. That said, however, slower films STILL are the champs as far as film grain size (and modulation transfer function response) are concerned. If you are using a relatively large image scale (long focal length lens) you will have to track the sun for long exposures taken (required with slow films to get the outer corona). Remember the Sun crosses it's own diameter as a result of its apparent movement through the sky almost exactly 2 minutes. In a 1/125th second exposure you likely will not notice it - but a 2 second exposure will certainly appear blurry. It's less noticeable with small image sizes (short focal lengths) simply because you won't have the same effective number of "resolution elements" across the solar diameter on the film with respect to the film's modulation transfer (or think of the resolution in lines per mm). Anyway, IF you choose a slow, or even medium speed film - ALSO bring a roll of fast film. IF there are not fully opaque (such as thin cirrus) clouds, you would likely be able to photograph right through them (with differing degradation, depending upon the cloud type, of course). However, the attenuation from clouds will require longer exposures - or faster film. In short, I usually bring the gamut from ISO 16 to the absurd ISO 3200 - just in case.

STABILITY

I am AMAZED at how many people think through their OPTICS, including cameras, and films, but then set up a heavy camera/lens or telescope on a rickety mount. Some of this is due to the "But, I'm only allowed 70lbs. (or 44lbs., or whatever) or luggage weight". Of course, one can always pay excess baggage, or pre-ship equipment. However, there are a few things you can do to beef up your tripod/mount stability without schlepping along barbell weights.

- 1) NEVER, NEVER, NEVER, "crank up" the pan head on your tripod. General rule: The higher the less stable.
- 2) Almost NEVER extend the multi-sectional legs on your tripod to gain a "convenient" viewing height. Close to the ground is good, you CAN photograph the eclipse on your knees or sitting on your derriere - believe me you really can.
- 3) ADD WEIGHT. Bring along plastic (neoprene or other) bags, like garbage bags, which you can fill with in-situ available materials such as sand, rocks, even water, and hang them from your tripod (at its horizontal plane center of gravity, or distributed around it). You would be amazed how "sturdy" even a really "cheap" tripod becomes when you hang 50 pounds of rocks from beneath it's center.
- 4) Stake down the legs/mount - or short of this, pile some heavy rocks around them. The LAST thing you want to do is kick your tripod at second contact as you are jumping for joy (see, I TOLD you to sit on your keyster) at the second contact.

FOCUS

It is REALLY easy to screw up your focus during the totality. Actually you should NEVER refocus during totality. Touching the focus ring (or knob, vernier, etc.) should be verboten during totality.

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1) Get your camera equipment set up at least a couple of hours before the eclipse. Focus WILL change with temperature (this is important for telescopes or long-focus lenses which can be par-focally adjusted). Do NOT assume that the "infinity" setting on long-lenses will necessarily really give you the best focus. Let your set up get into thermal equilibrium (or at least a quasi-equilibrium as the temperature will slowly be dropping through totality).

2) Establish "best focus" during the later stages of the partial ingress phase. It is quite easy to "peak up" your focus on the cusp of the occulted sun.

3) For camera lenses with focus rings: **TAPE DOWN THE FOCUS RING** so it cannot move after you have established "best focus". It is ridiculously easy, with many lenses, to reach for the f/ring - which you very well may want to adjust during totality, and grab the focus ring by mistake, and not ever notice it until you get your photos back and they look like they were taken through an empty mayonnaise jar. A little tape to secure the best focus position against an errant finger goes a LONG way in preventing this kind of disaster.

5) CENTERING

If you are not tracking the sun, remember it will "drift" across your camera field-of-view during totality. Depending upon your focal length you may have to make "centering corrections" occasionally during the eclipse. IF possible I would avoid this, as "unlocking" your pan head (which you would have to do in both the "vertical" and "horizontal" could lead to instability (when you forget to re-lock them) or even fumbling and losing the sun. This eclipse, for most of us, will last about 3-1/2 minutes. This means the sun will move by about twice its diameter during totality. If you are using a 400mm lens (As an example, but you can scale linearly) the field-of-view in the long dimension of a 35mm frame is about 7-degrees. The sun from contact II to III will move less than a degree (actually less than about 1/8 of the FOV width)]. Once you have your equipment set up, see how the sun "drifts" across your field. Then, shortly (about a minute) before second contact do a FINAL re-centering of the sun... but offset it a bit so it would drift through field center at mid eclipse, Even that is probably not necessary until you get into longer focal lengths. Of course, if you are tracking the Sun you needn't worry.

If you want to get a sense of what the solar motion through the sky, and the lunar motion w.r.t. the Sun (oriented with the Zenith "up"), from FIRST through FOURTH contacts from SE Zambia see: http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_01/ECLIPSE_2001_MVUU_ALTAZ.MOV and http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_01/WHOLE_ECLIPSE_2001.MOV

These are QuickTime movies. You can get a free Quicktime viewer for Windows at: <http://www.apple.com/quicktime/download/>

6) FILTER REMOVAL & COACHING

***** DON'T FORGET TO TAKE OFF YOUR SOLAR FILTER JUST BEFORE TOTALITY*****

Let me say this again:

***** DON'T FORGET TO TAKE OFF YOUR SOLAR FILTER JUST BEFORE TOTALITY*****

This is REALLY easy to screw up in the excitement of the eclipse. You should take off your solar filter about 10 seconds before second contact. This is when the last bit of photospheric arc is breaking up into Bailey's beads (unless you are very close to the Northern or Southern limit). Don't worry, there is not enough energy in the form of heat to damage, or even affect, your camera focal plane unfiltered at this point. BUT, don't LOOK through the camera at this point, it's still pretty bright and you don't want to have a residual (persistence) image on your retina during totality (or later in life...). Remember your last centering check should have been about a minute before this, while still filtered.

DON'T have screwed-on a screw-on filter. You really need to make it easy for yourself to remove the filter while you and everyone else has entered a state of Nirvana as you are thrust into the umbral shadow. Well ahead of time (like back home)



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work out a way to mount you filter so it pulls off, drops off removes, etc. off VERY easily in a way which will not disturb the pointing and focus (remember to tape down the focus your focus ring).

Hopefully, someone at your site will be calling out key times, like when to remove your filter. But if not, you may want to have pre-made a tape recording, to be started at a U.T. synchronized time to "coach" you through this critical moment. You, of course, can also put messages to yourself about your film speeds, how much time is left, etc. In fact you may want to have someone-else make the recording, a voice you would instinctively react to and obey without thinking. Eg.: "ONE MINUTE - Check Camera Focus ... TEN SECONDS - Remove Filters...
 ... + 5 SECONDS - take off your eye patch ... MID-ECLIPSE
 ... 10 SECONDS TO THIRD CONTACT...
 ...PLUS 8 DAYS - Honey, Take Out the Garbage..."

ALSO, DO'NT forget to PROTECT your camera focal plane against the heat of the Sun *AFTER* third contact. Likely you will be whooping up a storm, drinking champagne, and have forgotten all about the emerging solar photospheric disk which is now burning a hole in your camera shutter (and eclipse film) like an ant frying under a magnifying glass. Likely you will be too awestruck to immediately calmly replace your filter. So, after the 3rd contact diamond ring is over, if you don't get the filter back on, just point your camera away from the Sun, until you have regained your composure. Oh, yes, somewhere before "Honey, take out the garbage", put this reminder on your take as well.

There are LOTS of more tips out there, on this mail exploder, in books, and elsewhere. My intention here is not go through the details of building a photographic program, just to offer a few - hopefully - helpful preparatory pointers. There is probably a lot I am forgetting to mention, so I hope others will.

Penultimately, if you haven't this time, for 2002 consider:

<http://balder.prohosting.com/stouch/UMBGRAPHILE.html>

Finally, if this is your FIRST total solar eclipse, FORGET all of the above - just *WATCH* it and leave all of the photo-fumbling to the fool next to you (who might just be me ;-). Cheers, Glenn Schneider

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

I looked at the image, and don't consider what I see there as Baily's beads. They are merely breaks in the annulus. Baily's beads are an impressive phenomenon in which the last few beads of photosphere are the only part of the photosphere visible and therefore look so bright that they look like beads on a necklace. The last Baily's bead is the diamond ring.

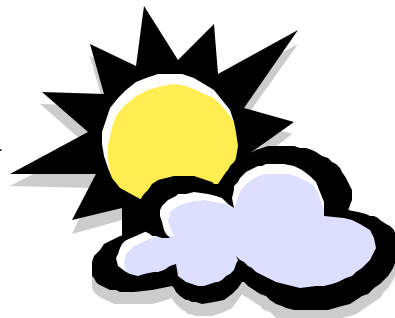
There is no possibility that anybody saw the chromosphere at this eclipse.

In the image shown, the sky was so bright that it was not at all as spectacular as Baily's beads.

The notation has been fixed for hundreds of years and we are not now free to apply names to different phenomena. Jay Pasachoff

From: Govert Schilling <mail@govertschilling.nl>

Jay: After looking at the photo, I agree that nobody would call these Baily's beads. However, isn't this mainly a matter of contrast? Suppose the moon was larger and the sun was smaller during this particular eclipse (so that it would actually be a TSE), and the rims of the sun and moon met at the same position angle where they do on the photo (so the observer would be on the edge of totality), wouldn't the 'breaks in the annulus' as you call them (the tiny parts of the photosphere that are visible through valleys in the moon's rim) be extremely nice Baily's beads? --Govert Schilling



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From: Yvonne Jacobs <ylj70@yahoo.co.uk> To:
<SOLARECLIPSES@AULA.COM> Sent: Thursday, May
17, 2001 3:53 PM Subject: [SE]

Annular eclipses

There's been some discussion about annular eclipses over the last couple of days, and I'd be interested to know what you actually see, and weather it's worth making a trip. Given that even just a minute before totality during a TSE, I felt nothing spectacular happened, I thought the effects of an annular probably weren't worth the trip. I'm not that experienced but I thought the diffence between 99% and 100% were immeasurable, and based on that, and annular would-n't offer much.

But I'm willing to have my mind changed if anyone has any good experiences to share. Thanks, Yvonne

From: Kidinvs@aol.com

My personal opinion is that I would not travel the world to see an Annular Eclipse. You must view the entire event with some sort of eye protection. However, I think that a Total/Annular might be an interesting thing to see. Eric Brown

From: Donald Watrous <watrous@cs.rutgers.edu>

But which side would you watch it from: total, annular, or the crossover point? You're only going to see one aspect of it and, judging from your comment above, you'd go for the total. Don

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

Nothing on Earth can compare with the spectacle of a total eclipse of the Sun.

NOTHING!

That being said, annular eclipses are quite interesting in their own right. I've been quite surprised at how dark the sky got at the two annular eclipses I've seen (1994 May 10, magnitude = 0.943; and 1999 Feb 16, magnitude 0.9906). Not anywhere as dark as totality, but it still got the hair on the back of my neck to stand up!

Annulars give you a good opportunity to test out your equipment and practice new techniques before the next total eclipse. There's also a great chance to observe and record Baily's beads. I also look for the crescent images projected under shade trees. I don't have time for this at total eclipses where I'm intent on observing/photographing the corona and have much equipment to attend to.

If you are so inclined, annulars offer the challenge to photographically capture the inner corona, prominences and chro-

mosphere. Once again I refer you to my 1999 annular eclipse report to get an idea of what an annular eclipse is like:

<http://www.mreclipse.com/ASE99reports/A99Espenak.html>

I find annular eclipses much more relaxing and less stressful, so they are actually more fun than totals, at least for me!

For all of these reasons, I'm organizing an expedition to Costa Rica for the annular eclipse on December 14 (<http://www.spearstravel.com/costarica01.htm>). - Fred Espenak

From: Kidinvs@aol.com

..... you hit the nail right on the head!!! Eric

From: Glenn Schneider <gschneider@mac.com>

Yvonne, A reply to your query is HIGHLY subjective, as what is "worth" the effort for one may not be so for someone else. For me, I have a very personal rule of "I don't do annulars". This is night to slight those who do, but is mealy a reflection of economic reality. I'm afraid my funds will not permit me to chase both totals AND annulars. That said, I do have a bit of slop in that rule, that I have called the "10 second tolerance" - if the DURATION of an annular eclipse is < about 10 seconds (which you can translate into a magnitude, obstruction, or other metric to your pleasing). While for such an eclipse the photosphere will not be instantaneously extinct completely everywhere simultaneously (around the limb) it is sufficiently covered to allow observation (with care) of the corona, and spectacular limb events, particularly if you DO locate yourself a bit off the very narrow centerline (also with care, looking at the limb profile) to extend the grazing phenomena near the grazing tangent point. With a very short annular you can experience not only a chromospheric arc, but a complete chromospheric ring, and Baily's beads will dance dynamically around the limb.

The first such eclipse I saw was the 1984 annular from North Carolina, where the duration of annularity was ~ 7 seconds. While NOT a total, it WAS an amazing event. I will try to scan and post some images from that eclipse (probably after this next TSE, as I'm rather time constrained at the moment), but we did see an amazingly extended chromospheric arc "rotate" around the limb as we were slightly off the center-of-figure line. That arc was punctuated with some "deep" beads which added to the unusual appearance of that eclipse. By simply holding up my thumb at arms length (very steadily) after third contact to block out the photospheric light, I could see the diminis-

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ing corona for more than half a minute. I have never built a moon-augmented coronagraph to photograph the corona more deeply from such an event, but I suspect that could be easily done (something to think about).

A second similar - but even more transitory - event I witnessed was the October 1986 "hybrid/annular/total" eclipse. I *THINK* Fred has classified it as an annular, from where we saw it at 44,000 ft. altitude I would call it "total" but in quotes. (There is still not universal agreement on the value of "k" which relates to the apparent angular size of the moon, but at many decimal places MUST be augmented for limb phenomena for eclipses like this). Actually I would be curious as to what Fred, or J. Meeuse (who had it listed many years predating that eclipse as "0m00s" in his wonderful Cannon of Solar Eclipses), would call it. In any case, it was SPECTACULAR. Perhaps the most memorable of any eclipse I have ever seen - though it was the shortest. For more about that amazing eclipse, with some photos see: http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_86/ECLIPSE_86.html or the Feb, 1987 Sky & Telescope for a short summary.

I was really torn two years ago about the Feb 1999 annular in Australia, as with limb corrections this would have fit in my "10 second tolerance" criteria. But economic realities made me choose between that and the TSE later that year. The latter one won. Still, it is quite apparent from Fred's wonderful pictures and report he recently pointed us to at: <http://www.mreclipse.com/ASE99reports/A99Esenak.html> that this was a very interesting eclipse. The actual degree of coverage at his location looks like it was less than the 1984 annular (i.e., more photosphere) at least from where I had seen it. The limb-uncorrected duration was much longer (outside my 10 second tolerance), whereas in 1984 the "smooth moon" gave a shorter duration. Perhaps we could coax Fred to compare these two.

So... in my opinion (for what it is worth), in general annulars are "fancy" partial eclipses, and I'll pass on most of them. Partial and Total eclipses may be connected as dynamical phenomena, but phenomenologically they are as different as night and day (somewhat literally - with license). Just as Roller Skates and a Rolls Royce are forms of transportation - and also sound alike, I would rather use the later. UNLESS the angular diameter ration of the Sun: Moon starts approaching unity. THEN it gets real interesting... Glenn Schneider

From: Francis Graham <francisgraham@rocketmail.com>
Dear Glenn, Yvonne, and List, I have coined a name for such an eclipse as the 1984 one seen in the Carolinas. A central eclipse of a perfectly spherical luminary by a perfectly spherical obstruction can produce only annular and total

eclipses. But the Moon is not perfectly spherical; it has mountains. I call the type of eclipse of May, 1984 "fractannular", since the ring was broken at all times. Francis Graham

From: Dale Ireland <direland@drdale.com>
Traveling the world has been half the fun of our eclipse hobby. I would have never seen El Paso TX without an annular eclipse :). What a great excuse to go to Costa Rica, I have always wanted to visit there and an annular would put the icing on that cake. We have worked all our recent "big" vacations for many years around eclipses. We always make the traveling and touring an important part which could be a big savior if the eclipse is clouded out. An annular is an excuse to travel. Dale

From: FRED ESPENAK <u32fe@lepvox.gsfc.nasa.gov>
I too saw the amazing annular eclipse of 1984 May 30 and I have some photos posted of it at the bottom of: <http://www.mreclipse.com/SEphoto/SEgallery1.html>

As you look at this mosaic of nine images taken over a period of about 45 seconds, you will see that the eclipse was never total, nor was it ever a complete, unbroken annular ring. At mid eclipse (middle image), the Sun's photosphere was broken up into a series of crescent segments and Baily's beads. Prominences, Chromosphere and inner corona were photographed. Really quite spectacular! Now I point out that I could not see any of this directly because the Sun was much too bright. Nevertheless, it was quite easy to photograph.

Dennis di Cicco shot a fabulous image of this eclipse by masking the exposed crescent with a 4.0 neutral density filter. It shows the inner corona and a large prominence. The image was published in Sky & Telescope in 1984 and is included in the Sky & Telescope slide set "Glorious Eclipses." It is also reproduced in the central color section of "Totality - Eclipses of the Sun" (Littmann, Willcox & Espenak - <http://www.mreclipse.com/Totality/Totality.html>).

This is such an unusual eclipse, that it really belongs to a different category than annular. I call it a "beaded annular" or "broken annular" eclipse.

Unfortunately, I missed the extremely short 1986 total eclipse described by Glenn Schneider (http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_86/ECLIPSE_86.html)

So how do the 1984, 1986 and 1999 eclipses compare? Using a mean lunar limb ($k=0.2722810$), I calculate the fol-

(Continued on page 24)

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lowing magnitudes and durations:

Date	Magnitude	Duration	Location
1984 May 30	0.9988	00m11.8s	Greenboro, NC (Espenak)
1986 Oct 03	1.0000-total	00m00.2s	Center Line at 19:06 UT
1999 Feb 16	0.9906	00m36.4s	Greenough, Australia (Espenak)
2005 Apr 08	0.9981	00m16.1s	Panama

Note that I've also included the hybrid eclipse of 2005 Apr 08. The total phase lasts 42 seconds out in the Pacific Ocean. If no cruise ships chase this eclipse, I will go for the beaded annular phase in Panama. The duration and magnitude are quite comparable to the 1984 eclipse. - Fred Espenak

From: Glenn Schneider <gschneider@mac.com>
Fred: You shocked me! Why limit this statement to the Earth? ;-) -GS-

From: Glenn Schneider <gschneider@mac.com>
I'm not sure if it was "fractannular", as that might imply self-similar at different spatial scales (which it is not), but it sure was spectanuular!

In my write-up of the Oct. 1986 eclipse, I had described the visual appearance of ever-changing Baily's beads as a "diamond tiara" rather than a "diamond" ring. I don't recall having come across that phrase before, but maybe I pulled it out of the deep recesses of my too-clogged mind. Has anyone here seen that appellation used before this?

ALSO: Though I asked this a couple of year's ago, there seem to be many more (or new) people here on Patrick's list. Did anyone else - by ship or air - see the central phase of the Oct 1986 eclipse? I've been looking for others to compare notes with ever since then with no success as of yet. I can't believe we were the only ones. Glenn Schneider

From: Peter Tiedt <rigel@stars.co.za>
Someone once said (and in this list too ...)

For a total eclipse - intercontinental travel is OK For an annular - within your home continent is OK For a partial - within your own state / province would be the furthest they would go.

Makes sense to me. Peter Tiedt

From: Govert Schilling <mail@govertschilling.nl>
I agree with what Dale Ireland wrote. In October 2005, there

will be an annular eclipse visible from central Spain (Madrid). Seems like a very good reason for me to pick that particular period for a nice visit/holiday to this inspiring city... But unfortunately, my bank account doesn't allow me to travel to each and every eclipse, so for the distant/expensive trips, I focus on the totals...

As for the question if there's something special about an annular: I've never seen one, but I would guess it's rather different from a partial eclipse: the view of the 'ring of fire' must be something special, right? Also the way in which the ring closes in on itself... I certainly want to see one sometime! --Govert

From: FRED ESPENAK <u32fe@lepvox.gsfc.nasa.gov>
>Fred: You shocked me! Why limit this statement to the Earth? ;-) -GS-



Because I have yet to get off-planet, and I want to keep an open mind 8-)

From: Mark
r a i n b o w s y m -
phony@rainbowsymphony.com>

I have seen a couple of annulars...one in Orange County at sunset '92...some of the photos from this sunset annular eclipse are classics. The second was in El Paso a few years later...very exciting and made friends I am still very close too today. It's as much as what it puts you in proximity to as the event itself. It's the journey!! Mark

From: Madden.G <iluvex@netacc.net>
I think this makes pretty good sense.

I would drive to say Ohio or Pennsylvania if the partial was, say, 80%. On Christmas Day I stayed home and had a good glimpse of a 30%er. I would not have gone more than 100 miles for that.

I think an annular is worth a trip to the West Coast (but not Hawaii or Alaska).

I saw the 1994 annular and thought is was quite wonderful. But I won't go to Costa Rica. madden/rochester

From: Bob Morris <morris@sce.carleton.ca>
The May 20 1996 "broken-ring" eclipse had a minimum central line duration as computed by the USNO of 0.4 sec. (Lat 39 30.0 long -27 01.7) Circular 109

Where I saw it, on the centerline where it intersected Ath-

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ens-Sounion Road, the predicted duration was 1 sec. (lat 37 28.9 long -23 28.1)

Can Fred provide a more accurate estimate of these times, assuming that we know delta T for May 66 better now than they did in May 66?

Also, was there any shorter duration central eclipse in the 20th century? Bob Morris

From: Bob Morris <morris@sce.carleton.ca>
The August 66 issue of Sky & Tel called the central phase of the May 20 1966 eclipse "diamond necklace".

I've been unsuccessful in finding out how far back this description goes.

A young lady described the April 17, 1912 broken-ring eclipse, seen from the western suburbs of Paris, as "an engagement ring," in Le Figaro.

I can give an exact reference if anyone wants it.

I believe that this indirect reference to diamonds is the first with respect to an eclipse. If anyone has seen an earlier one, it would be useful to know and establish.

>> ALSO: Though I asked this a couple of year's ago, there seem to be

I saw and photographed the central phase of the May 20 66, 1 sec duration.

(See Sky & Tel, Aug 66, p. 83.)

I have no notes, except that the sky was perfect, and about 100 people were on-site. And I took a regular bus from Athens, and got off when I saw this group at the spot where the path was predicted to cross the road!

I would argue (and I think successfully) that fewer people have ever photographed the relatively short central phase of a "broken ring central eclipse" than any other solar eclipse phenomenon. Bob Morris

From: Glenn Schneider @ Home <gschneider@mac.com>
Bob, I think this may be an "angles dancing on the head of a pin" question, as any annular/total eclipse has two points* somewhere along the centerline where the duration would be instantaneously zero, at least using a smooth lunar limb. Actually, the same MUST be true (if the central duration in the total part of the path is long enough) after applying limb corrections.

*Well, it could have just one if it were at very high |latitude|...

I would also be interested in Fred's computed duration for your location, to compare with the other "short" central eclipses recently discussed here on an apples-to-apples basis.

I don't have the USNO circular for the 1986 eclipse where I can get to it, so I don't know what they computed as a minimum (or maximum!) for that off hand.

From: Mike Simmons <msimm@ucla.edu>
The annular-total eclipse of 28 April 1930 had a duration of totality just a little longer than yours -- 1.4 seconds. A team from Mount Wilson Observatory made the short trip from Southern California in the USA to Honey Lake in Northern California to observe the total phase but was clouded out. The same had happened at the 10 September 1923 total eclipse just south of Los Angeles. Mike Simmons

From: Olivier "Klipsi" Staiger <olivier.staiger@span.ch>
> As for the question if there's something special about an annular: I've never seen one, but I would guess it's rather different from a partial eclipse: the view of the 'ring of fire' must be something special, right? Also the way in which the ring closes in on itself... I certainly want to see one sometime! --Govert

yes, there is much more to an annular eclipse than just a partial. Air may get cooler, depending on humidity and magnitude and daytime.

Also: a partial eclipse may last 3 hours, but an annular is shortlived like a total (though it may last a few more minutes). Thus, when it occurs, and when you see the ring, you realize how privileged you are to be here to see this rare event, which folks 100 miles away won't see. It is not as overwhelming as a total eclipse. But it is still a RARE event. Go for it!

From: Olivier "Klipsi" Staiger <olivier.staiger@span.ch>
> Nothing on Earth can compare with the spectacle of a total eclipse of the Sun. NOTHING!

Fred, I'll ask you the same question again but after November 18 ... I'm curious to see what you think of it, if it happens.

From: Olivier "Klipsi" Staiger <olivier.staiger@span.ch>
Certainly, you will not have the same thrill as for a total eclipse. But... Well, take the next three annular eclipses: Have you ever wanted to travel / spend a vacation to Costa Rica, or Mexico, or Iceland / Scotland? Bingo! And: they all occur near the horizon (sunset or sunrise), which allows - under certain conditions - to briefly see it without filter And: it is still a nice event to see some planets in daytime (Jupiter, Venus, even Mercury). And: seeing the Baily's beads (if you are on the edge) is surprisingly aesthetic and beautiful. And if you go to the centerline, seeing a "perfect ring" for 4 minutes is surprisingly

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enchanting. Yes, that is the word, I would say. Seeing a total eclipse is overwhelming. Seeing an annular eclipse is enchanting. I still prefer spending an enchanting day across the planet than having a dull day at home ... Go travel to the annular eclipse ! You'll discover new countries, new peoples, new cultures.

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

Using a mean lunar limb ($k=0.2722810$), I've calculated the magnitude and duration for Bob Morris' position during the 1966 May 20 eclipse. I list it below with other short annular eclipses for sake of comparison.

Date	Magnitude	Duration	Location
1966 May 20	0.9991	00m02.7s	Sounion, Greece (Morris)
1984 May 30	0.9988	00m11.8s	Greenboro, NC (Esenak)
1986 Oct 03	1.0000-total	00m00.2s	Center Line at 19:06 UT
1999 Feb 16	0.9906	00m36.4s	Greenough, Australia(Esenak)
2005 Apr 08	0.9981	00m16.1s	Panama



Although a duration of 2.7 seconds is predicted for Morris' position, corrections for the limb profile show that the eclipse was never truly annular but exhibited a broken or beaded annular phase as described. - Fred Espenak

From: Glenn Schneider <gschneider@mac.com>

Fred, et al., First thanks for your recent post via the [SE] mail exploder regarding the 1984/1986/1999 "broken annular"/"beaded"/"hybrid" (you pick, but I do like yours) eclipses. While I revel in the glory of true totality, these fleeting and highly dynamic phenomena are spectacular in their own unique way - different from a bona fide total. I would urge others on this mail exploder to put the 08 Apr 2005 eclipse on their list as a "close" annular if transport to the total part of the path cannot be found (though I suspect by sea or air it will). Two question for you, Fred, when you have time.

You had informed us (thanks again!) that:

Question 1. If you apply the limb corrections for the topocentric lunar librations for the west coast of Panama for the 08 April 2008 eclipse, what happens to the duration by the most conservative definition (i.e., last moment of internal tangency at 2nd and 3rd contact) as you would reckon it?

Question 2. Back to the 03 Oct 1986 eclipse, I believe we were located VERY close to the predicted centerline - as I had computed the path attempt at doing a "proper" atmospheric refraction correction for our 44,000 ft. altitude above MSL. In doing so I had presumed scale-heights and profiles for the atmospheric density/temperaure profiles starting at 21C and 1070mb taken from the literature**. Of course, this would deviate from in-situ reality, and I had no way to judge the fidelity of the atmosphere model we used except to INFER our position (displacement cross-track from centerline) based upon the bead phenomena we observed and mid-eclipse time. I would like to ask you what "duration" you would have predicted for our mid-eclipse intercept time (of 19:05:19 UT) at 44,000 ft (not at sea level, which is what I believe you have given as replicated above) applying what may be a better representation of the limb than I had available in 1986 when we planned this. With this, can I ask what the status/pedigree is of the limb corrections you may be using today (I presume as you have described in your most recent TP?). I had worked on this with Alan Fiala back then, and I *think* I had spoken to you about this as well, but my memory is failing me here. And, though it may be beyond the scope of a general posting, could you briefly summarize how you handle atmospheric refraction for specific places NOT at sea level? Maybe that normally is such a "detail" it gets lost in the noise (the effect of scale-height with altitude above MSL, not just solar elevation); do you bother with this for on-the-ground but not-at-sea-level predictions? I guess the bottom line is: to this day I am trying to better establish exactly where we were, but maybe I have already pushed that as far as I can - but maybe you have another idea in that regard as well. FYI - The sequence of images I have from that eclipse are taken about every half second (I have the exact delta-times) so there are many more images available for a proper limb analysis (which I did in an analog fashion in the good-old days), just not digitized or posted on the referenced (below) web page.

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**Just for background a summary of this is also on: http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_86/ECLIPSE_86.html which I know you have seen, and to this day I think makes sense as to how the refractive "problem" was handled, but if you have an opinion on that (for future eclipses - thinking way ahead!) I would welcome it. Cheers, Glenn Schneider

From: Glenn Schneider <gshneider@mac.com>
In question 1 where I had written "2008", I obviously meant 2005. Sorry for the error. -GS-

From: FRED ESPENAK <u32fe@lepvox.gsfc.nasa.gov>
I've just posted an animation of my still photos of the 1984 beaded annular eclipse. It shows the motion of the Moon and the complex morphology of the beads during the 45 seconds centered on maximum eclipse. The animation shows these events speeded up by about a factor of 10, but it gives you a good idea of how dynamic such an eclipse appears.

The animated GIF is located at the bottom of this page: <http://www.mreclipse.com/SEphoto/SEgallery1.html>
I very much want to see another eclipse of this type so I am looking forward to the hybrid eclipse of 2005 April 08. The beaded annular phase will occur from Panama. - Fred Espenak

From: Marc Weihrauch <marc.weihrauch@student.uni-halle.de>
What, actually, happens to these crescents during annularity? Do they turn to rings? Best regards, Marc

From: Carton, WHC <Wil.Carton@corusgroup.com> To: <patrick_poitevin@hotmail.com> Sent: Friday, May 18, 2001 10:35 AM Subject: 1. Annular eclipse ; 2. Corona color

Am I allowed to react to some SEMML-messages? [I react indirectly via the mailbox of Patrick because of complains (by E.Zucker and J.Meeus) that my messages are polluted with senseless html-attachments; these are caused by my company's present mixed mailsoftware-structure during a phased conversion from MS Exchange to Lotus Notes, says my helpdesk].

1. Govert Schilling wrote: "I've never seen one, but I would guess it's rather different from a partial eclipse: the view of the 'ring of fire' must be something special, right? Also the way in which the ring closes in on itself... I certainly want to see one sometime! "

I observed the annular solar eclipse of 29th April 1976 in Rhodos City on the Greek island Rhodos. The obscuration was 94% and the annular phase lasted 5 minutes, the sun's altitude about 70 degrees. It was not spectacular. It is in fact

only a peculiar partial eclipse, in which the crescent grows to a hors-shoe with its cusps creeping to each other and then form a closed ring. This happened without changing of the daylight, that already from magnitude > 0,8 had the flatness of a flood-lighted film set. The landscape looked like a faded old color picture. The blue sky had changed to purple, and during the annular eclipse we (my family) could see white snow peaks on the Turkish coast on the northern horizon 10 kilometers northward. Prior to the eclipse we were not aware of that weak features on the horizon.

Very remarkable was the temperature drop. People on the beach complained that they got cold. Solar rays gave no warmth any more. I decided that I should not spend inter-continental travels to annular eclipses in the future. Because I am an European, my only next annular will be the 3 October 2005 ASE in Spain, I hope together with Govert, whom I admire for his great journalistic astronomical oeuvre in Dutch newspapers, magazines and popular books.

2. Eric Brown wrote: "I have never really noticed any "motion" per sey.....

However, through a pair of Meade 11x80 binos that I love to use for a TSE, the corona seems to sort of shimmer. It is so difficult to explain, as are all the phenomena of a TSE, but the corona seems to be a very calm sea of beautiful white light, with the blackest of black in its center."

My reaction: Motion on the sun is going on, but totality on a specific location is too short to notice that. But during the TSE of 16 Febr 1980 in Kenya we saw a tennisracket structure, buth 1.5 hours later during totality in India, the "racket top" had been blown up and only two "spokes" remained. Serge Koutchmy told me in Antwerp (14, 15 October 2000) that this was a coronal mass ejection that coincided with a TSE on Earth. About the color of the corona, I declare after seven successfull eclipses, that it is very similar to the color and beauty of silverwhite ornamental firework, in motionless serenity. And prominences looks like magnificent magenta precious stones, that glitters much more intense than the thready coronal veil does. On pictures this is never well expressed, helas. Regards, Wil Carton.

From: Govert Schilling <mail@govertschilling.nl>
Marc: Yes, of course, but they might be too dim to be clearly visible (?) --Govert

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

Well, but look at these: I saw a partial eclipse on the Easter Island, on Kangaroo Island, on Baffin Island. All of these were worth the trip, even if no eclipse had occurred.

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Go travel the 3rd planet, from A to Z. Unless you're Dennis "the menace" Tito, you'll never get elsewhere (except heaven, eventually :-)

From: Olivier "Klipsi" Staiger <olivier.staiger@span.ch>
they certainly do, specially if the magnitude is not close to 1, but rather 0.9 or so. But of course, most people look up at the sun when the ring appears, instead of looking under the trees. It is a little like for the shadow bands: all concentration focuses on the sun at a certain moment, when other things may be seen elsewhere. Klipsi

From: Daniel Fischer <dfischer@astro.uni-bonn.de>
Well, I think the actual ring phase of an annular eclipse is both boring and depressing - it's the CONTACTS that count here. The dimming of the overall light starts out the same way as during the 1st partiality of a total eclipse, but right at the moment when one (as a seasoned totality watcher :-) expects the climax: Nothing! The dimming just stops at a certain level and doesn't change any further throughout all of annularity.

Therefore I try to shorten this phase and at the same time increase the one aspect that's better with annular than with total eclipses: This aspect is the high-speed development of the solar crescent just before 2nd and after 3rd contact. With a total eclipse the crescent just shrinks, more or less quickly, and then vanishes - but when the eclipse is annular it gets bigger and bigger, and ever faster the two 'horns' race towards each other until they finally meet in a striking display of Baily's Beads, just before the ring closes.

There are a few excellent video tapes of this phenomenon around, but they are rarely displayed outside the IOTA community (where such tapes are recorded in an attempt to measure the diameter of the Sun at extreme precision). The best one ever I saw was shown during the after-annular-eclipse party in Geraldton, Australia, in 1999, shot by an American with extreme magnification: Dozens and dozens of BB's appeared in rapid succession, to finally merge with the crescent itself. Daniel

From: Bob Morris <morris@sce.carleton.ca>
The broken ring eclipse is in a class by itself: the crescent of sun gets thinner and thinner until it is a 180 degree arc. The arc does not shrink as in a total eclipse.

Then, the ends of the arc break up, and a 360 degree broken ring (diamond necklace) appears -- and exists for only a few seconds!

In 1966, about 1 sec (more or less) at my location in Greece.

I will be posting the description of the "diamond necklace" phase as observed west of Paris on April 17, 1912 (and reported in Nature) in a few days. Their description is very unusual! Bob Morris

From: FRED ESPENAK <u32fe@lepvax.gsfc.nasa.gov>
During annularity on 1994 May 10, we projected little annular rings onto the ground using a straw hat! - Fred Espenak

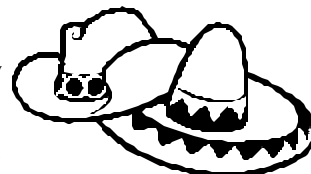
From: Eric Pauer <pauer@bit-net.com>
During annularity, you can see lots of little "rings" on the ground. I distinctly remember this effect during the 10 May 1994 annular eclipse which I viewed from Manchester, New Hampshire (USA). The leaves in the trees provided ample and effective filtering. It was very interesting to observe--crescents, rings, then crescents again. This annular eclipse was a magnitude 0.943, but since I was near the southern limit, annularity lasted only 2 min 16 sec (it was 6 min, 8 sec on the centerline). I also remember the sunlight becoming a weird steely grey for a few minutes before, during, and after annularity (max obscuration was 89%). I think annular eclipses are interesting in their own right. Regards, Eric

From: Kidinvs@aol.com
Straw hats are great to use for this... In Baja '91, we had a dozen or so straw hats, and projected crescents everywhere... we counted 13-14 million.... well, maybe not that many. Eric

From: Evan Zucker <ez@MrTotality.com>
Another great way to do this is to use a colander, which is a strainer used with pasta. Of course, it may not be as convenient to carry to the eclipse site as a hat, which serves double duty (unless you were planning on cooking pasta anyway!). -- EVAN

From: Marc Weihrauch <marc.weihrauch@student.uni-halle.de>

Dear Eric, and everyone else, I'm not an experienced eclipse chaser. The upcoming event will be my second total one, and the first without clouds (cross your fingers!). I've never



seen an annular one, but from what I heard here I do believe that they are a fascinating thing, and sooner or later I want to see one. On the other handside I have to pick "my" eclipses very carefully, and totals will have priority. Probably I'll go for the annular in 2005; Spain isn't that far from Germany. Thank you all for your answers. Marc

From: Marc Weihrauch <marc.weihrauch@student.uni-halle.de>

Hi there,
> Another great way to do this is to use a colander, which is a strainer used with pasta. Of course, it may not be as

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From: FRED ESPENAK <u32fe@lepvax.gsfc.nasa.gov> To: <SOLARECLIPSES@AULA.COM> Sent: Wednesday, May 16, 2001 10:37 PM Subject: [SE]

Baily's Beads

>The notation has been fixed for hundreds of years and we are not now free to apply names to different phenomena.

Francis Baily first described his famous beads after viewing the ANNULAR eclipse of 1836 May 15 (magnitude = 0.950). This phenomenon, the breaking up of the solar limb into a series of bright points and short segments just before 2nd and just after 3rd contact is visible at both total and annular eclipses.

Of course, during annular eclipses, you usually watch this event through a solar filter of some sort. I don't have Baily's paper in front of me, but I assume he probably used projection with his telescope.

At total eclipses, Baily's beads are usually observed without a solar filter so the phenomenon appears far more spectacular.

The recent annular eclipse of 1999 Feb 16 was nearly total with a magnitude of 0.9906. I observed the event from western Australia where the annular phase lasted a mere 9 seconds! Since the magnitude was nearly 1.0, I photographed the central phase without a solar filter. Although it was too bright to watch visually, I managed to photograph Baily's beads, prominences, and chromosphere. You can even detect the presence of the inner corona on some frames where the Moon's dark limb is silhouetted against a brighter background beyond the chromosphere. For more details and photos, see my report posted at:

<http://www.mreclipse.com/ASE99reports/A99Espenak.html>

Now I have also seen photographs taken by German amateur Freidhelm Dorst of the annular eclipse of 1995 Apr 29 (magnitude 0.9497) in which he also captures prominences and chromosphere using a telescope without solar filter. It IS possible, though I didn't believe it until I saw his images. Of course, visually observing these features at an annular eclipse is a dangerous proposition which I do not recommend. - Fred Espenak

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

I stand corrected. Thanks, Fred. Jay Pasachoff

From: Michael Gill <eclipsechaser@yahoo.com>

On page 42 of Sky & Telescope's August 1994 edition, there is a picture (unfiltered) credited to Conrad Pope showing the photosphere, chromosphere and a hooked prominence on a single exposure. This was taken from the northern limit of the May 10th 1994 annular eclipse.

Although some photographs taken at the diamond-necklace annular of May 30th 1984 showed similar features, as did some photographs taken at the February 1999 annular (magnitude 0.993) Mr Pope's photograph was the first that I'd seen exhibiting this phenomenon at a 'typical' annular eclipse (magnitude 0.943).

On the same page there is a picture (filtered) of Baily's Beads taken by Alberto Levy who was at the northern limit in New Mexico for this eclipse. Michael Gill.



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From: Ron Baalke <baalke@ZAGAMI.JPL.NASA.GOV> To: <HASTRO-L@WVNVM.WVNET.EDU> Sent: Friday, May 18, 2001 12:48 AM Subject:

Changes In Sun's Intensity Tied To Recurrent Droughts In Maya Region

News & Public Affairs, University of Florida, Contact Information: Mark Brenner, (352) 392-2231, brenner@ufl.edu

Writer: Aaron Hoover, ahoover@ufl.edu Sources: David Hodell, (352) 219-8873, dhodell@geology.ufl.edu May 17, 2001

CHANGES IN SUN'S INTENSITY TIED TO RECURRENT DROUGHTS IN MAYA REGION

GAINESVILLE, Fla. -- The Maya were talented astronomers, religiously intense in their observations of the sun, moon and planets. Now, new research shows something in the heavens may have influenced their culture and ultimately helped bring about their demise.

In an article set to appear in Friday's issue of the journal *Science*, a team of researchers led by a University of Florida geologist reports finding that the Yucatan Peninsula, seat of the ancient Maya civilization, was buffeted by recurrent droughts. More importantly, the research shows, the droughts -- one of which is thought to have contributed to the collapse of the Maya civilization -- appear to have been caused by a cyclical brightening of the sun.

"It looks like changes in the sun's energy output are having a direct effect on the climate of the Yucatan and causing the recurrence of drought, which is in turn influencing the Maya evolution," said David Hodell, a UF professor of geology and the paper's lead author.

In 1995, Hodell and two colleagues at UF published results in the journal *Nature* suggesting that the ninth-century collapse of the Maya civilization may have been influenced by a severe drought that lasted for more than 150 years. The paper, co-authored by Mark Brenner, a UF assistant professor of geology and director of UF's Land Use and Environmental Change Institute, and Jason Curtis, a UF geology researcher, was based on analysis of a sediment "core" from Lake Chichancanab on the north central Yucatan Peninsula in Mexico.

Cores are samples of lake sediment retrieved by driving a hollow tube into the lake bottom. The sediments are deposited layer by layer, like a wedding cake, with the oldest layer at the bottom. Such cores provide a timeline that allows researchers to obtain a continuous record of changes in climate, vegetation and land use.

For the latest research, Hodell, Brenner and Curtis returned to the lake and collected a new series of cores. The researchers discovered layers of calcium sulfate, or gypsum, concentrated at certain levels in the cores. Lake Chichancanab's water is nearly saturated with gypsum. During dry periods, lake water evaporates and the gypsum falls to the lake bottom. The layers therefore represent drought episodes. The researchers found the recurrence of the deposits is remarkably cyclical, occurring every 208 years, although they varied in intensity.

The 208-year cycle caught the researchers' attention because it is nearly identical to a known 206-year cycle in solar intensity, Hodell said. As part of that cycle, the sun is most intense every 206 years, something that can be tracked through measuring the production of certain radioactive substances such as carbon-14. The researchers found the drought episodes occurred during the most intense part of the sun's cycle.

Not only that, the researchers found the droughts occurred at times when archeological evidence reflects downturns in the Maya culture, including the 900 A.D. collapse. Such evidence includes abandonment of cities or slowing of building and carving activity.

As Hodell said, the energy received by the Earth at the peak of the solar cycle increases less than one-tenth of 1 percent, so it's likely that some mechanism in the climate is amplifying the impact in the Yucatan.

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Archaeologists know the Maya were capable of precisely measuring the movements of the sun, moon and planets, including Venus. Hodell said he is unaware, however, of any evidence the Maya knew about the bicentenary cycle that ultimately may have played a role in their downfall. "It's ironic that a culture so obsessed with keeping track of celestial movements may have met their demise because of a 206-year cycle," he said.

The cycle continues to the present, which happens to fall into about the middle of the 206-year period, Hodell said. Even a severe drought today, however, isn't likely to have the same impact on the culture as in ancient times. Brenner noted North Korea currently is suffering an extreme drought, but the country has the benefit of international aid.

"Nobody stepped in to help the Maya out," he said, "and as conditions worsened, it probably created a lot of stress among various Maya cities competing for resources."

Thomas Guilderson, of the Lawrence Livermore National Laboratory, assisted the UF scientists in the research, which was funded by the National Science Foundation Paleoclimate Program. The cores were collected for a BBC program on climate and Maya culture collapse.

From: Tom Settle <tsettle@RAMA.POLY.EDU>

Very interesting. For the record, and making no hypotheses, 208 is four times 52. So what? Fifty two years was the length of one of the prime calendar cycles for the Maya. Were Hodell et al. aware of that? Tom Settle

From: FRED ESPENAK <u32fe@lepvox.gsfc.nasa.gov> To: <SOLARECLIPSES@AULA.COM>; <eclipse@hydra.carleton.ca> Sent: Wednesday, May 02, 2001 6:13 PM Subject: [SE]

SENL April 2001 NOW ONLINE!

Joanne Edmonds has prepared another issue of the SENL (Solar Eclipse Newsletter). The April 2001 issue (Parts A & B) is now online in pdf format and can be accessed via the SENL index page of MrEclipse.com:
<http://www.mreclipse.com/SENL/SENLinde.htm>

Other recent issues currently online from the above page include:

SENL - August 2000 (Old Format, 65 Kb pdf file*)
SENL - September 2000 (Old Format, 93 Kb pdf file*)
SENL - October 2000 (Old Format, 62 Kb pdf file*)

SENL - November 2000 (1.4 Mb pdf file*)
SENL - December 2000 (995 Kb pdf file*)
SENL - January 2001 Special A (1.2 Mb pdf file*)
SENL - January 2001 Special B (0.9 Mb pdf file*)
SENL - January 2001 Special C (1.1 Mb pdf file*)
SENL - February 2001 Part A (1.0 Mb pdf file*)
SENL - February 2001 Part B (1.1 Mb pdf file*)
SENL - March 2001 (1.1 Mb pdf file*)
SENL - April 2001 Part A (1.3 Mb pdf file*)
SENL - April 2001 Part B (0.9 Mb pdf file*)

Note that all these files are in Adobe pdf format and can only be read with Adobe Acrobat Reader. This software is free and can be downloaded from Adobe's web site (<http://www.adobe.com/>).

The old format issues have no color, no figures or photos while the newer issues contain graphics, photos and illustrations.

Thanks for the hard work Joanne! - Fred Espenak

GENERAL TOPICS

From: <Rayabrooks2@cs.com> To: <SOLARECLIPSES@aula.com> Sent: Friday, May 18, 2001 12:29 AM Subject: [SE]

CORONA

Can anyone report whether they seem to discern any motion in the corona during a TSE? Negative and positive reports are equally important. Thank you, Raymond Brooks

From: Kidinvs@aol.com

I have never really noticed any "motion" per sey..... However, through a pair of Meade 11x80 binos that I love to use for a TSE, the corona seems to sort of shimmer. It is so difficult to explain, as are all the phenomena of a TSE, but the corona seems to be a very calm sea of beautiful white light, with the blackest of black in its center. Eric Brown

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

Using the naked eye, or even binoculars, the image scales are too large to see any motion in the corona during the several brief minutes of totality. If you've seen any motion, I suspect that it's an (Earth) atmospheric effect or turbulence. In a dozen total eclipses, I've never see any motion in the corona. - Fred Espenak

From: Michael Gill <eclipsechaser@yahoo.com>

I have never observed movement in the corona during a TSE.

However, suppose we get lucky and a coronal mass ejection (CME) occurs on June 21st at the solar limb. We know that velocities in these CMEs can reach 1000km/s:

http://cdaw.gsfc.nasa.gov/CME_list (as I write this some of the links are broken, but try Feb 2000)

If we have 180+ seconds of totality available to us, then material propelled out by the CME could reach $180 * 1000 / 1391000 = 13\%$ of the solar diameter. Surely, under these circumstances observers might be able to detect motion in the corona, or at least obtain time-lapse images of coronal movement during a TSE CME?

Did any observers see motion in the 'Tennis Racquet' feature in February 1980? Michael Gill.

From: <Rayabrooks2@cs.com>

Thanks for the reports. I have often been justifiably accused of slapping numbers on everything. I don't know why I have not done that with this issue until last week. In the back of my mind for the six TSE's I have witnessed (only 2 had perfectly clear blue non-hazy skies), I guess I just defaulted to assuming motion is undetectable at 100 million miles away. Certainly the 8,000 MPH sunspot speed is completely undetectable. The solar wind speed as I said last week is a solar diameter per hour which is not detectable by the eye even with binoculars. Light speed (magnetic effect) would have a proper motion of a solar diameter in 4.65 seconds and this is the "range" which I have so far deluded myself into thinking I might have seen using binoculars.

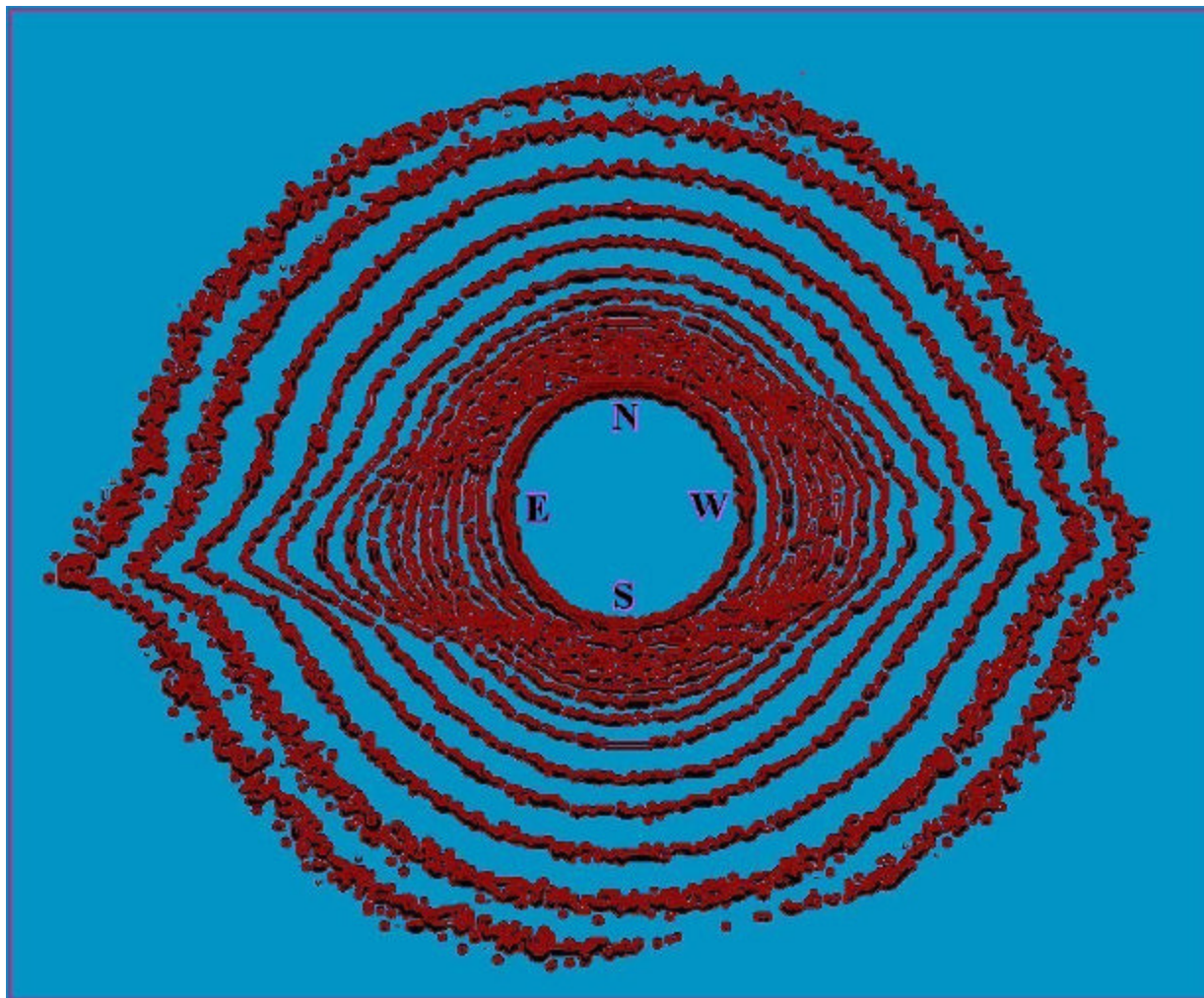
Sometimes one needs to verbalize an issue to resolve it..... or more pertinent to even first make it an issue. "Hey hon, is there a red fleck on that bird?" "Yeah, I guess I never noticed it."

I don't recall ever reading whether someone even attempted to look for motion. So now I have a reason to bring my monster 25x 100mm binocs just for the eclipse. I generally bring my 12x 80's. But I think the biggest weapon I have now is just consciousness of the question. So I promise to report on it if we don't get clouded out. Further I promise to couch it as definitely yes or no, not I think I saw. Raymond Brooks

From: Judy Anderson

Dear All: In answer to Raymond Brooks question if anyone has discerned motion in the corona during a TSE. I would like to respond that I certainly noticed a "pulsating" effect at the TSE in July, 1991, from Mexico. I was using 9 x 63 binoculars, and I have not seen this particular feature at any other TSE. I would like to know if it was atmospheric perturbations or what caused it. Whatever it was, it was certainly memorable. I can't afford the Africa TSE this year, so I will attend the Annular in Costa Rica. This will be my second Annular and the shadows are fantastic. I just enjoy Any kind of solar eclipse. Keep looking up, Judy Anderson, Mobile, AL USA

GENERAL TOPICS



From: Patrick Poitevin To: SE Mailing List Sent: Tuesday, May 22, 2001 8:49 PM Subject: [SE]

Coronal Mass Condensates

Dear All, Please find message below. Any replies, please send them straight to Bharat Adur: bharatadur@hotmail.com Best regards, Patrick

From: Bharat Adur To: Patrick_Poitevin@hotmail.com Sent: Sunday, May 20, 2001 10:19 AM Subject: To be on Your Mailing list

Dear Dr.Patrick Poitevin , I have following several Solar Eclipses with hope to understand if there is any material around the solar corona trapped by the streamers. I have called them CORONAL MASS CONDENSATES (CMC). Are you aware of any material on this topic available with you. Also please keep me on your Mailing List. regards, Bharat Adur

From: Jean Meeus
<JMeeus@compuserve.com> Sent:
Friday, May 11, 2001 7:27 PM Sub-
ject:

Delta T

On 2001 April 1, the difference "Delta T" between the uniform Dynamical Time and the Universal Time was 64.16 seconds. Jean Meeus

GENERAL TOPICS

From: Mike Simmons <msimm@ucla.edu> To: <SOLARECLIPSES@AULA.COM> Sent: Tuesday, May 22, 2001 10:45 PM Subject: [SE]

Eclipse article

Griffith Observer published by Griffith Observatory in Los Angeles, June 2001 issue, "The Eclipse Chasers" an article on 19th century eclipse chasing by Trudy Bell.

<http://www.griffithobs.org/Observer.html> for information on the publication but the article is not available online. Mike Simmons

From: Michael Gill <eclipsechaser@yahoo.com> To: <SOLARECLIPSES@AULA.COM> Sent: Wednesday, May 23, 2001 11:54 PM Subject: Re: [SE] Eclipse article

Trudy Bell's article "Ingenuity in the Moon's Shadow" that appeared in "The Sciences" can be read at: http://www.nyas.org/membersonly/sciences/sci9911/bell_body.html Michael Gill.

From: Patrick Poitevin <patrick_poitevin@hotmail.com> To: SE Mailing List <SOLARECLIPSES@AULA.COM> Sent: Thursday, May 10, 2001 9:02 PM Subject: [SE]

Eclipse reference

Dear All, The magazine of British Airways of May 2001, Essential, spends an article about Zambia: The global view, Fall's Gold. Of course the solar eclipse has a small brief as well: Zambia and the Eclipse.

Keep those solar eclipse related messages coming... Best regards, Patrick

From: Patrick Poitevin <patrick_poitevin@hotmail.com> To: SE Mailing List <SOLARECLIPSES@AULA.COM> Sent: Tuesday, May 22, 2001 9:25 PM Subject: [SE] References: Astronomia y Universo May 2001

Dear All, Please find following solar eclipse related references:

Astronomia y Universo May 2001

Tiempo de maximos by Alphonso Lopez Borgonoz, page 8 and 9

El Eclipse de los 1.200 kilometros by Ander Alcala Pascua, pages 28 to 31

Heliofisica par Al Fargani Ben Azahara, pages 48 and 49

El Sol: Una Estrella de Pelicula (part 3) by Jose Carlos del Toro Iniesta, pages 70 to 74

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

From: <KCStarguy@aol.com> To: <undisclosed-recipients::> Sent: Thursday, May 31, 2001 1:20 AM Subject: [eclipse] eclipse sightings

Eclipse sightings by Dr. Eric Flescher (KCStarguy@aol.com)

5/30 Quest and Astronomy magazine images of the 8/11/1999 totality and partial stages taken by Robert Turner

(I guess this magazine it takes awhile for them to get "current" pictures and cover main events)

5/30 Scientific American magazine June p. 47 article about how the solar corona gets so hot 8/11/1999 picture By Jay Pasacoff's crew of the solar corona with their instruments

GENERAL TOPICS

From: Hal Couzens <hal@dneg.com> To: <solareclipses@Aula.com> Sent: Friday, May 11, 2001 1:31 PM Subject: [SE] **Eggs**

Hi All, Is it possible for an egg to be balanced upright during a TSE? Regards, Hal Couzens

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

yes. but not because of the eclipse, but simply because you can do so also when there is no eclipse. Try it now. Sometimes you're lucky, sometimes you can do it. sometimes not. I did it, even got photos to prove it. It is a myth, got nothing to do with the eclipse. see <http://eclipse.span.ch/eggstand.htm>

I first heard about that egg myth when in Malaysia for the annular solar eclipse august 22 1998.

I fell for it . See <http://eclipse.span.ch/august22.htm> , and scroll down to the part about the eggs after the eclipse. It looked quite convincing. Then, later, back home, my little brain woke up of its lethargy, and started thinking, and so I did the test when no eclipse occurred, and the eggs were standing again.

The best thing to do with eggs is still to eat them (or, occasionally, throw them at certain politicians :-)

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

I think I have a few things a bit more pressing to be concerned with during my 3+ minutes of totality. But, you are welcome to spend your time trying, and report to us on the results. If you will be in Zambia/Zimbabwe why not try an Ostrich egg - that surely will help settle the matter. -GS-

From: Hal Couzens <hal@dneg.com>

ah well thanks for that, i got pretty excited by the idea and came up with a series of ideas for short films based around it. i'll just bury them quietly now.

i am glad it was you who dispelled this illusion, reasons to follow. Are you going to be in Zambia this year?

From: F.Podmore <podmore@science.uzac.zw>

At the Antwerp SE conference last year, someone (I think it was Sheridan Williams) gave me a photocopy of a newspaper article (The Malaysian Times I think) which was a largish photograph of an egg on end!!!!

But I don't believe for a moment it was a genuine physics demonstration - much more likely it was what my elderly father calls 'a clever piece of kidology', i.e. a trick to confuse/impress the uninitiated onlooker. Francis

From: Glenn Schneider <gschneider@mac.com>

There is a great web-site, the "Bad Astronomy" site managed by Phil Plait, which very nicely explains and de-hoaxes the egg-standing on end myth. While Phil discusses (and demonstrates) this for the equinoxes, it is equally germane to the discussion here re: eclipses. Cheers, Glenn Schneider

From: Marc Weihrauch <marc.weihrauch@student.uni-halle.de>

Hi there, I heard that rumour, too, or rather read it on Klipsi's website. The idea is that the united gravitation of sun and moon holds the egg up, right? Well, there are two plain reasons it doesn't work:

First, the force is far too weak. If it worked during totality because of sun and moon meeting in the sky, it had to work on an airplane in a few thousand meters height just as well, because of the larger distance to earth.

Second, even if the force was strong enough to make a distinct effect, it would almost always pull in the wrong direction!

Unless you have mid-totality right in the zenith, the gravitation of sun and moon tries to pull the egg out of its upright position.

Best regards, Marc

From: Glenn Schneider <gschneider@mac.com>

I had forgotten to post the "egg" URL: http://www.badastronomy.com/bad/misc/egg_spin.html

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From: F.Podmore <podmore@science.uz.ac.zw>

The website is www.badastronomy.com and there is a link on the home page to eggs on end at Vernal Equinox!!! [Sorry, Patrick - not quite eclipse-relevant!] Francis

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

This makes it all the more bizarre that the egg myth emerged around the annular eclipse of 1998 in Malaysia, where the eclipsed Sun was low on the horizon. If there were such an 'effect', it should have manifested itself dramatically for millions of Mexicans in 1991 when the (totally, for 7 minutes!) eclipsed Sun was near the zenith ... Daniel



From: John Leppert <johnleppert@peoplepc.com> To: <SOLARECLIPSES@AULA.COM> Sent: Wednesday, May 09, 2001 9:58 PM Subject: [SE]

EmapWIN software use on handheld PCs...

Has anyone used the EmapWIN V1.01 software on a handheld PC? I'm considering purchasing a HP Jornada 720 which has a 3/4 size keyboard and a 6.5-inch screen, thus larger and more functional than a HP Jornada 548 which is a "palm"-type unit. So, anyone had experience running it on the 720 or the smaller Palm or HP Jornada units? John Leppert Bismarck ND

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

Hi John, Current version of EmapWin is 1.21 Does 1.01 refer to a WinCE executable? If yes please let me know the Url to download and test it.

Does the HP jordana 720 runs under Win X enabling the possibility to run directly Win 95 applications? Cordialement / Regards Jean-paul.godard@noos.fr

From: Glenn Schneider <gschneider@mac.com> To: <SOLARECLIPSES@AULA.COM> Sent: Wednesday, May 09, 2001 11:11 PM Subject: [SE] UMBRAPHILE 2.3.1 advisory for Palm Pilot Users

Please note. If you have the Palm "Serial Port Manager" installed on a MAC on which you wish to run UMBRAPHILE, you *MUST* disable it by the "HotSync" menu in the Palm Desktop HotSync menu. There is NO control panel for this, and no Chooser item (thanks, Palm!). UMBRAPHILE will report an error "Unable to Reprogram Serial Port" if you do not do this. This error will occur even if you are not running your Palm Desktop S/W. If this has happened to you, this is the solution. Cheers, Glenn Schneider, gschneider@mac.com <http://balder.prohosting.com/stouch/UMBGRAPHILE.html>

From: <Jay.M.Pasachoff@williams.edu> To: <solareclipses@aula.com> Sent: Thursday, May 17, 2001 12:01 AM Subject: [SE]

GPS deviations

By accident, I ran into an excellent discussion on the Royal Observatory Greenwich's site on the question "Why does GPS receiver operated on the zero meridian at Greenwich indicate a longitude differing by about 100 metres from zero?" The question is very relevant to the thread on this mailing list about GPS accuracy.

See www.rog.nmm.ac.uk/leaflets/longitude/longitude.html.

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The major points are: "The basic longitude from a GPS receiver is referred to WGS 84..., which is a geocentric frame...referred to a spheroid that best fits mean sea level over the whole globe.... It is also the case that the longitudes, latitudes, and heights from this system will not agree well with those from Ordnance Survey maps anywhere in the UK and similarly in other countries it will be found that GPS coordinates will not agree well with the best maps of those countries. This is because within any country or region the maps are referred to a spheroid that best fits the sea level or mean land level of that region. This is necessary in order to give a sensible height system, in which heights are zero at the coast, and in which water flows downhill!" "As an example, at ... Herstmonceux the WGS84 coordinates and the Ordnance Survey coordinates differ by 179, 65, and 45 metres in longitude, latitude and height." Jay Pasachoff

From: Dale Ireland <direland@drdale.com>

Hi, I am not sure how many GPS models this applies to, but my Garmin has selectable map data types, maybe 40 types. I use the North American datum 1927 which matches the USGS maps rather than the WGS84. It also has Ordnance Survey Great Britain that you mentioned. Dale

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

Excellent point! Can anyone provide me with the details or an algorithm to convert coordinates from the IAU spheroid to WGS 84 coordinates and the inverse?

It might be useful to also include WGS 84 coordinates in future eclipse bulletins. - Fred Espenak

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

Most GPS units have a USER datum where you can enter whatever map datum you want, as long as you have the proper transformation coordinates.

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

I have actually verified this by experimentation.

When in London (after SEC2000) I took a walk up the hill to Greenwich with GPS in hand.

I found the zero meridian (WGS 84) - looking down from the observatory towards the Thames it is slightly down the hill on your right. I then switched to the UK co-ordinate system and walked back - and can report that Greenwich is indeed on that zero meridian. But as far as total eclipses are concerned - I think this level of accuracy is for purists only as other sources of error are greater. For 99.9% of observers, WGS 84 should suffice. Anyway, I don't think that GPS receivers support the IAU spheroid, which is what Fred uses to determine his co-ordinates. I would be interested to know which of the GPS datums corresponds most closely to the IAU spheroid though, and I might use that one! Peter Tiedt

From: <JohnLX200@aol.com>

Excellent! I propose a toast to GPS84, the de-facto geographic coordinate datum standard of gadget freaks and TSE chasers worldwide! John Hopper

No sign of new GPS arriving yet, but:

Yellow fever certificates in hand.

Bags starting to get packed!

One rabies shot to go.

Equipment set?

Psyched!

>O<

From: Glenn Schneider <gschneider@mac.com>

Fred, et al., Let me point you to an excellent public domain program called DTCC4 (Datum Transformation and Coordinate Conversion), distributed WITH the source code from the National Imagery and Mapping Agency. The main page for their "NIMUUSE" S/W is at:

http://www.nima.mil/geospatial/SW_TOOLS/NIMAMUSE/

and a description of the DTVV4 program at: http://www.nima.mil/geospatial/SW_TOOLS/NIMAMUSE/doc/apps/dtcc4_ug/

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dtcc4_ug.htm

I'm sure, but haven't looked at it myself yet, that you can extract the specific transformation to WGS 84 from the code. There is a technical note in th user documentation which says: "Datum transformation method uses standard Molodensky formulas. Refer toDMA Technical Report 8350.2"

You might be interested in seeing: <http://www.anzlic.org.au/icsm/gdatm/molodens.htm> which summarized a specific transformation, but it looks like all that is needed is a different set of parameters for a different transformation

And, also: <http://www.mentorsoftwareinc.com/freebie/FREE0199.HTM>, Cheers, -GS-

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

Don't know if this is necessary ;-)

I received the following reply to my post on sci.geo.satellite-nav

----8<-----

Unless you are a geodisist, consider the IAU ellipsoid identical to the GRS 80 ellipsoid referenced by WGS84.

Ref: <ftp://lareg.ensg.ign.fr/pub/itrf/WGS84.TXT>

In general the ITRS (and its relaizations ITRFyy) are identical to WGS84 at one meter level.

Meanwhile there are two types of WGS84 realization:

- old realization based on U.S. Navy Navigation Satellite System, commonly known as DOPPLER Transit, and provided station coordinates with accuracies of about one meter. With respect to this realization we published, some years ago, transformation parameters between ITRF90 and this Doppler realized system:

Parameters from ITRF90 to WGS84-Doppler realized system

UNITS	T1	T2	T3	D	R1	R2	R3	(")
----->	(m)	(m)	(m)	(m)	(ppm)	(")	(")	(")
-----	0.060	-0.517	-0.223	-0.011	0.0183	-0.0003	0.0070	

- New realizations of WGS84 based on GPS data, such as WGS84(G730 or G873). These new WGS84 realizations are coincident with ITRF at about 10-centimeter level. For these realizations there are no official transformation parameters. This means that one can consider that ITRF coordinates are also expressed in WGS84 at 10 cm level.

It doesn't help me much, but may help the more technical in the group ;-)
Peter Tiedt



GENERAL TOPICS

From: Peter Tiedt <rigel@stars.co.za> To: Solar Eclipse Mailing List <SOLARECLIPSES@AULA.COM> Sent: Saturday, May 26, 2001 8:28 PM Subject: [SE] GPS time out by 13 seconds?????

HI all, An excerpt from the following site - dealing with leap seconds

-- snip ---

<http://tycho.usno.navy.mil/leapsec.html>

The Global Positioning System (GPS) epoch is January 6, 1980 and is synchronized to UTC. GPS is NOT adjusted for leap seconds.

As of 1 January 1999,

TAI is ahead of UTC by 32 seconds.

TAI is ahead of GPS by 19 seconds.

GPS is ahead of UTC by 13 seconds.

--- end snip ---

Does this blow the recent discussion viz a viz GPS timing right out of the water? 13 seconds is a significant error! Or have I got something wrong? Peter Tiedt

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

Part of the almanac GPS receivers download from the satellites include the GPS time correction. Receivers adjust GPS time by 13 s (or whatever the exact value will be on 6/21/01) and give you UTC.

From: Joel M. Moskowitz, M.D. <moskowi@attglobal.net>

The GPS system has a cycle limited by some multiple of 2 in regards to the number of days that has elapsed since 1/6/80. The system has been reset (about 2 years ago?) . Log onto the website of your GPS manufacturer to get the instructions of how to reset your GPS receiver (it may be only removing the batteries for a time, then re-downloading the satellite data). This will take care of all the reset data. Joel M. Moskowitz, M.D.

From: Michael L. Gorodetsky <gorm@hbar.phys.msu.su> To: <solareclipses@Aula.com> Sent: Wednesday, May 16, 2001 5:56 PM Subject: [SE]

Ancient & early medieval eclipses in european sources

I want to invite everybody interested in historical eclipses to look at my virtual catalogue of ancient and medieval observations of solar and lunar eclipses:

<http://www.pereplet.ru/gorm/atext/ginzele.htm>

My aim was to collect as complete catalogue of quotations about eclipses as possible, and not only those that are interesting for astronomical or historical purposes. I would like to hear your opinion and suggestions and would be very glad if you could help me fill still many free cells in the table. Of course, the plan is to move ahead beyond the 600ad.

I have also composed the catalogue of eclipses in russian chronicles (letopises), however it is of course in russian.

<http://www.pereplet.ru/gorm/atext/russian.htm>

I've also collected links to the articles on ancient astronomical observations, available through internet.

<http://www.pereplet.ru/gorm/eclipse.htm>, Michael L. Gorodetsky

GENERAL TOPICS

From: Patrick Poitevin <patrick_poitevin@hotmail.com> To: SE Mailing List <SOLARECLIPSES@AULA.COM> Sent: Monday, May 14, 2001 8:59 PM Subject: [SE]

Lecture at Totality Day 11 August 2001

Dear All, Please find herewith the updated list of the lectures for Totality Day on 11 August 2001 in the Open University of Milton Keynes. Prof. Richard Stephenson, who had to cancel for SEC2000 due to illness, is trying to cancel an Asian trip and will confirm soon his presence at TD2001.

If you want to give a lecture as well, please let us know. TOTALITY DAY 2001



11 August 2001 - Open University of Milton Keynes, England

TOTALITY DAY will be organised after each total solar eclipse. To give the participants the time to evaluate their data, TOTALITY DAY will be one or two months after a total solar eclipse. To avoid confusion with the Solar Eclipse Conference, Totality Day is a one-day meeting. Three main subjects will be lectured and the remaining time of the day will be completed with short lectures and presentations about the last total solar eclipse.

We are pleased to announce that we have been able to arrange TOTALITY DAY 2001. Totality Day 2001 will be on Saturday 11 August 2001 in the Berrill Lecture Theatre of the Open University of Milton Keynes, England. Doors open at 8h00, closing at 20h00 and lectures from 10h00 to 12h00 and from 14h00 to 18h00. At lunchtime, the Berrill Cafe will be open from 12h00 to 14h00 where sandwiches and drinks can be purchased.

We have invited three guest speakers, to give a lecture on their own specialised subject. These three lectures are expected to last maximum 45 minutes and the smaller presentations from others to last maximum 15 minutes. We are currently waiting for a few final confirmations but herewith some names in alphabetical order: Dr. Francisco Diego, Henrik Glintborg (Denmark) Dr. Edward Hanna, David A. Hardy, Assoc. Prof. James R. Huddle (USA), Prof Ken J. H. Phillips, Dr. Barrie W. Jones, Prof. F. Richard Stephenson, Sheridan Williams. A final programme will be available soon.

The Open University is central located in England and has a wonderful theatre that can hold 300 participants. All technical facilities are available for the lectures. There will be large display areas, where everyone can present any interesting collections. This area is also dedicated for trade stands. If you want to present something about the 2001 Total Solar Eclipse, present a poster, or want to trade related to solar eclipses, please let us know. Thanks to the Open University of Milton Keynes, more particularly Dr. Barrie Jones, attending TOTALITY DAY 2001 is free of charge. It is necessary to make prior arrangements with us if you wish to make a presentation, lecture, or poster display.

It will be possible to meet from Friday evening. No official solar eclipse activities, though, an informal meeting in Milton Keynes. Saturday night, after Totality Day 2001, as well. No official activity either, though, it is the intention to have dinner together. Please contact us for more details on accommodation and the leisure program.

If you require any further information please do not hesitate to contact us for the latest update.
Patrick Poitevin - Joanne Edmonds

From: <Jay.M.Pasachoff@williams.edu> To: <SOLARECLIPSES@AULA.COM> Sent: Friday, June 01, 2001 3:57 AM Subject: [SE]

SolarMax IMAX Movie

Boston, May 31: I have just returned from the local IMAX theatre where I saw a magnificent and exciting movie entitled SolarMax. It is a huge-screen movie about the sun, covering topics from the Incas and sun-worship through results from the spacecraft SOHO and TRACE. The multi-story images of the sun at eclipses and from space are spectacular. Call your local science museum that has IMAX to ask them to carry the movie. You can read about it at www.solarmovie.com.

Jay Pasachoff

GENERAL TOPICS

From: Milo Grootjen <grootjen@artis.nl> To: <solareclipses@Aula.com> Sent: Wednesday, May 16, 2001 11:20 AM Subject: [SE]

Eclipses glasses

Hello, A question. I work at the Amsterdam planetarium and sometimes people ask for a pair of eclips glasses for the eclips of th 21st of June. Now, I still got some in storage of the 1999 eclips. My question is, are those glasses still save to use (they are never used)? I have heared that the material has a certain lifetime. Does anybody know how long this is? Thanks, Milo



From: Kidinvs@aol.com

Your eclipse glasses should be just fine for use. As long as the material is not cracked, and does not show any sign of mis use ie... holes.. they should be fine...PROVIDED that they were of good quality in the first place!! The life of polymer or mylar is at least 5 years. Eric

From: F.Podmore <podmore@science.uz.ac.zw>

I agree with Eric Brown. Some viewers I have in the Collection I put on display at the Solar Eclipse Conference last October have "Lifetime five years" printed on the cardboard frame, but I can't recall whether that was for the silver/mylar type or the black polymer type, or both. I'll check when I get home.

It would be Very helpful if someone like Ralph Chou could carry out a study over time of both kinds, and the Baader film type, and see if there is any evidence of corrosion or any other kind of decay over time.

Mark Margolis may have more on this - Mark: How long has Rainbow Symphony been making solar filters?? Any evidence of degradation? Francis Podmore

From: Mark <rainbowsymphony@rainbowsymphony.com>

Actually sent a message off to Milo this morning. We still have viewers/glasses that we produced over ten years ago that are as good as the day they where produced. I have seen no change in the optical clarity or any deterioration in the black polymer films or aluminum coatings on the polyester. The aluminized polyester is double coated and then laminated face to face with an optically clear adhesive so nothing can touch the coated surfaces. We would still advise that each viewer be checked for holes, separation from frames etc. before each use. Best To All, Mark S. Margolis, Rainbow Symphony, Inc.

From: Dale Ireland

So what is the mechanism of degradation that limits life to 5 years? Abrasion?, oxidation?, UV breakdown?, gamma rays? Dale

From: Mark

The "Solar Viewers" are great. They have a 2" X 4" lens of T-2 Optical Glass. It's the same material as the high end filters used on Telescopes, binoculars and cameras. My personal viewing device of choice. We have sent many out to folks in the group. Mark, Rainbow Symphony, Inc.

From: Felix Verbelen <gd32020@glo.be> To: <SOLARECLIPSES@AULA.COM> Sent: Friday, May 25, 2001 3:58 PM Subject: Re: [SE]

Saros/Inex number system

Dear umbraphiles, I'm looking on information about the Saros number system and, if it exists, the Inex (= 358 synodic months) number system. Could anyone, please, explain me how the different Saros (and Inex) series are numbered? Which is the algorithm to attribute these numbers to the different eclipses? I think that I could find this information in "Periodicity and Variations of Solar (and Lunar) Eclipses" by Van den Bergh but this book is difficult to get (it's out-of-sell).

Hello. Maybe you got the right answers in the meantime, but otherwise this might help: <http://user.online.be/felixverbelen/cycles.htm> Kind regards. Felix Verbelen

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From: FRED ESPENAK <u32fe@lepvax.gsfc.nasa.gov> To: <SOLARECLIPSES@AULA.COM>; <eclipse@hydra.carleton.ca> Sent: Wednesday, May 30, 2001 4:24 PM Subject: [SE] SENL May 2001 NOW ONLINE!

Joanne Edmonds has prepared another great issue of the SENL (Solar Eclipse Newsletter). The May 2001 issue (Parts A & B) contains lots of recent messages about the upcoming June eclipse in Africa so check it out. The issue is online in pdf format and can be accessed via the SENL index page of MrEclipse.com:

<http://www.mreclipse.com/SENL/SENLinde.htm>

Other recent issues currently linked from the above page include:

SENL - August 2000 (Old Format, 65 Kb pdf file*)
 SENL - September 2000 (Old Format, 93 Kb pdf file*)
 SENL - October 2000 (Old Format, 62 Kb pdf file*)

SENL - November 2000 (1.4 Mb pdf file*)
 SENL - December 2000 (995 Kb pdf file*)
 SENL - January 2001 Special A (1.2 Mb pdf file*)
 SENL - January 2001 Special B (0.9 Mb pdf file*)
 SENL - January 2001 Special C (1.1 Mb pdf file*)
 SENL - February 2001 Part A (1.0 Mb pdf file*)
 SENL - February 2001 Part B (1.1 Mb pdf file*)
 SENL - March 2001 (1.1 Mb pdf file*)
 SENL - April 2001 Part A (1.3 Mb pdf file*)
 SENL - April 2001 Part B (0.9 Mb pdf file*)
 SENL - May 2001 Part A (1.0 Mb pdf file*)
 SENL - May 2001 Part B (1.3 Mb pdf file*)

Note that all these files are in Adobe pdf format and can only be read with Adobe Acrobat Reader. This software is free and can be downloaded from Adobe's web site (<http://www.adobe.com/>).

The old format issues have no color, no figures or photos while the newer issues contain graphics, photos and illustrations.

Thanks for the hard work Joanne! Clear skies in Africa! - Fred Espenak

From: <KCStarguy@aol.com> To: <undisclosed-recipients:;> Sent: Wednesday, May 30, 2001 1:19 AM Subject: [eclipse]

eclipse sighting Witchblade on tuesday 3/27

On the movie Witchblade on tuesday 3/27 on WBN channel

the movie starts out with the sun rising in eclipse on Nov 3, 2000. The limb shows the sun about to be eclipsed (for totality)?

Later on the woman policeman is lying in bed dreaming and a sequence shows of totality and prominences erupting. Dr. Eric Flescher (KCStarguy@aol.com)

From: <KCStarguy@aol.com> To: <eclipse@hydra.carleton.ca> Sent: Saturday, May 26, 2001 4:39 PM Subject: [eclipse] **why eclipse chasing?**

I will be doing an article about "Why people chase eclipses?" Anyone who wants to contribute their ideas and comments can email me directly. This can also be posted on other listserves, sent to websites, friends etc.

Please send to Dr. Eric Flescher (KCStarguy@aol.com)

Name :

Town/City/Country etc:

email address:

Why people chase eclipses? my comments

I give permission to Dr. Eric Flescher (KCStarguy@aol.com) to use my comments etc in an article if it meets specifications etc signed (just place your name and email address) thanks

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From: <Jay.M.Pasachoff@williams.edu> To: <solareclipses@aula.com> Cc: <Jay.M.Pasachoff@williams.edu> Sent: Wednesday, May 02, 2001 1:53 PM Subject: [SE]

Donald H. Menzel Centennial Symposium

On Friday, May 11, at the Harvard-Smithsonian Center for Astrophysics, there will be a scientific/historical symposium to celebrate the 100th anniversary of the birth of Donald H. Menzel (1901-1976). Menzel was one of this country's foremost and first astrophysicists. He reached astronomical fame with his massive and erudite analysis of eclipse spectra of the solar chromosphere, published in 1931. He designed a number of innovative eclipse observing devices, including the "jumping-film spectrograph."

The symposium is described at cfawww.harvard.edu/menzel.

Menzel's book "Our Sun" (last revised in 1959) remains a readable introduction to the sun. His "Peterson Field Guide to the Stars and Planets" (1963) was taken over by me at the request of the family and the publisher by me in 1983, 1992, and 2000. Menzel was the author of hundreds of scientific papers about the sun, gaseous nebulae, atomic physics, and other topics. His prediction that hydrogen should have an isotope of mass 2 led to the discovery of deuterium. His catalogue of planetary nebulae includes Menzel 3 (Mz 3), in recent months the widely circulated image from the Hubble Heritage Program. For an image, see <http://oposite.stsci.edu/pubinfo/PR/2001/05/index.html>.

Menzel observed 15 total eclipses and 1 partial eclipse. I am speaking at the symposium on May 11 about "Menzel and Eclipses." In view of the recent discussion on this eclipse list about how to print out and use eclipse-path programs, I wonder if anybody would volunteer to make a compound map showing all the eclipses that Menzel viewed. Such a person could correspond off line with me at jay.m.pasachoff@williams.edu. That account gets only text; any maps can be sent simultaneously to smartin@williams.edu and to eclipse@williams.edu.

A second generation effect could be marking the place along the path where Menzel was.

June 8, 1918 Evergreen, Colorado
 September 19, 1923* Catalina Island, California
 April 28, 1930 Camptonville, California
 August 31, 1932 Freyburg, Maine
 June 19, 1936 Southwestern Siberia (Ak Bulak), USSR
 July 9, 1945* Canada
 June 30, 1954 Minneapolis-St. Paul, Minnesota
 October 2, 1959 right over the Atlantic coast of Massachusetts
 February 15, 1961 Northern Italy
 July 20, 1963* Orono, Maine
 May 20, 1966 Athens, Greece
 November 12, 1966 Arequipa, Peru
 February 7, 1970 Miahuatlan, south of Oaxaca, Mexico
 July 10, 1972 Prince Edward Island, north coast, Canada
 June 30, 1973 western Mauritania
 December 24, 1973 (annular) Pacific coast of Costa Rica.

* cloudy

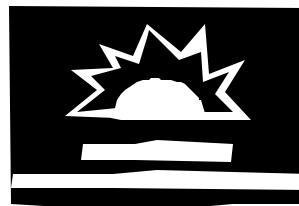
From: Bob Morris <morris@sce.carleton.ca>

May 20, 1966 Athens, Greece

Oops! On the "Athens-Cape Sunion Road", about midway between the two places. (I was there too! See Menzel's report, and my photos, Sky & Tel, pp. 80-83, August 66)

February 7, 1970 Miahuatlan, south of Oaxaca, Mexico

Oops! March 7, 1970 (I was in Cape Charles, VA.) Bob Morris



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From: <Rayabrooks2@cs.com> To: <SOLARECLIPSES@aula.com> Sent: Saturday, May 05, 2001 3:47 PM Subject: [SE]

Missed eclipse

I read in Astronomy magazine or an eclipse book that a noted astronomer in the 1800's lead a science party to I think it was Africa and they were outside the path of totality. I think he chaired a Great Britain University.

From Wil Carton: Friends, I remember to have read this about the solar physicist Evershed who studied the fountainous movement of solar gas above solar flecks. I am not sure, but thought that his expedition meant to observe the TSE of 28 May 1900 within the totality belt across the United States, but made a positional error and appeared to be outside the pathlimits. So they missed totality.

Patrick, To the SE-mailing list here a detail from S.A. Mitchell "Eclipses of the Sun", as a better answer to the posting "missed eclipse":

Successful photographs of the flash spectrum were secured by Fowler and Lockyer, and also by Dyson at Ovar, and Evershed in Algeria. Evershed had selected his station so that it might be as near as possible to the edge of the band of totality in order that the photographs of the chromosphere might be obtained in high solar latitudes. Unfortunately, through an error in the Nautical Almanac, Evershed found himself just outside, instead of barely inside, the path of totality. The series of photographs obtained, however, were of fine definition and were specially valuable in affording a means of comparison with photographs of the flash spectrum which have usually been taken of the sun near its equator. This comparison shows that the spectrum of the chromosphere is the same at the sun's polar regions as at low latitudes, and it appears fairly certain that the spectrum of the sun's limb is as constant in character as the ordinary Fraunhofer spectrum. In this connection it should be borne in mind that Evershed's photographs showed the flash spectrum where the moon was practically at grazing incidence with the sun, and consequently the layer of the chromosphere photographed must have been very close to the edge of the photosphere.

From: Bob Morris <morris@sce.carleton.ca> To: SE from LRM <solareclipses@Aula.com> Sent: Saturday, May 19, 2001 4:41 AM Subject: [SE]

My 1966 eclipse expedition!

I have just recovered my passport re my "expedition" to see the May 20, 1966 eclipse.

I was a Ph.D. student in London and booked train passage via a student travel service. I had previously seen the July 63 eclipse in Quebec and had never been to Greece. This was a good excuse.

Here is my iterinary as reconstructed from my passport:

Leave London 14 May 1966 via train.

Arrive Ostend 14 May by boat.

1/2 day stopover in Munich.

Transit Yugoslavia 16 May by train.

Arrive Greece 17 May.

Leave Greece 2 Jun

Transit Yugoslavia 2 Jun

Arrive Dover 4 Jun.

My most interesting story (at the time) was this, which I still tell to my non-astronomer friends: A couple of days after the eclipse we took a boat to Crete. In those days the poor man's section was sexually segregated.

While strolling the deck we saw in the rich, un-segregated section a handsome obviously American blonde hunky guy with his

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wife and two kids.

While strolling around Heraklion, the capital of Crete, we kept on running into this guy. I suspected that my wife and I, and this guy and his family, were the only tourists there!

I almost asked him to take a picture of my wife and I, and was tempted to ask him whether he had seen the eclipse.

In any case, I never did say hello to him.

A couple of weeks after getting back to London we went to see a movie, Inside Daisy Clover.

The stars were Natalie Wood, Christopher Plummer, and an actor then unknown to me, who was the guy I had seen in Crete: Robert Redford!

About twenty years later, I read a bio of Redford which indicated that he had been travelling Europe at the time.

I wrote a letter to him at Sundance Ranch, telling him my story and asking for an autographed picture for my wife.

Six months later, the picture arrived (with an apology for the delay) inscribed "To Joanne from Robert Redford."

What I did not tell him was that the wife I had travelled to Greece with was a different one. :-) Bob Morris

From: Gale, George <GaleG@UMKC.EDU> To: <HASTRO-L@WVNVM.WVNET.EDU> Sent: Friday, May 04, 2001 6:00 PM Subject: FW:

New online guide for HPS,T,M

(Please forward to other lists as appropriate.) Do you or your students need a free user-friendly guide to virtual resources in history & philosophy of science, technology and medicine? If so you can now find one at: <http://www.humbul.ac.uk/vts/hps/index.htm>

This is the recently launched on line tutorial 'Internet for History and Philosophy of Science' prepared by James Sumner, a PhD student at the University of Leeds, as one of 29 new such 'virtual training suites' supported by the Resource Discovery Network for HUMBUL in a wide range of disciplines. A complete list of these suites with hyperlinked gateways can be found at <http://www.vts.rdn.ac.uk/>

The complete range humanities suites - including specialist tutorials for History and for Philosophy - can also be accessed at <http://www.humbul.ac.uk/vts/>

Graeme Gooday Dr Graeme Gooday Associate Director(History & Philosophy of Science) LTSN Philosophy & Religious Studies Subject Centre School of Philosophy, Division of HPS University of Leeds Leeds LS2 9JT, UK e-mail g.j.n.gooday@leeds.ac.uk Tel: 0113 233 3274 Fax: 0113 233 3265 <http://www.prs-ltsn.leeds.ac.uk/>



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From: Govert Schilling <mail@govertschilling.nl> To: <SOLARECLIPSES@AULA.COM> Sent: Saturday, May 12, 2001 5:03 PM Subject: [SE]

Next TSE for any country

Very often, people ask questions like 'When is the next total eclipse in country x or in city y?' I am wondering if someone knows about a website where all the world's countries and their major cities are listed, with information per entry on the next expected total solar eclipse(s). --Govert Schilling

From: Jean Meeus <JMeeus@compuserve.com>

I have searched for the last and the next total solar eclipses visible in every country. The list will be published in my next book, a sequel to my "Mathematical Astronomy Morsels" to be published by Willmann-Bell, I hope in early 2002.

So, sorry, I cannot divulge that list for the moment.

To the 192 "official" states, I added several areas which I call "pseudostates". This seemed necessary. For instance, Antarctica is not a "state", but it would be odd not to include that continent in the list. Also, it appears that Greenland is not a state but is "part" of Denmark. But who will say that he is going to Denmark when actually he is going to Greenland? Or who would say he is going to France when actually he is making a trip to New Caledonia in the Pacific Ocean? That would be very misleading.

I did NOT, however, calculate the last/next TSE for big towns. That looked as an 'impossible' job : which towns? Cities with more than 2 million people? And how should those populations be counted? Including the town's suburbs? Jean Meeus

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

Radio amateurs, with our "DXing" (making contact with a rare location) have this problem. Following some fairly arcane rules dealing with geography, politics and other matters, we have come up with a list of over 300 "entities", which, for amateur radio purposes, we choose to call "countries". Jan has enough problems if he means to list the TSE's for such UN member countries as Nauru, let alone Kerguelen Island, which for amateur radio purposes is a "country". Gerry K8EF

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

I'm actually working on something along these lines. I hope to have it up sometime in the coming months. - Fred Espenak

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

Emapwin's Search Mode, Site/Mag., Set Longitude, Latitude and Altitude (Be sure to change Mag. to 1.0 if you only want TSE) does this job quite nicely. If you want to pick up deep annulars and close by TSE's, set Mag. to .95 or so (as I did last December when someone asked this information for Los Angeles, which covers a larger area than the CIA map city dot). You don't have to know the latitude and longitude; you can use a zoomed CIA map and click on the location you want to get it. For small countries or those with a not too elongated shape (such as U.S. lower 48, India or Australia), search on a point near the geographic center with an appropriate magnitude (.6 works for the above 3 examples) and you should get all the TSE's near the borders. Only a few countries should require a lot of trial and error to make sure you get everything. Chile comes to mind as a probable worst case, but everyone on this list probably knows about 2010, 2019 and 2020 already.



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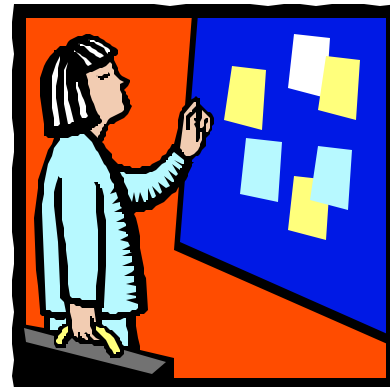
From: Patrick Poitevin <patrick_poitevin@hotmail.com> To: SE Mailing List <SOLARECLIPSES@AULA.COM> Sent: Tuesday, May 08, 2001 10:33 PM Subject: [SE]

Up to date status of the SEML

Dear All, The SEML started 10 December 1997. Today we have over 300 subscribers. The amount of subscribers has been between 270 and 300 since the last total solar eclipse of August 1999. Since two weeks we are over the limit of 300.

The subscribers are out of 40 different countries. Please let me share the basic figures of earlier this week when the number was 300. More details in one of the next Solar eclipse newsletters.

USA 86
 Belgium 32
 The Netherlands 25
 UK 25
 France 24
 Germany 20
 Canada 9
 Australia 7
 Spain 6
 Denmark 5
 Italy 5
 Hungary 4
 India 4
 South Africa 4
 Switzerland 4
 Austria 3
 Sweden 3
 Turkey 3
 Venezuela 3
 Colombia 2
 Czech Republic 2
 Ireland 2
 Poland 2
 Thailand 2
 Zambia 2
 Zimbabwe 2
 Argentina 1
 Bolivia 1
 Costa Rica 1
 Finland 1
 HongKong 1
 Japan 1
 Korea 1
 Mexico 1
 Nigeria 1
 Norway 1
 Qatar 1
 Romania 1
 Russia 1
 Sri Lanka 1



Different countries 40. Number of subscribers 300

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... and ... keep those solar eclipse related messages coming. Best regards, Patrick
From: Patrick Poitevin <patrick_poitevin@hotmail.com> To: SE Mailing List <SOLARECLIPSES@AULA.COM> Sent: Thursday, May 10, 2001 9:28 PM Subject: [SE] Updated SEML Welcome

Dear All, Although most of you do not read the <SEML Welcome> or <From the List Owner> barely or partly, please find below the updated SEML Welcome which every new subscriber receives. Whenever an update, the entire SEML does receive the text (see below). So no surprises. Save the message in your directory.

Please take the time to read and try to utilise the SEML as such. Thank you ever so much for all your support, contributions and ... friendship.

... and ... keep those solar eclipse related messages coming!

Any comments? Please send them to me and NOT to the entire SEML. Thank you.

The Solar Eclipse Mailing List

The Solar Eclipse Mailing List (SEML) is an electronic newsgroup dedicated to Solar Eclipses. Published by eclipse chaser Patrick Poitevin (patrick_poitevin@hotmail.com), it is a forum for discussing anything and everything about eclipses.

Thanks to the voluntary efforts of Jan Van Gestel of Geel, Belgium, the Solar Eclipse Mailing List (listserver) has been in operation since 10 December 1997. This is the first mailing list devoted solely to topic of solar eclipses on the internet.

You can send an e-mail message to the list server solareclipses@Aula.com, which will then forward your e-mail to all the subscribers on the list. Likewise, you'll receive e-mail messages that other subscribers send to the listserver. Only subscribers can send messages.

Status after 3 years and 5 months: 301 subscribers out of 40 different countries.

Countries: Argentina, Australia, Austria, Belgium, Bolivia, Canada, Colombia, Costa Rica, Czech Republic, Denmark, Finland, France, Germany, HongKong, Hungary, India, Ireland, Italy, Japan, Korea, Mexico, Nigeria, Norway, Poland, Qatar, Romania, Russia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Thailand, The Netherlands, Turkey, UK, USA, Venezuela, Zambia, Zimbabwe.

Main purpose of this Solar Eclipse Mailing List is to share information between all Solar Eclipse enthusiasts. Our objective is to permit and encourage world wide contacts among eclipse observers, calculators, scientists, ancient researchers, etc. It is a media where you can send questions, answers, items wanted, items for sales, announcements, reports, observations, discussions, information, introductions, etc. All topics should be related to Solar Eclipses. No commercial advertisements are allowed.

Do not send large files. For the convenience of the subscribers, there is an automatic filter on the size of the messages. Send plain text, not in html or any other format. Watch your settings. No attachments at all. The language is English. Unsubscribe during your holidays or do not use auto replies or confirmation of receipts. Do not send <Thank You> messages to the entire list. Personal messages should not be send to the whole list. Problems with WebPages or private e-mail addresses, info about virus files or any other non-solar eclipse related messages are not allowed on the SEML. Do not get on and on about certain topics. It might bore the other SEML subscribers after a while.

If you want to publish pictures, graphs or your reports about solar eclipses, please send them to joanne_edmonds@hotmail.com. Joanne is the editor of the Solar Eclipse Newsletter. Your contribution will be published in the monthly Solar Eclipse Newsletter (SENL). The SENL (since November 1996) is available on the internet and can be downloaded free of charge. See: <http://www.MrEclipse.com/SENL/SENLinde.htm>

Besides the Solar Eclipse Newsletter, where all SEML messages (and solar eclipse related messages of other mailing lists of

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course) are captured, the archive of the SEML messages can be found on: www.astroarchive.com

All subscribers automatically give the permission to archive the messages being sent. If you decline, please write your copyright on the bottom of each message. The non-copyright messages are regarded as public domain and imply your silent consent to include such messaging in the archive or Solar Eclipse Newsletter. If you feel this is wrong or you have changed your mind, please contact the list owner. If you use information or messages from the SEML in any correspondence, article, paper or lecture, please mention the SEML and how to subscribe.

It is never the intention to announce the addresses of the members. If you are looking for somebody, write a message to the list owner and the contact person will be informed. A list of the subscribers is not available to the members. In this case we avoid junk mailers. Again: Only subscribers can send messages to the Solar Eclipse Mailing List.

The Solar Eclipse Mailing List is for 99.9 percent safe for virus files or messages. The server is updated twice a week with the latest virus scans. Thanks to Jan Van Gestel of eMailMasters.com

If you change your e-mail address, please unsubscribe with your old address and re-subscribe with your new address. If you have problems, please feel free sending a message to the list owner.

The Solar Eclipse Mailing List is maintained by the list owner Patrick Poitevin (patrick_poitevin@hotmail.com). It is the right of the list owner to put a subscriber on READ ONLY or even abandon complete from the list.

Keep those solar eclipse messages coming! Best regards, Patrick, Patrick Poitevin, patrick_poitevin@hotmail.com

From: F.Podmore <podmore@science.uz.ac.zw> To: <solareclipses@aula.com> Sent: Saturday, May 12, 2001 6:21 PM Subject: [SE] **Using binoculars and telescopes for TSE**

Please forgive me if I've overlooked this information in whatever websites or books that have the answer, but...

1. Can I watch the partial phase of the SE with BINOCULARS provided I cover both objectives with card or thick paper which has a hole no larger than 1 cm by 1 cm (or 1 cm diameter) cut in it, which is firmly covered by one 'lens' of a standard commercial solar viewer? And this mask must be taped firmly to the binos. AND remove the masks during totality - ONLY.

Is that aperture size about right? Should it vary with size of bino lens?

Should the hole be in the centre of the objective, or off axis? Why?

2. What are the guidelines for aperture size and position for TELESCOPES of various diameters?

Thanks for the advice I expect to get :) I've not seen a TSE yet!! Francis

From: Marc Weihrauch <marc.weihrauch@student.uni-halle.de>

Dear Francis, Well, what I do is get a piece of filter film as it could be used for a telescope. With the Baader film comes an instruction (email me if you want that) how to build a filter for binoculars - that type uses full aperture, and it really stays where it's supposed to. I've been using this kind of filter for months now with my small 8x30 bino (still my only telescope) to watch sunspots. Not much detail, but better than nothing; so it's even useful when there's no eclipse.

I hope this helps. Marc

From: Marc Weihrauch <marc.weihrauch@student.uni-halle.de>

Dear Johanna, You can read the English general instruction at

http://www.baader-planetarium.de/bauanleitung_e.htm

This refers to larger telescopes as well.

There was another instruction especially for binoculars which is too long for posting here, so I'll email it to you in the next days (and to anyone interested). This second way seems even simpler and is totally safe, too.

The reason to reduce aperture with a larger telescope is to avoid turbulence in the tube. This is not a problem with binos, so you can use full aperture here. Best wishes, Marc

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From: Marc Weihrauch <marc.weihrauch@student.uni-halle.de> To: Finsternisliste <solareclipses@aula.com> Sent: Tuesday, May 22, 2001 10:51 PM Subject: [SE]

Strawhat crescents

Dear shadow-chasers, here's a question of highest scientific interest (oh, well...):

What does the optimal eclipse strawhat look like? What diameter and distance should the holes have?

I know, this is a weird question, but perhaps someone cares to answer, anyway? And in fact, there really is some physics behind this question: Under which conditions does the pinhole-effect image the solar crescent? Best wishes for June! Marc

From: Govert Schilling <mail@govertschilling.nl>

Marc: My experience is that a hole of about a millimeter works fine. Smaller holes produces sharper, but dimmer images. Larger holes produce brighter, but fuzzier images. As for the distance between the holes: this depends on the distance between the hat and the projection screen (usually the ground). The larger this projection distance, the larger the images, and the earlier they will start to overlap. Which isn't that bad, since it's a nice sight. If you're after one single projected image, just use a piece of cardboard with a hole punched in it. If you use a strawhat or something like that, just enjoy the view of many overlapping crescents... --Govert

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

Mark, Who knows, who cares? It is just a magical part of attending an eclipse. Everywhere the sunlight finds a little hole it makes a crescent on the ground (or the nearest object). I will scan a photo from the Feb 1999 annular and send to you at your personal email (may take a day or two - I've got to find them). I was near some trees and the dappled shade turned into dappled crescents and at annularity into little rings (no photo of this, as both cameras on tripods pointed, naturally, at eclipse!). Don't worry about the diameter of the hole - enjoy the experience. Odille Esmonde-Morgan

From: Mike Simmons <msimm@ucla.edu>

Here are two photos of crescent solar images taken after totality in Iran in 1999.

The first is from random "pinholes" made by the needles of a pine tree with the crescents projected onto concrete: http://webpages.charter.net/msimm/Iran/Eclipse99/Eclipse_pictures/Eclipse19.htm

The second is intentional, multiple pinholes made in an eclipse related brochure about an exhibition in Esfahan: http://webpages.charter.net/msimm/Iran/Eclipse99/Eclipse_pictures/Eclipse20.htm Mike Simmons

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

For another photo of pinhole eclipse crescents, see the image posted at:

<http://www.MrEclipse.com/Totality/TotalityCh12-4.html#Pinholes>

I took this photo of Pat Totten in Australia ten minutes or so after annularity on 1999 Feb 16. Pat was standing under a shade tree and she was covered with hundreds of crescents filtering down through the leaves above. Wish I had thought to shoot video of it! - Fred Espenak

From: Eric Pauer <pauer@bit-net.com>

During the 1998 total solar eclipse in Aruba, a school teacher in our group was wearing a dress with a pattern of small holes in it on E-day. In the gusty winds after totality, we noticed that these holes served as effective apertures to produce some nice little crescent suns on the ground. The pattern in her dress yielded crescents in groups of nine. I took a photo and some video footage of the effect. The photo is on-line near the bottom of the following page:

<http://www.bit-net.com/~pauer/eclipse98/eclipse98.html> Regards, Eric

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